BINDER NO. WBNEQ-MOT-004 PLANT WBN UNIT(S) 1 SHEET 1 OF 29

BINDER TITLE LOUIS ALLIS - INDUCTION MOTORS - OUTSIDE CONTAINMENT

COMPUTED [illegible] DATE 8/23/86 R ___ R ___

CHECKED [illegible] DATE 8/25/86

A. DOCUMENTATION

Equipment Description Squirrel-Cage Induction Motor

Vendor/Manufacturer Louis Allis

Equipment Model No.(s) 3hp, 460VAC, NH7 Insulation System

M.O. Nos. 4-147740 and 4-147745

QUALIFICATION REPORTS

(1) Title/Number/Revision Insulation System Study Class 200°C - Safety Class 1E - 600 Volt A.C. Random Wound Stator (1 x 10^7 Rads Total) M&M Report No. 280B RIMS B71 860512 102 DATE March 26, 1986

(2) Title/Number/Revision Insulation System Evaluation Qualification for Safety Class 1E Normal Service M&M Report No. 282 RIMS B71 860512 104 DATE September 20, 1983

(3) Title/Number/Revision Insulation System Study Class 200 + °C - Safety Class 1E - 600 VAC Random Wound Stator (1 x 10^7 Rads Total) M&M Report No. 280A-1 RIMS B71 860512 101 DATE November 13, 1980

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(4) Louis Allis letter to D. F. Ackerly dated March 26, 1986 (B71 860512 105) TAB E-5.

(5) Louis Allis letter to F. W. Chandler dated April 1, 1986 (B43 8600403 004) TAB E-5.

(6) IEEE paper 32C3-76 and support documentation (proprietary - TAB D-5).

(7) WBN Environmental Dwg. 47E235-48 R3.

(8) Material Aging Calculation WAC-169 (TAB D-6).

(9) TVA Radiation Calculation WBNNAL3-025 R0 (B45 860401 235).

(10) TVA Radiation Calculation WBNNAL3-007 R0 (B45 860626 235).

(11) Nuclear Qualification Report 4-147740-NQR, Rev. A (TAB E-2).

(12) Nuclear Qualification Report 4-147745-NQR, Rev. A (TAB E-3).

(13) System 30 Category and Operating Times-WBNOSG4-008 R10 (B45 860320 224).

(14) TVA Condensation Calculation GENNAL6-002 R1 (B45 851017 235).

(15) TVA Flooding Calculation WBNOSG4-44 R0 (B45 860110 218).

(16) TVA Degraded Voltage Calculation WBP-EVAR 8602001 R0 (B43 860227 901).

(17) Memo to CEB files (CEB 841022 252) (TAB E-5).

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BINDER TITLE LOUIS ALLIS - INDUCTION MOTORS - OUTSIDE CONTAINMENT COMPUTED [illegible] DATE 9/15/86 R ___ R ___

CHECKED [illegible] DATE 9/15/86

B. CONCLUSION OF REVIEW (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 Refer to open items presented in the front of this binder.

1. Obtain revised field verification (Open Item 1)

COMMENTS/RECOMMENDATIONS

BINDER NO. WBNEQ-MOT-004 PLANT WBN UNIT(S) 1 SHEET 3 OF 29

BINDER TITLE LOUIS ALLIS - INDUCTION MOTORS - OUTSIDE CONTAINMENT COMPUTED [illegible] DATE 8/23/86 CHECKED [illegible] DATE 8/28/86 R ___ R ___

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

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

NEMA MG-11982 Motors and Genertors.

IEEE 334-1974 Type Test of Continuous Duty Class 1E Motors.

IEEE 117-1974 Evaluation of Insulating Materials for Random-Wound AC Electric Machinery.

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BINDER TITLE LOUIS ALLIS - INDUCTION MOTORS - OUTSIDE CONTAINMENT COMPUTED [illegible] DATE 8/23/86 CHECKED [illegible] DATE 8/25/86 R ___ R ___

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 Refer to TAB C, Section 3.0 for additional details.

BINDER NO. WBNEQ-MOT-004 PLANT WBN UNIT(S) 1 SHEET 5 OF 29

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R ___ R ___

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Induction Motor	Motorette	TAB C, Sect. 3.1
(2) Manufacturer	Louis Allis	Louis Allis	
(3) Model Number(s)	3hp, 460VAC	NH7 ins. sys.	Qual. Rpt. Title Page
	4-147740 4-147745		
(4) Serial Number(s)	4-147740-001 4-147740-002	NA	Note 1
	4-147745-001 4-147745-002		
(5) Identify Component-Unique checksheet attached:	Supplement 1, Component - Unique Checklist, Motors		

JUSTIFICATION/COMMENTS The equipment provided for the plant consists of complete motor assemblies which includes a random wound stator with the NH7 insulation system. The qualification report documents the motorette testing performed on the NH7 insulation in accordance with IEEE 117-1974. Applicability of the data from the qualification report is dependent solely upon the use of the NH7 system (Louis Allis System P4-9128) in the stator assembly and is independent of the motor horsepower rating.

Note 1: Serial numbers were obtained from Section B of the appropriate NQR report. These reports are in sub-tabs located in TAB E.

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BINDER TITLE LOUIS ALLIS - INDUCTION MOTORS - OUTSIDE CONTAINMENT COMPUTED [illegible] DATE 8/23/86 CHECKED [illegible] DATE 8/23/86 R ___ R ___

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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		NA	
Electrical Connections		NA	
Conduit Seals		NA	
Connector Seals		NA	
Orientation		NA	
Physical Configuration	horizontal shaft	Yes	
Other			

JUSTIFICATION/COMMENTS Refer to TAB C, Section 6.0, Interfaces.

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	No	TAB C, Sect. 3.2
(b) Baseline performance measurements taken	Yes	TAB C, Att. 2, Sect. B.3.b
(c) Equipment aged:		
Thermal	Yes	TAB C, Att. 2, Sect. B.3.d
Radiation	Yes	TAB C, Att. 2, Sect. C. 2
Wear	NA	TAB C, Sect. 3.1
(d) Vibration/seismic testing conducted	Yes	TAB C, Sect. 3.2, and Att. 2, Sect. B.3.e
(e) Design basis event (DBE) exposure	NA	TAB C, Sect. 3.3
(f) Post-DBE exposure	NA	TAB C, Sect. 3.3
(g) Final inspection and disassembly	NA	Note 1

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? NA (Reference Note 1).

JUSTIFICATION/COMMENTS

Note 1 - The ability of the motorette and the insulation system to function is predicated upon its ability to withstand dielectric proof tests in TAB C, Attachment 2, Section B.3.e. Failure of a dielectric proof test is a conclusive failure and does not require accurate and calibrated test equipment.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Sections B.1, B.2, and B.3.d.

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	Refer to H.4.a
Radiation exposure	Yes	Refer to H.5.a
Vibration (non-seismic) aging	Yes	Refer to H.6.a
Operational (electrical/mechanical/process) stress aging	Yes	Refer to H.7.a

JUSTIFICATION/COMMENTS Motorettes testing consists of subjecting models to heat, vibration, and moisture to simulate the effects of long service, thereby, simulating the cumulative effect of extended operation.

(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

JUSTIFICATION/COMMENTS A review of the materials used in these motors indicates that there are no known synergistic effects.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Section B.1.

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes
(Reference: Qualification Report 1, pp 2-4, Section B.

JUSTIFICATION/COMMENTS Also refer to TAB C, Attachment 2, Section B.

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference ___).

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Sections B.2 and B.3.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference ___).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature			
Time			

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Section B.3.d.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference ___).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.1

(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)? NA
(Reference ___).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.1.

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)? Yes (Reference ___).

JUSTIFICATION/COMMENTS Qualification of the motors through the use of the equation of a regression-type implied average life characteristic. Refer to TAB C, Section 3.1.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? NA (Reference ___).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.1.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Qualification Report, 1, p 5, Data Evaluation, Section B).

JUSTIFICATION/COMMENTS Also refer to TAB C, Attachment 2, Section C.2.

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Qualification Report 1, Attachment 7).

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Section C.2.

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? NA (Reference ___

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Section C.2.

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? NA (Reference).

Plant normal ambient radiation dose (rd) 8.8×10^5 rads.

Test exposure dose (rd)

Test exposure dose rate (rd/hr)

Test exposure source type (e.g., Co-60 gamma)

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Section C.2.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? Yes (Reference

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Section B.3.e.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? Yes (Reference

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Section B.3.e.

H. AGING (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)? Yes
(Reference ___

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.1

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? Yes (Reference ___

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.1.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes
(Reference ___

Qualified life (Document in QMDS) Expected qualified life is 40 + years.

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Section D.

H. AGING (Continued)

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? Yes
(Reference _____

Replacement Intervals (Document in QMDS) Refer to TAB G.

JUSTIFICATION/COMMENTS No replaceable items were identified in the insulation system qualification program described in M&M Reports 280B and 280A-1. The bearings and lubricants are routine maintenance items, the replacement of which are addressed in individual Qualification Maintenance Data Sheets in this binder. Basically, lubrication schedules, bearing replacement intervals and electrical and mechanical surveillance recommendation, particularly regarding the neoprene slingers and gaskets, are detailed.

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BINDER TITLE LOUIS ALLIS - INDUCTION MOTORS - OUTSIDE CONTAINMENT COMPUTED [illegible] DATE 8/28/86 R ___ R ___

CHECKED [illegible] DATE 8/28/86

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 Threshold	Reference	Activation Energy	Reference
(a)	NH7 Insulation/Electrical	1×10^7	Note 1	.92	WAC-169 TAB D-6
(b)	Chevron SRI-2/Lubricant	2×10^8	Note 2	Note 4	
(c)	Neoprene/mechanical/ slinger & gasket	2×10^6	Note 3	Note 4	
(d)					
(e)					

JUSTIFICATION/COMMENTS Detailed Material Analysis is TAB C, Attachment 2.

Note 1: Value shown is insulation rating. Radiation threshold is actual rating of system. Refer to TAB C, Attachment 2.

Note 2: Refer to Digital Material Aging and Radiation Effects Library, Library Code No. 157-83.

Note 3: Refer to Digital Material Aging and Radiation Effects Library, Library Code No. 202-83A, Radiation Library Code 094-83.

Note 4: Consideration of long term thermal degradation is not required because lubricant and slingers are not considered to be substances and devices with infinite lives. A surveillance and maintenance program is established in the QMDS in TAB G to ensure proper operation.

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

(1) 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 ___).

Identify Acceptance Criteria: Refer to TAB C, Attachment 2, Section B.3.e.

(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 ___

Identify baseline and functional testing: Refer to TAB C, Attachment 2, Sections B.3.b and B.3.e.

JUSTIFICATION/COMMENTS ___

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? NA (Reference ___).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.3.

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? Yes (Reference _____).

JUSTIFICATION/COMMENTS Voltages applied to the motorettes during baseline testing addressed in TAB C, Attachment 2, Section B.3.b are conservatively typical of the stressing occurring in motors rated 460 VAC.

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	NA	
Load	NA	
Frequency	NA	
Accuracy	NA	
Other(s)		

JUSTIFICATION/COMMENTS Refer to TAB C, Section 5.0 for discussion of Voltage and Frequency requirements.

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	NA	
Load	NA	
Frequency	NA	
Accuracy	NA	
Other(s)		

JUSTIFICATION/COMMENTS Refer to TAB C, Section 5.0 for discussion of Voltage and Frequency requirements.

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-48, R3 Node 14

(1) Normal Max		(2) Abnormal Max	
(a) Temperature (°F)	104°F	(a) Temperature (°F)	110
(b) Pressure (psig)	ATM (-)	(b) Pressure (psig)	ATM (-)
(c) Humidity (%)	80	(c) Humidity (%)	90
(d) Radiation (rd)	8.8×10^5	(d) Radiation (rd)	-

(3) Process Interfaces: None.

(4) State anticipated occurrence frequency and duration of abnormal conditions: 8 hours per excursion and will occur less than 1% of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	(1) 196°F for 15 min. decaying to 110°F in 24 hours and continuing for 30 days. (2) 110°F for 100 days	Accident type	(1) RH/A (2) LOCA
(b) Pressure (psig)	ATM (-)	Accident type	HELB
(c) Humidity (%)	100%	Accident type	HELB
(d) Radiation (rd)	$1.2 \times 10^{6*}$	Accident type	L
(e) Spray Type	NA	Accident type	

Affected Motors: 1-MTR-30-194-A
1-MTR-30-195-B
2-MTR-30-194-A
2-MTR-30-195-B

*Location specific radiation value from TVA Calculation WBNNAL3-007 R0, (B45 860626 235)

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Motors are located outside containment and are not subject to chemical spray.

(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 GENNAL6-002 (B45 851017 235) and TAB C, Section 7.0).

(7) Subject to submergence (yes/no/NA)? No
(Reference WBNOSG444, Rev. 0 (B45 860110 218) and TAB C, Section 7.0).

Identify initiation time and duration of submergence:

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

Type	RIMS No.
WBNNAL3-007 R0,(Radiation)	B45 860626 235

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	Note 1		
Temperature (^{o}F)	Note 1		
Pressure (psig)	ATM(-)	Sect. 3.5	
Relative Humidity (%)	100%	TAB C, Att.2, Sect. B.3.e	
*Chemical Spray	NA	TAB C, Sect. 3.4	
**Radiation (rd)	2.08×10^{6}	TAB C, Att. 2, Sect. C.2	
Submergence	NA	TAB C, Sect. 7.0	

*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, Att.2, Sect. C.1
Pressure	Yes	TAB C, Sect. 3.5
Relative Humidity	Yes	TAB C, Att.2, Sect.B.3.e
Chemical Spray	NA	TAB C, Sect. 3.4
Submergence	NA	TAB C, Sect. 7.0

JUSTIFICATION/COMMENTS Note 1: Worst case temperature is the result of an HELB and is 196°F (91°C) for 15 minutes, decaying to 110°F (43.3°C) in 24 hours and continuing for 30 days.

Worst case life is based upon conditions resulting from a LOCA which is 110°F for a duration of 100 days. See TAB C, Attachment 2, Section C.1.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	Note 1	Yes
Pressure: +10% but no more than 10 psig		NA (2)
Radiation: +10% of accident dose	380.8%	Yes(6)
Time: +10% (or 1 hour + operating time per NUREG-0588)	Note 1	Yes
Voltage: ±10% of rated value		NA (3)
Frequency: ±5% of rated value		NA (3)
Environmental Transient: the initial transient and the peak temperature applied twice		NA (4)
Vibration: +10% added to acceleration		NA (5)

JUSTIFICATION/COMMENTS:

Note (1) Per TAB C, Attachment 2, Section C.1, a worst case expected life is 6,066.79 years with a maximum hot spot temperature of 95.40°C. The required operating time is 40.27 years. A significant margin exists in the relationship between time and temperature criteria.

Note (2) Refer to TAB C, Section 3.5.

Note (3) Refer to TAB C, Section 5.0.

Note (4) Refer to TAB C, Section 3.3.

Note (5) These motors do not experience significant process-related vibration and as such, a vibration margin above the levels addressed in TAB C, Attachment 2, Section B.3.e., is not required.

Note (6) Refer to TAB C, Attactment 2, Section C.2.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment:
(Reference _____).

JUSTIFICATION/COMMENTS Motors utilizing the stator insulation system tested, must be capable of starting and maintaining operation. Refer to TAB A.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? NA
(Reference _____).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.3.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? NA
(Reference _____).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.3.

(4) Did the test demonstrate the operability requirements for the required time interval for which the equipment is required to operate (yes/no/NA)? _____ (Reference _____).

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 2, Section D.

M. OPERABILITY TEST RESULTS (Continued)

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes
(Reference _____).

JUSTIFICATION/COMMENTS In the DuPont test, results were reported on only 9 motorettes at 260°C. The omission of the data regarding one motorette out of a total set of 50 motorettes does not have a significant adverse effect upon the implied average life characteristic developed through the use of the test data.

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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS No replaceable items were identified in the insulation system qualification program. The bearings and lubricants are routine maintenance items, the replacement of which are addressed in individual Qualification Maintenance Data Sheets in this binder. Basically, lubrication schedules, bearing replacement intervals and electrical and mechanical surveillance recommendations particularly regarding the neoprene slingers and gaskets, are detailed in the QMDS located in TAB G.

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BINDER TITLE LOUIS ALLIS - INDUCTION MOTORS - OUTSIDE CONTAINMENT COMPUTED [illegible] DATE 8/23/86 CHECKED [illegible] DATE 8/26/86 R ___ R ___

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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	Yes
(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?	Yes
(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 aging identified?	Yes

O. SUMMARY 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	NA
(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?	NA
(11) Criteria regarding submergence satisfied?	Yes
(12) Criteria regarding radiation satisfied?	Yes
(a) Was dose rate considered?	Yes
(b) Was beta radiation considered?	Section P-Note 1
(13) Criteria regarding operability status/mode satisfied?	Yes
(14) Criteria regarding test failures or anomalies satisfied?	Yes

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA
(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?	NA
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

NOTE 1: Motors are located throughout the Auxiliary Building. Beta radiation is confined to the Reactor Building by plant design; therefore, these motors are not required to be evaluated for the effects of beta radiation.

SUPPLEMENT 1
COMPONENT-UNIQUE CHECKLIST
MOTORS

EQUIPMENT IDENTIFICATION

(1) Is the motor identified in the qualification report identical to the plant motors which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable (Yes/No/NA)	Report Section
(a) Insulation system materials	NH7 (P4-9128)	NH7 (P4-9128)	Yes	Qual. Rpt.1, p 1, Object
(b) Coil construction (form or random wound, cast)	random	random	Yes	Qual. Rpt. 1, Title Page
(c) Insulation class (B, F, H)	H	H	Yes	Qual. Rpt. 1, p 5, Data Eval. Sect.A, Thermal
(d) Lubricant				
Manufacturer	Chevron	NA	Yes	Refer to TAB C, Sect. 4.2
Type	SRI-2	NA	Yes	
(e) Bearing				
Manufacturer	MRC	NA	Yes	Refer to (3) this supplement
Type	Anti-friction	NA	Yes	
Bearing life				
(f) Seals				
Manufacturer		NA		Refer to (5) this supplement
Type	Slinger	NA	Yes	
Material	Neoprene		Yes	

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable (Yes/No/NA)	Report Section
(g) Motor lead insulation	Nomex w/ Glass Braid	Nomex/w Glass Braid	Yes	TAB C, Att. 2, Sect. C.3

Comments: _____

(2) Does the qualification report indicate that the motorette insulation system is the same as that used on the motors (yes/no/NA)? Yes
(Reference _____).

Comments: Refer to TAB C, Attachment 3, Sections B.1 and B.2.

(3) Has the vendor provided the bearing rating (yes/no/NA)? Yes
(Reference _____).

Comments: Refer to TAB C, Section 4.1.

(4) Was the lubricant included in the test program (yes/no/NA)? No
(Reference _____).

Comments: Refer to TAB C, Section 4.2.

(5) Were the seals included in the test program (yes/no/NA)? No
(Reference _____).

Comments: Refer to TAB C, Section 4.3.

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BINDER TITLE LOUIS ALLIS - INDUCTION MOTORS - OUTSIDE CONTAINMENT COMPUTED Ackerly DATE 9/15/86 R ___ R ___

CHECKED B DATE 9/15/86

A. DOCUMENTATION

Equipment Description Squirrel-Cage Induction Motor

Vendor/Manufacturer Louis Allis

Equipment Model No.(s) 3hp, 460 Vac, NH9 insulation system, M.O. 4-147746

QUALIFICATION REPORTS

(1) Title/Number/Revision Insulation System Evaluation Qualification for Safety Class 1E Normal Service. M & M Report No. 282 RIMS B71 860512 104 DATE Sept. 20, 1983

(2) Title/Number/Revision _____ RIMS _____ DATE _____

(3) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(4) Louis Allis letter to D. F. Ackerly dated March 26, 1986 (B71 860512 105) TAB E-5.

(5) Nuclear Qualification Report 4-147746-NQR, Rev. A (TAB E-4).

(6) Material Aging Calculation WAC-082 (TAB D-8).

(7) WBN Environmental Dwg. 47E235-78, Rev. 3.

(8) TVA Radiation Calculation WBNNAL3-025 R0 (B45 860401 235).

(9) TVA Radiation Calculation WBNNAL3-031 R0 (B45 860529 237).

(10) System 30 Category and Operating Times WBNOSG4-008 R10 (B45 860320 224).

(11) TVA Condensation Calculation GENNAL6-002 R1 (B45 851017 235).

(12) TVA Degraded Voltage Calculation WBP-EVAR 8602001 Rev. 0 (B43 860227 901).

(13) TVA Flooding Calculation WBNOSG4-44 R0 (B45 860110 218).

(14) Memo to CEB files (CEB 841022 252) (TAB E-5).

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B. CONCLUSION OF REVIEW (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 Refer to Open Items listed in the front of this binder.

1. Obtain revised field verification (Open Item 1)

COMMENTS/RECOMMENDATIONS

C. QUALIFICATION CRITERIA

Criteria Used to Demonstrate Oualification 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 Oualified to the Criteria of NUREG-0588 Category II or the DOR Guidelines of IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 334-1974 Type Test of Continuous Duty Class 1E Motors.

NEMA MG1-1982 Motors and Generators

IEEE 117-1974 Evaluation of Insulating Materials for Random-Wound AC Electric Machinery

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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 Refer to TAB C, Section 3.0 for additional details.

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Induction Motor	Motorettes	Qual. Rpt 1, p 1
(2) Manufacturer	Louis Allis	Louis Allis	Qual. Rpt 1, p 2
(3) Model Number(s)	3hp, 460 Vac	NH9 Ins. Sys.	Qual. Rpt 1, p 2
	NH9 Ins. Sys		
	MO 4-147746		
(4) Serial Number(s)	4-147746-001	NA	TAB E-6
	4-147746-002		Rpt 4-147746-NQR, Rev A, Sect B
(5) Identify Component-Unique checksheet attached:	Supplement 1, Component - Unique Checklist, Motors		

JUSTIFICATION/COMMENTS The equipment provided for the plant consists of complete motor assemblies which includes a random-wound stator with the NH9 insulation system. The qualification report documents the motorette testing performed on the NH9 insulation system in accordance with IEEE 117-1974. Applicability of the data from the qualification report is dependent solely upon the use of the NH9 system (Louis Allis System P4-9061) in the stator assembly and is independent of the motor horsepower rating.

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F. INSTALLATION INTERFACES

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

Interface	Identify Interface	Plant Requirement? (Yes/No)	Reference Test Report
Mounting Bolts	NA	NA	
External Process Connections	NA	NA	
Electrical Connections	NA	NA	
Conduit Seals	NA	NA	
Connector Seals	NA	NA	
Orientation	horizontal shaft	Yes	
Physical Configuration	NA	NA	
Other			

JUSTIFICATION/COMMENTS Refer to TAB C, Section 6.0, Interfaces

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	No	TAB C. Sect 3.2
(b) Baseline performance measurements taken	Yes	Note 1 also, TAB C, Att 3, Sect B-2
(c) Equipment aged:		Qual. Rpt 1. p 2 Discussion,
Thermal	Yes	Sect D
Radiation	Yes	Qual. Rpt 1. p 1 Discussion. Sect C
Wear	No	TAB C, Sect 3.1
(d) Vibration/seismic testing conducted	Yes	TAB C, Sect 3.2
(e) Design basis event (DBE) exposure	NA	TAB C, Sect 3.3
(f) Post-DBE exposure	NA	TAB C, Sect 3.3
(g) Final inspection and disassembly	Yes	TAB C, Att 3, Sect B.7

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes
(Reference Note 2

JUSTIFICATION/COMMENTS Note 1 - Refer to Qualification Report 1, Attachment 6, Document LTP-110, page 1, Method of Test, Sect 2.

Note 2 - The ability of the motorette and the insulation system function is predicated upon its ability to withstand dielectric proof tests in TAB C, Attachment 3, Section B.7. Failure of a dielectric proof test is a conclusive failure and does not require accurate and calibrated test equipment.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference Qualification Report 1, page 1, Discussion, Section B).

JUSTIFICATION/COMMENTS Aging factors were applied to models of the stator insulation following methods outlined in IEEE 117-1974.

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	H.4.a
Radiation exposure	Yes	H.5.a
Vibration (non-seismic) aging	Yes	H.6.a
Operational (electrical/mechanical/process) stress aging	Yes	H.7.a

JUSTIFICATION/COMMENTS Motorette testing consists of subjecting models of insulation systems to a series of exposures to radiation, heat, vibration, and moisture to simulate the effects of long service, thereby simulating the cumulative effect of extended operation. Refer to TAB C, Section 3.1.

(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

JUSTIFICATION/COMMENTS A review of the materials used in these motors indicates that there are no known synergistic effects.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Qualification Report 1, page 4, Test Program, Section B, Thermal Qualification.).

JUSTIFICATION/COMMENTS Also refer to TAB C, Attachment 3, Section B.4.

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: Qualification Report 1, Attachment 3).

JUSTIFICATION/COMMENTS Refer to TAB C, Att. 3, Section B.1.

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Qualification Report 1, page 4, Section B, Thermal Qualification).

JUSTIFICATION/COMMENTS Refer to TAB C, Att. 3, Section B.4.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature			
Time			

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.0

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.0

(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)? NA (Reference).

JUSTIFICATION/COMMENTS Refer to TAB C. Section 3.0

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)? Yes (Reference).

JUSTIFICATION/COMMENTS Qualification of the motors through the use of motorette tests involves the use of the equation of a regression-type implied average life characteristic. Refer to TAB C, Section 3.0

(h) Was the equipment operated during the thermal aging (yes/no/NA)? NA (Reference).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.1.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Qualification Report 1, page 2, Section A, Radiation Qualification).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Qualification Report 1, Attachment 3.).

JUSTIFICATION/COMMENTS

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Qualification Report 1, page 2, Subsection A.1, General.).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Qualification Report 1, page 3, Section A.4.a.).

Plant normal ambient radiation dose (rd)	1.8×10^3 rads TID normal 1.7×10^6 rads TID accident
Test exposure dose (rd)	1.1×10^9 rads TID
Test exposure dose rate (rd/hr)	0.49×10^6 rads/hr for 2245 hrs
Test exposure source type (e.g., Co-60 gamma)	Co-60 gamma

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? Yes (Reference Qualification Report 1, page 4. Section B.1).

JUSTIFICATION/COMMENTS Refer to TAB C. Attachment 3, Section B.5.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? Yes (Reference Qualification Report 1, page 4. Section B.3.b.).

JUSTIFICATION/COMMENTS Mechanical stress testing performed in accordance with Section 2.2.3 of IEEE 117-1974 to simulate winding forces that occur in an actual motor.

H. AGING (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)? Yes
(Reference _____).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.1.

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? Yes (Reference _____).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.1.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes
(Reference _____).

Qualified life (Document in QMDS) Expected qualified life is 40+ years.

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 3, Section D.

H. AGING (Continued)

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? Yes
(Reference _____
_____).

Replacement Intervals (Document in QMDS) Refer to TAB G.

JUSTIFICATION/COMMENTS No replaceable items were identified in the insulation system qualification program described in M&M report 282. The bearings and lubricants are routine maintenance items, the replacement of which are addressed in individual Qualification Maintenance Data Sheets in this binder. Basically, lubrication schedules, bearing replacement intervals and electrical and mechanical surveillance recommendations, particularly regarding the neoprene slingers and gaskets, are detailed.

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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 Threshold	Reference	Activation Energy	Reference
(a)	Type NH9 insulation sys	1.1×10^9	Note 1	1.22	Note 3
(b)	Bearing lubricant (CHEVRON SRI-2 grease)	2.0×10^8	Note 2	Note 5	
(c)	Neoprene/mechanical/ slinger & gasket	2×10^6	Note 4	Note 5	
(d)					

JUSTIFICATION/COMMENTS Note 1 - The NH9 system withstood a total dose of 1.1×10^9 rads and maintained its ability to perform its required function as demonstrated by passing a post-exposure dielectric test. Refer to Qualification Report 1, page 2, Section A.

Note 2 - Refer to Digital Material Aging and Radiation Effects Library Code No. 157-83A.

Note 3 - Refer to Material Aging Calculation WAC-082. Refer to TAB D-8.

Note 4 - Refer to Digital Material Aging and Radiation Effects Library, Library Code No. 202-83A, Radiation Library Code 094-83.

Note 5 - Consideration of long term thermal degradation is not required because lubricant and slingers are not considered to be substances or devices with infinite lives. A surveillance and maintenance program is established in the QMDS in TAB G to ensure proper operation.

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

(1) 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 Qualification Report 1, page 4. Section B.3.d.).

Identify Acceptance Criteria: Failure to withstand 10 minute applied potential tests at the following levels: turn-to-turn, 120 Vac; coil-to-coil and coils-to-ground, 600 Vac.

(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 Qualification Report 1, Attachment 6, LTP-110, page 1, Method of Test, paragraph 2).

Identify baseline and functional testing: Functional tests listed in section J.1 above. Each motorette was subjected to the following baseline tests: turn-to-turn, 400 Vac; coil-to-coil, 2000 Vac; coils-to-ground, 2000 Vac.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? NA (Reference).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.3.

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? Yes (Reference).

JUSTIFICATION/COMMENTS Voltages applied to the motorettes during baseline testing described in J.2 were chosen to be above the maximum service voltage for motors rated 460 Vac.

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	NA	
Load	NA	
Frequency	NA	
Accuracy	NA	
Other(s)		

JUSTIFICATION/COMMENTS Refer to TAB C, Section 5.0 for discussion of voltage and frequency requirements.

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	NA	
Load	NA	
Frequency	NA	
Accuracy	NA	
Other(s)		

JUSTIFICATION/COMMENTS Refer to TAB C, Section 5.0 for discussion of voltage and frequency requirements.

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-78, Rev. 3.

(1) Normal Max

(a) Temperature (°F) 104

(b) Pressure (psig) ATM

(c) Humidity (%) 80

(d) Radiation (rd) 1.8×10^3

(2) Abnormal Max

(a) Temperature (°F) 110

(b) Pressure (psig) ATM

(c) Humidity (%) 90

(d) Radiation (rd) NA

(3) Process Interfaces: None.

(4) State anticipated occurrence frequency and duration of abnormal conditions: 8 hours per excursion and will occur less than 1% of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	110 for 100 days	Accident type	L
(b) Pressure (psig)	NA	Accident type	
(c) Humidity (%)	NA	Accident type	
(d) Radiation (rd)	1.7×10^6*	Accident type	L
(e) Spray Type	NA	Accident type	

*Location specific dose per TVA calculation WBNNAL3-031, Rev 0 (B45 860529 237).

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Motors are located outside containment and are not subject to chemical spray.

(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)? No (Reference TAB C, Section 7.0).

(7) Subject to submergence (yes/no/NA)? No
(Reference TAB C, Section 7.0).

Identify initiation time and duration of submergence: _____

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

Type	RIMS No.
WBNNAL3-031, R0	B45 860529 237

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 days	TAB C, Att. 3, Sect. C.1	
Temperature (^{o}F)	110	TAB C, Att. 3, Sect. C.1	
Pressure (psig)	ATM	TAB C, Sect. 3.5	
Relative Humidity (%)	100	TAB C, Att. 3, Sect. B.6	
*Chemical Spray	NA	TAB C, Sect. 3.4	
**Radiation (rd)	1.7018×10^6 gamma	TAB C, Att. 3, Sect. C.1	
Submergence	NA	TAB C, Sect. 7.0	

*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, Att. 3, Sect. C.1
Pressure	Yes	TAB C, Sect. 3.5
Relative Humidity	Yes	TAB C, Att. 3, Sect. B.6
Chemical Spray	NA	TAB C, Sect 3.4
Submergence	NA	TAB C, Sect 7.0

JUSTIFICATION/COMMENTS

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	Note 1	Yes
Pressure: +10% but no more than 10 psig		NA(2)
Radiation: +10% of accident dose	10%	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	Note 1	Yes
Voltage: ±10% of rated value		NA(3)
Frequency: ±5% of rated value		NA(3)
Environmental Transient: the initial transient and the peak temperature applied twice		NA(4)
Vibration: +10% added to acceleration		NA(5)

JUSTIFICATION/COMMENTS: Note 1: Per TAB C, Att. 3, Sect. C.1, a worst case expected life was calculated to be 1,098,226 years with a maximum hot spot temperature of 78.33°C. The required operating time is 40.27 years. A significant margin exists in the relationship between the time and temperture criteria.

(2) Refer to TAB C, Section 3.5.

(3) Refer to TAB C, Section 5.0.

(4) Refer to TAB C, Section 3.3.

(5) These motors do not experience significant process-related vibration and as such, a vibration margin above the levels addressed in TAB C, Att. C, Section B.5 is not required.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment:
(Reference _____).

JUSTIFICATION/COMMENTS Motors utilizing the stator insulation system tested, must be capable of starting and maintaining operation. Refer to TAB A.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? NA
(Reference _____).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.3.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? NA
(Reference _____).

JUSTIFICATION/COMMENTS Refer to TAB C, Section 3.3.

(4) Did the test demonstrate the operability requirements for the required time interval for which the equipment is required to operate (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS Refer to TAB C, Attachment 3, Section D.

M. OPERABILITY TEST RESULTS (Continued)

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? NA
(Reference _____).

JUSTIFICATION/COMMENTS No anomalies were noted throughout the motorette testing.

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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS No replaceble items were identified in the insulation system qualification program described in M & M report 282. The bearings and lubricants are routine maintenance items, the replacement of which are addressed in individual Qualification Maintenance Data Sheets in this binder. Basically, lubrication schedules, bearing replacement intervals, and electrical and mechanical surveillance recommendations, particularly regarding the neoprene slingers and gaskets, are detailed in the QMDS located in TAB G.

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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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	Yes
(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?	Yes
(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 aging identified?	Yes

0. SUMMARY 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	NA
(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?	NA
(11) Criteria regarding submergence satisfied?	Yes
(12) Criteria regarding radiation satisfied?	Yes
(a) Was dose rate considered?	Yes
(b) Was beta radiation considered?	Section P - Note 1
(13) Criteria regarding operability status/mode satisfied?	Yes
(14) Criteria regarding test failures or anomalies satisfied?	Yes

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA
(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?	NA
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

NOTE 1: Motors are located throughout the Auxiliary Building. Beta radiation is confined to the Reactor Building by plant design; therefore, these motors are not required to be evaluated for the effects of beta radiation.

SUPPLEMENT 1
COMPONENT-UNIQUE CHECKLIST
MOTORS

EQUIPMENT IDENTIFICATION

(1) Is the motor identified in the qualification report identical to the plant motors which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable (Yes/No/NA)	Report Section
(a) Insulation system materials	NH9 (P4-9061 -115)	NH9 (P4-9061 -115)	Yes	Refer to (2) this supplement
(b) Coil construction (form or random wound, cast)	RANDOM	RANDOM	Yes	Qual. Rpt 1 p 1, OBJECT
(c) Insulation class (B, F, H)	H	H	Yes	Refer to Note 1 in Comments
(d) Lubricant				
Manufacturer	CHEVRON	NA	Yes	Refer to TAB C Section 4.2
Type	SRI-2	NA	Yes	
(e) Bearing				
Manufacturer	MRC	NA	Yes	Refer to (3) this Supplement
Type	Antifriction	NA	Yes	
Bearing life	___	NA	___	___
(f) Seals				
Manufacturer	-	NA	-	-
Type	Slinger	NA	Yes	Refer to (5) this Supplement
Material	Neoprene	NA	Yes	___

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable (Yes/No/NA)	Report Section
(g) Motor lead insulation	NOMEX w/ Glass Braid	NOMEX w/ Glass Braid	Yes	TAB C, Att. 3, Sect. D

Comments: Note 1 - TAB E-6, Document 4-147746-NRQ, Rev A, page 3, Section G.12.

(2) Does the qualification report indicate that the motorette insulation system is the same as that used on the motors (yes/no/NA)? Yes
(Reference TAB E-6, Document 4-147746-NQR, Rev A, page 2, Section D.2).

Comments:

(3) Has the vendor provided the bearing rating (yes/no/NA)? Yes
(Reference TAB E-6, Document 4-147746-NQR, Rev A, page 4, item 13).

Comments: Also refer to TAB C, Section 4.1

(4) Was the lubricant included in the test program (yes/no/NA)? No
(Reference).

Comments: Refer to TAB C, Section 4.2

(5) Were the seals included in the test program (yes/no/NA)? No
(Reference).

Comments: Refer to TAB C, Section 4.3.

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-APL-067-2145A-A	OPL2145-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APL-067-2165A-A	OPL2165-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APL-067-2178A-B	OPL2178-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0310-A	OPP 310-A	PXMJ	WHM-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0330A-A	OPP 330-A	PXMJ	WHE-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0338A-A	OPP 338-A	PXMJ	WHE-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0430-A	OPP 430-A	PXMJ	WHM-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0550-B	OPP 550-B	PXMJ	WHM-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0570A-B	OPP 570-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0578A-B	OPP 578-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0670-B	OPP 670-B	PXMJ	WHM-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0690B-B	OPP 690-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0698B-B	OPP 698-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ARM-090-0032A-A	ORM 32-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ARM-090-0037A-B	ORM 37-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0133-A	OSG 133-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0160-B	OSG 160-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0161-B	OSG 161-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0163-B	OSG 163-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0166-B	OSG 166-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0603-A	OV 603-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0616-A	OV 616-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0626-B	OV 626-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0637-B	OV 637-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1225-A	OV 1225-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1226-A	OV 1226-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1239-A	OV 1239-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-026-1981-A	OV 1981-A	PXMJ	WGG-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2082-B	OV 2082-B	PJMJ	WGG-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-040-2533-A	OV 2533-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-040-2537-B	OV 2537-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-268-3380-A	1M 3380-A	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-3480-A	1M 3480-A	PXMJ	WFB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-3481-A	1M 3481-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-3482-A	1M 3482-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-3483-A	1M 3483-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-3484-A	1M 3484-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE 9.21.86

CHECKED/DATE 9-21-86 FOR ETD

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-AM-043-3486-B	1M 3486-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-3487-B	1M 3487-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-3488-B	1M 3488-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-031-3586-A	1M 3586-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3011-B	1PL3011-B	PXMJ	WFC-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3137-A	1PL3137-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3147-B	1PL3147-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3207-B	1PL3207-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3533-B	1PL3533-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3542-A	1PL3542-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3546-A	1PL3546-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3551-B	1PL3551-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3552-B	1PL3552-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3556-B	1PL3556-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3836-B	1PL3836-B	PXMJ	WHC-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4022-A	1PL4022-A	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4049-B	1PL4049-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4431-B	1PL4431-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4731-A	1PL4731-A	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4737-A	1PL4737-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4739-A	1PL4739-A	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4748-B	1PL4748-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-026-5019-B	1PL5019-B	PXMJ	WHJ-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-5204-B	1PL5204-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-212-5270-B	1PL5270-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-212-5273-B	1PL5273-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6152-B	1PL6152-B	PXMJ	WFC-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6156-B	1PL6156-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-6443-A	1PL6443-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-6455-B	1PL6455-B	PXMJ	WGC-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-047-2035-D	1PM2035-D	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-2046-E	1PM2046-E	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-065-5203-B	1PM5203-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-065-5204-B	1PM5204-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-065-5205-A	1PM5205-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-211-0480-B	1PP 480-B	PXMJ	WGH-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-062-0566-B	1PP 566-B	PXMJ	WGH-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Qm 9.21.86			
CHECKED/DATE	FW Kahn 9-21-86 FOR ETN			

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APP-067-0704-B	1PP 704-B	PXMJ	WGH-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0706-B	1PP 706-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0716-B	1PP 716-B	PXMJ	WGH-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0718-B	1PP 718-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-068-0823-B	1PP 823-B	PXMJ	WGK-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APS-068-0305-E	1PS 305-E	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-003-0174-B	1PV 174-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0283-A	1RM 283-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0285-A	1RM 285-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0293-A	1RM 293-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0295-A	1RM 295-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0305-A	1RM 305-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0313-A	1RM 313-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0315-A	1RM 315-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0384-A	1RM 384-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0396-A	1RM 396-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0424-A	1RM 424-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0429-B	1RM 429-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0432-A	1RM 432-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0433-A	1RM 433-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0437-B	1RM 437-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-046-0219-S	1SG 219-S	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-046-0228-S	1SG 228-S	PXMJ	WHM-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-003-0536-B	1SG 536-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-003-0561-B	1SG 561-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0039-B	1V 39-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0047-A	1V 47-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0064-A	1V 64-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0071-A	1V 71-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0076-B	1V 76-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0077-B	1V 77-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0078-B	1V 78-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0096-B	1V 96-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0097-B	1V 97-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0098-B	1V 98-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0951-B	1V 951-B	PXMJ	WHG-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0952-B	1V 952-B	PXMJ	WHG-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE Qm 9-21-86 ----- ----- -----

CHECKED/DATE FW Vaughn 9-21-86 FOR ETD ----- ----- -----

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-001-0953-B	1v 953-B	PXMJ	WHG-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0954-B	1v 954-B	PXMJ	WHG-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0955-A	1v 955-A	PXMJ	WHC-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0956-A	1v 956-A	PXMJ	WHC-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0957-A	1v 957-A	PXMJ	WHC-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0958-A	1v 958-A	PXMJ	WHC-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0959-B	1v 959-B	PXMJ	WHC-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0960-B	1v 960-B	PXMJ	WHC-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0961-B	1v 961-B	PXMJ	WHC-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0962-B	1v 962-B	PXMJ	WHC-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0963-B	1v 963-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0964-A	1v 964-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1025-A	1v 1025-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1035-B	1v 1035-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1044-B	1v 1044-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1045-B	1v 1045-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1046B-B	1v 1046-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1054-A	1v 1054-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1055-A	1v 1055-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1700-B	1v 1700-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1706-B	1v 1706-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1916-B	1v 1916-B	PXMJ	WHJ-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1918-B	1v 1918-B	PXMJ	WHG-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1955-A	1v 1955-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1965-A	1v 1965-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-1992A-A	1v 1992-A	PXMJ	WHH-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2062A-B	1v 2062-B	PXMJ	WHH-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2085-B	1v 2085-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2135-B	1v 2135-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2407-B	1v 2407-B	PXMJ	WHG-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2423A-A	1v 2423-A	PXMJ	WHL-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2561-A	1v 2561-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2573-A	1v 2573-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2581-A	1v 2581-A	PXMJ	WHH-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-2633-B	1v 2633-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-2634-B	1v 2634-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-2768-A	1v 2768-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9.21.86			
CHECKED/DATE	9-21-86 FOR ETD			

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME		MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-062-2769-B	1V 2769-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2955-A	1V 2955-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2965-B	1V 2965-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3187-B	1V 3187-B	PXMJ	WHL-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3601-A	1V 3601-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3603-A	1V 3603-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3648-B	1V 3648-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3650-B	1V 3650-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4082-B	1V 4082-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4083-A	1V 4083-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-4205-A	1V 4205-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-4210-B	1V 4210-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-4212-B	1V 4212-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-5480-A	1V 5480-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-5481-A	1V 5481-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-5490-B	1V 5490-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-5491-B	1V 5491-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-5598-B	1V 5598-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-5610-A	1V 5610-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-5660-B	1V 5660-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6575-A	1V 6575-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6576-A	1V 6576-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7143-B	1V 7143-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7193-A	1V 7193-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7195-A	1V 7195-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7201-A	1V 7201-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7520-A	1V 7520-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7536-A	1V 7536-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7567-B	1V 7567-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7581-B	1V 7581-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7964A-A	1V 7964-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8044A-A	1V 8044-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8402A-A	1V 8402-A	PXMJ	WHE-1	VARIOUS	VARIOUS	0	N79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8420-B	1V 8420-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8427-B	1V 8427-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-8661-A	1V 8661-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-8675-B	1V 8675-B	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-825342-2	A	100	D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE Jm 9.21.86 ____ ____ ____

CHECKED/DATE FW Vail 9-21-86 (FOR FTI) ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-AV-043-8761-A	1V 8761-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-8767-A	1V 8767-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-8769-A	1V 8769-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-8770-A	1V 8770-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-8784-A	1V 8784-A	PJMJ	WGG-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-026-9146-A	1V 9146-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-026-9164-A	1V 9164-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9556-B	1V 9556-B	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9567-B	1V 9567-B	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9576-B	1V 9576-B	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9585-B	1V 9585-B	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9594-B	1V 9594-B	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9601-A	1V 9601-A	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9610-A	1V 9610-A	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9619-A	1V 9619-A	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9628-A	1V 9628-A	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9637-A	1V 9637-A	PXMJ	WHC-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-9901-A	1V 9901-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-9904-A	1V 9904-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-9905-B	1V 9905-B	PXMJ	WHD-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-9906-B	1V 9906-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-9908-B	1V 9908-B	PXMJ	WHD-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-9909-B	1V 9909-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-0004-A	2PL 4-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-0005-B	2PL 5-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3077-A	2PL3077-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3087-B	2PL3087-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3137-A	2PL3137-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3764-B	2PL3764-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-070-4737-B	2PL4737-B	PXMJ	WHD-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-070-4738-B	2PL4738-B	PXMJ	WHH-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-070-4739-B	2PL4739-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-031-6705-B	2PL6705-B	PXMJ	WHD-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APP-067-0704-B	2PP 704-B	PXMJ	WGH-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APP-067-0716-B	2PP 716-B	PXMJ	WGH-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-AV-067-2407-B	2V 2407-B	PXMJ	WHG-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-AV-067-2793-B	2V 2793-B	PXMJ	WHL-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE Jm 9-21-86 ____ ____ ____

CHECKED/DATE FW Vaden FOR EFD 9-21-86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	* BM	** CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-QV-030-2955-A	2V 2955-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6594-B	2V 6594-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6595-B	2V 6595-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6596-B	2V 6596-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6603A-A	2V 6603-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6613A-B	2V 6613-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6630B-A	2V 6630-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6631-A	2V 6631-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6632-A	2V 6632-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K5-825342-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Qm 9-21-86			
CHECKED/DATE	FW Wisler FOR ETO 9-21-86			

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-002
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-BV-030-0817-B	OV 817-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-BV-030-0819-B	OV 819-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BM-031-2340-A	1M 2340-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BM-031-3005-B	1M 3005-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BM-031-3007-B	1M 3007-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BM-031-3012-B	1M 3012-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BM-031-3014-B	1M 3014-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-031-3827-A	1PL3827-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-031-3828-A	1PL3828-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-031-3829-A	1PL3829-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-031-3837-B	1PL3837-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-031-3838-B	1PL3838-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-031-3839-B	1PL3839-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-031-4430-B	1PL4430-B	PXJ	WDO	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-068-0283-D	1PS 283-D	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-068-0284-D	1PS 284-D	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-068-0285-D	1PS 285-D	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-068-0343-G	1PS 343-G	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-068-0344-G	1PS 344-G	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-068-0345-G	1PS 345-G	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BSG-003-0125-B	1SG 125-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BSG-003-0133-B	1SG 133-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-003-1024-A	1V 1024-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-003-1034-B	1V 1034-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-003-1084-A	1V 1084-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1415-A	1V 1415-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-074-1932-A	1V 1932-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-2973-A	1V 2973-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-3653-A	1V 3653-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-3740-A	1V 3740-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-3835-B	1V 3835-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-3837-B	1V 3837-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-4202-A	1V 4202-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-4206-A	1V 4206-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-4213-B	1V 4213-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-4215-B	1V 4215-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-4216-B	1V 4216-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9-21-86	-----	-----	-----
CHECKED/DATE	9-21-86 FOR ETD	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-001-7585-B	1V 7585-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-7586-B	1V 7586-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-7587-B	1V 7587-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-7588-B	1V 7588-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QM-031-2340-A	2M 2340-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QM-031-2347-B	2M 2347-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QM-031-2352-A	2M 2352-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QM-031-2353-A	2M 2353-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QM-031-2353-B	2M 2353-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QPL-031-2899-B	2PL2899-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QPL-030-3104-B	2PL3104-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QPL-030-3752-A	2PL3752-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QPL-030-3753-A	2PL3753-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QPL-031-3991-B	2PL3991-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	79K8-825668-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

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		R____	R____	R____
PREPARER/DATE	9.21.86			
CHECKED/DATE	9-21-86 (For RT)			

PRINT DATE: 09/21/86

BINDER NO. : W8NEQ-CABL-002
MANUFACTURER : AIW

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-ARM-090-00373-B	ORM 37-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C762-A	OV 762-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C786-B	OV 786-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C802-B	OV 802-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C810-A	OV 810-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C818-B	OV 818-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1215-B	OV 1215-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1216-B	OV 1216-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825843-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1941-A	OV 1941-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1942-A	OV 1942-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2061-B	OV 2061-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2600-A	1M 2600-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2601-A	1M 2601-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2602-A	1M 2602-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2603-A	1M 2603-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2604-A	1M 2604-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825843-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2605-A	1M 2605-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825843-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2606-A	1M 2606-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2607-A	1M 2607-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2608-A	1M 2608-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2609-A	1M 2609-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2610-B	1M 2610-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2611-B	1M 2611-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2612-B	1M 2612-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2613-B	1M 2613-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2614-B	1M 2614-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2615-B	1M 2615-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2616-B	1M 2616-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2617-B	1M 2617-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2618-B	1M 2618-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2619-B	1M 2619-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-211-0429-B	1PP 429-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-211-0439-A	1PP 439-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825843-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-211-0444-B	1PP 444-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-211-0445-A	1PP 445-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-211-0466-A	1PP 466-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-211-0489-B	1PP 489-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

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R____ R____ R____

PREPARER/DATE Ory 9.21.86 ____ ____ ____

CHECKED/DATE FW Voden 9-21-86 FOR EM ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±RM	**CONTRACT	C A I*	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APS-099-0161-A	1PS 161-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-003-0593-A	1PV 593-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-046-0240-A	1SG 240-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1439-B	1V 1439-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3562-A	1V 3562-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3572-A	1V 3572-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3612-B	1V 3612-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3622-B	1V 3622-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3668-A	1V 3668-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3708-B	1V 3708-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3713-B	1V 3713-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3761-A	1V 3761-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3766-A	1V 3766-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3815-B	1V 3815-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3821-B	1V 3821-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3828-B	1V 3828-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3836-B	1V 3836-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-032-9100-A	1V 9100-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-032-9109-A	1V 9109-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-032-9110-A	1V 9110-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-032-9112-A	1V 9112-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9846-B	1V 9846-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9853-B	1V 9853-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9861-B	1V 9861-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9869-B	1V 9869-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9942-A	1V 9942-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	N79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9952-A	1V 9952-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9962-B	1V 9962-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9972-B	1V 9972-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APP-211-0444-B	2PP 444-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	79K8-825848-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Dy 9.21.86	-----	-----	-----
CHECKED/DATE	FW Vestes 9-21-86 FOR ETD	-----	-----	-----

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-002
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-@M-067-0850-A	OM 850-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@M-067-0851-B	OM 851-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@SG-012-0157-B	OSG 157-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-0754-B	OV 754-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-0770-B	OV 770-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-0966-A	OV 966-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-0976-B	OV 976-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-031-1242-A	OV 1242-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-031-1252-B	OV 1252-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-026-1991-A	OV 1991-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-026-2009-B	OV 2009-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-031-2065-B	OV 2065-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-031-2347-B	1M 2347-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-031-2352-A	1M 2352-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-043-3489-B	1M 3489-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3134-A	1PL3134-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-065-3523-A	1PL3523-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-065-3541-A	1PL3541-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-067-3921A-B	1PL3921-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-4508-A	1PL4508-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-5212-B	1PL5212-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-6705-B	1PL6705-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-6816-A	1PL6816-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0606-A	1PP 606-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0610-B	1PP 610-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0282-D	1PS 282-D	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0321-F	1PS 321-F	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0341-G	1PS 341-G	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PV-003-0590-B	1PV 590-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PV-003-0591-B	1PV 591-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0303-A	1RM 303-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0382-B	1RM 382-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0386-A	1RM 386-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0394-B	1RM 394-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0398-A	1RM 398-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0428-B	1RM 428-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0602-A	1SG 602-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

	R____	R____	R____
PREPARER/DATE Ow 9.21.86	____	____	____
CHECKED/DATE FW Vaka FOR ETD 9-21-86	____	____	____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-ASG-003-0610-A	1SG 610-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-003-0611-A	1SG 611-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-003-0614-A	1SG 614-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-003-0615-B	1SG 615-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-003-0619-B	1SG 619-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-003-0623-B	1SG 623-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-003-0624-B	1SG 624-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-003-0627-B	1SG 627-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-0015-A	1V 15-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0040-B	1V 40-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0044-B	1V 44-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0045-A	1V 46-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-0050-A	1V 50-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1047-B	1V 1047-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1064-A	1V 1064-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1465-A	1V 1465-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1467-A	1V 1467-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-2624-A	1V 2624-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3581-A	1V 3581-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3582-A	1V 3582-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3583-A	1V 3583-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3592-A	1V 3592-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3593-A	1V 3593-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3594-A	1V 3594-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3602-A	1V 3602-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3628-B	1V 3628-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3629-B	1V 3629-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3630-B	1V 3630-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3635-B	1V 3635-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3636-B	1V 3636-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3637-B	1V 3637-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3641-B	1V 3641-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3642-B	1V 3642-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3649-B	1V 3649-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3662-A	1V 3662-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3702-B	1V 3702-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-3727-B	1V 3727-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE Qm 9-21-86 ----- ----- -----

CHECKED/DATE R W Vale 9-21-86 ----- ----- -----
FOR STD

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@V-030-3754-A	1V 3754-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-3772-A	1V 3772-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-3773-A	1V 3773-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-3774-A	1V 3774-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-3780-A	1V 3780-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-3808-B	1V 3808-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-4101-B	1V 4101-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-4102-A	1V 4102-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-4103-A	1V 4103-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-4201-A	1V 4201-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-4204-A	1V 4204-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-4207-A	1V 4207-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-4211-B	1V 4211-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-4214-B	1V 4214-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-4217-B	1V 4217-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-031-7144-B	1V 7144-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-031-7145-B	1V 7145-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-031-7152-B	1V 7152-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-031-7153-B	1V 7153-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-031-7194-A	1V 7194-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-031-7202-A	1V 7202-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-031-7203-A	1V 7203-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-031-8669-B	1V 8669-B	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-032-9104-A	1V 9104-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-032-9106-A	1V 9106-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-032-9107-A	1V 9107-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-032-9124-B	1V 9124-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-032-9126-B	1V 9126-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-032-9127-B	1V 9127-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9599-A	1V 9599-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9608-A	1V 9608-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9617-A	1V 9617-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9626-A	1V 9626-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9635-A	1V 9635-A	PXMJ	WHD-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3204-B	2PL3204-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3777-A	2PL3777-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3921C-B	2PL3921-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE Qu 9.21.86 ----- ----- -----

CHECKED/DATE Ted Vaka 9-21-86 FOR RTD ----- ----- -----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

SDIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-PPL-031-5132-A	2PL5132-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PPP-211-0445-B	2PP 445-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PPP-211-0606-A	2PP 606-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PPP-211-0610-B	2PP 610-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PV-065-6571-A	2V 6571-A	PXMJ	WHD-1	VARIOUS	VARIOUS	O	N80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PV-065-6574-A	2V 6574-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PV-065-6575-A	2V 6575-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PV-065-6576-A	2V 6576-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PV-065-6613-B	2V 6613-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PV-065-6622-B	2V 6622-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PV-065-6623-B	2V 6623-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PV-065-6624-B	2V 6624-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	80K8-827292-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Qm 9.21.86			
CHECKED/DATE	FW Vesler 9-21-86 FOR ETD			

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-002
MANUFACTURER : AIW
PAGE 1 OF 1

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-003-2990-A	1V 2990-A	PXMJ	WFA-2	VARIOUS	VARIOUS	0	80K7-827594-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-003-3000-B	1V 3000-B	PXMJ	WFA-2	VARIOUS	VARIOUS	0	80K7-827594-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Qus 9.21.86			
CHECKED/DATE	FW Vaby 9-21-86 FOR ETD			

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-002
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TA3 A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT ID	DEV NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PL-067-3921C-B	1PL	3921-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C037-B	1V	37-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C041-B	1V	41-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C043-B	1V	43-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C045-A	1V	45-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C049-A	1V	49-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C066-A	1V	66-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C067-A	1V	67-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C068-A	1V	68-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C072-A	1V	72-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-C073-A	1V	73-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3921B-B	2PL	3921-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N81K6-828714-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Qm 9.21.86	-----	-----	-----
CHECKED/DATE	FW Vash 9-21-86 PER FTD	-----	-----	-----

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-002
MANUFACTURER : AIM

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-APL-082-3460-A	0PL3460-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APL-082-3461-A	0PL3461-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-1946-B	0PP1946-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-1948-A	0PP1948-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-1949-B	0PP1949-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-1950-B	0PP1950-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-1952-A	0PP1952-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AB-099-0036-A	1B 36-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AB-099-0041-B	1B 41-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-003-1433-B	1M 1433-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-003-1439-B	1M 1439-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-003-1453-A	1M 1453-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-003-1454-A	1M 1454-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3077-A	1PL3077-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3087-B	1PL3087-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-6812-A	1PL6812-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-6814-A	1PL6814-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-6815-A	1PL6815-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-6817-B	1PL6817-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-6818-B	1PL6818-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-6819-B	1PL6819-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-211-0570-B	1PP 570-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-211-0574-A	1PP 574-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-046-0222-S	1SG 222-S	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-046-0234-S	1SG 234-S	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-046-0242-S	1SG 242-S	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-1835-A	1V 1835-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-2423B-A	1V 2423-A	PXMJ	WHL-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-070-2578-A	1V 2578-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-2627-A	1V 2627-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-3139-A	1V 3139-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-3149-B	1V 3149-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-4081A-B	1V 4081-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-031-8660-A	1V 8660-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-031-8662-B	1V 8662-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-031-8663-A	1V 8663-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-031-8667-A	1V 8667-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR

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R____ R____ R____

PREPARER/DATE Qm 9.21.86 ____ ____ ____

CHECKED/DATE HWVolz 9-21-86 FOR ETD ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-2V-031-3670-B	1V 3670-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-031-3674-B	1V 3674-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-2PL-030-3147-B	2PL3147-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-2V-065-6622A-B	2V 6622-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-2V-065-6630A-A	2V 6630-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N81K5-828920-3	A	100 D	LOCA/HELB	CARRY VLTG/CURR

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** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9-21-86			
CHECKED/DATE	9-21-86 FOR EIO			

BINDER NO. WBNEQ-CABL-002 PLANT WBN UNIT(S) 1 SHEET 1 OF 33

BINDER TITLE AIW/LOW VOLTAGE POWER & CONTROL-EPDM INS/TVA TYPES PXJ, PXMJ

COMPUTED [illegible] DATE 8.27.86 R ___ R ___

CHECKED [illegible] DATE 9.2.86

A. DOCUMENTATION

Equipment Description: 600V Power and Control Cables

Vendor/Manufacturer: American Insulated Wire Corporation (AIW)

Equipment Model No.(s): TVA Types PXJ & PXMJ

TVA Contract Nos.:

79K05-825342-02	80K07-827594-00
79K08-825668-02	81K06-828714-00
79K08-825848-00	81K05-828920-03
80K08-827292-00	

QUALIFICATION REPORTS

(1) Title/Number/Revision: Qualification Tests of Electrical Cables in a Simulated SLB and LOCA Environment; F-C4997-2 — RIMS: EEB 820527 320 — DATE: December 1978

(2) Title/Number/Revision: Not used; for future — RIMS: ___ — DATE: ___

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(3) AIW letter dated April 28, 1980 (RIMS EEB 800502 049) furnishing Arrhenius plot for EPDM insulation material (TAB C).

(4) AIW letters dated January 13, 1984, February 6, 1985 and December 9, 1985 (RIMS EEB 840118 014, EEB 850212 003 and B70 851216 005, respectively) confirming that (a) Same compound was used in manufacturing EPDM insulated cables supplied under different contracts and (b) Reports F-C4997-1 and F-C4997-2 are applicable for qualifying EPDM insulated cables supplied under the same contracts (TAB E).

(5) Analysis & Calculations for Qualification of Cables of Binder WBNEQ-CABL-002 (TAB C).

A. DOCUMENTATION (Continued)

(6) AIW-Vertical Flame Test (UL44, VW-1) (TAB E).

(7) TVA Calculation WAC-175 titled "Material Aging Calculation Report Transmittal," dated August 16, 1986 (TAB C).

NOTE: The above references are referred to throughout the TAB B by reference number; for example: Reference 3.

BINDER NO. WBNEQ-CABL-002 PLANT WBN UNIT(S) 1 SHEET 3 OF 33

BINDER TITLE AIW/LOW VOLTAGE POWER & CONTROL-EPDM INS/TVA TYPES PXJ,PXMJ COMPUTED [illegible] DATE 9.21.86 R ___ R ___

CHECKED [illegible] FOR BTO DATE 7-23-86

B. CONCLUSION OF REVIEW (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) On issuance of the official CACTAT, it shall be confirmed that the conductor temperature for all subject cables is less than 85°C qualified valve.

(2) The cables which are subject to submergence in the NVR and SVR are not qualified to function under a submerged condition.

(3) Cable with ID Nos. 1PL3546A, 1PL3551B, 1PL3552B, 1PL3556B, 1PL3557B, 1PM5203B, 1PM5204B and 2PL4A are not qualified for the total integrated dose (TID) of 1.1×10^{8} rads to which they would be minimally subjected due to their being routed within 2.5 feet of the HEPA filters in the EGT and the ABGT rooms as identified in OE Calculation WBPEVAR 8606004 (RIMS B26 860618 020).

(4) Reevaluate qualification data and TAB A listing, if required, due to certain cables being rerouted/repulled to new locations of their end devices.

(5) Resolution of existing discrepancies between design and installation records for cables that have been identified by an "N" prefixed contract number in TAB A.

COMMENTS/RECOMMENDATIONS The subject cable is qualified for service conditions outside the containment with a qualified life of 40 years at 185°F (85°C) conductor temperature and 100 days post-accident operating time. The detailed service conditions are listed in Section K of this tab.

BINDER NO. WBNEQ-CABL-002 PLANT WBN UNIT(S) 1 SHEET 4 OF 33

BINDER TITLE AIW/LOW VOLTAGE POWER & CONTROL-EPDM INS/TVA TYPES PXJ,PXMJ COMPUTED Qm DATE 8.27.86 R ___ R ___

CHECKED [illegible] DATE 9.2.86

C. 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-0588 Category II or the DOR Guidelines of 1E Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 383-1974

IEEE 323-1974

BINDER NO. WBNEQ-CABL-002 PLANT WBN UNIT(S) 1 SHEET 5 OF 33

BINDER TITLE AIW/LOW VOLTAGE POWER & CONTROL-EPDM INS/TVA TYPES PXJ,PXMJ COMPUTED [illegible] DATE 8.27.86 CHECKED [illegible] DATE 9.2.86 R ___ R ___

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 A 1/C, #16 AWG test sample was tested for qualification and it is considered a representative sample for qualifying low voltage, single conductor power cables and multiconductor control cables which have identical insulation material as that of the test sample. AIW, in Reference 4, confirms the use of same EPDM insulation material.

Based on Reference 1, Sections 1 and 2, the test cable was without a jacket as against the supplied cables which are provided with hypalon jackets (chlorosulfonated polyethylene). This, in fact, directly exposes the test cable insulation to a harsh environment and, therefore, a more severe and conservative test condition. Reference 5, Paragraph 1 gives the size, number of conductors, and insulation thickness data for the supplied cables.

The qualification of supplied cables by testing a representative sample is also in compliance with IEEE 383-1974 Table 1 and therefore acceptable.

E. EQUIPMENT DESCRIPTION

Is the equipment identified in the qualification report identical to the plant equipment which requires qualification (yes/no/NA)? No(1)

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Cable	1, Sec. 1
(2) Manufacturer	AIW	AIW	1, Sec. 1
(3) Model Number(s)	(3) TVA Type PXMJ	(2) Not stated	NA
	TVA Type PXJ	--	--
(4) Serial Number(s)	NA	NA	NA
(5) Identify Component-Unique checksheet attached:	See Supplement 2		

JUSTIFICATION/COMMENTS (1) The cables requiring qualification are with multiconductors and of sizes different than the 1/C, #16 AWG cable tested for the qualification; however, the supplied cables have the insulation material identical to the test cable. See Supplement 2, page 30 of this tab for comparison between the supplied and the tested cable.

(2) No specific model number for the test cable is assigned by the manufacturer.

(3) TVA type PXJ (PXMJ) cable is single conductor (multiconductor) cable with flame-retardant ethylene-propylene rubber insulation and chlorosulfonated polyethylene or chlorinated-polyethylene jacket materials.

BINDER NO. WBNEQ-CABL-002 PLANT WBN UNIT(S) 1 SHEET 7 OF 33

BINDER TITLE AIW/LOW VOLTAGE POWER & CONTROL-EPDM INS/TVA TYPES PXJ, PXMJ COMPUTED [illegible] DATE 8.27.86 CHECKED [illegible] DATE 9.2.86

R ___ R ___

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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	NA		
Electrical Connections	NA		
Conduit Seals	NA		
Connector Seals	NA		
Orientation	NA		
Physical Configuration	NA		
Other			

JUSTIFICATION/COMMENTS The cable interfaces are not considered for cable qualification.

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	1, Sec. 4.1
(b) Baseline performance measurements taken	Yes	1, Sec. 4.1
(c) Equipment aged:		
Thermal	Yes	1, Sec. 2.0
Radiation	Yes	1, Sec. 4.2
Wear	NA	See Comment on page 9
(d) Vibration/seismic testing conducted	NA	See Comment on page 9
(e) Design basis event (DBE) exposure	Yes	1, Sec. 4.4
(f) Post-DBE exposure	Yes	1, Sec. 4.5
(g) Final inspection and disassembly	Yes	1, Sec. 4.5

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference 1, Appendix A).

JUSTIFICATION/COMMENTS

VIBRATION, WEAR AND OPERATIONAL STRESS AGING

Normal Service Related Stresses: In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards..." Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria." Included in the list that follows the above quote is the standard to which TVA purchased the cables addressed in this binder: IPCEA S-68-516, Interim Standards for Ethylene-Propylene-Rubber-Insulated Wire and Cable. Number 1, Cables Rated 0-35000V. Number 2, Cables Rated 2000V, Integral Insulation and Jacket.

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference 1, Section 4.0 to 4.2).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	1, Sec. 4.0
Radiation exposure	Yes	1, Sec. 4.2
Vibration (non-seismic) aging	NA	See Comment on p. 9
Operational (electrical/mechanical/process) stress aging	NA	See Comment on p. 9

JUSTIFICATION/COMMENTS

(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)? Yes (Reference 5, paragraph 6.0).

JUSTIFICATION/COMMENTS

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference 1, Section 4.0).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference 1, p. 2-1).

JUSTIFICATION/COMMENTS The cable insulation material is considered susceptible to thermal degradation. The cable tested had fire retardant-ethylene propylene diene monomer (FR-EPDM) insulation (EPDM is a specific type of compound in the EPR class of insulation materials).

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference 3).

JUSTIFICATION/COMMENTS ___

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference 1, Section 2.0 & 4.5).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	130°F	150°C	85°C(185°F)
Time	40 years	600 hrs.	40 years

JUSTIFICATION/COMMENTS The cable thermal life equivalent to an accelerated aging at 150°C temperature and for 600 hours is 40 years at 90°C conductor service temperature. However, the conductor service temperature is restricted to 85°C considering the cable current loading during LOCA/HELB simulation testing (See Reference 5 paragraphs 4.0 & 8.0 for details)

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference 3).

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)? NA (Reference ___).

JUSTIFICATION/COMMENTS Vendor's cable-specific regression curve is used (Reference 3).

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)? Yes (Reference 3).

JUSTIFICATION/COMMENTS AIW supplied an Arrhenius plot showing that test program age-conditioning corresponded to greater than 60% retention of insulation elongation. The AIW cover letter in Reference 3 refers to TVA Contract 79K5-825342-2 only, however, since the same EPDM insulation materials have been used for all the subject cables (per Reference 4), the regression curve furnished by AIW stands applicable for all contracts.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS Cable specimen aging was based on 90°C which included temperature rise of energized conductor and, therefore, aging while energized was not required. The analysis in Reference 5 limits the conductor temperature to 85°C.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference 1, Section 4.2).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference 1,p. 2-1).

JUSTIFICATION/COMMENTS Test program was based on IEEE Std 383-1974 which implicitly considers insulation material as susceptible to radiation.

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS The test specimen was tested for IR values before and after the irradiation test. This is considered as an acceptable basis for ascertaining the retention of cable insulation property on radiation aging.

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference 1, Section 4.2).

Plant normal ambient radiation dose (rd) 19×10^6

Test exposure dose (rd) 100×10^6

Test exposure dose rate (rd/hr) 0.8×10^6

Test exposure source type (e.g., Co-60 gamma) Co-60 (gamma)

JUSTIFICATION/COMMENTS The worst case 40 years maximum normal ambient dose is postulated in the spent resin storage tank valve gallery room A16 at elevation 692'. See Reference 5, paragraph 3.2.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS See G(1)(d)

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS See G(1)(d)

(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)? NA (Reference _____).

JUSTIFICATION/COMMENTS See G(1)(c)

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? NA (Reference).

JUSTIFICATION/COMMENTS See G(1)(c)

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference 5, paragraph 4.0 & 8.0).

Qualified life (Document in QMDS) 40 years at 85°C (185°F) conductor temperature.

JUSTIFICATION/COMMENTS Qualified life is evaluated in Reference 5. Maximum conductor temperature was downrated to 85°C to meet post-accident extrapolation requirements.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA (Reference).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS Cable replacement is not required since the cables are qualified for the design life of the plant.

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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)

	Material/Property/Function	Threshold	Reference	Activation Energy	Reference
(a)	FR-EPDM	NA	NA	1.42	5, para 4
(b)					
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS

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

(1) Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure if not met (yes/no/NA)? No (Reference 1, Section 5.4 & 1).

Identify Acceptance Criteria: No specific requirements were stated in the test report. Ability to maintain current and voltage loads, and pass high voltage withstand test with mandrel bend indicate acceptable performance in IEEE Std 383-1974.

(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 1, Section 4.6).

Identify baseline and functional testing: IR measurements were made on receipt of cable specimens and throughout the test (See Table 2 in Reference 1). Total specimen leakage current was to be less than 1A (total all specimens) and monitored throughout test while energized at 600 Vac.

JUSTIFICATION/COMMENTS Baseline IR measurements were not made prior to thermal aging because specimens were aged by AIW prior to shipment to FIRL for testing.

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference 1, Section 4.4).

JUSTIFICATION/COMMENTS Cables were loaded to 10A and were maintained at 600 Vac potential above ground.

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? Yes (Reference 1, Sect. 4.1 & 5.1).

JUSTIFICATION/COMMENTS

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	480V	See Comment 1
Load	24A	See Comment 2
Frequency	NA	
Accuracy	NA	
Other(s)		

JUSTIFICATION/COMMENTS (1) The subject cables are for low voltage power and control circuits. At Watts Bar, a nominal system low-voltage is 480VAC or less (A.C. or D.C. in case of control circuits) with a 600V grade insulation.

(2) As a worst case 1/C, #16 AWG EPDM cable is considered to be loaded to its rated ampacity of 24A in air as identified in NEC.

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	600V	1, Sect. 5.3
Load	10A	1, Sect. 5.3 and comment
Frequency	NA	
Accuracy	NA	
Other(s)		

JUSTIFICATION/COMMENTS The 1/C, #16 AWG test cable per NEC is rated for full load current of 24A in air at 30°C ambient temperature as against 10A load current subjected during HELB/LOCA testing. This discrepancy in load current is accounted in the post-accident operating time analysis in Reference 5 paragraph 8.0.

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. For K(1): Temperature and pressure - Dwg 47E235-76R2; Rel. Humidity - normal max and abnormal max - Dwgs 47E235-44R0 and 47E235-76R2 respectively (typical of various outside containment plant location); Radiation -OE Calculation WBNNAL3-025 (RIMS B45 860401 235) in the spent resin storage tank valve gallery room A16 at elevation 692' (See comment to Section H (5)(d). For K(5): Drawing No. 47E235-76 & Reference 5, paragraph 3.1.

(1) Normal Max

(a) Temperature (^{o}F) 130

(b) Pressure (psia) 14.4

(c) Humidity (%) 80

(d) Radiation (rd) 1.9×10^{7}

(2) Abnormal Max

(a) Temperature (^{o}F) 140

(b) Pressure (psia) 14.4

(c) Humidity (%) 100

(d) Radiation (rd) -

(3) Process Interfaces: None.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Abnormal service condition duration is less than 8 hours per occurrence and total time does not exceed 1% of plant life. This will have negligible impact on cable qualification.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (^{o}F) 325 Accident type HELB

(b) Pressure (psia) 25.18 Accident type HELB

(c) Humidity (%) 100 Accident type HELB

(d) Radiation (rd) 9.0×10^{7} Accident type LOCA

(e) Spray Type NA Accident type NA

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Per Watts Bar Equipment List (WBEL, QIRWBPEVAR 8604004) all subject cables are routed outside containment where chemical spray is not postulated.

(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)? No (Reference See K(6) in Sect. P).

(7) Subject to submergence (yes/no/NA)? No (Reference _____).

Identify initiation time and duration of submergence: NA; the subject cables are not qualified for submergence (See open item (1) in Sect. B).

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

Type	RIMS No.
OE Calculation WBNNAL3-031 (1)	B45 860529 237
OE Calculation WBNNAL3-007 (2)	B45 860626 235

(1) 100-Day Loss of Coolant Accident Dose to Electrical Equipment in the EGTS Filter Train Room.

(2) Post-Loss of Coolant Accident Radiation Environment in Elevation 737 Purge Air and Ventilation Rooms.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 day	34 day (1)	1, p. 4-4
Temperature (°F)	325	381	1, pp. 4-4 & 5-5
Pressure (psia)	25.18	89.7	1, pp. 4-4 & 5-5
Relative Humidity (%)	100	100 (2)	1, Section 5.3
*Chemical Spray	NA(3)	Chemical (3)	1, Section 5.3
**Radiation (rd)	(4) 9.0×10^7 (gamma)	1×10^8	1, Section 5.2
Submergence	NA	NA	See Section K(7)

*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	1, pp. 4-4 & 5-5
Pressure	Yes	1, pp. 4-4 & 5-5
Relative Humidity	Yes	1, Sec. 5.3
Chemical Spray	NA	See comment (3)
Submergence	NA	See Section K(7)

JUSTIFICATION/COMMENTS See comments on following page.

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Notes for Section L Environmental Parameters:

(1) Extrapolation to 100 days is performed (Reference 5 paragraph 8.0).

(2) Humidity levels were maintained at or near 100 percent RH throughout the test because a chemical spray solution pool existed at the bottom of the chamber, and spray was not terminated until the end of the test.

(3) The cable is located outside containment and is not exposed to spray. The test included a 4000 ppm H_3BO_3 solution in water with NaOH during which the spray pH was maintained for the 34-day test at values between 9 and 11.

(4) The worst case radiation dose is postulated for the cables routed within 2.5 feet of the HEPA filters in the EGT and the ABGT rooms. See Reference 5, paragraph 3.0 for additional information on the accident dose.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	56	Yes
Pressure: +10% but no more than 10 psig	64.5	Yes
Radiation: +10% of accident dose	10%	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	NA (1)	NA
Voltage: ±10% of rated value	10% (2)	Yes
Frequency: ±5% of rated value	NA	NA
Environmental Transient: the initial transient and the peak temperature applied twice	Single (3)	NA
Vibration: +10% added to acceleration	NA	NA

JUSTIFICATION/COMMENTS (1) There is no explicit time margin; extrapolation is performed in Reference 5, paragraph 8.0 which documents that the 34-day test demonstrates greater than 100-day operation in the WBN accident environment.

(2) 600 Vac was applied during the test and corresponds to the cable insulation rating. Cables are operated up to nominal system voltages of 480 Vac. The test was performed at 25% above nominal.

(3) The test sample was tested for mandrel bend test following post-LOCA simulation (Reference 1, Sections 4.5 and 5.4) which per IEEE 383-1974 Section 2.4.3.1 and the note to Section 3.4.4 is considered more severe than two peak transient conditions.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference ____).

JUSTIFICATION/COMMENTS Electrical power to auxiliary power and control circuits for Class 1E equipment of 480V or less rating outside containment. Cables must maintain circuit integrity during and after a HELB/LOCA.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference 1, Section 5.3, & page 5-4).

JUSTIFICATION/COMMENTS The test cable remained energized at 600V AC and 10 Amps load current. The cable also maintained IR values above 1xE9 ohms.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference 1, Section 5.3).

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 1, Section 5.3).

JUSTIFICATION/COMMENTS Test duration was 34 days. An extrapolation in Reference 5, paragraph 8.0 demonstrates 100-day operability.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference 1, Sections 5.3 and 5.5).

JUSTIFICATION/COMMENTS One of nine specimens failed during the test because of the failure of a cable which did not belong to the test specimen group, but it was being tested in the same LOCA chamber. See M(5) in Section P for disposition.

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)? NA (Enter all requirements in Section G of the Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS

No surveillance or maintenance requirements have been identified from review and evaluation of vendor documentation. However, TVA has an in-house cable surveillance practice which is given in TAB G, QMDS.

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?	Yes-See O(2) in Sect. P
(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

O. SUMMARY 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) Criteria regarding test sequence satisfied?	Yes
(10) Criteria regarding spray satisfied?	See O(10) in Section P
(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?	NA
(11) Criteria regarding submergence satisfied?	NA; See Sect. K(7)
(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

O. SUMMARY OF REVIEW (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, See O(15)(b) in Section P
(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?	NA
(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. DISCUSSION

K(6): The IEEE 383-1794 Section 2.3.4 indicates that a cable which is shown to comply with IPCEA S-68-516 requirements is considered to have met with moisture resistance requirement during normal operation. Since TVA specification requires the supplied cables to be manufactured to the above referred industry standard, they are considered to have resistance to moisture intrusion.

Also, in addition to the above justification, test sample was tested to withstand 600 Volts, 10A load under the simulated accident condition of 100% relative humidity, elevated temperature and pressure and chemical spray..

M(5): Test Anomaly Disposition - Specimen C4997-C9 was de-energized 23.8 days into the test. Post-test inspections showed a bare conductor portion of the specimen near the vessel penetration where another cable crossed over. The faulted cable was removed and inspected. Visual inspection and highpotting at 2400V ac for 5 minutes resulted in no failure. Report F-C4997-2 attributed failure of the specimen to failure of another specimen (C4997-D9) that crossed over and was in physical contact with specimen C4997-C9. (FIRL Report F-C4997-2 stated that specimen C4997-D9 was not included within the scope of the report)

FIRL's explanation is reasonable with respect to the testing anomaly of the C4997-C9 specimen because:

1. The C4997-D9 specimen had to be de-energized prior to the C4997-C9 specimen (4.2 days vs. 23.8 days).

2. The C4997-C9 specimen was damaged from the point of crossover contact to the epoxy-potted pressure vessel penetration location. Since the vessel was at ground potential, leak-current paths could be established over the relatively short distance to the penetration area.

3. All other (8) specimens in the F-C4997-2 test performed satisfactorily.

In summary, FIRL's explanation is plausible and test data demonstrates that all other specimens not located near specimen C4997-D9 successfully passed the test.

O(2): The maximum conductor temperature for the subject cable was downrated to 85°C, as contrary to 90°C design value, to meet 100 days post-accident operating time requirement. See Reference 5.0, paragraphs 4.0, 5.0, & 8.0 for analysis and justification.

O(10): The subject cables are being qualified for installation outside containment and therefore chemical spray criteria is not applicable. However, the test sample had been subjected to chemical spray during HELB-LOCA testing, and this could be accounted as an additional conservatism.

O(15)(b): The test sample received at the test laboratory had already been thermally aged by the manufacturer (Reference 1, Sect. 1.0, page 1-2) and therefore the baseline IR values (before thermal aging) have not been documented in the test report. However, the IR values before irradiation and subsequently all throughout the qualification testing had been above 1xE9 ohms, and it is considered acceptable (Reference 1, Table 2, page 5-4).

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	FR-EPDM	FR-EPDM	Yes	Ref. 1, Section 2
Size	See Ref. 5, Para. 1.0	#16	Yes	Ref. 1, Section 2
Stranding	Class B	Not Stated	Yes	See Comment (1)
Coating	-	-	NA	-
Insulation Thickness	See Ref. 5, Para. 1.0	0.030 in.	Yes	Ref. 1, Section 2
Number of conductors	See Ref. 5, Para. 1.0	1/c	Yes	Ref. 1, Section 2
Arrangement of conductors	-	-	NA	-
(b) Shielding	None	None	NA	-
(c) Insulation jacket				
Material	-	None	NA	-
Thickness	-	None	NA	-
(d) Outer jacket				
Material	Hypalon (CSPE)	None	NA	-
Thickness	See Comment (2)	None	NA	-

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	600V	600V	Yes	Ref. 1, Section 2
(f) Rated current	NA	Not Stated	NA	-
(g) Operating temperature rating				
Normal	85°C(3)	Not Stated	Yes	-
Emergency	NA	NA	NA	-
Short circuit	NA	NA	NA	-
(h) Insulation resistance	NA	60,000 per 1000 ft at 120°F	Yes	Ref. 1, Section 5.1
(i) Splice				
Material	NA	NA	NA	-
Thickness	NA	NA	NA	-
Identification	NA	NA	NA	-

Comments: (1) Since no exception was taken by AIW in regard to TVA specification for stranding, it is construed that the supplied cables are with Class B stranding as specified by TVA; (2) In accordance with cable O.D. and number of conductors; (3) Reference 5, para. 4.0 & 5.0 for normal operating temperature calculation and justification.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference 1, Sections 4.4 & 4.5).

Comments:

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference 1, Section 4.4).

Comments: Energized at 600 VAC and 10A.

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference _____).

Comments: See (6) below.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference 1, Section 5.3 & Table 2).

Comments: Performed prior and after irradiation. Performed 7 times during DBE exposure and at post-DBE final testing. Minimum IR was 1.5E + 9 @ 500 VDC.

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference 1, Section 4.5 & 5.4).

Comments: Two mandrel bend tests were performed at 52X and 39X specimen diameter. In both the mandrel tests, cables withstood 2400 VAC for 5 minutes.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference 6).

Identify flame test standard: UL44; VW-1

Comments:

BINDER NO. WBNEQ-CABL-003 PLANT WBN UNIT(S) 1 SHEET 1 OF 1

BINDER TITLE EQ DOCUMENTATION COMPUTED JDJ DATE 9-19-86 R ___ R ___

AMERICAN INSULATED WIRE PXJ, PXMJ CHECKED CJ DATE 9-20-86

TAB A

Any cable contracts with an "N" prefix have problems with the cable mark number, reel number, and/or contract number. The "N" prefixed cables are not qualified in this binder and must be evaluated pending resolution of SCRs WBNEQP8624, 25, 26, 28.

See the open item concerning the "N" prefixed cables in the front of TAB A.

PRINT DATE: 09/20/86

BINDER NO. : WBNEQ-CABL-003
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION %BM	CONTRACT	C A I *	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PL-068-4627-A	1PL4627-A	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4628-A	1PL4628-A	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4629-A	1PL4629-A	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4630-A	1PL4630-A	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4631-A	1PL4631-A	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4632-A	1PL4632-A	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4633-A	1PL4633-A	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4679-B	1PL4679-B	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4853-B	1PL4853-B	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4873-B	1PL4873-B	PXJ	WDH-1	VARIOUS	VARIOUS	0	77K5-822173-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

PAGE A 2

PREPARER/DATE J.D. Jackson 9-20-86 R____ R____ R____

CHECKED/DATE [illegible] 9/22/86

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-aV-077-0420-A	OV 420-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-0694-A	OV 694-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-0758-A	OV 758-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-0876-B	OV 876-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-031-1196-A	OV 1196-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-031-1200-B	OV 1200-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-040-2531-A	OV 2531-A	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-040-2535-B	OV 2535-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aB-099-0037-B	1B 37-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aG-047-0217-B	1G 217-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aG-047-0222-A	1G 222-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPL-030-3071-A	1PL3071-A	PXMJ	WFC-1	VARIOUS	VARIOUS	O	N77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPL-067-3920C-B	1PL3920-B	PXMJ	WFC-1	VARIOUS	VARIOUS	O	N77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPL-031-4060-A	1PL4060-A	PXMJ	WFC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPL-062-6176-B	1PL6176-B	PXMJ	WFC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPL-062-6188-B	1PL6188-B	PXMJ	WFC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPL-003-6320-A	1PL6320-A	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPL-003-6330-B	1PL6330-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	N77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPP-211-0446-A	1PP 446-A	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPP-211-0447-B	1PP 447-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPP-063-0605-A	1PP 605-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPP-003-0667-B	1PP 667-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-030-1237-B	1V 1237-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	N77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-030-1308-B	1V 1308-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-030-1392-B	1V 1392-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-030-1414-A	1V 1414-A	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-030-1582-B	1V 1582-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-030-1597-B	1V 1597-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-030-1609-A	1V 1609-A	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-030-1622-A	1V 1622-A	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-030-1636-A	1V 1636-A	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-074-1900-B	1V 1900-B	PXMJ	WFC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-074-1915-B	1V 1915-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-074-1920-A	1V 1920-A	PXMJ	WFC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-070-2566-A	1V 2566-A	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-3350-B	1V 3350-B	PXMJ	WGC-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-087-3388-D	1V 3388-D	PXMJ	WFB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 ____ ____ ____

CHECKED/DATE [illegible] 9/26/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

SDIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION ±BR	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@V-087-3398-E	1V 3398-E	PXMJ	WFB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-087-3420-A	1V 3420-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-087-3430-A	1V 3430-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-087-3440-B	1V 3440-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-087-3450-B	1V 3450-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-087-3460-B	1V 3460-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-3985-A	1V 3985-A	PXMJ	WFB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-3993-B	1V 3993-B	PXMJ	WFB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-3995-B	1V 3995-B	PXMJ	WFB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-4004-A	1V 4004-A	PXMJ	WFB-1	VARIOUS	VARIOUS	0	N77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-062-4361-A	1V 4361-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5860-A	1V 5860-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5870-A	1V 5870-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5883-B	1V 5883-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5903-B	1V 5903-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5920-A	1V 5920-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5930-A	1V 5930-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5943-B	1V 5943-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5963-B	1V 5963-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-065-6697-A	1V 6697-A	PXMJ	WGC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-065-6714-B	1V 6714-B	PXMJ	WGC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-032-9121-B	1V 9121-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-026-9155-B	1V 9155-B	PXMJ	WGC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-026-9175-A	1V 9175-A	PXMJ	WGC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3071-A	2PL3071-A	PXMJ	WFC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3081-B	2PL3081-B	PXMJ	WFC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3101-B	2PL3101-B	PXMJ	WFC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3111-A	2PL3111-A	PXMJ	WFC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3131-A	2PL3131-A	PXMJ	WFC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3141-B	2PL3141-B	PXMJ	WFC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3201-B	2PL3201-B	PXMJ	WFC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3774-A	2PL3774-A	PXMJ	WFC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3920C-B	2PL3920-B	PXMJ	WFC-1	VARIOUS	VARIOUS	0	N77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-211-0447-B	2PP 447-B	PXMJ	WGC-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-3985-A	2V 3985-A	PXMJ	WFB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-3993-B	2V 3993-B	PXMJ	WFB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-3995-B	2V 3995-B	PXMJ	WFB-1	VARIOUS	VARIOUS	0	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 _____ _____ _____

CHECKED/DATE D.J. Cap 9/20/86 _____ _____

PRINT DATE: 09/20/86

BINDER NO. : WONEQ-CABL-003
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/BI.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-QV-067-4004-A	2V 4004-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	77K5-822401-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

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** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

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PREPARER/DATE J.D. Jackson 9-20-86 R____ R____ R____
CHECKED/DATE D.T. Cox 9/22/86

PRINT DATE: 09/20/86

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	*BB	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-@SG-012-0127-A	OSG 127-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@SG-012-0128-A	OSG 128-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@SG-012-0130-A	OSG 130-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@SG-012-0135-A	OSG 135-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@SG-012-0150-B	OSG 150-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@SG-012-0158-B	OSG 158-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@SG-012-0159-B	OSG 159-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@SG-012-0162-B	OSG 162-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@SG-012-0164-B	OSG 164-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-065-C600-A	OV 600-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C705-B	OV 705-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C706-B	OV 706-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C707-B	OV 707-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C761-A	OV 761-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C763-A	OV 763-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C771-B	OV 771-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C777-A	OV 777-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C779-A	OV 779-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C793-A	OV 793-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C795-A	OV 795-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C801-B	OV 801-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C803-B	OV 803-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C809-A	OV 809-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-@V-030-C811-A	OV 811-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-2984-A	1PL2984-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-2994-B	1PL2994-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3014-B	1PL3014-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3074-A	1PL3074-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3084-B	1PL3084-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3114-A	1PL3114-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3124-B	1PL3124-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3144-B	1PL3144-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3194-A	1PL3194-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3204-B	1PL3204-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-062-6178-B	1PL6178-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-062-6184-A	1PL6184-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-062-6190-B	1PL6190-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

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* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	J.D. Jackson 9-20-86	-----	-----	-----
CHECKED/DATE	D.J. Cox 9/22/86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION ±RB	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APL-087-6248-A	1PL6248-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6253-A	1PL6253-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6258-B	1PL6258-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6263-B	1PL6263-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0280-A	1RM 280-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0290-A	1RM 290-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0300-A	1RM 300-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0310-A	1RM 310-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0320-B	1RM 320-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0330-B	1RM 330-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0340-B	1RM 340-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0350-B	1RM 350-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0360-B	1RM 360-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0370-B	1RM 370-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0423-A	1RM 423-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0436-B	1RM 436-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-077-0785-A	1V 785-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-077-0786-A	1V 786-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-077-0787-A	1V 787-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-077-0794-A	1V 794-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-077-0795-A	1V 795-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-077-0837-A	1V 837-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-077-0838-A	1V 838-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-077-0943-A	1V 943-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-077-0944-A	1V 944-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1030-B	1V 1030-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1038-B	1V 1038-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1040-B	1V 1040-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1048-B	1V 1048-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1393-B	1V 1393-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1416-A	1V 1416-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1637-A	1V 1637-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-072-1804-B	1V 1804-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-3134-A	1V 3134-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-3196-B	1V 3196-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-062-4226-B	1V 4226-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-062-4228-B	1V 4228-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

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** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 _____ _____ _____

CHECKED/DATE D.F. Cox 9/22/86 _____ _____ _____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BR	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-aV-062-4244-A	1V 4244-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4245-A	1V 4245-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4246-A	1V 4246-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4263-A	1V 4263-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4266-A	1V 4266-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4282-A	1V 4282-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4283-A	1V 4283-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4284-A	1V 4284-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4298-A	1V 4298-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4299-A	1V 4299-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4300-A	1V 4300-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4337-A	1V 4337-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4338-A	1V 4338-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4339-A	1V 4339-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4340-A	1V 4340-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4357-A	1V 4357-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-4358-A	1V 4358-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4765-B	1V 4765-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4768-B	1V 4768-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4769-B	1V 4769-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4786-B	1V 4786-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4787-B	1V 4787-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4799-B	1V 4799-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4800-B	1V 4800-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4831-A	1V 4831-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4832-A	1V 4832-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4973-B	1V 4973-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4978-B	1V 4978-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-4981-B	1V 4981-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-068-5503-A	1V 5503-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-068-5504-A	1V 5504-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-070-5746-B	1V 5746-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-070-5748-B	1V 5748-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-065-6590-B	1V 6590-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-065-6610-B	1V 6610-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-065-6620-B	1V 6620-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-065-6641-A	1V 6641-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

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R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 ____ ____ ____

CKED/DATE [illegible] 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-AV-065-6642-A	1V 6642-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-065-6643-A	1V 6643-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-065-6644-A	1V 6644-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-065-6645-A	1V 6645-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-065-6669-B	1V 6669-B	PXMJ	WHB	VARIOUS	VARIOUS	0	N78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-065-6670-B	1V 6670-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-065-6671-B	1V 6671-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-065-6672-B	1V 6672-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-065-6673-B	1V 6673-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-031-7215-B	1V 7215-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-031-7224-B	1V 7224-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-7960-A	1V 7960-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-7970-B	1V 7970-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-8040-A	1V 8040-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-8050-B	1V 8050-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-8060-B	1V 8060-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-8074-A	1V 8074-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-8080-A	1V 8080-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-8090-B	1V 8090-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-8604-A	1V 8604-A	PXMJ	WHB	VARIOUS	VARIOUS	0	N78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-081-9245-A	1V 9245-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-081-9246-A	1V 9246-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3074-A	2PL3074-A	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3084-B	2PL3084-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3144-B	2PL3144-B	PXMJ	WHB	VARIOUS	VARIOUS	0	78K5-823128-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

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R____ R____ R____

PREPARER/DATE J D Jackson 9-20-86 _____ _____ _____

CHECKED/DATE [illegible] 9/20/86 _____ _____ _____

PRINT DATE: 09/20/86

BINDER NO. : WBNEQ-CABL-003
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-aM-070-C320-B	0M 320-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-077-C433-B	0V 433-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-077-C435-B	0V 435-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C602-A	0V 602-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C604-A	0V 604-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C605-A	0V 605-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C615-A	0V 615-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C618-A	0V 618-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C619-A	0V 619-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C627-B	0V 627-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C629-B	0V 629-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C630-B	0V 630-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C634-B	0V 634-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C635-B	0V 635-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C638-B	0V 638-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-065-C639-B	0V 639-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-C697-A	0V 697-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-C698-A	0V 698-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-C699-A	0V 699-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-C753-B	0V 753-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-C755-B	0V 755-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-C885-B	0V 885-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-C965-A	0V 965-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-aV-030-C975-B	0V 975-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-043-C591-B	1M 591-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-003-1433-A	1M 1433-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-003-1437-B	1M 1437-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-2346-B	1M 2346-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-2353-A	1M 2353-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-2358-B	1M 2358-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-2359-B	1M 2359-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-3008-B	1M 3008-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-3009-B	1M 3009-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-3010-B	1M 3010-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-3011-B	1M 3011-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-3013-B	1M 3013-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aM-031-3025-A	1M 3025-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

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R____ R____ R____

PREPARER/DATE J.J. Jackson 9-20-86 ____ ____ ____

CHECKED/DATE [illegible] 9/20/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	*BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@M-031-3027-A	1M 3027-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-031-3028-A	1M 3028-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-031-3030-A	1M 3030-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-031-3031-A	1M 3031-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-031-3032-A	1M 3032-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-031-3033-A	1M 3033-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-031-3034-A	1M 3034-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-083-1063-A	1PL1063-A	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-083-1083-B	1PL1083-B	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-3154-A	1PL3154-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-065-3524-A	1PL3524-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-065-3534-B	1PL3534-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-4029-A	1PL4029-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-4031-B	1PL4031-B	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-4032-B	1PL4032-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-4500-A	1PL4500-A	PXJ	WDK-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-4521-A	1PL4521-A	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-078-4540-A	1PL4540-A	PXJ	WDK-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4677-B	1PL4677-B	PXJ	WDH-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4678-B	1PL4678-B	PXJ	WDH-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4680-B	1PL4680-B	PXJ	WDH-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4681-B	1PL4681-B	PXJ	WDH-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4682-B	1PL4682-B	PXJ	WDH-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-068-4683-B	1PL4683-B	PXJ	WDH-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-070-4742-B	1PL4742-B	PXJ	WDN-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-070-4743-B	1PL4743-B	PXJ	WDN-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4816-A	1PL4816-A	PXJ	WDH-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4836-A	1PL4836-A	PXJ	WDH-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-026-5008-A	1PL5008-A	J	WDD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-026-5022-B	1PL5022-B	J	WDD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-5210-B	1PL5210-B	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-5211-B	1PL5211-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-070-6138-B	1PL6138-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-062-6149-A	1PL6149-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-099-0181-B	1PS 181-B	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-072-0235-B	1PS 235-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0302-B	1PS 302-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 _____ _____ _____

CHECKED/DATE [illegible] 9/22/86 _____ _____ _____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PS-068-0303-E	1PS 303-E	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0304-E	1PS 304-E	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0322-F	1PS 322-F	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0323-F	1PS 323-F	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0324-F	1PS 324-F	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0325-F	1PS 325-F	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-068-0342-G	1PS 342-G	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0052-A	1RM 52-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0055-B	1RM 55-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0101-A	1SG 101-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0109-A	1SG 109-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0370-S	1SG 370-S	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0520-A	1SG 520-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0521-A	1SG 521-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0522-A	1SG 522-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0523-A	1SG 523-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0527-B	1SG 527-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0531-A	1SG 531-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0539-B	1SG 539-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0540-B	1SG 540-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0545-A	1SG 545-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0547-A	1SG 547-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0548-A	1SG 548-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0549-A	1SG 549-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0553-B	1SG 553-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0557-A	1SG 557-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0563-B	1SG 563-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0564-B	1SG 564-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0603-A	1SG 603-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0606-A	1SG 606-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0616-B	1SG 616-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1027-A	1V 1027-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1037-B	1V 1037-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-062-1160-A	1V 1160-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-1483-A	1V 1483-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-1485-A	1V 1485-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-1492-A	1V 1492-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE J D Jackson 9-20-86 ____ ____ ____

CKED/DATE [illegible] 9/20/86 ____ ____

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	** CONTRACT	C A I.	OPER TIME		MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-030-1494-A	1V 1494-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1501-A	1V 1501-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1510-A	1V 1510-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1924-A	1V 1924-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-2623-A	1V 2623-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2639-B	1V 2639-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2786-A	1V 2786-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2845-B	1V 2845-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2933-A	1V 2933-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-3116-A	1V 3116-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3560-A	1V 3560-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3561-A	1V 3561-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3563-A	1V 3563-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3571-A	1V 3571-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3573-A	1V 3573-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3587-A	1V 3587-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3588-A	1V 3588-A	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3589-A	1V 3589-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3610-B	1V 3610-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3611-B	1V 3611-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3613-B	1V 3613-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3621-B	1V 3621-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3623-B	1V 3623-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3640-B	1V 3640-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3661-A	1V 3661-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3663-A	1V 3663-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3667-A	1V 3667-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3669-A	1V 3669-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3673-A	1V 3673-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3674-A	1V 3674-A	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3675-A	1V 3675-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3701-B	1V 3701-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3703-B	1V 3703-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3707-B	1V 3707-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3709-B	1V 3709-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3712-B	1V 3712-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3714-B	1V 3714-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100	D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 _____ _____ _____

CHECKED/DATE [illegible] 9/30/86 _____ _____ _____

PRINT DATE: 09/20/86

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-030-3753-A	1V 3753-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3755-A	1V 3755-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3760-A	1V 3760-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3762-A	1V 3762-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3765-A	1V 3765-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3767-A	1V 3767-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3781-A	1V 3781-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3782-A	1V 3782-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3783-A	1V 3783-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3807-B	1V 3807-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3809-B	1V 3809-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3814-B	1V 3814-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3816-B	1V 3816-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3820-B	1V 3820-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3822-B	1V 3822-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3829-B	1V 3829-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-4100-B	1V 4100-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-4200-A	1V 4200-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-4203-A	1V 4203-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4264-A	1V 4264-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4360-A	1V 4360-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-5640-A	1V 5640-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6564-A	1V 6564-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6565-A	1V 6565-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6566-A	1V 6566-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6574-A	1V 6574-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6584-B	1V 6584-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6585-B	1V 6585-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6586-B	1V 6586-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6594-B	1V 6594-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6595-B	1V 6595-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6596-B	1V 6596-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6603-A	1V 6603-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6605-A	1V 6605-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6613-B	1V 6613-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6615-B	1V 6615-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6622-B	1V 6622-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 ____ ____ ____

CHECKED/DATE [illegible] 9/20/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BR	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-065-6623-B	1V 6623-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6624-B	1V 6624-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6630-A	1V 6630-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6631-A	1V 6631-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6632-A	1V 6632-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7524-A	1V 7524-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7525-A	1V 7525-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7526-A	1V 7526-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7527-A	1V 7527-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7540-A	1V 7540-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7541-A	1V 7541-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7542-A	1V 7542-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7543-A	1V 7543-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7565-B	1V 7565-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7566-B	1V 7566-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7571-B	1V 7571-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7572-B	1V 7572-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7961-A	1V 7961-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8041-A	1V 8041-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8051-B	1V 8051-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8061-B	1V 8061-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8091-B	1V 8091-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8403-A	1V 8403-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8405-A	1V 8405-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8410-A	1V 8410-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8411-A	1V 8411-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8412-A	1V 8412-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8423-B	1V 8423-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8425-B	1V 8425-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8430-B	1V 8430-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8432-B	1V 8432-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8564-A	1V 8564-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8574-B	1V 8574-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8584-A	1V 8584-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8594-B	1V 8594-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8618-B	1V 8618-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8624-A	1V 8624-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 ____ ____ ____

CHECKED/DATE [illegible] 9/20/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BR	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-AV-001-8638-B	1V 8638-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9550-B	1V 9550-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9555-B	1V 9555-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9560-B	1V 9560-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9566-B	1V 9566-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9569-B	1V 9569-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9575-B	1V 9575-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9578-B	1V 9578-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9584-B	1V 9584-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9587-B	1V 9587-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9593-B	1V 9593-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9597-A	1V 9597-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9598-A	1V 9598-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9940-A	1V 9940-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9941-A	1V 9941-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9950-A	1V 9950-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9951-A	1V 9951-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9960-B	1V 9960-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9961-B	1V 9961-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9970-B	1V 9970-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9971-B	1V 9971-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-AM-031-2341-A	2M 2341-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-AM-031-2346-B	2M 2346-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-AM-031-2359-B	2M 2359-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3202-B	2PL3202-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3754-A	2PL3754-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3765-B	2PL3765-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-030-3766-B	2PL3766-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-031-3981-B	2PL3981-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-031-4011-A	2PL4011-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-031-4021-A	2PL4021-A	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-031-4022-A	2PL4022-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-031-4023-A	2PL4023-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-031-5120-A	2PL5120-A	PXJ	WDN-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-031-5124-A	2PL5124-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-031-5130-A	2PL5130-A	PXMJ	WHD-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-AV-065-6564-A	2V 6564-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86

CKED/DATE [illegible] 9/25/86

A-16

PRINT DATE: 09/20/86

BINDER NO. : W8NEQ-CABL-003
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BR	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-QV-065-6565-A	2V 6565-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6566-A	2V 6566-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6584-B	2V 6584-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6585-B	2V 6585-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6586-B	2V 6586-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6603B-A	2V 6603-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6605-A	2V 6605-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6615-B	2V 6615-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	78K5-823412-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

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R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 _____ _____ _____

CHECKED/DATE [illegible] 9/26/86 _____ _____ _____

PRINT DATE: 09/20/86

BINDER NO. : WBNEQ-CABL-003
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BB	CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APL-067-3905B-B	1PL3905-B	PXJ	WDK	VARIOUS	VARIOUS	O	78K5-824164-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3960A-A	1PL3960-A	PXJ	WDK	VARIOUS	VARIOUS	O	78K5-824164-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-5200-B	1PL5200-B	PXJ	WDN-1	VARIOUS	VARIOUS	O	78K5-824164-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-067-3960A-A	2PL3960-A	PXJ	WDK	VARIOUS	VARIOUS	O	78K5-824164-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APL-078-4895-A	2PL4895-A	PXJ	WDK-1	VARIOUS	VARIOUS	O	78K5-824164-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

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R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 ____ ____ ____

CHECKED/DATE R.L. Cox 9/26/86 ____ ____ ____

PRINT DATE: 09/20/86

BINDER NO. : W8NEQ-CABL-003
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION BLDG	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PL-031-3831-8	1PL3831-8	PXMJ	WF8-1	VARIOUS	VARIOUS	0	79K5-824597-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-3832-8	1PL3832-8	PXMJ	WF8-1	VARIOUS	VARIOUS	0	79K5-824597-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PV-070-0181-8	1PV 181-8	PXMJ	WF8-1	VARIOUS	VARIOUS	0	79K5-824597-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

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PREPARER/DATE J D Jackson 9-20-86 R____ R____ R____

CHECKED/DATE [illegible] 9/20/86

PRINT DATE: 09/20/86

BINDER NO. : WBNEQ-CABL-003
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-aSG-012-0126-A	0SG 126-A	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPL-031-4042-B	1PL4042-B	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPL-031-5209-B	1PL5209-B	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aPP-068-0895-B	1PP 895-B	J	WDD-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0947-A	1V 947-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	N79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0948-A	1V 948-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	N79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0949-A	1V 949-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	N79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-0950-A	1V 950-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	N79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-1823-A	1V 1823-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-1824-A	1V 1824-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-1833-A	1V 1833-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-1834-A	1V 1834-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2447-B	1V 2447-B	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2567-A	1V 2567-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2572-A	1V 2572-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-2622-A	1V 2622-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2995-A	1V 2995-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3353-B	1V 3353-B	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8409-A	1V 8409-A	PXMJ	WHE-1	VARIOUS	VARIOUS	0	N79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8422-B	1V 8422-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	N79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-8668-A	1V 8668-A	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-8671-A	1V 8671-A	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-8672-B	1V 8672-B	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-8760-A	1V 8760-A	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-8766-A	1V 8766-A	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-8771-B	1V 8771-B	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-8777-B	1V 8777-B	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-9145-A	1V 9145-A	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-9163-A	1V 9163-A	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-9549-B	1V 9549-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-9561-B	1V 9561-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-9570-B	1V 9570-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-9579-B	1V 9579-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-9588-B	1V 9588-B	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-9729-A	1V 9729-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-aPL-030-3093-A	2PL3093-A	PXMJ	WHE-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-aPL-031-5133-A	2PL5133-A	PXMJ	WHG-1	VARIOUS	VARIOUS	0	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

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R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 ____ ____ ____

CHECKED/DATE D.L. Cox 9/22/86 ____ ____ ____

PRINT DATE: 09/20/86

BINDER NO. : WBNEQ-CABL-003
MANUFACTURER : AIW

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	* BR	** CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-BV-067-2401-A	2V 2401-A	PXMJ	WHG-1	VARIOUS	VARIOUS	O	79K5-824965-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

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R____ R____ R____

PREPARER/DATE J.D. Jackson 9-20-86 _____ _____ _____

CHECKED/DATE D.J. Cof 9/22/86 _____ _____ _____

BINDER NO. WBNEQ-CABL-003 PLANT WBN UNIT(S) 1 SHEET 1 OF 1

BINDER TITLE EQ DOCUMENTATION AMERICAN INSULATED WIRE PXJ, PXMJ

COMPUTED JDJ DATE 9-19-86 R ___ R ___

CHECKED CJP DATE 9/22/86

TAB B

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A. DOCUMENTATION

Equipment Description: Cable

Vendor/Manufacturer: American Insulated Wire

Equipment Model No.(s): TVA Type PXJ, PXMJ

TVA Contracts: 79K5-824965, 78K5-823412-1, 77K5-822173-2, 79K5-824597, 78K5-823128, 78X5-824164, 77K5-822401

QUALIFICATION REPORTS

(1) Title/Number/Revision "Nuclear Environmental Qualification Test Program on Various Cables Used Outside Containment (Profile 3) for Tennessee Valley Authority for Use in Sequoyah and Watts Bar Nuclear Generating Stations," 17732-1, Revision C — RIMS B70 860228 100 — DATE Feb. 24, 1986

(2) Title/Number/Revision "Nuclear Environmental Qualification Test Program on Various Cables for Use in Sequoyah Nuclear Plant East and West Steam Valve Rooms and East Steam Valve Vault Instrument Rooms and Watts Bar Nuclear Plant North and South Steam Valve Rooms and North Steam Valve Vault Instrument Rooms," 17740-1, Revision D — RIMS B43 860409 500 — DATE Mar. 4, 1986

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(3) Wyle letter to TVA dated December 16, 1985 (RIMS B70 851230 001) TAB E.

(4) Letter from American Insulated Wire dated December 9, 1985 (RIMS B70 851216 005) TAB E.

(5) Letter from American Insulated Wire dated February 6, 1985 (RIMS EEB 850212 003) TAB E.

(6) Normal Operation Dose for Equipment Qualification Outside the Shield Building (RIMS B45 860401 235) TAB E.

(7) Steam Valve Room Feedwater Line Break Temperature, Pressure, vs. Time QIR NEB86035 (RIMS B45 860317 251) TAB E.

(8) Post-LOCA Dose Rates Around EGTS and ABGTS Filters, EN DES Calculation TI-RPS-194 - Excerpts (RIMS NEB 850118 235) TAB E.

(9) Field Verification - EGTS & ABGTS Rad Dose QIR WBNEEB86058 (RIMS B26 860620 001).

(10) Determination of Flooding Levels in the MSVV at Watts Bar. SCR WBNEEB8584, RIMS B43 851226 911.

(11) Class 1E Cables and Junction Boxes Below Flood Level in the Auxiliary Building, QIR WBNEEB 86037, RIMS B26 860310 004.

NOTE: Also, see TAB C, 5.1, for additional references specifically applicable to TAB C, Section 5.0.

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BINDER TITLE EQ DOCUMENTATION AMERICAN INSULATED WIRE PXJ, PXMJ COMPUTED JDJ DATE 9-20-86 R ___ R ___

CHECKED Caf DATE 9/22/86

B. CONCLUSION OF REVIEW (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) Issue Rev. 1 to OE Calculation "Normal Operation Dose for Equipment Qualification Outside the Shield Building."

2) Re-route cables subject to submergence.

3) Cable documentation discrepancies between design and as-built (i.e., reel, contract, mark no., in TAB A).

4) Issuance of updated and correct CACTAT.

5) Re-route/remove or shield cable in EGTS to provide an acceptable radiation dose of 6.75E7 rads.

6) Vendor confirmation of cable insulation material used on contract 78K5-823128.

7) Removal of System 87 cables.

8) Cables with design changes which may impact qualification.

COMMENTS/RECOMMENTATIONS: Qualification has been demonstrated for American Insulated Wire Cable TVA Type PXJ and PXMJ with FR-XLPE insulation and Hypalon (CSPE) jackets for HELB and LOCA service conditions for all outside containment locations, including those in the ABGTS and EGTS filter rooms and the MSVV rooms. Qualified life and aging evaluations show the test program demonstrated a qualified life for 38.29 years in the MSVV room and 40 years in all other outside containment harsh areas at a 60°C conductor rating.

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BINDER TITLE EQ DOCUMENTATION AMERICAN INSULATED WIRE PXJ, PXMJ COMPUTED JDJ DATE 9-19-86 R ___ R ___

CHECKED Cup DATE 9/22/86

C. 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 None

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 323-1971, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations."

Note: Wyle Test Reports 17740-1 and 17732-1 were performed to satisfy the intent of IEEE Std. 323-1974, however, NUREG 0588 Category II to which these cables are qualified, meets the intent of IEEE Standard 323-1971.

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 tested cables are representative of the cables used in the plant which are listed in Section A, "Equipment Identification Matrix" (TAB A). See TAB C, 1.0 "Similarity: Tested Cable Vs. Installed Cable," for justification.

NOTE: The following test reports and test specimens are used to determine qualification for areas noted:

Test Report	Specimen	Area(s)	Qualification
Reference 1 17732-1	12b, 25b	All outside containment areas except MSVV room.	40 Years
Reference 2 17740-1 (Radiation and thermal aging was performed on these specimens and reported in Ref. 1, 17732-1)	12a, 25a	MSVV room	20 Years

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Cable	Test Rpt 17732-1, pp xi & VII-6 & VII-7; 177401, p vi Specimens 12 & 25
(2) Manufacturer	American Insulated Wire	American Insulated Wire	Test Rpt 17732-1, pp xi & VII-6 & VII-7; 17740-1 p vi Specimens 12 & 25
(3) Model Number(s)	TVA Type PXJ,PXMJ (1) TVA Mark Nos. WDK-1 WDD-1 WHB-1 WHE-1 WHD-1 WHG-1 WHB WHH-1 WFC-1 WFB-1 WGB-1 WDK WGC-1 WDN-1 WDH-1	TVA Type PXJ,PXMJ (1) TVA Mark Nos. WHB WDB-1	Test Rpt 17732-1, pp xi & VII-6 & VII-7; 17740-1 p vi Specimens 12 & 25
(4) Serial Number(s)	NA	NA	NA
(5) Identify Component-Unique checksheet attached:	Supplement 2 component-unique checklist cables/splices		

JUSTIFICATION/COMMENTS Test specimens in the Wyle Test Reports 17732-1 and 17740-1 were taken from the same TVA contracts as the 50.49 cables installed in TVA nuclear plants. Their physical characteristics, conductor size, number, etc., are representative of the cables purchased on the contracts and installed at Watts Bar. See TAB C, paragraph 1.0, for further discussion.

E. EQUIPMENT DESCRIPTION (Continued)

JUSTIFICATION/COMMENTS

(1) PXJ: Single conductor cable with flame-retardant, cross-linked polyethylene (FX-XLPE) insulation and a chlorosulfonated-polyethylene (CSPE) jacket over the insulation.

PXMJ: Multiple conductor cable with a core of the specified number of Type PX single conductor covered with a chlorosulfonated-polyethylene outer jacket.

NOTE: Hypalon, a brand name CSPE, is used on the cables in the contracts covered by this binder.

BINDER NO. WBNEQ-CABL-003 PLANT WBN UNIT(S) 1 SHEET 8 OF 35

BINDER TITLE EQ DOCUMENTATION AMERICAN INSULATED WIRE PXJ, PXMJ COMPUTED JOJ DATE 9-19-86 R ___ R ___

CHECKED Cap DATE 9/22/86

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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 justificaton.

Interface	Identify Interface Identify Interface	Plant Requirement? (Yes/No)	Reference Test Report
Mounting Bolts		NA	
External Process Connections		NA	
Electrical Connections		NA	
Conduit Seals		NA	
Connector Seals		NA	
Orientation		NA	
Physical Configuration		NA	
Other		NA	

JUSTIFICATION/COMMENTS This section is not required for cable.

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	17732-1, VII-9, & 17740-1, p III-6,
(b) Baseline performance measurements taken	Yes	17732-1, Section I
(c) Equipment aged:		
Thermal	Yes[1]	17732-1, Section IV,
Radiation	Yes	17732-1, Section II
Wear	NA	
(d) Vibration/seismic testing conducted	NA	
(e) Design basis event (DBE) exposure	Yes[1]	17732-1, Section V, & 17740-1, Section I
(f) Post-DBE exposure	Yes[1]	17732-1, pp V-3 & VII-22, 17740-1, pp I-3 & III-14
(g) Final inspection and disassembly	Yes	17732-1, Section VIII, & 17740-1, Section IV

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference See TAB C, 7.0).

JUSTIFICATION/COMMENTS G(1)(c) Wear and (1)(d) Vibration/seismic testing: see Sheet 10.

[1] See TAB C, paragraph 6.0, for further discussion.

VIBRATION WEAR AND OPERATIONAL STRESS AGING

Normal Service Related Stresses- In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life, as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards..." Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria." Included in the list that follows the above quote are three standards to which TVA routinely purchases power, control and signal cables. They are as follows:

1. IPCEA S-19-81, Rubber-Insulated Cable.

2. IPCEA S-66-524, Cross-Linked-Polyethylene-Insulated Cable.

3. IPCEA S-68-516, Interim Standards for Ethylene-Propylene-Rubber-Insulated Wire and Cable. Number 1, Cables Rated 0-35000V. Number 2, Cables Rated 2000V, Integral Insulation and Jacket.

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service. Vendor certified inspection test reports verify that the cable qualified in this binder was manufactured in accordance to the various IPCEA standards.

SEISMIC

Qualification for these cables is NUREG-0588, Category II, and seismic testing is not a consideration for Environmental Qualification.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference 17732-1, Sects. II and IV).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	17732-1, Sect. IV
Radiation exposure	Yes	17732-1, Sect. II
Vibration (non-seismic) aging	NA	
Operational (electrical/mechanical/process) stress aging	NA	

JUSTIFICATION/COMMENTS Vibration and operational stress aging; see Sheet 10.

(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)? No (Reference ---).

JUSTIFICATION/COMMENTS This cable is being qualified to NUREG-0588, Category II, which does not require synergistic effects considerations.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference 17732-1, Sect. IV).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: 17732-1, pp VII-17, VII-26, and VII-28).

JUSTIFICATION/COMMENTS

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, pp VII-16, VII-17, VII-18).

JUSTIFICATION/COMMENTS

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference *).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	130°F (Outside Cont)	*	60°C
Time	40 years	*	40 years and 38.29 years

JUSTIFICATION/COMMENTS *see TAB C, paragraph 6.1.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference 17732-1, pp VII-16 and VII-38 to VII-45

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 17732-1, pp VII-26, VII-28, VII-31).

JUSTIFICATION/COMMENTS See letter from Wyle Labs, 12/16/85, B70 851230 001, TAB E.

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)? NA (Reference _____).

JUSTIFICATION/COMMENTS A regression line was not used.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS Conductor temperature (60°C; which is ambient plus heat rise) was used as a baseline for computing accelerated aging, thus powering during thermal aging was not required.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference 17732-1, Section II).

JUSTIFICATION/COMMENTS _____

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, pp VII-15, VII-26, and VII-28).

JUSTIFICATION/COMMENTS _____

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, pp VII-15, VII-16).

JUSTIFICATION/COMMENTS _____

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference 17732-1, p VII-16, Section II).

Plant normal ambient radiation dose (rd)	4.2E7 (see TAB C, 2.0)*
Test exposure dose (rd)	40-Yr: 7.5E7, 20-Yr: 6.5E7** (17732-1, II-1)
Test exposure dose rate (rd/hr)	Between .313E6 and .616E6 (17732-1, II-1)
Test exposure source type (e.g., Co-60 gamma)	Co-60 gamma (17732-1, II-1)

JUSTIFICATION/COMMENTS *40-year dose.

**Includes normal plus accident.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS See Sheet 10.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS See Sheet 10.

(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)? NA (Reference _____).

JUSTIFICATION/COMMENTS See Sheet 10.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS See Sheet 10.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference 17732-1, 17740-1).

Qualified life (Document in QMDS) 38.29 years in MSVV room and 40 years in all other outside containment areas.

JUSTIFICATION/COMMENTS This was not directly stated, but since the test specimens identified and set up as 40-year specimens (12b and 25b: 17732-1, Section VII) passed all tests (17732-1, Sections I through VI and VIII), it is concluded they are qualified for 40 years for all areas outside containment except MSVV room. Test specimens identified and set up as 20-year specimens (12a and 25a: 17732-1, Section VII) passed all tests (17732-1, Sections I through IV and 17740-1, Sections I, II, and IV). They are qualified for 38.29 years in the MSVV room based on Arrhenius parameters (see TAB C, 6.0).

H. AGING (Continued)

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA
(Reference _____).

Replacement Intervals (Document in QMDS) None were identified in the test program. Cable is qualified for the 40 year design life of the plant, for all areas outside of containment except the MSVV room, and for 38.29 years in the MSVV room. The cable in the MSVV must be replaced 38.29 years after initial criticality. These cables are identified in TAB G.

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 Threshold	Reference	Activation Energy	Reference
(a)	XLPE/Electrical/Insulation	1.0E6	Wyle Rpt 17732-1 pp VII-26, VII-28	1.11	Wyle Rpt 17732-1 pp VII-26, VII-28
(b)	Mechanical/Jacket	4.0E6	Wyle Rpt 17732-1 pp VII-26 VII-28	1.07	Wyle Rpt 17732-1 pp VII-26, VII-28
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS The testing was done in accordance with industry standards and was done to test the cable insulation. The jacket material is considered sacrificial since its only function is to protect the insulation during pre-installation handling and during installation. Therefore, only the insulation is considered during the qualification program.

The activation energy of 1.11 for XLPE used in the Wyle Test Report 17732-1, page VII-17, paragraph 3.3.2, and pages VII-25 through VII-31, is considered the best available data, as referenced in a Wyle letter to TVA dated December 16, 1985 (RIMS B70 851230 001). While this value is the most conservative entry in the Wyle aging library data base, two XLPE entries of lower eV are in the Digital 1000 data base used by TVA. One entry is for Raychem cable insulation with a .89 eV. This is

I. MATERIALS ANALYSIS (Continued)

the lowest. Since this is unique because it applies only to this Raychem compound, it can be excluded as not being the best available data. The other entry is for an eV of 1.09, representing a composite set of data of four EP compounds and two XLPE compounds produced by Okonite. This is also not considered the best available data. Therefore, the eV of 1.11 is used as the most conservative and best available data.

The lowest radiation threshold is 1.0E6 rads for the XLPE insulation material. The required radiation parameter is 6.75E7 rads, however, the test successfully concluded the capability of the cable to perform satisfactorily at 7.5E7 rads (see L(1) p. 24).

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

(1) 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 17732-1, VII-11 and VII-12 17740-1, III-8).

Identify Acceptance Criteria: During the accident simulation, the cables must demonstrate integrity sufficient to maintain as a minimum 528 VAC, 60 Hz, 18 amps (17732-1) or 1 amp (17740-1) in a fused circuit. See also TAB C, paragraph 3.0, for further discussion.

(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 See below).

Identify baseline and functional testing: Insulation resistance testing was performed for information only during functional tests before and after each major test and are shown in TAB C, paragraph 3.0. Performance testing performed during the accident test is described in J(1) above. See also TAB C, paragraph 3.0, for further discussion.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference See below).

JUSTIFICATION/COMMENTS

528 VAC, 18A (17732-1, V-3).

528 VAC, 1A (17740-1, I-4).

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS Baseline testing and subsequent functional tests consisted of insulation resistance measurements which provide an indication of the condition of the cable but are not the actual voltage and load carried by the cable in service in the plant. Qualification for normal operation is established by the cables being manufactured to IPCEA S-66-524 (see TAB B, page 10).

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

(a)

Parameter	Specific Accident Conditions	Reference Contracts listed in TAB B, Sect.A
Voltage	600 V	
Load	NA	NA
Frequency	NA	
Accuracy	NA	
Other(s)		
	NA	
	NA	

JUSTIFICATION/COMMENTS Frequency: Cables are not frequency sensitive. Accuracy: Cables have no accuracy requirements.

NOTE: "Specified" voltage is cable rating as specified in the contracts.

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	528 VAC, Min* 569 VAC, Max	17732-1, p V-34
	528 VAC, Min* 542 VAC, Max	17740-1, p I-12
Load	18.0 to 18.5 amps	17732-1, p V-34
	1.0 amp	17740-1, p I-12
Frequency	NA	
Accuracy	NA	
Other(s)		
	NA	
	NA	

JUSTIFICATION/COMMENTS Frequency: Cables are not frequency sensitive.

Accuracy: Cables have no accuracy requirements.

NOTE: "Specified" voltage is cable rating as specified in the contracts.

*See Tab B, Sheet 27, Note 2.

K. REQUIRED OPERATING ENVIRONMENT (OUTSIDE CONTAINMENT, HARSH, ONLY)

Reference Environmental Drawing No. (See footnotes below)

(1) Normal Max (Worst Case)

(a) Temperature (°F) 130 [1]
(b) Pressure (psig) Atmospheric (14.4 psia) [1]
(c) Humidity (%) 80 [2]
(d) Radiation (rd) 7.5E6 [3]

(2) Abnormal Max (Worst Case)

(a) Temperature (°F) 140 [4]
(b) Pressure (psig) Atmospheric (14.4 psia) [2]
(c) Humidity (%) 100 [5]
(d) Radiation (rd) NA [2]

1) 47E235-76R2 (MSVV); next worst case is the Boric Acid Evap. Pkg. Rooms A29/A30, elev 692, 111°F max
2) All areas outside containment listed as harsh: Dwg series 47E235.
3) 47E235-60R1, -61 R1 Pipe Chase Rooms A8/A24 and A28/A29.
4) 47E235-76R2 (MSVV); next worst case is the Annulus, Sump Pump Rm, and Sump Tank Rm, 120°F max
5) 47E235-76R2 (MSVV); all others 90% R.H. maximum.

(3) Process Interfaces: None required for cable.

(4) State anticipated occurrence frequency and duration of abnormal conditions: It could exist for up to eight hours duration per excursion and will occur less than 1 percent of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F) 325 [1, 5a,7] Accident type HELB
(b) Pressure (psig) 25.18 psia [2, 5b] Accident type HELB
(c) Humidity (%) 100 [3] Accident type HELB
(d) Radiation (rd) 6.0E7 [4] Accident type LOCA
(e) Spray Type None [6] Accident type ---

1) QIR-NEB86035(NVR), Figure 25, next worst case is the Boric Acid Evap. Pkg. Rooms A29/A30, 218°F (47E235-85 R0).
2) QIR-NEB86035(SVR), Figure 26, next worst case is in RHR Pump Room: 15.95 psia (47E235-74 R0)
3) Worst case for all areas outside containment listed as harsh: Dwg series 47E235.
4) 47E235-78R2 (EGTS) (See TAB C, paragraph 2.1).

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

All conditions are worst case outside containment.

5(a) Duration of peak temperature is 10 minutes from QIRNEB86035 (see Note 1).

5(b) Duration of peak pressure is 10 minutes from QIRNEB86035 (see Note 2).

6) Spray is not required for outside containment.

7) See TAB C, Section 2.2 for explanation of 535°F MSLB in the MSVV.

(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 C, 4.0, for moisture intrusion).

(7) Subject to submergence (yes/no/NA)? No (Reference See Sheet 25, Note 2).

Identify initiation time and duration of submergence:

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

Type	RIMS No.
QIR NEB86101 (Radiation)	B45 860723 261
QIR NEB86035 (Temp. & Press.)	B45 860317 251
QIR WBNEEB86037 (Submergence)	B26 860310 004
WBNNAL3-025 (Radiation)	B45 860401 235
TI-RPS-194 (Radiation)	NEB 850118 235

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 Days (Max)	295 hrs (MSVV) 13 Days (Other) Note 1	17740-1, p I-18, 17732-1, p V-45
Temperature (°F)+	325 (NVR) 210 (Other)	330 (MSVV) 240 (Other)	17740-1, p I-18, 17732-1, p V-45
Pressure (psig)	10.7 (SVR) 1.5 (Other)	13.0 (MSVV) 1.9 (Other)	17740-1, p I-18, 17732-1, p V-45
Relative Humidity (%)	100	95-100	17732-1, p VII-23, 3.4.9
*Chemical Spray	NA	NA	----
**Radiation (rd)	***6.75E7 gamma	7.5E7 gamma	17732-1, p II-1
Submergence	None	None	Note 2

*Includes spray concentration, flowrate, density, duration, and pH.
**Enter 40-year integrated normal dose plus integrated accident dose and specify type.
***See TAB C, paragraph 2.1.
+See TAB C, paragraph 2.2 for an explanation of 535°F MSLB in the MSVV.

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	17740-1, p I-18, 17732-1, p V-45
Pressure	Yes	17740-1, p I-18, 17732-1, p V-45
Relative Humidity	Yes	17732-1, p VII-23
Chemical Spray	NA	Note 3
Submergence	None	Note 2

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

JUSTIFICATION/COMMENTS Notes:

1) See TAB C, paragraph 6.3, for extrapolation.

2) According to QIR WBNEEB86037 (RIMS B26 860310 004), a total of 40 cables listed in this binder are subject to submergence. Cable submergence is possible in the North and South Steam Valve Vault Rooms (elevation 729, Rooms A1, A2). No cables are subject to submergence in other areas outside containment. The QIR may be revised which will eliminate some of the cables from being considered submersible. ECNs 6340 and 6390 were issued to resolve cable submergence problems. Therefore, submergence qualification for cables covered in this binder is not required. See open item regarding cable submergence in the front of this binder.

3) The cable is located outside of containment and is not exposed to spray.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	5°F Note 3	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)	None, Note 1	NA
Voltage: ±10% of rated value	10%, Note 2	Yes
Frequency: ±5% of rated value	NA	NA
Environmental Transient: the initial transient and the peak temperature applied twice	No	NA
Vibration: +10% added to acceleration	NA	NA

JUSTIFICATION/COMMENTS: Frequency (electrical): Cables are not frequency sensitive. Vibration: See TAB B, page 10. Environmental Transient: The application of two initial transients in an accident test is to add margin. Since margin is applied in other ways (5°F on accident temperature, +10 percent on accident pressure and +10 percent on accident radiation), margin need not be applied twice. Therefore, an additional initial transient is not required.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

JUSTIFICATION/COMMENTS:

1) There is no time margin. Extrapolation from test time to 100 days is explained in TAB C, paragraph 6.3.

2) The cables were tested at a minimum of 528 VAC and a maximum of 569 VAC (17732-1, p V-34) and a minimum of 531 VAC and a maximum of 540 VAC (17740-1, p I-12). The voltage rating for the cables in the plant is 480V or less. The requirements for Category II, low voltage power and control cables are stated in Generic Binder WBNEQ-GEN-001.

3) For Category II cables, Reg Guide 0588 does not require the IEEE 323 (1974) recommended 15°F margin. A 5°F accident temperature margin is adequate to prove qualification especially since accident pressure, accident radiation, and applied voltage each had over a 10 percent margin providing for a more severe test. See TAB C, Section 2.2 for an explanation of the 535°F MSLB in the MSVV. Of course, the 5°F accident temperature margin does not apply to the MSLB, but to the HELB scenario delineated in drawing 47E235-76.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference 17732-1, VII-11, -12 and 17740-1, III-8).

JUSTIFICATION/COMMENTS Auxiliary power and control cables, in 480V or less applications outside containment, that will demonstrate, during an accident simulation, integrity sufficient to maintain as a minimum 528 VAC and 18 amps for all areas outside containment except MSVV, and 528 VAC and 1 amp for the MSVV. See TAB C, paragraph 3.0, for additional discussion.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference 17732-1, p x, and 17740-1, p iv).

JUSTIFICATION/COMMENTS See TAB C, paragraph 3.0, for discussion.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference 17732-1, p x, and 17740-1, p iv).

JUSTIFICATION/COMMENTS See TAB C, paragraph 3.0, for discussion.

(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 17732-1, V-5, V-34, and V-45, and 17740-1, I-12, and I-18).

JUSTIFICATION/COMMENTS The test duration for outside containment areas other than MSVV was 13 days, and for the MSVV it was 295 hours. An extrapolation to 100 days for each is demonstrated in TAB C, paragraph 6.3.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference 17732-1, pp iii and v, and 17740-1, p iii).

JUSTIFICATION/COMMENTS See TAB C, paragraph 8.0, for discussion of the anomalies which apply to these test specimens.

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)? No (Enter all requirements in Section G of the Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS There were no surveillance or maintenance requirements identified in the test report.

A TVA formulated recommended surveillance is described in TAB G.

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)?	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?	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

0. SUMMARY 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) 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?	NA
(11) Criteria regarding submergence satisfied?	Yes
(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 satisfied?	Yes

O. SUMMARY OF REVIEW (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?	Yes
(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 1-hour minimum operating time was taken, was adequate justification provided?	NA
(18) Criteria regarding synergistic effects satisfied?	NA See H(3)
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

O.(6)(a) Mechanical and/or cycle aging are not required for cable per IEEE 383-1974.

O.(8)(c) & (d) The test profile adequately envelops the WBN requirements, and, although the post-DBE test profiles do not envelop the post-DBE requirements by virtue of the test having a shorter post-DBE duration, TAB C, paragraph 6.3, demonstrates that the shorter post-DBE durations are equal to the 100-day post-DBE requirements through use of the Arrhenius technique.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				17732-1, pp VII-6, VII-7, VII-26,
Insulation material	FR-XLPE	FR-XLPE	Yes	VII-28
Size	See TAB C, para. 1.0	See TAB C, para. 1.0	Yes	17732-1, pp VII-6, VII-7, VII-26, VII-28
Stranding	TAB C, para. 1.0	TAB C, para. 1.0	Yes	17732-1, pp VII-6, VII-7, VII-26, VII-28
Coating	--	--	NA	
Insulation Thickness	See TAB C, para. 1.0	See TAB C, para. 1.0	Yes	17732-1, pp VII-6, VII-7, VII-26, VII-28
Number of conductors	See TAB C, para. 1.0	See TAB C, para. 1.0	Yes	17732-1, pp VII-6, VII-7, VII-26, VII-28
Arrangement of conductors	See TAB C, para. 1.0	See TAB C, para. 1.0	Yes	17732-1, pp VII-6, VII-7, VII-26, VII-28

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant *	Report	Acceptable Yes/No/NA	Report Section
(b) Shielding	None	None	NA	
(c) Insulation jacket				
Material	None	None	NA	
Thickness	None	None	NA	
(d) Outer jacket				
Material	Hypalon (CSPE)	Hypalon (CSPE)	Yes	17732-1, pp VII-6, VII-7, VII-26, VII-28
Thickness	See TAB C, para. 1.0	See TAB C, para. 1.0	Yes	17732-1. pp VII-6, VII-7, VII-26, VII-28
(e) Rated voltage	600V	528VAC	Yes	17732-1, VII-12 17740-1, III-8
(f) Rated current	NA	Not Stated	NA	---
(g) Operating temperature rating				
Normal	60°C **	60°C	Yes	17732-1, pp VII-17, VII-18, IV-12
Emergency	Not Stated	Not Stated	Yes	---
Short circuit	Not Stated	Not Stated	Yes	---

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant *	Report See TAB C, para.	Acceptable Yes/No/NA	Report Section See TAB C, para.
(h) Insulation resistance	Not Stated	3.0	Yes	3.0
(i) Splice				
Material	NA	NA	NA	---
Thickness	NA	NA	NA	---
Identification	NA	NA	NA	---

Comments: *From cable contracts.

**TVA's rating for this cable.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference -----).

Comments: See TAB C, paragraph 4.0. Also, temperature and moisture resistance qualification for normal operation is demonstrated by AIW certification to TVA specification 25.016 which requires testing to IPCEA S-66-524 (See TAB E.16 and E.22).

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference 17732-1, p V-34 & 17740-1, p I-12).

Comments:

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference 17740-1, Sect. II).

Comments:

EQUIPMENT IDENTIFICATION (Continued)

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference See below).

Comments: 17732-1, Sections I, III, & V-76, V-77, V-83, V-84, V-90, V-91; 17740-1, I-36, I-37.

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? No (Reference ----).

Comments: These are not required for NUREG 0588, Category II, qualification, although Specimens 12a, 25a, and 25b were subjected to a voltage withstand test (see paragraph 3.0, TAB C.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Contract Specs.).

Identify flame test standard: IPCEA S-66-524

Comments:

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-005
MANUFACTURER : ANACONDA

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±2M	** CONTRACT	C A I *	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APP-074-0575-A	1PP 575-A	EPSJ	WNB	VARIOUS	VARIOUS	0	76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-063-0600-A	1PP 600-A	EPSJ	WNB	VARIOUS	VARIOUS	0	76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-072-0637-B	1PP 637-B	EPSJ	WNB	VARIOUS	VARIOUS	0	76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-003-0650-A	1PP 650-A	EPSJ	WNB	VARIOUS	VARIOUS	0	76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-003-0662-B	1PP 662-B	EPSJ	WNB	VARIOUS	VARIOUS	0	76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0675-A	1PP 675-A	EPSJ	WNB	VARIOUS	VARIOUS	0	76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0687-A	1PP 687-A	EPSJ	WNB	VARIOUS	VARIOUS	0	76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-212-0762-B	1PP 762-B	EPSJ	WNB	VARIOUS	VARIOUS	0	N76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APP-067-0675B-A	2PP 675-A	EPSJ	WNB	VARIOUS	VARIOUS	0	N76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APP-067-0687-A	2PP 687-A	EPSJ	WNB	VARIOUS	VARIOUS	0	76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APP-067-0700A-B	2PP 700-B	EPSJ	WNB	VARIOUS	VARIOUS	0	N76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APP-067-0712A-B	2PP 712-B	EPSJ	WNB	VARIOUS	VARIOUS	0	N76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APP-212-0759-A	2PP 759-A	EPSJ	WNB	VARIOUS	VARIOUS	0	76K5-087365-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

PREPARER/DATE [signature] 9/21/86 R____ R____ R____
CHECKED/DATE [signature] 9-21-86 _____ _____ _____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-005
MANUFACTURER : ANACONDA

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-APP-082-0350-A	OPP 350-A	EPSJ	WNC-1	VARIOUS	VARIOUS	0	N8CK8-827337-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0351-A	OPP 351-A	EPSJ	WNC-1	VARIOUS	VARIOUS	0	N8CK8-827337-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0710-B	OPP 710-B	EPSJ	WNC-1	VARIOUS	VARIOUS	0	N8CK8-827337-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0711B-B	OPP 711-B	EPSJ	WNC-1	VARIOUS	VARIOUS	0	N8CK8-827337-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-062-0562-B	1PP 562-B	EPSJ	WNB-1	VARIOUS	VARIOUS	0	8CK8-827337-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-074-0587-B	1PP 587-B	EPSJ	WNB-1	VARIOUS	VARIOUS	0	8CK8-827337-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-063-0612-B	1PP 612-B	EPSJ	WNB-1	VARIOUS	VARIOUS	0	8CK8-827337-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	_____	_____	_____
CHECKED/DATE	9-21-86	_____	_____	_____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-005
MANUFACTURER : ANACONDA

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION CSM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-APP-067-07008-B	2PP 700-B	EPSJ	WN8-1	VARIOUS	VARIOUS	O	N79K8-825471-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-APP-067-07120-B	2PP 712-B	EPSJ	WN8-1	VARIOUS	VARIOUS	O	N79K8-825471-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	L. Randall 9/21/86	____	____	____
CHECKED/DATE	[illegible] 9-21-86	____	____	____

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 1 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE POWER - EPR INS/TVA TYPE EPSJ COMPUTED LAQ DATE 9/21/86 CHECKED [illegible] DATE 9-21-86

R R

A. DOCUMENTATION

Equipment Description 8 kv Power Cable

Vendor/Manufacturer The Anaconda Company

Equipment Model No.(s) EPSJ

TVA Contract(s) 80K8-827337, 76K5-87365, and 79K8-825471

QUALIFICATION REPORTS

(1) Title/Number/Revision Tests of Electrical Cables Subjected to Thermal Aging, Gamma Radiation, and a Loss-of-Coolant-Accident Simulation/F-C4350-4. RIMS B70 860206 102 DATE July 1976

(2) Title/Number/Revision Tests of Electrical Cables Subjected to Thermal Aging, Gamma Radiation and Loss-of-Coolant-Accident Simulation/F-C4350-3 RIMS B71 860615 100 DATE July 1976

(3) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(1) TAB C, Section A - Discussion of Normal Service Related Stresses and Seismic Testing

(2) TAB C, Section B - Discussion of Similarity of Test of Actual Service and Qualified Life

(3) TAB C, Section C - Cable Submergence Due to Flooding in the Auxiliary Building

(4) TAB C, Section D - Cable Location - Outside Containment

(5) TAB C, Section E - Performance Characteristics - Medium Voltage Power Cable

(6) TAB D, Anaconda Power Cable Company letter to TVA dated 10-25-85 (B70 851028 001)

(7) TAB E, Anaconda Letter to TVA dated February 21, 1985 (EEB 850225 008)

(8) TAB E, TVA Standard Procurement Specification for 5-15 kv Cable Ethylene - Propylene Rubber or Non-chlorinated, Mineral-filled, Cross-linked Polyethylene Insulated dated 6-25-84.

Section A (Cont.)

The references below represent the guidelines for determining the cables and the environmental parameters for the 10CFR50.49 equipment evaluation. Reference 1 identifies the Class 1E cables to be addressed. No cables from the contracts addressed by this binder were on the inside containment list. References 2 and 3 identify cables in areas with particularly harsh environments. No cables from the contracts addressed by this binder were affected by these calculations. Reference 4 is the series of drawings that define the environmental parameters for all areas of the Watts Bar Nuclear Plant, from which the limiting parameters for cables included in this binder were determined. Reference 5 is a program used for evaluating specific qualification parameters.

References

1. Watts Bar Class 1E Equipment List - Harsh Environment (WBPEVAR8508005)

2. Class 1E Cables and Junction Boxes below 10CFR50.49 Flood Level in Auxiliary Building (B26 860310 004)

3. Post-LOCA Dose Rates and Doses around EGTS and ABGTS Filters (NEB 850118 235)

4. TVA Environmental Drawing Series 47E235

5. Digital Engineering System 1000 - Material Aging Calculation Report (B70 850925 013)

Upon review of these references, 22 cables from the contracts covered by this binder were identified as being in use at Watts Bar Unit 1. Mark No. WBN and (WBN-1) from contracts 76K5-87365, 80K8-827337 and 79K8-825471 were identified to be in use at WBN.

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 2 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED LAQ DATE 9/20/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 9-21-86

B. CONCLUSION OF REVIEW (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. Heat rise studies and calculations must be performed to ensure that the qualification temperature is not exceeded.

2. Ensure that agreement between design and installation records is established and documented.

COMMENTS/RECOMMENDATIONS Cables purchased on the contracts listed in Tab A are qualified for outside containment use in 6.9 kV systems at Watts Bar Nuclear Plant Unit 1 with the following restrictions:

1. These cables have not been qualified for use in the Main Steam Valve Vaults (Env. Dwg. No. 47E235-76R2).

2. These cables have not been qualified for use in the Emergency Gas Treatment Room (Env. Dwg. No. 47E235-78R2) nor the Auxiliary Building Gas Treatment System Rooms. (Env. Dwg. No. 47E235-48 R2).

3. These cables have not been qualified for use at continuous conductor temperatures greater than 79.4°C.

4. Qualified for outside containment except for the special interest rooms listed in TAB C, Section D.

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 3 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED LAC DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS The general requirements of 10CFR50.49 were met and demonstrated by the qualification test and combination analysis.

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE Standard 323-1974

IEEE Standard 383-1974

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 4 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED JAQ DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

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 See Tab C, Section B.

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 5 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED [illegible] DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Cable	F-C4350-4 & -3, sht. 1-1
(2) Manufacturer	Anaconda	Anaconda	F-C4350-4 & -3, sht. 1-1
(3) Model Number(s)	EPSJ	Uniblend EP	F-C4350-4 & -3, sht. 2-1
(4) Serial Number(s)	NA	Specimen No. 19.22, 19.23 & 19.21	F-C4350-4 & 3, sht. 2-1

(5) Identify Component-Unique checksheet attached: See Tab B, Supplement 2.

JUSTIFICATION/COMMENTS See Tab C, Section B.

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 6 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED LAQ DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

F. INSTALLATION INTERFACES

Does the qualification program address all relevant interfaces of the equipment so that the installed design and configuration is similar or identical to the test configuration (yes/no/NA)? (note below)

Interface	Identify Interface Requirement	Acceptable? (Yes/No/NA)	Reference Test Report
Mounting Bolts	NA	NA	NA
External Process Connections	NA	NA	NA
Electrical Connections	NA	NA	NA
Conduit Seals	NA	NA	NA
Connector Seals	NA	NA	NA
Orientation	NA	NA	NA
Physical Configuration	NA	NA	NA
Other	NA	NA	NA

JUSTIFICATION/COMMENTS

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	F-C4350-4 & -3, Sects. 3.1 & 4.1
(b) Baseline performance measurements taken	Yes	F-C4350-4 & -3, Sects. 3.1 & 4.1
(c) Equipment aged:		
Thermal	Yes	F-C4350-4 & -3, Sects. 3.2 & 4.2
Radiation	Yes	F-C4350-4 & -3, Sects. 3.2 & 4.2
Wear	No	See Tab C, Section A
(d) Vibration/seismic testing conducted	NA*	*
(e) Design basis event (DBE) exposure	Yes	F-C4350-4 & -3, Sects. 3.3 & 4.3
(f) Post-DBE exposure	Yes	F-C4350-4 & -3, Sects. 3.3 & 4.3
(g) Final inspection and disassembly	Yes	F-C4350-4 & -3, Sect. 4.4 & App. B

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes
(Reference F-C4350-4 & -3, Appendix A).

JUSTIFICATION/COMMENTS *See Tab C, Section A for justification of wear aging. Vibration/sesimic testing not applicable to environmental qualification of cable.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference F-C4350-4 & -3, Section 3.2).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	F-C4350-4 & -3, Sect. 3.2
Radiation exposure	Yes	F-C4350-4 & -3, Sect. 3.2
Vibration (non-seismic) aging	NA	See Tab C, Section A
Operational (electrical/mechanical/process) stress aging	No	See Tab C, Section A

JUSTIFICATION/COMMENTS

(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)? Yes (Reference See Sheet 8A).

JUSTIFICATION/COMMENTS

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference F-C4350-4&3, Section 3.2).

JUSTIFICATION/COMMENTS

H.(3) Aging (continued)
Specific synergistic effects and testing techniques were not addressed by the vendor in the LOCA test program. The test program was, however, done in accordance with IEEE 323-1974 and IEEE 383-1974 requirements. Sandia Laboratories has done some research on EPR in this area as documented in NUREG/CR2533 (accelerated aging techniques) and NUREG/CR 3538 (accident simulation techniques); however, no generic conclusion could be drawn from the data. The research indicated that the different EPR compounds formulated for insulation varies in characteristics exhibited during the stresses imposed through accelerated aging and accident simulation; however, large electrical performance variations caused by differences in simultaneous and sequential test procedures on insulated single conductors was not observed.

Medium voltage cable of this type is single conductor and used exclusively outside containment at Watts Bar (WBN), although the vendor's test was performed to the much more severe environment of inside containment parameters. Due to this "overtest" in comparison to WBN requirements, the conservatism and margin demonstrates the acceptable performance of the cable and will account for any unknown synergisms in the applications, specifically:

1. The test performed included 130 days of real time simulation at an elevated temperature, whereas requirements are only 100 days and ambient temperatures are expected to return to near normal by the end of 24 hours into the accident.

2. Irradiation performed on the test samples was done at a relatively low dose rate of 0.35 Mrads per hour for a total of 200 Mrads minimum. The low dose rate would tend to age the EPR insulation more assuming any dose rate synergism exists (as reported by some research organizations, whereas more severe degradation is predicted at lower dose rates than the industry standard of one Mrad per hour). Outside containment 40-year total integrated dose plus accident will not exceed approximately 18 Mrads in areas where the cable will be installed. In areas where the largest 40-year TID and highest normal dose rate will be experienced, the accident dose is very low and, conversely, areas with high accident doses expected do not experience a high 40-year TID. And even if this is taken into consideration the highest total for the areas where the cable is installed will not exceed 18 Mrads dose.

3. A post-LOCA AC dielectric breakdown test demonstrated greater than 11 kv withstand voltage, thus sufficient margin exists even if synergistic scenarios are proven to exist through future research.

4. The test specimen's insulation resistance reduced to a minimum of 8.2E + 05 ohms. This value is much greater than the minimum of 1.0E + 04 ohms for medium voltage power cable as stated in Section III.C.4.1 of the Generic EQC Binder (WBNEQ-GEN-001).

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: F-C4350-4, F-C4350-3, Section 2).

JUSTIFICATION/COMMENTS Also, see attachment to F-C4350-4.

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference F-C4350-4 - Attachment).

JUSTIFICATION/COMMENTS

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Section 3.2 and Attachment to F-C4350-4).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	43.3°C	150°C	79.4°C *
Time	40 years	168 hrs	40 years

JUSTIFICATION/COMMENTS *See Tab C, Section B.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference Attachment to F-C4350-4).

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 Attachment to F-C4350-4).

JUSTIFICATION/COMMENTS Activation energy calculated in Tab C, Section B using data points and Arrhenius plot in above reference.

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)? Yes (Reference Attachment to F-C4350-4).

JUSTIFICATION/COMMENTS

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS Aging times and temperatures were sufficient to account for ambient plus heat rise due to loading.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Sect. 3.2).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Section 2).

JUSTIFICATION/COMMENTS

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Secton 3.2).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Appendix C).

Plant normal ambient radiation dose (rd) 1.8E + 07

Test exposure dose (rd) 2E + 08

Test exposure dose rate (rd/hr) 3.5E + 05

Test exposure source type (e.g., Co-60 gamma) Co-60 gamma

JUSTIFICATION/COMMENTS Dose rate is reasonable. See Sheet 8A this TAB.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Tab C, Section A.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Tab C, Section A.

(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)? No (Reference NA).

JUSTIFICATION/COMMENTS See Tab C, Section A.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Tab C, Section A.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes
(Reference Attachment to F-C4350-4, paragraph (c)).

Qualified life (Document in QMDS) 40 years

JUSTIFICATION/COMMENTS See also Tab C, Section B.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? No
(Reference NA).

Replacement Intervals (Document in QMDS) None required; cable qualified for life of plant.

JUSTIFICATION/COMMENTS

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 13 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED SAQ DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

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 Threshold	Reference	Activation Energy	Reference
(a)	EPR/Cable Insulation	1E+07rads	Tab C, Section B	1.39 eV	Tab C, Section B
(b)	CSPE/Cable Jacket	1E+07rads	Tab C, Section B	1.07 eV and 0.92 eV	Tab C, Section B
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS Testing was done in accordance with IEEE Standards 323-1974 and 383-1974 and was done to test the insulation and jacket materials (EPR and Hypalon, respectively). Thermal and radiation age-conditioning was performed as part of the test program.

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BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED YAQ DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

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

(1) Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure if not met (yes/no/NA)? No (Reference NA).

Identify Acceptance Criteria: Maintain specified current and voltage during accident simulation and maintain 80 V/mil insulation during post-accident voltage withstand testing in accordance with IEEE 383-1974.

(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 F-C4350-4 and F-C4350-3, Tables 2 & 3).

Identify baseline and functional testing: IR measurements taken at 500 Vdc during baseline testing, LOCA simulation, and post-LOCA simulation. High voltage withstand test was taken at 7200 Vac. See Tab C, Section E.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Table 1).

JUSTIFICATION/COMMENTS 2900 Vac/170 A

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference IEEE 383-1974, Sect. 2.3.1, F-C4350-4 and F-C4350-3, Sect. 6).

JUSTIFICATION/COMMENTS Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria." IPCEA S-68-516 is the industry standard used by ANACONDA to manufacture and test the cable which is acceptable by IEEE 383-1974.

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

(a)

Parameter	Specific Accident Conditions	Reference Contract Requirements
Voltage #	8k Vac	
Load	NA#	NA
Frequency	60 Hz	TVA Spec. 25.015
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS #For the specific performance and requirements of medium voltage cables, see Section III of the Generic EQ Binder WBNEQ-GEN-001. The cables are used in a meduim voltage situation where the voltage is 6900 Vac (3984v/phase) and 52.5 amp maximum current load.

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

(5)(b)

Parameter	Demonstrated Accident Conditions	Reference
Voltage *	2.9k Vac	F-C4350-3&-4, Sect 3.3
Load	170A	F-C4350-3&-4, Sect 3.3
Frequency	60 Hz	F-C4350-3&-4, Sect 3.3
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS Contract requirements specified a rated line voltage of 8000 Vac. Actual operating line voltage is 6900 Vac, which is equivalent to approximately 3985 Vac per phase (line to ground). The tested sample had an insulation thickness of 90 mils. At 2900 Vac, this is equivalent to 32.2 V/mil. Cables from the subject contracts have 140 mils insulation operating at about 3985 Vac or approximately 28.5 V/mil which is lower than the tested cable.

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BINDER TITLE ANACONDA/MEDIUM VOLTAGE POWER - EPR INS/TVA TYPE EPSJ COMPUTED YAQ DATE 8/28/86 R ___ R ___

CHECKED Kenn DATE 8-29-86

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-52 R0, -62 R0, -70 R0, -74 R0

(1) Normal Max

(a) Temperature (°F) 110

(b) Pressure (psig) 0

(c) Humidity (%) 80

(d) Radiation (rd) 1.8×10^{7}*

(2) Abnormal Max

(a) Temperature (°F) 120

(b) Pressure (psig) 0

(c) Humidity (%) 90

(d) Radiation (rd) NA

(3) Process Interfaces: None

(4) State anticipated occurrence frequency and duration of abnormal conditions: Conditions could exist for up to eight hours per excursion and will occur less than 1 percent of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F) 216 Accident type RHR

(b) Pressure (psig) 1.5 Accident type RHR

(c) Humidity (%) 100 Accident type RHR

(d) Radiation (rd) 1.0×10^{4}* Accident type LOCA/HELB

(e) Spray Type NA Accident type NA-Outside Containment

*These doses are the worst case combination of 40-year integrated normal plus integrated accident dose in any single area. Even if we take the worst normal 40 year dose (1.8E07) plus worst accident dose (1.0E07) will give a total dose of 2.8E07 gamma rads.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Cable is outside containment, therefore, not subject to beta radiation or chemical spray. See sheets 19 and 19A for duration/peak/profile of temperature, pressure, humidity conditions.

(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)? No (Reference Manufacturer's Standard Tests to IPCEA S-68-516).

(7) Subject to submergence (yes/no/NA)? No (Reference See Tab C, Section C).

Identify initiation time and duration of submergence: NA

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

Type	RIMS No.
40 Year Dose Outside Containment, OE Calculation WBNNAL3-025	B45 860401 235

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BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED YAC DATE 8/28/86 R ___ R ___

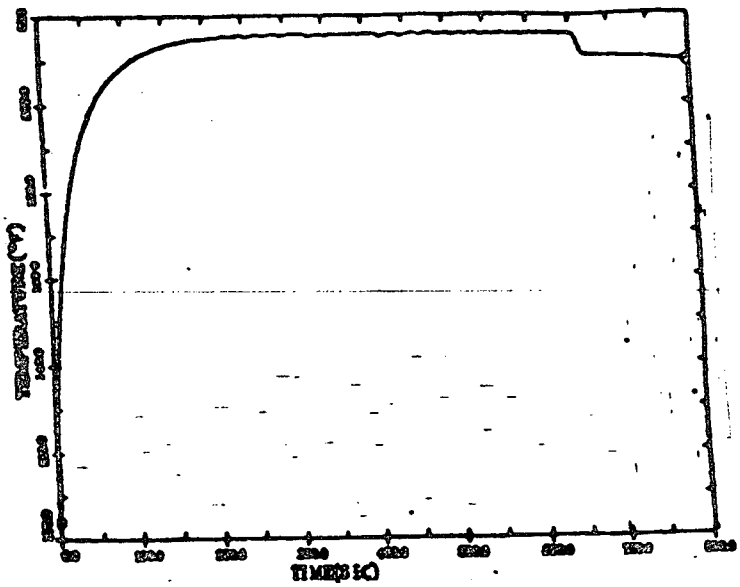
POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

TEMPERATURE AND PRESSURE PROFILES FROM

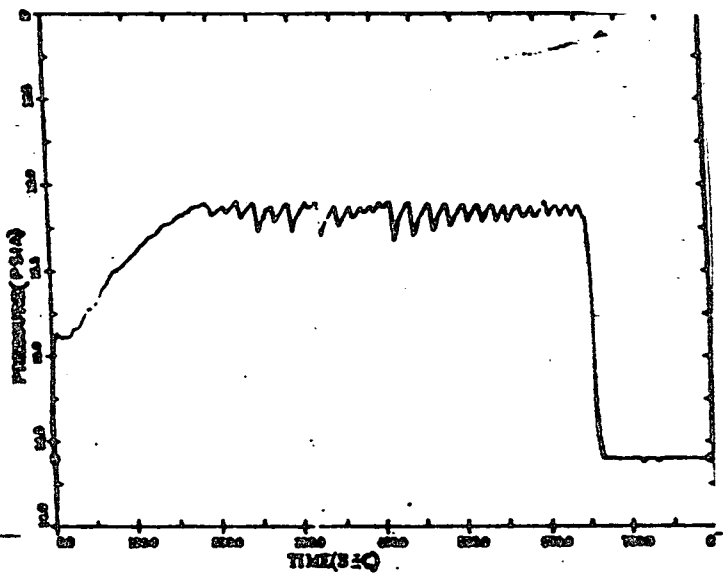
TVA DWG. 47E235-50 R0 AND ASSOCIATED WITH

ENVIRONMENTAL CONDITIONS ON TVA DWG. 47E235-51 R1

WBN RHR - NODE 10 RHR Exchanger Room
a = Volume 10



WBN RHR - NODE 10 - RHR Exchanger Room
a = Volume 10



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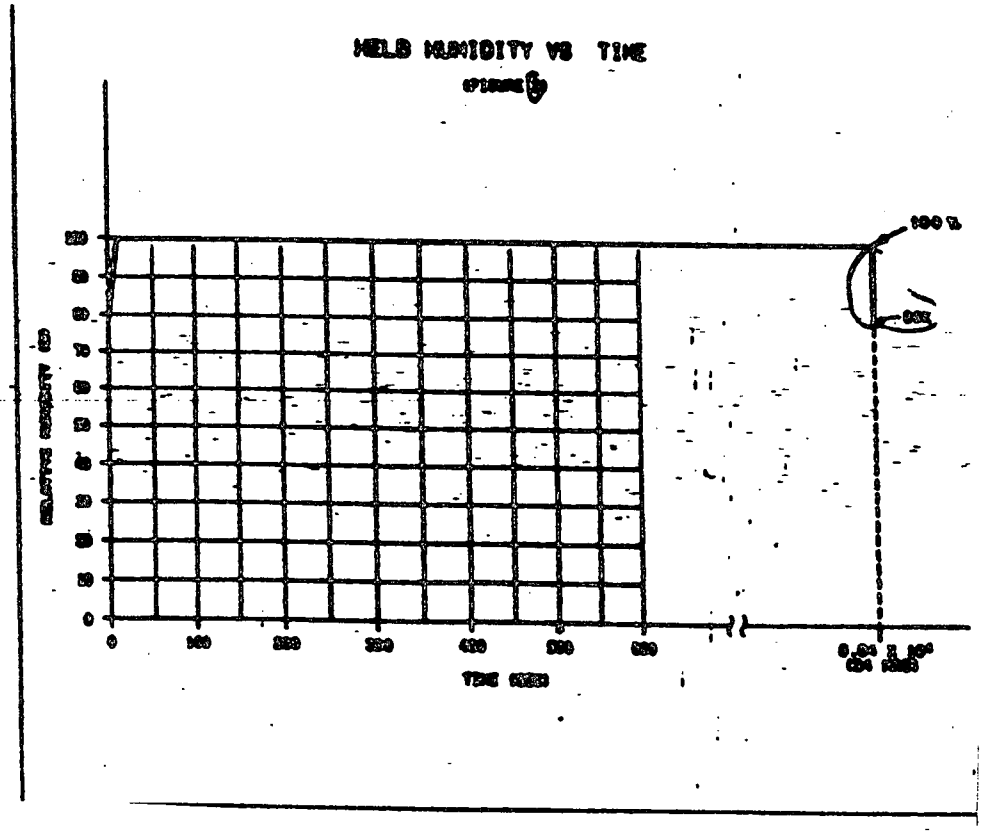
BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED DAQ DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED HWC DATE 8-29-86

HELB HUMIDITY PROFILE FROM

TVA DWG. 47E235-50 R0



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L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 days	30 days	F-C4350-4 and F-C4350-3, Fig. 2 & Section 4.3 (A)
Temperature (°F)	216	346	F-C4350-4 and F-C4350-3, Fig. 2 & Section 4.3
Pressure (psig)	1.5	113	F-C4350-4and F-C4350-3, Fig. 2 & Section 4.3
Relative Humidity (%)	100	100	F-C4350-4 and F-C4350-3, Sects. 3.3 & 4.3
*Chemical Spray	None	Per IEEE 323-1974	F-C4350-4and F-C4350-3, Section 3.3
**Radiation (rd)	1.8E + 07 gamma	2.0E + 08 gamma	F-C4350-4 and F-C4350-3, Appendix C
Submergence	None	NA	NA

*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	F-C4350-4 and F-C4350-3, Fig. 2
Pressure	Yes	F-C4350-4 and F-C4350-3, Fig. 2
Relative Humidity	Yes	F-C4350-4 and F-C4350-3, Sects. 3.3 and 4.3
Chemical Spray	NA	NA
Submergence	NA	NA

JUSTIFICATION/COMMENTS (A) Also, see Anaconda letter to TVA dated October 25, 1985 (B70 851028 001) in Tab D and TAB C Section B.

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 21 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED [illegible] DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	> 15°F	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)	None	No, See TAB C, Sect. B
Voltage: ±10% of rated value	10%	Yes (on volts/mil basis)
Frequency: ±5% of rated value	NA	NA *
Environmental Transient: the initial transient and the peak temperature applied twice	---	No **
Vibration: +10% added to acceleration	NA	See Tab C, Sect. A

JUSTIFICATION/COMMENTS

*Not applicable to power cable.

**Transient includes adequate margin for the cable application. IEEE 383-1974 paragraph 2.4.4 states that post-LOCA mandrel re-bend and in-water high voltage withstand tests, as performed in F-C4350-4 and F-C4350-3, Sect. 3.4, demonstrated an adequate margin of safety and are more severe than exposure to two cycles of the environment.

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M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment:
(Reference See TAB A).

JUSTIFICATION/COMMENTS Function electrically throughout its exposure to the environmental extremes within specified electrical parameters.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes
(Reference F-C4350-4 and F-C4350-3, Section 5).

JUSTIFICATION/COMMENTS On the basis of successful results of qualification testing in the referenced test report, the Anaconda medium voltage cable is qualified to 10CFR50.49 for the postulated accident condition outside containment.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes
(Reference F-C4350-4 and F-C4350-3, Section 5).

JUSTIFICATION/COMMENTS Also, Anaconda letter to TVA dated October 25, 1985 in Tab D.

(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, Section B).

JUSTIFICATION/COMMENTS

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes
(Reference F-C4350-4, Section 4.3).

JUSTIFICATION/COMMENTS Disposition of anomalies by FIRL reviewed and approved; no impact on subject cable.

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 23 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED LAQ DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS See Tab G. There were no surveillance or maintenance requirements identified from the vendor or test documentation; however, TVA does have a maintenance and surveillance program at the plant.

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BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 24 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED YAQ DATE 8/28/86 R R

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	NA None Taken
(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 Aging Performed
(d) Materials susceptible to thermal/radiation aging identified?	Yes

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BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 25 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED SAQ DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 9-29-86

0. SUMMARY 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) 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?	NA*
(11) Criteria regarding submergence satisfied?	Yes-See TAB C, Section C
(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 satisfied?	Yes

*Test specimens were subjected to chemical spray testing, however, the cables covered by this binder are located outside containment.

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TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 26 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED [illegible] DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

O. SUMMARY OF REVIEW (Continued)

	Yes/No/NA
(15) Criteria regarding functional testing satisfied?	Yes
(a) Does the test plan/report specify an acceptance criteria for equipment performed?	No See J(1)
(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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA
(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 None Taken
(18) Criteria regarding synergistic effects satisfied?	Yes
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

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TVA 19537 (OE-3-86)

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable Yes/No/NA	F-C4350-4 & F-C4350-3 Reports Section
(a) Conductor				
Insulation material	EPR	EPR	Yes	2.B & 2.C respectively
Size	No. 2 AWG	No. 2 AWG	Yes	2.B & 2.C
Stranding	19/W	7/W	Yes	2.B & 2.C
Coating	Not Listed	Not Listed	Yes	2.B & 2.C
Insulation Thickness	140 mils	90 mils	Yes	2.B & 2.C
Number of conductors	1	1	Yes	2.B & 2.C
Arrangement of conductors	Single	Single	Yes	2.B & 2.C
(b) Shielding	Extruded Strand Shield	Extruded Strand Shield	Yes	2.B & 2.C
(c) Insulation shield				
Material ____	Extruded Insulation Shield	CSPE	Yes	2.B & 2.C
Thickness ____	30mils	30mils	Yes	2.B & 2.C
(d) Outer jacket				
Material ____	CSPE	CSPE	Yes	2.B & 2.C
Thickness ____	80mils	60mils	Yes	2.B & 2.C

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	F-C4350-4 & F-C4350-3 Reports Section
(e) Rated voltage	8 kV	MVP	Yes	Table 1
(f) Rated current	NA	170 A	Yes	Table 1
(g) Operating temperature rating				Attachment to F-C4350-4 Sect. (c)
Normal	43.3°C*	90°C	Yes	
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	**	**	Yes	Table 2, F-C4350-4
(i) Splice				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: Test cables and plant cables are similar, but not identical. Test cable is a representative cable in accordance with IEEE 383-1974. *See TAB C, Section B. ** Insulation resistance for medium voltage cable, plant application, is referenced in the Generic binder WBNEQ-GEN-001 to be a minimum of 1E04 ohm-1000 ft. The tested cable demonstrated an insulation resistance value of 1.5E07 ohm-15 ft at a temperature of 265°F. This value is equal to $1.5E07 \times \left(\frac{15}{1000}\right) = 2.25E05$ ohm-1000 feet.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Section 3.3).

Comments: _____

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Sect. 3.3).

Comments: _____

BINDER NO. WBNEQ-CABL-005 PLANT WBN UNIT(S) 1 SHEET 29 OF 29

BINDER TITLE ANACONDA/MEDIUM VOLTAGE COMPUTED [illegible] DATE 8/28/86 R ___ R ___

POWER - EPR INS/TVA TYPE EPSJ CHECKED [illegible] DATE 8-29-86

EQUIPMENT IDENTIFICATION (Continued) Page 3 of 3

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Sect. 3.4 & Table 3).

Comments: ___

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference F-C4350-4 and F-C4350-3, Fig. 2, Table 2 and Section 3.1).

Comments: ___

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference F-C4350-4, F-C4350-3, Section 3.4).

Comments: ___

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Contract Reports in Tab E).

Identify flame test standard: IEEE 383 Vertical and IPCEA Standard 5-19-81.

Comments: ___

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TVA 19537 (OE-3-86)

GENNAL6-002

Table C-2

COMPUTED [illegible] DATE 9-20-85
CHECKED [illegible] DATE [illegible]

Breaks Causing Condensation

Zone No.	* Node/Volume Corresponding to Zone No. affected by break	Break Description (system - node - description)
1	Inside Containment	MSLB or LOCA in the containment
3	14	RHR - Node 17 - pipe chase
4	10	RHR - Node 10 - RHR Hx Room
6	15	RHR - Node 17 - Pipe chase
7	17	RHR - Node 17 - pipe chase
10	5	FFW Pump turbine - Node 5
12	2	RHR - Node 2 - RHR Pump room
13	Valve Vault	MSLB in Valve vault MFLB in Valve Vault
14	11	CVCS - Node 11 - Exchanger room.

Add Note R2 NOW 9-18-86

* Node/volume may be determined from figure H-1 thru H-6 in appendix H.

TVA 11030 (WM-7-75)

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-006
MANUFACTURER : ANACONDA

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV.	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-ANM-092-0030-D	1NM 30-D	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-083-1085-B	1PL1085-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0500-F	1PM 500-F	MS	WVA	VARIOUS	VARIOUS	I	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0501-F	1PM 501-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0606-D	1PM 606-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0626-F	1PM 626-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0637-E	1PM 637-E	MS	WVC	VARIOUS	VARIOUS	I	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0696-D	1PM 696-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0711-F	1PM 711-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0778B-D	1PM 778-D	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0783-E	1PM 783-E	MS	WVC	VARIOUS	VARIOUS	I	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0791-D	1PM 791-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0811-F	1PM 811-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0820-G	1PM 820-G	MS	WVC	VARIOUS	VARIOUS	I	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0821-G	1PM 821-G	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0822-G	1PM 822-G	MS	WVC	VARIOUS	VARIOUS	I	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0823-G	1PM 823-G	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0830-G	1PM 830-G	MS	WVC	VARIOUS	VARIOUS	I	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0832-G	1PM 832-G	MS	WVC	VARIOUS	VARIOUS	I	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0875-E	1PM 875-E	MS	WVC	VARIOUS	VARIOUS	I	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0881-D	1PM 881-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0901-F	1PM 901-F	MS	WVA	VARIOUS	VARIOUS	O	N76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0950-D	1PM 950-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-1008-F	1PM1008-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-1026-G	1PM1026-G	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-1041-D	1PM1041-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-1086-F	1PM1086-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1223-F	1PM1223-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1232-G	1PM1232-G	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1241-G	1PM1241-G	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1250B-F	1PM1250-F	MS	WVA	VARIOUS	VARIOUS	I	N76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1251-F	1PM1251-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1314-D	1PM1314-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1401-F	1PM1401-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1454-D	1PM1454-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1521-F	1PM1521-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1536-D	1PM1536-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE Dm 9.21.86

CHECKED/DATE DD Dayton 9/22/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION ±BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APM-001-1573-D	1PM1573-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1641-F	1PM1641-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1656-D	1PM1656-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1694-D	1PM1694-D	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1756-F	1PM1756-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-074-1800-G	1PM1800-G	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-074-1807-F	1PM1807-F	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2242-A	1PM2242-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-2245-A	1PM2245-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-2435-B	1PM2435-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-2445-B	1PM2445-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-2485B-B	1PM2485-B	MS	WVA	VARIOUS	VARIOUS	O	N76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2540-B	1PM2540-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2541-B	1PM2541-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2542-A	1PM2542-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2543-A	1PM2543-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2544-A	1PM2544-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2545-A	1PM2545-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-3096-A	1PM3096-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-3806-B	1PM3806-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-063-3870-D	1PM3870-D	MS	WVA	VARIOUS	VARIOUS	O	N76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-063-3877B-E	1PM3877-E	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-063-3882B-F	1PM3882-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-063-3887-G	1PM3887-G	MS	WVA	VARIOUS	VARIOUS	O	N76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-4430-A	1PM4430-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4457-B	1PM4457-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4467-A	1PM4467-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4477-A	1PM4477-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4487-B	1PM4487-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4492-A	1PM4492-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4507-A	1PM4507-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-063-4801-F	1PM4801-F	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-063-4810-G	1PM4810-G	MS	WVA	VARIOUS	VARIOUS	I	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-063-4811-G	1PM4811-G	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-030-5051-A	1PM5051-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APS-099-0183-B	1PS 183-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APS-099-0186-B	1PS 186-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE Ou 9-21-86 ____ ____ ____

CHECKED/DATE D.D. Dayton 9/22/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-aPS-099-0188-B	1PS 188-B	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0250-S	1SG 250-S	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0251-S	1SG 251-S	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0252-S	1SG 252-S	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0253-S	1SG 253-S	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0255-S	1SG 255-S	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0260-S	1SG 260-S	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0261-S	1SG 261-S	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0264-S	1SG 264-S	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0266-S	1SG 266-S	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0267-S	1SG 267-S	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aSG-046-0268-S	1SG 268-S	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-0017-A	1V 17-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-0018-A	1V 18-A	MS	WVA	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-1001-B	1V 1001-B	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-1011-B	1V 1011-B	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-1110-B	1V 1110-B	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-1130-B	1V 1130-B	MS	WVC	VARIOUS	VARIOUS	O	76K5-087232-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE Ary 9-21-86 ____ ____ ____

CHECKED/DATE D.D. Dayton 9/22/86 ____ ____ ____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-006
MANUFACTURER : ANACONDA

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV.	*BM	CONTRACT	CAT	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APM-068-0505-D	1PM 505-D	MS	WVC	VARIOUS	VARIOUS	I	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0515-D	1PM 515-D	MS	WVC	VARIOUS	VARIOUS	I	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0638-E	1PM 638-E	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0646-E	1PM 646-E	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0648-E	1PM 648-E	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0726-F	1PM 726-F	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0728-F	1PM 728-F	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0741-F	1PM 741-F	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0743-F	1PM 743-F	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0870-E	1PM 870-E	MS	WVC	VARIOUS	VARIOUS	I	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0876-E	1PM 876-E	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0934-F	1PM 934-F	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5138-E	1PM5138-E	MS	WVB	VARIOUS	VARIOUS	I	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5140-E	1PM5140-E	MS	WVB	VARIOUS	VARIOUS	I	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5156-D	1PM5156-D	MS	WVB	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5162-D	1PM5162-D	MS	WVB	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5164-D	1PM5164-D	MS	WVB	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5166-D	1PM5166-D	MS	WVB	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5168-D	1PM5168-D	MS	WVB	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-C981-A	1V 981-A	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-C991-A	1V 991-A	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1070-A	1V 1070-A	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1090-A	1V 1090-A	MS	WVC	VARIOUS	VARIOUS	O	78K5-824447-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

		R____	R____	R____
PREPARER/DATE	Qu 9.21.86			
CHECKED/DATE	DDDayton 9/22/86			

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-006
MANUFACTURER : ANACONDA

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APM-068-1025-G	1PM1025-G	MS	WVA	VARIOUS	VARIOUS	I	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-1070-E	1PM1070-E	MS	WVA	VARIOUS	VARIOUS	I	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-1085-F	1PM1085-F	MS	WVA	VARIOUS	VARIOUS	I	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-030-1847-E	1PM1847-E	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-077-2085-A	1PM2085-A	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-3921-B	1PM3921-B	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4465B-A	1PM4465-A	MS	WVA	VARIOUS	VARIOUS	I	N80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4466-A	1PM4466-A	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4475B-A	1PM4475-A	MS	WVA	VARIOUS	VARIOUS	I	N80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4476-A	1PM4476-A	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4491-A	1PM4491-A	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4503-B	1PM4503-B	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4506-A	1PM4506-A	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4508-A	1PM4508-A	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-030-5053-B	1PM5053-B	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5142-E	1PM5142-E	MS	WVB	VARIOUS	VARIOUS	I	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5155-D	1PM5155-D	MS	WVB	VARIOUS	VARIOUS	I	N80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5161-D	1PM5161-D	MS	WVB	VARIOUS	VARIOUS	I	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5163-D	1PM5163-D	MS	WVB	VARIOUS	VARIOUS	I	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5165-D	1PM5165-D	MS	WVB	VARIOUS	VARIOUS	I	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5167-D	1PM5167-D	MS	WVB	VARIOUS	VARIOUS	I	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0385-A	1RM 385-A	MS	WVA	VARIOUS	VARIOUS	O	80K8-827380-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Qu 9.21.86			
CHECKED/DATE	DDDayta 9/22/86			

BINDER NO. WBNEQ-CABL-006 PLANT WBN UNIT(S) 1 SHEET 1 OF 34

BINDER TITLE ANACONDA/SIGNAL CABLE - FR-EP INS/TYPE MS COMPUTED Ow DATE 8.28.86 R R

CHECKED DDD DATE 9/23/86

A. DOCUMENTATION

Equipment Description Signal Cable

Vendor/Manufacturer Anaconda - Continental Wire and Cable

Equipment Model No.(s) TVA Type MS*

TVA Contracts: 76K5-087232-00, 78K5-824447-00, and 80K8-827380-00

QUALIFICATION REPORTS

(1) Title/Number/Revision Qualification Tests of FR-EP/CPE Instrumentation Class 1E Electric Cables in a Simulated Steam-Line Break and Loss of Coolant Accident Environment F-C4836-3. RIMS B70 851020 100 DATE January 1978

(2) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(3) Anaconda letter dated July 5, 1983 (RIMS EEB 830712 005) confirming that the materials used in manufacturing of cables supplied under TVA Contract 76K5-87232-00 and for the cable tested in FIRL Report F-C4836-3 are identical (TAB E).

(4) Copy of TVA contract document with Anaconda bid statement (RIMS QAS 780922 534) confirming cables of Contract 78K5-824447 are identical to cables of Contract 76K5-87232 (TAB E).

*MS - Multiconductor insulated signal cable (not paired) with shield and overall jacket.

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A. DOCUMENTATION (Continued)

(5) TVA Calculation WAC-113 titled "Material Aging Calculation Report Transmittal" (TAB C).

(6) Vertical cable tray flame test (from contract documents) (TAB E).

(7) Analysis & Calculations of Qualification of Cables of Binder WBNEQ-CABL-006 (TAB C).

NOTE: The above references are referred to throughout TAB B by reference numbers, for example: Reference 3.

BINDER NO. WBNEQ-CABL-006 PLANT WBN UNIT(S) 1 SHEET 3 OF 34

BINDER TITLE ANACONDA/SIGNAL CABLE - FR-EP INS/TYPE MS COMPUTED [illegible] DATE 9.21.86 R ___ R ___

CHECKED [illegible] DATE 9/23/86

B. CONCLUSION OF REVIEW (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. To identify and reroute the subject cables that may be submerged inside containment. 2. To identify and reroute the subject cables that may be submerged in the SVR. 3. Irradiation qualification of the subject cables for the total integrated dose of gamma plus beta radiation postulated in the lower compartment during normal and accident conditions. 4. It is indeterminate if the leakage current and the IR value measured during the qualification testing are acceptable for the subject cable application. 5. Reevaluate qualification data and TAB A listing, if required, due to certain cables being rerouted/repulled to new locations of their end devices. 6. Resolution of existing discrepancies between design and installation records for cables that are identified by an "N" prefixed contract number in TAB A.

COMMENTS/RECOMMENDATIONS The subject cable is qualified for the service conditions inside the containment. It has a qualified life of 40 years at 73°C (163.4°F) conductor temperature and 100 days post-accident operating time. Other service parameters are given in Section K of this tab.

BINDER NO. WBNEQ-CABL-006 PLANT WBN UNIT(S) 1 SHEET 4 OF 34

BINDER TITLE ANACONDA/SIGNAL CABLE - FR-EP INS/TYPE MS COMPUTED [illegible] DATE 8.28.86 R ___ R ___

CHECKED [illegible] DATE 9/23/86

C. 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

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 383-1974 and IEEE 323-1974

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BINDER NO. WBNEQ-CABL-006 PLANT WBN UNIT(S) 1 SHEET 5 OF 34

BINDER TITLE ANACONDA/SIGNAL CABLE - FR-EP INS/TYPE MS COMPUTED [illegible] DATE 9.21.86 CHECKED [illegible] DATE 9/23/86 R ___ R ___

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 A 2/c, #16 AWG test sample was tested for qualification, and it is considered a representative sample for qualifying cables of the same type. The cables listed in TAB A are of 2/c, #16 AWG; 3/c, #16 AWG; and 4/c, #16 AWG and are supplied under the TVA contracts listed in Section A of this tab with insulation and jacket materials identical to the test sample as confirmed by the manufacturer in References 3 and 4. This is in accordance with IEEE 384-1974, Table 1 and, therefore, the qualification by similarity is acceptable.

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TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-006 PLANT WBN UNIT(S) 1 SHEET 6 OF 34

BINDER TITLE ANACONDA/SIGNAL CABLE - FR-EP INS/TYPE MS COMPUTED [illegible] DATE 8.28.86 R ___ R ___

CHECKED [illegible] DATE 9/23/86

E. EQUIPMENT DESCRIPTION

Is the equipment identified in the qualification report identical to the plant equipment which requires qualification (yes/no/NA)? No(1)

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Signal Cable	Signal Cable	1, p 2-1
(2) Manufacturer	Anaconda - Continental Wire	Anaconda - Continental Wire	1, p 1-1
(3) Model Number(s)	TVA Type MS(2)	NA(2)	NA
(4) Serial Number(s)	NA	NA	NA

(5) Identify Component-Unique checksheet attached: Supplement 2, Component-Unique Checklist, Cable/Splices

JUSTIFICATION/COMMENTS (1) See Supplement 2, sheet 31 for comparison between the installed and the tested cables, and justification/comment in Section D for similarity.

(2) No specific model number for this cable is identified by the manufacturer. TVA "Type MS" identifies multiconductor insulated signal cable (not paired) with shield and overall jacket.

EQP147.61

TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-006 PLANT WBN UNIT(S) 1 SHEET 7 OF 34

R R

BINDER TITLE ANACONDA/SIGNAL CABLE - COMPUTED [illegible] DATE 8.28.86

FR-EP INS/TYPE MS CHECKED [illegible] DATE 9/23/86

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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	NA		
Electrical Connections	NA		
Conduit Seals	NA		
Connector Seals	NA		
Orientation	NA		
Physical Configuration	NA		
Other			

JUSTIFICATION/COMMENTS The cable interfaces are not considered for cable qualification.

EQP147.61

TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-006 PLANT WBN UNIT(S) 1 SHEET 8 OF 34

BINDER TITLE ANACONDA/SIGNAL CABLE - FR-EP INS/TYPE MS COMPUTED [illegible] DATE 8.28.86 R ___ R ___

CHECKED [illegible] DATE 9/23/86

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	1, p 3-1
(b) Baseline performance measurements taken	Yes	1, p 3-1
(c) Equipment aged:		
Thermal	Yes	1, p 3-1
Radiation	Yes	1, p 3-1
Wear	NA	See sh. 15
(d) Vibration/seismic testing conducted	NA	See sh. 15
(e) Design basis event (DBE) exposure	Yes	1, p 3-2
(f) Post-DBE exposure	Yes	1, p 3-2
(g) Final inspection and disassembly	Yes	1, p 3-3

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference 1, Appendix A).

JUSTIFICATION/COMMENTS

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H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference 1, p 3-1).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	1, p 3-1
Radiation exposure	Yes	1, p 3-1
Vibration (non-seismic) aging	NA	See sh. 15
Operational (electrical/mechanical/process) stress aging	NA	See sh. 15

JUSTIFICATION/COMMENTS

(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).

JUSTIFICATION/COMMENTS Cable being qualified to NUREG-0588, Category II.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference 1, p 3-1).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference 1, p 2-1).

JUSTIFICATION/COMMENTS Use of IEEE 383-1974 test guidelines implicitly consider cable insulation material susceptible to thermal degradation.

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference 1, attachment).

JUSTIFICATION/COMMENTS

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference 1, attachment).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	130°F	150°C	73°C (163.4°F)
Time	40 years	168 hrs	40 years

JUSTIFICATION/COMMENTS See Reference 5 for equivalent temperature calculation. Per Reference 1, attachment, the cable accelerated aging was based on 50% retention of insulation elongation property.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference 1, attachment).

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)? NA (Reference ___).

JUSTIFICATION/COMMENTS Points on the curve established by testing (Section 8.1.1.2 of attachment in Reference 1).

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)? Yes (Reference 1, attachment).

JUSTIFICATION/COMMENTS The aging test data furnished in the report (Reference 1, attachment) was used to perform linear regression by the method of least squares, programmed in "System 1000" (Reference 5). The activation energy calculated for the insulation material using "System 1000" is more accurate and conservative than the Arrhenius aging plot furnished with Reference 1.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS The qualified life for a cable is calculated considering the expected conductor temperature at its rated or at operating load current. Therefore, energization of the test sample during accelerated thermal aging is not required.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference 1, p 3-1).

JUSTIFICATION/COMMENTS _____

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference 1, p 2-1).

JUSTIFICATION/COMMENTS The cable insulation material is the primary material to be considered for irradiation aging. The test cable has flame-resistant cross-linked ethylene propylene rubber insulation and chlorinated polyethylene jacket materials.

H. AGING (Continued)

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes
(Reference 1, p 3-1).

JUSTIFICATION/COMMENTS The test sample was tested underwater for IR values before and after the irradiation test (Reference 1, p 4-3). This is considered an acceptable basis for ascertaining the retention of cable insulation property on radiation aging.

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference 1, p 3-1).

Plant normal ambient radiation dose (rd)	1×10^8
Test exposure dose (rd)	2×10^8
Test exposure dose rate (rd/hr)	1×10^6
Test exposure source type (e.g., Co-60 gamma)	Co-60 gamma

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference NA).

JUSTIFICATION/COMMENTS See sheet 15.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA
(Reference NA).

JUSTIFICATION/COMMENTS See sheet 15.

H. AGING (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)? NA (Reference NA).

JUSTIFICATION/COMMENTS See sheet 15.

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? NA (Reference NA).

JUSTIFICATION/COMMENTS See sheet 15.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference Reference 5).

Qualified life (Document in QMDS) 40 years at 73°C (163.4°F) conductor temperature.

JUSTIFICATION/COMMENTS The subject cable is qualified for installation inside containment with exposure to one DBE condition and for the 100 days post-DBE operating time, as listed in Section K of this tab. The qualified life and the post-DBE operating time are calculated by using System 1000 and it is given in Reference 5. The cable qualification at 73°C conductor temperature is considered acceptable in view of the following analysis. The TVA "Type MS" cables are used in instrument signal circuits and the load current in these circuits is less than 1 ampere (In addition, none of the addition, none of the subject cables are listed in the CACTAT - a

H. AGING (Continued)

calculation for giving conductor temperatures of Class 1E cables with load current greater than 1 ampere). Keeping in view that the 2/c, #16 AWG subject cable is rated for 10 amperes, it's an engineering judgment that the conductor temperature in case of "Type MS" cable would be insignificantly above the normal maximum ambient temperature of 130°F (54.4°C) considered for the subject binder.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA
(Reference _____).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS Cable qualified for design life of the plant.

GENERIC COMMENT FOR G(1)(C)WEAR, G(1)(D)VIBRATION, H(2),H(6), AND H(7)

Normal Service Related Stresses- In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards...". Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria". Included in the list that follows the above quote is the standard to which TVA routinely purchased the subject cables:

> IPCEA S-68-516, Interim Standards for Ethylene-Propylene Rubber-Insulated Wire and Cable. Number 1, Cable Rated 0-35000 V. Number 2, Cable Rated 2000 V, Integral Insulation and Jacket.

As part of the contract specifications, TVA includes this standard as a requirement for manufacturing and testing the cable being supplied. Based on the above, it is concluded that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty operational stresses and vibration.

GENERIC COMMENT FOR G(1)(D) SEISMIC

Seismic events are natural phenomena which are not considered in 10CFR50.49. Specific seismic testing on the cables was not performed; however, upon completion of the LOCA simulation, the cable samples were subjected to a mandrel rebend test and an in-water hi-pot test. IEEE 383-1974, paragraph 2.4.4, regards that the performance of this test demonstrates that the cables have retained considerable mechanical durability and would be more severe even than the application of two cycles of the environment. The retention of a high degree of flexibility at the end of life (plus an accident) demonstrates the cable ability to withstand significant mechanical stresses.

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R ___ R ___

BINDER TITLE ANACONDA/SIGNAL CABLE - COMPUTED [illegible] DATE 8-28-86

FR-EP INS/TYPE MS CHECKED [illegible] DATE 9/23/86

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)

	Material/Property/Function	Radiation Threshold	Reference	Activation Energy	Reference
(a)	Flame-Resistant Cross-Linked Ethylene Propylene Rubber Insulation	NA	NA	1.26	5
(b)	NA				
(c)	NA				
(d)	NA				
(e)	NA				

JUSTIFICATION/COMMENTS

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

(1) 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 1, pp 1-1, 3-8, and 5-1).

Identify Acceptance Criteria: 1. Ability to maintain electrical loading (480VAC, 10A) during the LOCA/HELB testing. 2. Post-accident mandrel bend and high potential withstand tests (high potential equivalent to 80V/mil insulation thickness). Also see Open Item No. 4 in Section B of this tab.

(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 1, pp 4-3 and 4-5).

Identify baseline and functional testing: Insulation resistance measurements as a baseline test and all throughout the qualification testing; mandrel bend and hi-potential withstand tests post-LOCA/HELB exposure.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference 1, pp 2-1, 3-8, and 4-2).

JUSTIFICATION/COMMENTS 480VAC and 10A current.

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? NA (Reference 1, p 4-3, cable specimens 26.4 and 26.5).

JUSTIFICATION/COMMENTS Baseline testing consisted of insulation resistance tests which provide an indication of the electrical condition of the cable. This is considered acceptable.

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	135VDC/125VAC	See comment
Load	NA	NA
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		
	NA	NA

JUSTIFICATION/COMMENTS The subject cables are for instrumentation applications where at Watts Bar system nominal voltage during any condition would not be greater than the control supply voltage of 135VDC/125VAC.

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	480VAC	1, p 2-1, Table 1
Load	10Amp	1, p 2-1, Table 1
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		
	NA	NA

JUSTIFICATION/COMMENTS See comment for Section J(4).

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. See page 21 and reference 7, Paragraph 1.0 for Sect. K(5)(a).

(1) Normal Max

(a) Temperature (°F) 130°

(b) Pressure (psia) 14.7

(c) Humidity (%) 80

(d) Radiation (rd) 1×10^8

(2) Abnormal Max

(a) Temperature (°F) 140°

(b) Pressure (psia) 14.7

(c) Humidity (%) 100

(d) Radiation (rd) NA

(3) Process Interfaces: Not applicable in case of cable qualification.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Up to eight hours per excursion and will occur less than 1 percent of the life of the plant.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	327	Accident type LOCA/HELB
(b) Pressure (psia)	26.7	Accident type LOCA
(c) Humidity (%)	100	Accident type LOCA
(d) Radiation (rd)	4.7×10^8 (beta) 4.0×10^7 (gamma)	Accident type LOCA
(e) Spray Type	Chemical	Accident type LOCA/HELB

The typical location and the corresponding reference for the worst case environmental parameters postulated for the subject cables are as follows:

1. The normal maximum temperature and the abnormal maximum temperature are in the SVR; Drawing No. 47E235-76.
2. The normal maximum pressure and the abnormal maximum pressure are in the lower compartment and instrument room in the reactor building; Drawing Nos. 47E235-42 and 45.
3. The normal maximum relative humidity (RH) is in the lower compartment and annulus; Drawing Nos. 47E235-42 and 44, and the abnormal maximum RH is in the lower compartment and SVR; Drawing Nos. 47E235-42 and 76.
4. The normal maximum radiation dose is in the lower compartment; refer to OE Calculation GENNAL3-001, Rev. 0 (RIMS B45 851117 235).
5. Accident peak temperature is in the lower compartment and instrument room in the reactor building; Drawing Nos. 47E235-42 and 45 (also See Reference 7, paragraph 1.0).
6. Accident peak pressure is in the lower compartment; Drawing No. 47E235-42.
7. Accident relative humidity is in the lower compartment and SVR; Drawing Nos. 47E235-42 and 76.
8. Accident radiation dose is in the lower compartment; refer to OE Calculations TI-RPS-48, Rev. 2 (RIMS B45 851105 235) and WBNNAL3-004, Rev. 0 (RIMS B45 860205 235).

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

0.1847 Molar H_3BO_3 (2000 ppm boron), 0.033 Molar NaOH resulting in a pH of 8.35 at 25°C at a rate of 0.92 (gal/min)/ft^2 for 30 days duration (47E235-42 R1).

(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)? No (Reference See K(6) in Section P).

(7) Subject to submergence (yes/no/NA)? No (See Open Item No. 1 and No. 2 in Section B) (Reference _____).

Identify initiation time and duration of submergence: NA; the subject cables are not qualified to function under a submerged condition.

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

Type	RIMS No.
None	

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BINDER TITLE ANACONDA/SIGNAL CABLE - FR-EP INS/TYPE MS COMPUTED [illegible] DATE 8.28.86 R ___ R ___

CHECKED [illegible] DATE 9/23/86

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time (days)	100	16	1, p 3-9
Temperature (°F)	327	385	1, p 3-9
Pressure (psia)	26.7	80.7	1, p 3-9
Relative Humidity (%)	100	100	1, pp 3-2 & 3-9
*Chemical Spray	See L(2) Comment	See L(1) in Section P	1, p 3-9
**Radiation (rd)	4.7×10^8 (beta) 1.4×10^8 (gamma)	2×10^8	1, p 4-1 & L(2) Comment
Submergence	NA	NA	See Sect K(7)

*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	1, p 3-9
Pressure	Yes	1, p 3-9
Relative Humidity	Yes	1, p 3-2
Chemical Spray	NA	See Comment
Submergence	NA	See Sect K(7)

JUSTIFICATION/COMMENTS All cables inside containment are routed through conduits and therefore any difference between the specified and the demonstrated chemical spray parameters is not of concern. The subjection of chemical spray is in fact an exposure to a severe environmental condition. Also, the beta radiation inside containment would be shielded off by conduit except for the portion of cables that is routed through flexible conduits (see Open Item No. 3 in Section B).

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L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	58°F	Yes
Pressure: +10% but no more than 10 psig	54 psi	Yes
Radiation: +10% of accident dose	10%	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	NA	See Comment 1
Voltage: +10% of rated value	+10%	See Comment 2
Frequency: +5% of rated value	NA	NA - See Comment 3
Environmental Transient: the initial transient and the peak temperature applied twice	Single	No - See Comment 4
Vibration: +10% added to acceleration	NA	NA - See Comment 3

JUSTIFICATION/COMMENTS: 1) There is no explicit time margin; the test sample was tested for 16 days in a harsh environment which has been extrapolated to show 100 days operating time by a calculation, No. WAC-113 (Reference 5). This meets the specified operating time requirement.
2) The contract specifies cables of 600V insulation grade which is a nominal insulation level for all cables operated at 480V and less. The subject cables under qualification are for instrumentation applications where the nominal system voltage at Watts Bar would be 135VDC or 125VAC with a load current not exceeding 1 ampere. The test sample cable was connected to 480VAC which gives margin of greater than +10%.
3) Frequency and vibration are not considered to have impact on the qualification of cable and, therefore, are not considered.
4) Since the test sample on post-LOCA simulation was tested for mandrel bend test (Reference 1, pp 4-2 and 4-5), the single peak transient exposure is in accordance with IEEE: 383-1974, Section 2.4.3.1 and the note to Section 2.4.4.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference 1, p 4-2, Sect. 4.4).

JUSTIFICATION/COMMENTS Transmission of electrical signals between safety-related devices and for that cables must maintain circuit integrity during and after a LOCA/HELB.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference 1, p 5-1).

JUSTIFICATION/COMMENTS See Open Item No. 4 in Section B of this tab.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference 1, p 5-1).

JUSTIFICATION/COMMENTS See Open Item No. 4 in Section B of this tab.

(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 1, p 5-1).

JUSTIFICATION/COMMENTS Tested for 16 days in a harsh environmental condition. This was extrapolated to show 100 days operating time by a calculation No. WAC-113 (Reference 5).

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS There were no anomalies related to testing or cable performance. The visual inspection of the test sample after thermal aging indicated increased stiffness and small radial splits which slightly exposed the shield in spots (Reference 1, p 4-1). However, the same test samples after having been irradiated and exposed to simulated accident conditions withstood the IR test, bend test, and hi-pot test (Reference 1, pp 4-3 and 4-5). Per same reference, p 4-5, the jacket material was cracked along entire length of the test cable after LOCA/HELB exposure. Evidently the cable insulation had not degraded to a point of failure. Further, it should be noted that the test cables were subjected to a more severe environment during testing due to direct impingement of chemical spray, as the cables inside containment are routed through conduits.

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)? NA (Enter all requirements in Section G of the EQC Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS No surveillance or maintenance requirements have been identified by the vendor or on review of the qualification document. However, TVA has an in-house maintenance and surveillance program on cables; See TAB G.

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BINDER TITLE ANACONDA/SIGNAL CABLE - FR-EP INS/TYPE MS COMPUTED [illegible] DATE 8-28-86 CHECKED [illegible] DATE 9/23/86 R ___ R ___

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?	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?	NA - See O(6)(a) in Sect P
(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

O. SUMMARY 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) 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?	NA, see Comment L(2) on sh. 23
(11) Criteria regarding submergence satisfied?	NA - See Sect K(7) on sh. 22
(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

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA
(17) Test duration margin (1 hour + function time) satisfied?	NA-See Comment 1 for Sect L(3)
(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?	NA-See O(18) in Sect P
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

K(6) IEEE 383-1974 section 2.3.1 addresses the requirements for moisture resistance under normal operating conditions. The same would also apply under accident conditions since the basic design of inside containment is such that all cables are inside conduits or shielded from direct spray impingement. Cables are manufactured to IPCEA S-68-516, which assures moisture resistance during normal operations.

Also, in addition to the above justification, test sample was tested to withstand 480 volts, 10A load under the simulated accident conditions of 100% relative humidity, elevated temperature and pressure and chemical spray.

L(1) Spray composition and rate: 6200 ppm boron as H_3BO_3, 50 ppm hydrazine (NH_2NH_2) Na_2PO_4 added to make the pH between 8.6 and 10.0 at 77°F. Rate is 0.15 (gal/min)/ft^2 (Reference 1, p 3-9).

O(6)(a) Mechanical and/or cycle aging is not considered a factor in establishing aging degradation in cables.

O(18) Synergisms were not considered, as the cable was being tested to NUREG-0588, Category II.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? Yes

Item	Plant(1)	Report(1)	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	FR-EP	FR-EP	Yes	F-C4836-3 Page 2-1
Size	16 & 18 AWG	16 AWG	Yes	F-C4836-3 Page 2-1
Stranding	Class B	7 Strand	Yes	F-C4836-3 Page 2-1
Coating	Tinned	Tinned	Yes	F-C4836-3 Page 2-1
Insulation Thickness	25 mils	25 mils	Yes	F-C4836-3 Page 2-1
Number of conductors	2,3, & 4	2	Yes	F-C4836-3 Page 2-1
Arrangement of conductors	NA	NA	NA	F-C4836-3 Page 2-1
(b) Shielding	Al/polyester or Al/mylar	Al/mylar	Yes	F-C4836-3 Page 2-1
(c) Insulation jacket				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
(d) Outer jacket				
Material	CPE	CPE	Yes	F-C4836-3 Page 2-1
Thickness	30 mils	30 mils	Yes	F-C4836-3 Page 2-1

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	600VAC	480VAC(2)	Yes	F-C4836-3 Page 2-1
(f) Rated current	NA	10 amps	NA	F-C4836-3 Page 2-1
(g) Operating temperature rating				
Normal	73°C (3)	90°C	Yes	Attachment to F-C4836-3
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	NA	1.2×10^7	Yes	F-C4836-3 Page 4-3
(i) Splice Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: (1) The information listed under "Plant" is taken from the contract(s) and from the routine test reports for the cable. The information listed under "Report" is for Category 26 as identified on page 2-1 of report F-C4836-3 in Tab D.

(2) The subject cables are for instrumentation applications where the nominal system voltage at Watts Bar would be 135VDC/125VAC or less. In addition, the test sample was tested for hi-pot test at voltage equivalent to 80V/mil of insulation thickness as required in IEEE 383-1974. Therefore, testing of cable sample at 480VAC is considered acceptable.

(3) See justification/comments for Section H(8) on Sheet 13 of this Tab.

EQUIPMENT IDENTIFICATION (Continued)

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference F-C4836-3, p 1-1).

Comments: IEEE 383-1974, Section 2.3.1 addresses the requirements for moisture resistance under normal operating conditions. Cables are manufactured to IPCEA S-68-516, which assures moisture resistance during normal operations.
In addition to the above justification, test sample withstood 480 volts, 10A load under the simulated accident conditions of 100% relative humidity, elevated temperature and pressure and chemical spray.

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference F-C4836-3, p 1-1).

Comments:

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference F-C4836-3, pp 3-3 and 4-5).

Comments: Voltage withstand test was 2000VAC for 5 minutes.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference F-C4836-3, p 4-3).

Comments: The data under cable specimen 26.4 and 26.5 given in the above reference is pertinent to the subject cables.

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference F-C4836-3, pp 4-2 and 4-5).

Comments: Cable had six turns on a mandrel with a mandrel diameter to cable O.D. ratio of 36.7. The test sample withstood 2000VAC with 1.6 mA leakage current under an immersed condition.

EQUIPMENT IDENTIFICATION (Continued)

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference 6).

Identify flame test standard: IEEE 383-1974

Comments:

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MANUFACTURER : ANACONDA
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PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QPV-275-0035-A	1PV 35-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPV-065-0105-A	1PV 105-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	N81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPV-065-0184-B	1PV 184-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	N81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPV-065-0185-B	1PV 185-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	N81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPM-090-0380-B	1RM 380-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPM-090-0392-B	1RM 392-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-043-8785-A	1V 8785-A	PXMJ	WGD-1	VARIOUS	VARIOUS	O	N81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-043-8786-A	1V 8786-A	PXMJ	WGD-1	VARIOUS	VARIOUS	O	N81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-043-8787-B	1V 8787-B	PXMJ	WGD-1	VARIOUS	VARIOUS	O	N81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-043-8788-B	1V 8788-B	PXMJ	WGD-1	VARIOUS	VARIOUS	O	N81K7-828633-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D. Smithson 9-2-86 ____ ____ ____

CHECKED/DATE N. Gunter 9/2/86 ____ ____ ____

PRINT DATE: 09/20/86

BINDER NO. : WBNEQ-CABL-008
MANUFACTURER : ANACONDA

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-001-1825-A	1V 1825-A	PXMJ	WHC-2	VARIOUS	VARIOUS	O	79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-2621-A	1V 2621-A	PXMJ	WHJ-2	VARIOUS	VARIOUS	O	79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-2631-B	1V 2631-B	PXMJ	WHJ-2	VARIOUS	VARIOUS	O	79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2984-A	1V 2984-A	PXMJ	WHJ-2	VARIOUS	VARIOUS	O	79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-3004-B	1V 3004-B	PXMJ	WHJ-2	VARIOUS	VARIOUS	O	79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-3014A-B	1V 3014-B	PXMJ	WHJ-2	VARIOUS	VARIOUS	O	N79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-3014B-B	1V 3014-B	PXMJ	WHJ-2	VARIOUS	VARIOUS	O	79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3791-B	1V 3791-B	PXMJ	WHJ-2	VARIOUS	VARIOUS	O	N79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-8664-A	1V 8664-A	PXMJ	WHE-2	VARIOUS	VARIOUS	O	79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-8665-B	1V 8665-B	PXMJ	WHE-2	VARIOUS	VARIOUS	O	79K6-825722-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Scarlthorpe 9/20/86 ____ ____ ____

CHECKED/DATE M. M. Gunter 9/21/86 ____ ____ ____

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 1 OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE POWER AND CONTROL - EPR INS/TVA TYPE PXMJ

COMPUTED DJB DATE 8/29/86 R ___ R ___

CHECKED B DATE 8/30/86

A. DOCUMENTATION

Equipment Description 600 Volt Power & Control Cable

Vendor/Manufacturer Anaconda

Equipment Model No.(s) *TVA Type PXMJ (EPR/CPE)

TVA Contracts 79K6-825722-2, 81K7-828633

QUALIFICATION REPORTS

(1) Title/Number/Revision "Qualification Tests of Flame Guard FR-EP Instrumentation and Control Class 1E Electric Cables in a Simulated Steam-Line Break and Loss-of-Coolant Accident Environment." FIRL #F-C4836-2 RIMS B70 850920 100 DATE January 1978

(2) Title/Number/Revision _____ RIMS _____ DATE _____

(3) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(4)Anaconda letter to TVA dated February 11, 1985 (EEB 850214 017) documents that Report #1 is applicable to TVA Contracts 79K6-825722-2 and 81K7-828633.

(5)Anaconda Certificate of Compliance for IEEE-383 Vertical Tray Flame Test dated June 26, 1980. (See TAB E).

*TVA type designation for 600V, multiconductor power and control cable 90°C, with a specified number of single conductors insulated with flame-retardant ethylene-propylene rubber and a chlorinated polyethylene outer jacket.

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 2 OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE COMPUTED DLS DATE 9/21/86 R ___ R ___

POWER AND CONTROL - EPR INS/TVA TYPE PXMJ CHECKED [illegible] DATE 9/21/86

B. CONCLUSION OF REVIEW (Check only one block)

X Equipment Qualified (pending satisfactory 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) CACTAT

*2) Submergence

*3) Unverified contract numbers with "N" prefix

* See open items in front of binder for additional discussion.

COMMENTS/RECOMMENDATIONS Cables furnished on TVA Contracts 79K6-825722-2 and 81K7-828633 have been demonstrated to have a qualified life at 73.4°C of 40 years including one DBA and 100-days post-accident operating time to environmental parameters (profiles) which exceed WBN's required operating environments outside containment. This cable shall not be used in any installations after the issue date of this binder.

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 3 OF 27

R ___ R ___

BINDER TITLE ANACONDA/LOW VOLTAGE COMPUTED DCS DATE 8/29/86

POWER AND CONTROL - CHECKED B DATE 8/30/86

EPR INS/TVA TYPE PXMJ

C. 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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 323-1971

Vendor test program was conducted in accordance with the general guidelines of IEEE 323-1974 and IEEE 383-1974.

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 4 OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE POWER AND CONTROL - EPR INS/TVA TYPE PXMJ COMPUTED DLS DATE 8/20/86 R ___ R ___

CHECKED B DATE 8/26/86

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 Tested representative sample in accordance with Table 1 IEEE 383-1974. See TAB B Section E for comparison of tested specimens to installed cable.

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Rprt 1, Sec. 2 Tbl 1	(FIRL # F-C4836-2)
(2) Manufacturer	Anaconda	Rprt 1, Sec. 2 Tbl 1	(FIRL # F-C4836-2)
(3) Model Number(s)	PXMJ	Rprt 1, Sec. 2 Tbl 1	(FIRL # F-C4836-2)
		NA	NA
		NA	NA
(4) Serial Number(s)		NA	NA
		NA	NA
		NA	NA
(5) Identify Component-Unique checksheet attached:	Supplement 2 - Cables/Splices		

JUSTIFICATION/COMMENTS Representative samples tested were:

600V, 1/c, #12 AWG copper conductor, with .030" Flame Resistant Ethylene Propylene Rubber (EPR) (Specimen 23.01 & 23.02).

600V, 2/c, #16 AWG copper conductor, with .025" Flame Resistant Ethylene Propylene Rubber (EPR), tinned copper drain wire, and .045" Chlorinated Polyethylene (CPE) Jacket (Specimens 26.1, 26.2, and 26.3).

600V, 7/c, #14 AWG copper conductor, with .030" Flame Resistant Ethylene Propylene Rubber conductor insulation and .060" Chlorinated Polyethylene Jacket (CPE) (Specimen 27.1).

The tested samples are representative samples in accordance with IEEE 383-1974 Table 1 Guidelines.

Purchased cables for Contract 79K6-825722-2 are as follows: (information obtained from routine vendor test reports in contract file)

600V, #10 AWG copper 2&3/C conductors, with .030" Flame Resistant Ethylene Propylene Rubber (EPR) and .045" Chlorinated Polyethylene Jacket (CPE) (TVA Mk. Nos. WFB-2 & WFC-2).

600V; 4/c, 5/c, 7/c & 9/c #10 AWG copper conductors; with .030" Flame Resistant Ethylene Rubber (EPR) and .060" Chlorinated Polyethylene (CPE) Jacket (TVA Mk. Nos. WFD-2, WFE-2, WFG-2 & WFH-2).

600V, 12/c & 19/c, #10 AWG copper conductors, with .030" Flame Resistant Ethylene Propylene Rubber (EPR) and .080" Chlorinated Polyethylene (CPE) Jacket. (TVA Mk. Nos. WFL-2, WFN-2).

600V; 2/c, 3/c & 4/c #12 AWG copper conductors; with .030" Flame Resistant Ethylene Propylene Rubber (EPR) and .045" Chlorinated Polyethylene (CPE) Jacket. (TVA Mk. Nos. WGB-2, WGC-2 & WGD-2).

600V; 5/c, 7/c, 9/c & 12/c #12 AWG copper conductors; with .030" Flame Resistant Ethylene Propylene Rubber (EPR) and .045" Chlorinated Polyethylene (CPE) Jacket (TVA Mk. Nos. WGE-2, WGG-2, WGH-2 & WGK-2).*

600V, 16/c, #12 AWG copper conductor, with .030" Flame Resistant Ethylene Propylene Rubber (EPR) and .080" Chlorinated Polyethylene (CPE) Jacket (TVA Mk. No. WGM-2).

600V; 2/c, 3/c, 4/c & 5/c #14 AWG copper conductors; with .030" Flame Resistant Ethylene Propylene Rubber (EPR) and .045" Chlorinated Polyethylene (CPE) Jacket (TVA Mk. Nos. WHB-2, WHC-2, WHD-2 & WHE-2).*

600V; 7/c, 9/c, 12/c, 16/c & 19/c #14 AWG copper conductors; with .030" Flame Resistant Ethylene Propylene Rubber (EPR) and .060" Chlorinated Polyethylene (CPE) Jacket (TVA Mk. Nos. WHG-2, WHH-2, WHJ-2, WHL-2 & WHM-2).*

*TVA Mark Nos. WHC-2 (3/c #14 AWG), WHE-2 (5/c #14 AWG) and WHJ-2 (12/c #14 AWG) are the only mark numbers from Contract 79K6-825722-2 presently installed at WBN (see TAB A) in a harsh environment. All other cables shown above are also qualified, but they are not currently installed in a harsh environment.

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 5C OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE COMPUTED DKL DATE 8/29/86 R ___ R ___

POWER AND CONTROL - EPR INS/TVA TYPE PXMJ CHECKED B DATE 8/30/86

Purchased cables for Contract 81K7-828633:

600V, 2/c, #10 AWG copper conductors with .030" Flame Resistant Ethylene Propylene Rubber (EPR) and .045" Chlorinated Polyethylene (CPE) Jacket (TVA Mark #WFB-1).*

600V, 4/c, #12 AWG copper conductors with .045" Flame Resistant Ethylene Propylene Rubber (EPR) and.060" Chlorinated Polyethylene (CPE) Jacket (TVA Mark #WGD-1).

600V, 3/c, #6 AWG copper conductors with .030" Flame Resistant Ethylene Propylene Rubber (EPR) and.045" Chlorinated Polyethylene (CPE) Jacket (TVA Mark #WFA-3)*

*TVA Mark No. WFB-1 (2/c #10AWG) is the only mark No. presently installed at WBN (see TAB A) in a harsh environment. All other cables shown above are also qualified, but they are not currently installed in a harsh environment.

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 6 OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE COMPUTED DKJ DATE 9/6/86 R ___ R ___

POWER AND CONTROL - EPR INS/TVA TYPE PXMJ CHECKED B DATE 9/11/86

F. INSTALLATION INTERFACES

Does the qualification program address all relevant interfaces of the equipment so that the installed design and configuration is similar or identical to the test configuration (yes/no/NA)? (note below)

Interface	Identify Interface Requirement	Acceptable? (Yes/No/)	Reference Test Report
Mounting Bolts	NA	Yes	
External Process Connections	NA	Yes	
Electrical Connections	NA	Yes	
Conduit Seals	NA	Yes	
Connector Seals	NA	Yes	
Orientation	NA	Yes	
Physical Configuration	NA	Yes	
Other	NA	Yes	

JUSTIFICATION/COMMENTS Not required for cable qualification.

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 7A OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE COMPUTED DLB DATE 8/29/86 R ___ R ___

POWER AND CONTROL - CHECKED RB DATE 8/30/86

EPR INS/TVA TYPE PXMJ

GENERIC COMMENT FOR G(1)(C)WEAR, G(1)(D)VIBRATION, H(2),H(6), AND H(7)

Normal Service Related Stresses-In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards..." Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria." Included in the list that follows the above quote is the following standard which TVA specified in procuring this cable:

> IPCEA S-68-516 Interim Standards for Ethylene-Propylene Rubber-Insulated Wire and Cable. Number 1, Cables Rated 0-35000V. Number 2, Cables Rated 2000V, Integral Insulation and Jacket.

Based on the above, we conclude that the cables, having been manufactured and tested in accordance with this standard, are qualified for normal duty, including vibration commensurate with such service.

GENERIC COMMENT FOR G(1)(D) SEISMIC

Upon completion of the LOCA simulation, the cable samples were subjected to a mandrel rebend test and an in-water hipot test. IEEE 383-1974, paragraph 2.4.4 regards that the performance of this test demonstrates that the cables have retained considerable mechanical durability and would be more severe even than the application of two cycles of the environment. The retention of a high degree of flexibility at the end of life (plus an accident) demonstrates the cables ability to withstand significant mechanical stresses.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference Report #1, p. 3-1).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	Report #1 p. 3-1
Radiation exposure	Yes	Report #1 p. 3-1
Vibration (non-seismic) aging	Yes	Tab B, Sheet 7A
Operational (electrical/mechanical/process) stress aging	Yes	Tab B, Sheet 7A

JUSTIFICATION/COMMENTS Vibration and Operational Stress Aging - See Comments Sheet 7A of TAB B.

(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 NA).

JUSTIFICATION/COMMENTS 0588 Category II qualification. For additional comments see TAB C, Section D.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 3-1 & Attachment to F-C4836).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 3-1).

JUSTIFICATION/COMMENTS

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 3-1 & Attachment to FIRL F-C4836).

JUSTIFICATION/COMMENTS See TAB C, Sections A & C for aging discussion. Aging was performed on sample for type test in accordance with IEEE 383-1974, para. 2.2 and accepted industry methods.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 3-1 & Attachment to FIRL F-C4836).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	130°F	150°C	73.4°C
Time	40 years	168 hrs	40 years

JUSTIFICATION/COMMENTS See TAB C, Section A for aging discussion.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference Report #1, Attachment to FIRL F-C4836).

JUSTIFICATION/COMMENTS See TAB C, Section A for aging discussion.

(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)? NA (Reference NA).

JUSTIFICATION/COMMENTS Cable specific regression curve was used for aging. See H(4)(g).

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)? Yes (Reference Report 1, p. 3-1 & Attachment to FIRL F-C4836).

JUSTIFICATION/COMMENTS Vendor supplied Arrhenius plot for 50% elongation. See TAB C, Section A, for revised plot discussion.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference Report 1, p. 3-1).

JUSTIFICATION/COMMENTS Not required. The thermal aging simulates a 40-year life for the cable operated in a 40°C ambient plus a 33.4°C rise (due to energized cable). This is a 73.4°C rated cable.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 3-1).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 2-1).

JUSTIFICATION/COMMENTS

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 3-1 & Appendix B).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report 1, p. 3-1).

Plant normal ambient radiation dose (rd) 1.9×10^7

Test exposure dose (rd) 2E08rads

Test exposure dose rate (rd/hr) Average 1E06rads/hr.

Test exposure source type (e.g., Co-60 gamma) Cobalt 60 gamma

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? Yes (Reference NA).

JUSTIFICATION/COMMENTS See Comments Sheet 7A of TAB B.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? Yes (Reference NA).

JUSTIFICATION/COMMENTS See Comments Sheet 7A of TAB B.

(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)? Yes (Reference NA).

JUSTIFICATION/COMMENTS See Comments Sheet 7A of TAB B.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? Yes (Reference NA).

JUSTIFICATION/COMMENTS See Sheet 7A of TAB B.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference Report #1, Attachment to FIRL F-C4836).

Qualified life (Document in QMDS) 40 years at 73.4°C

JUSTIFICATION/COMMENTS See TAB C, Section A for discussion.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA (Reference NA).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS Not required because cable is qualified for the design life of the plant.

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 13 OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE COMPUTED DLS DATE 8/29/86 R ___ R ___

POWER AND CONTROL - EPR INS/TVA TYPE PXMJ CHECKED B DATE 8/30/86

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 Threshold Tested to	Reference	Activation Energy	Reference TAB C, Section A
(a)	Ethylene Propylene Rubber	2.0×10^8 rads		1.26eV	Sheet 1
(b)					
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS Thermal and radiation age-conditioning were performed as part of the test program so that the complete equipment item was accounted for and thus, precludes the need to separately test the component parts.

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

(1) 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 Report 1, Section 3.5).

Identify Acceptance Criteria: Per IEEE 383-1974, the criteria included functioning continuously at test specified voltage and current levels, and passing mandrel bend and voltage withstand tests at the conclusion of the test.

(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 Report 1, p. 4-3,4-2,5-1).

Identify baseline and functional testing:

Before, during, and after: Insulation resistance @500VDC (Report 1, p. 4-3). During: Cables energized @480VAC and 25 or 10 amperes (Report 1, p. 2-1 & 3-8). After: High voltage withstand test with cable immersed in water 2.4KVAC (80V/ml) for 5 minutes (Report 1, p. 3-3, 4-5 & 5-1).

JUSTIFICATION/COMMENTS Maximum leakage current at 2400 VAC was 4.0 ma, but power and control cable circuits are not adversely affected by currents of this magnitude (Refer to Generic Binder discussion for Power and Control Cable).

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report 1, p. 2-1).

JUSTIFICATION/COMMENTS The report requires that specimens maintain test specified voltage and current levels while continuously energized. Specific values are as follows:

1/c #12 specimens - 480V, 25 amps

2/c #16 specimens - 480V, 10 amps

7/c #14 specimens - 480V, 10 amps

EQP209.22

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 16 OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE POWER AND CONTROL - EPR INS/TVA TYPE PXMJ

COMPUTED DLS DATE 8/29/86 R ___ R ___

CHECKED B DATE 8/30/86

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	480V	Report 1, p. 2-1
Load	25a or 10a	Report 1, p. 2-1
Frequency	NA	Report 1, p. 2-1
Accuracy	NA	NA
Other(s)		
NA	NA	NA
NA	NA	NA

JUSTIFICATION/COMMENTS The cables's normal operating voltage will be 480VAC or less. Therefore, testing at 480 volts is acceptable.

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BINDER TITLE ANACONDA/LOW VOLTAGE COMPUTED DJL DATE 9/5/86 R ___ R ___

POWER AND CONTROL - EPR INS/TVA TYPE PXMJ CHECKED B DATE 9/11/86

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. Various drawings (47E235 Series) and OE Calculations are applicable. Values shown below are limiting worst case values for outside containment. See Comments on Sheets 17A and 17B.

(1) Normal Max

(a) Temperature (°F)	130°F*
(b) Pressure (psig)	ATM
(c) Humidity (%)	80%
(d) Radiation (rd)	1.9×10^7*

(2) Abnormal Max

(a) Temperature (°F)	140°F*
(b) Pressure (psig)	ATM
(c) Humidity (%)	90%
(d) Radiation (rd)	NA

(3) Process Interfaces: None Required.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Could exist up to 8 hours duration per excursion and will occur less than 1% of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	325*	Accident type HELB
(b) Pressure (psia)	16	Accident type HELB
(c) Humidity (%)	100	Accident type HELB
(d) Radiation (rd)	1.1×10^8**	Accident type HELB/LOCA
(e) Spray Type	NA	Accident type NA

*See Comments on Sheets 17A and 17B.

**No Beta radiation is included because there are no cables from these contracts in the annulus or inside containment.

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BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 17A OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE COMPUTED DLA DATE 9/4/86 R ___ R ___

POWER AND CONTROL - EPR INS/TVA TYPE PXMJ CHECKED B DATE 9/4/86

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Worst case accident radiation (shown in OE Calc WBNNAL3-031 R0 (See TAB E). Worst case normal radiation is shown in OE Calc WBNNAL3-023 and worst case humidity is shown on Dwg. 47E235-52 R0. Worst case temperature and pressure shown on Dwg. 47E235-76 R2. (See Sheet ~~17A~~ 17B for additional comments). DLA 9/4/86 B 9/4/86

(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)? No (Reference NA).

(7) Subject to submergence (yes/no/NA)? No (Reference NA).

Identify initiation time and duration of submergence: Open Item

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

Type	RIMS No.
ABGTS & EGTS Radiation Dose	NEB 850118 235
Radiation (OE Calculation TI-RPS-194)	
Radiation (OE Calc WBNNAL3-023,	B45 860328 236
100-Day) "Normal	
Operation Dose for Equipment	
Qualification Outside	
the Shield Building"	
OE Calc WBNNAL3-031 "100-Day	B45 860529 237
Loss of Coolant Accident Dose	
to Electrical Equipment in	
the EGTS Filter Train Room"	

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TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 17B OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE POWER AND CONTROL - EPR INS/TVA TYPE PXMJ COMPUTED DCS DATE 9/4/86 CHECKED B DATE 9/4/86

R ___ R ___

Cable in this binder is located throughout outside containment. The maximum normal temperature which any of the cables could experience is 130°F (54.4°C) for those cables in the main steam valve vault rooms. Cables installed in ambient temperatures higher than 40°C (104°F) are derated during the design process to account for the higher ambient temperature environment per TVA Electrical Design Standards DS-E12.1.1 thru DS-E12.1.4 (All Revision 0). There are no cables from this contract located within 2-1/2' of the EGTS HEPA Filters and and 1-1/2' of the ABGTS filters per OE Calculation WBPEVAR 8606004 R0 (B26 860618 020). The dose 2 feet from EGTS and 1-1/2 feet from ABGTS HEPA filters is 1.18×10^8 rads per OE Calculation WBNNAL3-031 (B45 860529 237) and TI-RPS-194 (NEB 850118 235) respectively.

Per OE Calculation WBNOSG4-003 R2 (B45 851112 218), all cables entering the valve vaults terminate at devices in the valve vaults and all these devices (except PAM devices) perform their required function to mitigate a MSLB within 9.7 seconds. This is prior to any significant superheat. Per this OE calculation, subsequent failure of cables due to higher temperatures (535°F superheat) does not have any adverse effect on the mitigation of an MSLB. Therefore, qualification to the higher superheat temperatures is not required. No cable in this binder is used in any PAM circuits in valve vaults.

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TVA 19537 (OE-3-86)

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100day	16day	Report #1 page 3-9
Temperature (°F)	325	385	Report #1 page 3-9
Pressure (psig)	16.0psia	66psig	Report #1 page 3-9
Relative Humidity (%)	100%	100%	Report #1 page 3-9
*Chemical Spray	Not Required	***	Report #1 page 3-9
**Radiation (rd)	1.1×10^{8}****	2E08rad,gamma	Report #1 page 3-9
Submergence	NA See K(7)	NA	NA

*Includes spray concentration, flowrate, density, duration, and pH.
**Enter 40-year integrated normal dose plus integrated accident dose and specify type.
***0.15 (gal/min)/ft^2-6200ppm H_3BO_3, 50ppm NH_4NH_2, pH between 8.6 & 10.0 @77°F.
****This is the worst case total integrated dose.
This is not the sum of worst case normal (K(1) on Sheet 16) and worst case accident (K(5) on Sheet 16) doses because the worst case normal and accident doses do not occur in the same room. The specified values do account for the worst case combination in the specified rooms, however.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Post-Accident - No LOCA - Yes	Report #1 TAB C, p 3-9
Pressure	Yes	Report #1 TAB C, p 3-9
Relative Humidity	Yes	Report #1 TAB C, p 3-9
Chemical Spray	Yes	Report #1 TAB C, p 3-9
Submergence	NA (See K(7)	Report #1 TAB C, p 3-9

JUSTIFICATION/COMMENTS

Comment - See Binder TAB C, Sections A, B, and C for 100-day post-accident operating justification.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	> +15,	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)	None	Yes***
Voltage: ±10% of rated value	No*	Yes
Frequency: ±5% of rated value	NA	NA
Environmental Transient: the initial transient and the peak temperature applied twice	Peak 385,F Single Transient	No**
Vibration: +10% added to acceleration	NA	NA

JUSTIFICATION/COMMENTS: *Cable is rated @ 600V but is only required to operate 480 volts. Test was conducted at 480VAC and 25 amperes. **Test profile exceeds the required HELB with considerable margin. ***See Tab C, Sections A, B, and C, for thermal degradation equivalency discussion to demonstrate 100-day post-accident qualification based on 16-day test profile.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference NA).

JUSTIFICATION/COMMENTS Capable of maintaining specified voltage and connected equipment required current.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference Report 1, page 4-2).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference Report 1, page 4-2).

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)? No (Reference Report 1, page 3-9).

JUSTIFICATION/COMMENTS See TAB C for justification of 16-day test results being used to demonstrate qualification for 100-day WBN operating requirement.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? NA (Reference ___).

JUSTIFICATION/COMMENTS No anomalies occurred.

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)? NA (Enter all requirements in Section G of the Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS No vendor required surveillance, maintenance, and inspection parameters are necessary to maintain qualification. TVA storage and recommended surveillance requirements have been included in TAB G of QMDS. Purpose of surveillance requirements is to accumulate historical data and identify any potential cable degradation.

BINDER NO. WBNEQ-CABL-008 PLANT WBN UNIT(S) 1 SHEET 22 OF 27

BINDER TITLE ANACONDA/LOW VOLTAGE POWER AND CONTROL - EPR INS/TVA TYPE PXMJ COMPUTED DJ DATE 8/29/86 R ___ R ___

CHECKED B DATE 8/30/86

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?	No
(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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TVA 19537 (OE-3-86)

0. SUMMARY 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) 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?	Yes
(11) Criteria regarding submergence satisfied?	No
(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?	NA
(14) Criteria regarding test failures or anomalies satisfied?	NA

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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 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?	Yes
(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 1-hour minimum operating time was taken, was adequate justification provided?	NA
(18) Criteria regarding synergistic effects satisfied?	NA
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

O(2) - No exceptions taken. O(6)(a) - See Sheet 7A. O(6)(c) - Pre-aging was done. O(11) - No cables from this contract are subject to submergence (See Open Item). O(13) - There is no criteria for operability status/mode. O(14) - No anomalies or test failures. O(18)-Category II qualification.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No. See EQ Checklist Section E.

Item	Plant	Report	Acceptable Yes/No/NA	Report 1 Section 2, Table 1
(a) Conductor	EQ Checklist Section	EQ Checklist Section		
Insulation material	E	E	Yes	X
Size	E	E	Yes	X
Stranding	E	E	Yes	X
Coating	E	E	Yes	X
Insulation Thickness	E	E	Yes	X
Number of conductors	E	E	Yes	X
Arrangement of conductors	E	E	Yes	-
(b) Shielding	NA	NA	NA	-
(c) Insulation jacket				
Material NA	NA	NA	NA	X
Thickness NA	NA	NA	NA	X
(d) Outer jacket	EQ Checklist Section	EQ Checklist Section		
Material -	E	E	Yes	X
Thickness -	"	"	Yes	X

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant EQ Checklist Section	Report EQ Checklist Section	Acceptable Yes/No/NA	Report 1 Section 2, Table 1
(e) Rated voltage	E	E	Yes	X
(f) Rated current	*	Tested @ 10 and 25 amperes	Yes	X
(g) Operating temperature rating		EQ Checklist		
Normal	Contract	Section E	Yes	X
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	NA	NA	NA	NA
(i) Splice				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: See Section E of TAB B. Construction of plant cables is determined from Contract files.

*Allowable ampacities for cable are contained in TVA Electrical Design Standards DS-E12.1.1 thru DS-E12.1.4 (All Revision 0).

EQUIPMENT IDENTIFICATION (Continued)

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference Contract).

Comments: Cable is qualified for temperature and moisture resistance for normal operation because it has been manufactured and tested (routine) in accordance with IPCEA S-68-516 per the contract requirements. This is acceptable per IEEE 383-1974, paragraph 2.3.1

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference Report 1, Section 3.3).

Comments: 1/c #12 specimens were energized @480VAC; 25 amps. 2/c #16 specimens and 7/c #14 specimens were energized @480VAC, 10 amps.

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report 1, p. 4-2).

Comments: Applied voltage was 2400VAC, and maximum leakage current was 4.0mA. Cable from this contract is installed in control and solenoid valve, handswitch, and miscellaneous power type circuits. Leakage currents of this magnitude will not affect these circuits (Refer to Generic Binder discussion for power and control cables).

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference Report 1, pp. 4-1 & 4-2).

Comments:

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report 1, p. 4-2).

Comments: 38x to 39.9x mandrel bend followed by 2400VAC withstand test for 5 minutes while submerged in tap water with maximum leakage current at 4.0mA.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Anaconda *).

Identify flame test standard: IEEE 383-1974 Vertical Tray Test

Comments: *Certificate of Conformance dated June 26, 1980 (See TAB E).

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-010
MANUFACTURER : BELDEN
PAGE 1 OF 1

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BPL-093-1024-B	1PL1024-B	MS	WVB	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0506-D	1PM 506-D	MS	WVC	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0508-D	1PM 508-D	MS	WVC	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0513-D	1PM 513-D	MS	WVC	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0595-E	1PM 595-E	MS	WVC	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0635-E	1PM 635-E	MS	WVC	VARIOUS	VARIOUS	I	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0645-E	1PM 645-E	MS	WVC	VARIOUS	VARIOUS	I	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0691-E	1PM 691-E	MS	WVC	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0778A-D	1PM 778-D	MS	WVC	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0831-G	1PM 831-G	MS	WVC	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-0833-G	1PM 833-G	MS	WVC	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-5132-E	1PM5132-E	MS	WVB	VARIOUS	VARIOUS	I	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-5144-E	1PM5144-E	MS	WVB	VARIOUS	VARIOUS	I	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-5348-E	1PM5348-E	MS	WVB	VARIOUS	VARIOUS	I	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPM-068-5349-E	1PM5349-E	MS	WVB	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-090-0207-B	1PS 207-B	MS	WVA	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BSG-046-0369-S	1SG 369-S	MS	WVE	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-003-0990-A	1V 990-A	MS	WVC	VARIOUS	VARIOUS	O	74C7-085259-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

PREPARER/DATE Ronald John Grace 9/21/86 R____ R____ R____
CHECKED/DATE [illegible] 9-21-86

BINDER NO. WBNEQ-CABL-010 PLANT WBN UNIT(S) 1 SHEET 1 OF 28

BINDER TITLE EQ DOCUMENTATION COMPUTED RJZ DATE 9/22/86 R R

FOR BELDEN CORPORATION CHECKED KWL DATE 9-22-86
(TVA TYPE MS-XLPE/CPE)

A. DOUCMENTATION

Equipment Description Signal Cable

Vendor/Manufacturer Belden Corporation

Equipment Model No.(s) TVA Type MS(1) (XLPE/CPE)

TVA Contract: 74C7-85259

QUALIFICATION REPORTS

(1) Title/Number/Revision Nuclear Environmental Qualification Test Report-Wyle Lab No. 17733-1 Revision B. RIMS B71 860625 100 DATE 3-19-86

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(2) Transmittal letter for Isomedix Test Report and Arrhenius Plot from Belden to TVA, dated 8/4/78; RIMS: EEB 780809 017 (TAB E, Section E.3.1).

(3) Arrhenius Plot per IEEE 383 on Belden ST-1350; this plot is included in documentation package retrievable under RIMS: B70 851220 100 (TAB C, Section C.10).

(4) Generic Cable Curve #5 (WCABGEN5), Digital Engineering's System 1000, Material Aging Calculation Report WAC-218, DATE: 9/16/86 (TAB C, Section C.12).

(5) Activation Energy Calculation, Digital Engineering's System 1000, Material Aging Calculation Report WAC-194, Date 8/26/86. (TAB C, Section C.10).

(6) Qualified Life & Degradation Equivalency, Digital Engineer's System 1000, Material Aging Calculation Report WAC-225 Date 9/17/86 TAB C, Section C.11).

(7) Post-LOCA Dose Rates and Doses Around EGTS and ABGTS Filters, TI-RPS-194, RIMS: NEB 850118 235; DATE 1/18/85.

(8) Class 1E Cables and Junction Boxes Below 10CFR50.49 Flood Level in Auxiliary Building (QIR WBNEEB86037), RIMS: B26 860310 004, DATE: 3/10/86.

(9) Class 1E Conduit and Cable Walkdown for Selected Areas within the Aux. & Reactor Bldg., Cal. # WBPEVAR8606004, RIMS: B26 860618 020; DATE: 6/18/86.

(10) TVA Contract 74C7-85259, Routine Test Reports, Belden Engineering Specifications and Constructions Details. (TAB E, Section E-1).

(11) Belden transmittal letter for manufacturing specification (Engineering Specifications) dated February 27, 1975 (TAB E, Section E.2)

(12) Two letters documenting the lack of cable qualification for inside containment usage in Class 1E applications (TAB E, Section E.4).

RIMS No. EEB 781031 911

RIMS No. EEB 790126 901

(1) MS - Multiconductor insulated signal cable (not paired) with shield and overall jacket.

BINDER NO. WBNEQ-CABL-010 PLANT WBN UNIT(S) 1 SHEET 2 OF 28

BINDER TITLE EQ DOCUMENTATION COMPUTED RJJ DATE 9/22/86 R ___ R ___

FOR BELDEN CORPORATION CHECKED [illegible] DATE 9-22-86
(TVA TYPE MS - XLPE/CPE)

B. CONCLUSION OF REVIEW (Check only one block)

X Equipment Qualified (Pending 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 See Sheet 2A.

COMMENTS/RECOMMENDATIONS See Sheet 2 B.

OPEN ITEMS AND QUALIFICATION DEFICIENCIES

REQUIRED FIELD WORK:

(ITEM #1) It is an unverified assumption that instrument cables bought on TVA Contract 74C7-85259 are not installed inside containment because qualification does not support this type of installation. As consequence of this determination cables 1-@PM 68-5132-E, 1-@PM 68-5144-E, 1-@PM 68-5348-E, 1-@PM 68-0635-E, 1-@PM 68-0645-E which were bought by TVA on the subject contract have been SCRed and identified for removal.

TECHNICAL ISSUES:

(ITEM #2) At present, the acceptability or functionability of a given instrument cable cannot be analyzed for a specific circuit. Set values limiting performance characteristics (insulation resistance or leakage currents) cannot be established which will work in all cases of installaiton. It is assumed that the performance characteristics documented in this binder are acceptable for operation in the present applications.

COMMENTS/RECOMMENDATIONS

Cables included in this binder are qualified for the following Environmental Extremes and Applications:

ENVIRONMENTAL EXTREMES:

QUALIFIED WBN PLANT AREAS: Outside Primary Containment excluding the MSVV (Main Steam Valve Vault), and Radiation Areas not exceeding 6.8E 7 rads of radiation.

ACTIVATION ENERGY USED IN AGING CONSIDERATIONS:

1.43 eV

TEMPERATURE: Maximum operating temperature used to establish maximum leakage current and insulation resistance is 219 degrees F.

RADIATION: 40 year total integrated dose (including accident) of 6.8E 7 rads of radiation.

SUBMERGENCE: Not qualified for submergence.

HUMIDITY: 100%

APPLICATION:

Despite the fact that these cables were overaged for the environment where they are installed, they successfully passed a 2200 volt ac high pot test (see 17733-1, p. XI-4) after being energized to 133 VAC while carrying a current of 4.7 amp (see 17733-1, p. VIII-21 thru VIII-22) with a leakage current of .218 ma, 63 hours after LOCA testing at a temperature of 180 degree F (see 17733-1, p. VIII-43). For the 4.5 foot test sample, this equates to an insulation resistance of approximately 5490 ohms/500 ft. of cable. See TAB C, Section C.7 for the application specific performance characteristics for the cables qualified by this binder.

BINDER NO. WBNEQ-CABL-010 PLANT WBN UNIT(S) 1 SHEET 3 OF 28

BINDER TITLE EQ DOCUMENTATION COMPUTED RJJ DATE 9/22/86 R ___ R ___

FOR BELDEN CORPORATION (TVA TYPE MS - XLPE/CPE) CHECKED [illegible] DATE 9-22-86

C. 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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

Test was conducted in accordance with the general guidelines of IEEE 323-1974.

Certain sections of IEEE 383-1974 identified when applicable.

BINDER NO. WBNEQ-CABL-010 PLANT WBN UNIT(S) 1 SHEET 4 OF 28

BINDER TITLE EQ DOCUMENTATION COMPUTED RJJ DATE 9/22/86 R ___ R ___

FOR BELDEN CORPORATION CHECKED [illegible] DATE 9-22-86
(TVA TYPE MS - XLPE/CPE)

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 See Section E, page 5 of 28, and Supplement 2, page 26 of 28, for supporting analysis between tested and installed cables. The tested cable came from the same contract as installed cables. (TAB B, Sheet 1; Test Report 17733-1, p. vi, Test Specimen 22A and 22B). For Similarity Analysis, see TAB C, Section C.1

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Signal Cable	Signal Cable	17733-1, p vi
(2) Manufacturer	Belden	Belden	17733-1, p vi
(3) Model Number(s)	TVA Type MS	TVA Type MS	17733-1, p vi
	TVA mark nos.	TVA mark nos.	
	WVA, WVB,	WVA-1	
	WVC, WVE		
(4) Serial Number(s)	NA	Test Specimen 22A and 22B	17733-1, p vi
(5) Identify Component-Unique checksheet attached:	Supplement 2, Cables/Splices		

JUSTIFICATION/COMMENTS The only differences in the tested cable and the plant equipment are the size of conductors and number of conductors in the cable. All the other materials are the same. This is acceptable for qualification purposes as both are essentially equivalent because the application is low-voltage signal cable (therefore the configuration, size, etc., does not affect qualification)(see TAB C, Section C.1).

F. INSTALLATION INTERFACES

Does the qualification program address all relevant interfaces of the equipment so that the installed design and configuration is similar or identical to the test configuration (yes/no/NA)? (note below)

Interface	Identify Interface Requirement	Acceptable? (Yes/No/NA)	Reference Test Report
Mounting Bolts		NA	
External Process Connections		NA	
Electrical Connections		NA	
Conduit Seals		NA	
Connector Seals		NA	
Orientation		NA	
Physical Configuration		NA	
Other		NA	

JUSTIFICATION/COMMENTS This section is not required for cables.

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	17733-1 p I-1
(b) Baseline performance measurements taken	Yes	17733-1 p I-1 & I-3
(c) Equipment aged:		
Thermal	Yes	17733-1 p IV-1
Radiation	Yes	17733-1 p II-1
Wear	NA	TAB C Sect C.2
(d) Vibration/seismic testing conducted	NA	TAB C Sect C.2, C.3
(e) Design basis event (DBE) exposure	Yes	17733-1 p VIII-4 & Fig VIII-5
(f) Post-DBE exposure	Yes	17733-1 p VIII-4 & Fig VIII-5
(g) Final inspection and disassembly	Yes	17733-1 p IX-1

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes
(Reference 17733-1, page VIII-47).

JUSTIFICATION/COMMENTS See TAB C, Section C.8 "Equipment Accuracies and Calibration Data".

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference 17733-1, p II-1 & IV-1).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	17733-1 p IV-1
Radiation exposure	Yes	17733-1 p II-1
Vibration (non-seismic) aging	NA	See TAB C, Sect C.2
Operational (electrical/mechanical/process) stress aging	NA	See TAB C, Sect C.2

JUSTIFICATION/COMMENTS

(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)? Yes (Reference 17733-1, p X-14).

JUSTIFICATION/COMMENTS See TAB C, Section C.4.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference 17733-1, p IV-1).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: 17733-1, p X-17).

JUSTIFICATION/COMMENTS

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference 17733-1, p IV-1, X-15, & X-17).

JUSTIFICATION/COMMENTS Aging was performed on sample for type test in accordance with IEEE 383-1974, and accepted industry standards.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference 17733-1, p IV-1).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	111°F	120°C	111°F
Time	40 Years	254 hrs	500+ Years

JUSTIFICATION/COMMENTS See Material Aging Calculation, WAC-225, Cal. 4 (TAB C, Section C.11) for verification of the above parameters based on an activation energy of 1.43 established by Material Aging Calculation, WAC-194, Cal. 1 (TAB C, Section C.10).

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference 17733-1, p X-49).

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 17733-1, p X-16, -17).

JUSTIFICATION/COMMENTS See TAB C, Section C.6.

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)? NA (Reference).

JUSTIFICATION/COMMENTS Activation energies were used to determine accelerated aging.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS Operation was not necessary because current through signal cables is negligible when in operation.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference 17733-1, p II-1).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference 17733-1, pp X-13, X-14).

JUSTIFICATION/COMMENTS

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference 17733-1, pp X-13, X-14).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference 17733-1, p II-1, II-11).

Plant normal ambient radiation dose (rd) 8.8×10^5 (1)

Test exposure dose (rd) 7.5×10^7

Test exposure dose rate (rd/hr) $.604 \times 10^6$ Gamma

Test exposure source type (e.g., Co-60 gamma) CO-60

JUSTIFICATION/COMMENTS (1) See TAB C, Section C.5.2.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference ___).

JUSTIFICATION/COMMENTS See TAB C, Section C.2.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA (Reference ___).

JUSTIFICATION/COMMENTS See TAB C, Section C.2.

(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)? NA (Reference ___).

JUSTIFICATION/COMMENTS See TAB C, Section C.2.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS See TAB C, Section C.2

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes
(Reference 17733-1, p IV-1).

Qualified life (Document in QMDS) >40 years @ 111°F

JUSTIFICATION/COMMENTS See Material Aging Calculation , WAC-225, Calc. 4 (TAB C, Section C.11).

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? No
(Reference _____).

Replacement Intervals (Document in QMDS) None required.

JUSTIFICATION/COMMENTS Cable is qualified for greater than 40 years; therefore no replacement intervals were established.

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BINDER TITLE EQ DOCUMENTATION COMPUTED RJJ DATE 9/22/86 R ___ R ___

FOR BELDEN CORPORATION (TVA TYPE MS - XLPE/CPE) CHECKED [illegible] DATE 9-22-86

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 Threshold	Reference	Activation Energy	Reference
(a)	Cross-Linked Polyethylene	NA	NA	1.43eV	*
(b)					
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS *See Material Aging Calculation WAC-194, Calc. 1 (TAB C, Section C.10) and Similarity Analysis (TAB C, Section C.1).

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

(1) 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 17733-1, p X-9).

Identify Acceptance Criteria: The cable shall maintain operability while electrically loaded and fused during the LOCA test.

(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 See below).

Identify baseline and functional testing: Insulation resistance @ 500VDC: baseline 17733-1, p I-13; post-radiation 17733-1, p III-11; post-thermal aging 17733-1, p V-5; LOCA Test energization: Cables energized (134VAC, 4.8A), Leakage current monitored - 17733-1, p VIII-5, Table VIII-4, p VIII-21 & p VIII-43, Submergence/Dielectric Withstand Test, p XI-1 & p XI-4.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference 17733-1, Table VIII-4, page VIII-21).

JUSTIFICATION/COMMENTS

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference 17733-1, p VIII-22).

JUSTIFICATION/COMMENTS Baseline testing consisted of IR measurements. Evidence of qualification for normal operation is established through manufacturing and testing per ICEA S-66-524 (see TAB C, Section C.2).

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

(a) Parameter	Specific Accident Conditions	Reference
Voltage	(1)	
Load	(1)	
Frequence	(1)	
Accuracy	(1)	
Other(s)		

JUSTIFICATION/COMMENTS (1) See TAB C, Section C.7 and Open Item #2 (TAB B, Section B).

(b) Parameter	Demonstrated Conditions	Reference
Voltage	134 VAC	17733-1 p. VIII-21, & VIII-22
Load	4.8 AMP	1733-1 p. VIII-21, p. VIII-22
Frequence	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS See sheet 2b (TAB B, Section B).

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-85R1(1), -48R3(2), -44R1(3), -86R1(4), 75R2(5). These drawings along with References 7 and 9 (TAB B Section A) represent the maximum parameters for the areas where the cables are installed).(6)

(1) Normal Max		(2) Abnormal Max	
** (a) Temperature (°F)	111 (1)	(a) Temperature (°F)	120 (3)
(b) Pressure (psia)	ATM (-) (3)	(b) Pressure (psia)	ATM (-) (3)
(c) Humidity (%)	80 (3)	(c) Humidity (%)	90 (3)
* (d) Radiation (rd)	8.8×10^5 gamma (2)	(d) Radiation (rd)	NA

(3) Process Interfaces: NA

(4) State anticipated occurrence frequency and duration of abnormal conditions: Eight hours per excursion and will occur less than 1% of plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

**(a) Temperature (°F)	219 (4)	Accident type	HELB
(b) Pressure (psia)	15.9 (5)	Accident type	HELB
(c) Humidity (%)	100 (4)	Accident type	HELB
*(d) Radiation (rd)	5.71×10^7 gamma (6)	Accident type	LOCA (Outside Primary Containment)
(e) Spray Type	NA	Accident type	

*See TAB C, Section C.5.2.

**See TAB C, Section C.5.1.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Chemical Spray and Beta radiation is not a qualification concern as all cables are installed outside primary containment.

(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)? No (Reference See TAB C, Section C.5.3).

(7) Subject to submergence (yes/no/NA)? No
(Reference See TAB C, Section C.5.4).

Identify initiation time and duration of submergence: _____

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

Type	RIMS No.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 days	340 hours	17733-1, p VIII-28 thru VIII-30
Temperature (°F)	219	350	17733-1, p VIII-28
Pressure (psia)	15.9	35.7	17733-1, p VIII-28
Relative Humidity (%)	100	100	17733-1, p VIII-28
*Chemical Spray	NA	See p 25 Discussion	17733-1, p VIII-1, -2, -28
**Radiation (rd)	5.8E7 (1) (gamma)	7.5E+07 (gamma)	17733-1, p II-11
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
(1) See TAB C, Section C.5.2

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	17733-1 p VIII-28
Pressure	Yes	17733-1 p VIII-28
Relative Humidity	Yes	17733-1 p VIII-28
Chemical Spray	NA	NA
Submergence	NA	NA

JUSTIFICATION/COMMENTS

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	> 15°F	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)	* 10%	Yes
Voltage: ±10%	10%	Yes
Frequency: ±5% of rated value	-	Not Applicable to low voltage signal cable.
Environmental Transient: the initial transient and the peak temperature applied twice	No	CAT II
Vibration: +10% added to acceleration	No	See TAB C, Section C.2

JUSTIFICATION/COMMENTS: *See Material Aging Calculation WAC-225, Calc. 2, Plot 2, (TAB C, Section C.11).

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment:
(Reference See TAB A.).

JUSTIFICATION/COMMENTS Maintain electrical integrity and operability for duration of DBE.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes
(Reference 17733-1, page VIII-6).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes
(Reference 17733-1, page VIII-6).

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 TAB C, Section C.11).

JUSTIFICATION/COMMENTS

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? NA
(Reference 17733-1, page ii thru iv).

JUSTIFICATION/COMMENTS See TAB C, Section C.9.

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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS There are no surveillance or maintenance requirements identified in the test or vendor documentation; however, TVA has initiated a maintenance and surveillance program as described in TAB G.

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)?	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?	NA, See Sect P of this TAB
(b) Equipment aged to end of life condition prior to application of DBE conditions?	Yes
(c) Absence of preaging in test/analysis justified?	NA, See Sect P of this TAB
(d) Materials susceptible to thermal/radiation aging identified?	Yes

0. SUMMARY 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) 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?	NA *
(11) Criteria regarding submergence satisfied?	Yes, See TAB C, Sect C.5.4
(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

*Test specimens were subjected to chemical spray testing, however, the cables covered by this binder are located outside of primary containment.

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA
(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, See TAB C, Sect C.4
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

0(6)(a) Mechanical and/or cycle aging are not required for establishing aging degradation.

0(6)(c) Cables were preaged prior to LOCA testing.

P. DISCUSSION (Continued)

L(1) Chemical Spray Demonstrated: 0.1847 Molar H_3BO_3 (2000 PPM Boron), 0.033 Molar NaOH resulting in a pH of 8.3 (±0.5 for first 24 hours and then, ±1 thereafter) rate .30 (gal/min)/ft^2, duration approximately 8.3 days (Ref: 17733-1, p VIII-4, p X-26).

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	XLPE	XLPE	Yes	17733-1 p vi
Size	16 AWG	18 AWG	Yes	17733-1 p vi
Stranding	stranded	*	Yes	NA
Coating	tinned	*	Yes	NA
Insulation Thickness	.025"	*	Yes	NA
Number of conductors	2,3,4&7	2	Yes	17733-1 p vi
Arrangement of conductors	twisted	*	Yes	NA
(b) Shielding	aluminum mylar	*	Yes	NA
(c) Insulation jacket				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
(d) Outer jacket				
Material		CPE	CPE	Yes	17733-1 p vi
Thickness		.025"	*	Yes	NA

*See Sheet 27, Comment for (1)

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	NA	134VAC	Yes	17733-1 VIII-21, VIII-22
(f) Rated current	NA	4.8 amp	Yes	17733-1 VIII-21, VIII-22
(g) Operating temperature rating				
Normal	90°C	90°C	Yes	17733-1 p vi
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	NA	NA	NA	NA
(i) Splice				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: See TAB C, Section C.1.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference _____).

Comments: See TAB C, Section C.5.3.

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference 17733-1, page VIII-5).

Comments: _____

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference 17733-1, p XI-4).

Comments:

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference).

Comments: See TAB B, Section J(2).

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? No (Reference 17733-1, p IX-1).

Comments: Cables were subject to submergences/dielectric withstand test following post-DBE inspection.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Ref. TVA Contact 74C7-85259).

Identify flame test standard: UL-44 flame test.

Comments: See TAB E, Section E.1.

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-012
MANUFACTURER : BRAND REX

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	* RM	** CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APM-068-0494A-E	1PM 494-E	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1222A-F	1PM1222-F	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1231A-G	1PM1231-G	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1240A-G	1PM1240-G	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1250A-F	1PM1250-F	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1313A-D	1PM1313-D	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1380A-G	1PM1380-G	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1400A-F	1PM1400-F	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1415A-E	1PM1415-E	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1465A-E	1PM1465-E	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1505A-G	1PM1505-G	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1520A-F	1PM1520-F	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1535A-D	1PM1535-D	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1572A-D	1PM1572-D	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1585A-E	1PM1585-E	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1625A-G	1PM1625-G	MS	WVA	VARIOUS	VARIOUS	O	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1640A-F	1PM1640-F	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1655A-D	1PM1655-D	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1693A-D	1PM1693-D	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1705A-E	1PM1705-E	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1740A-G	1PM1740-G	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1755A-F	1PM1755-F	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1770A-E	1PM1770-E	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-3195B-A	1PM3195-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-065-3721-A	1PM3721-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-065-3723-A	1PM3723-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-065-3725-B	1PM3725-B	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-065-3727-B	1PM3727-B	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-065-3765-B	1PM3765-B	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-065-3780-A	1PM3780-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-063-3877A-E	1PM3877-E	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-063-3882A-F	1PM3882-F	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4455A-B	1PM4455-B	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4465A-A	1PM4465-A	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4475A-A	1PM4475-A	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4485A-B	1PM4485-B	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4490A-A	1PM4490-A	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Qy 9-21-86	-----	-----	-----
CHECKED/DATE	HWH/RLW 9/22/86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

SGIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	* BM	** CONTRACT	CA I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APM-003-4495A-B	1PM4495-B	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4500A-B	1PM4500-B	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4505A-A	1PM4505-A	MS	WVA	VARIOUS	VARIOUS	I	N80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5483-A	1V 5483-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5484-A	1V 5484-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5485-A	1V 5485-A	MS	WVA	VARIOUS	VARIOUS	I	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5486-A	1V 5486-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5487-A	1V 5487-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5488-A	1V 5488-A	MS	WVA	VARIOUS	VARIOUS	I	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5493-B	1V 5493-B	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5494-B	1V 5494-B	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5495-B	1V 5495-B	MS	WVA	VARIOUS	VARIOUS	I	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5496-B	1V 5496-B	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5497-B	1V 5497-B	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5498-B	1V 5498-B	MS	WVA	VARIOUS	VARIOUS	I	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-070-8646-A	1V 8646-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-070-8647-A	1V 8647-A	MS	WVA	VARIOUS	VARIOUS	O	80K6-825419-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Ow 9.21.86	-----	-----	-----
CHECKED/DATE	UWH/RGW 9/22/86	-----	-----	-----

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-012
MANUFACTURER : BRAND REX
PAGE 1 OF 1

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION ±RM	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QPM-070-2425A-B	1PM2485-B	MS	WVA	VARIOUS	VARIOUS	0	N81K5-828072-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPM-070-3101-B	1PM3101-B	MS	WVA	VARIOUS	VARIOUS	0	81K5-828072-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPM-003-4395-B	1PM4395-B	MS	WVA	VARIOUS	VARIOUS	0	81K5-828072-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPM-003-4396-A	1PM4396-A	MS	WVA	VARIOUS	VARIOUS	0	81K5-828072-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPM-003-4397-B	1PM4397-B	MS	WVA	VARIOUS	VARIOUS	0	81K5-828072-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPM-003-4398-A	1PM4398-A	MS	WVA	VARIOUS	VARIOUS	0	81K5-828072-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

	R____	R____	R____
PREPARER/DATE Qw 9.21.86	-----	-----	-----
CHECKED/DATE HWH/DRW 9/22/86	-----	-----	-----

BINDER NO. WBNEQ-CABL-012 PLANT WBN UNIT(S) 1 SHEET 1 OF 33

BINDER TITLE BRAND REX/SIGNAL CABLE COMPUTED [illegible] DATE 8-15-86 R ___ R ___

XLPE INS/TVA TYPE MS CHECKED HWH DATE 8/15/86

A. DOCUMENTATION

Equipment Description Signal Cable

Vendor/Manufacturer Brand-Rex Company

Equipment Model No.(s) TVA Type MS(1)

TVA Contract # 80K6-825419-0, 81K5-828072-0

QUALIFICATION REPORTS

(1) Title/Number/Revision Qualification Tests of Instrument Cables in a Simulated Steam Line Break and Loss-of-Coolant Accident Environment F-C5120-4 RIMS B70 851105 104 DATE Jan. 11, 1982

(2) Title/Number/Revision Not Used; for future RIMS ___ DATE ___

(3) Title/Number/Revision Not Used; for future RIMS ___ DATE ___

OTHERS (ANALYSIS, VENDOR DATA, ETC.)

(4) Brand-Rex Company letter dated April 9, 1985 (RIMS B43 850410 001) confirming that the qualification report F-C5120-4 is applicable for cables supplied under the TVA contract 80K6-825419-0 (Tab E)

(5) Brand-Rex Company letter dated Sept. 5, 1985 (RIMS B43 850909 019) furnishing Arrhenius aging plot for crosslinked polyethylene insulation used in their cables (Tab C)

(6) Brand-Rex Company letter dated Nov. 6, 1985 (RIMS B43 851113 003) confirming that the compound used in manufacturing of cables supplied under the contract 80K6-825419-0 and the test sample qualified by Report F-C5120-4 are identical (TAB E)

(7) TVA Calculation WAC-117 titled "Material Aging Calculation Report Transmittal" (Tab C) dated June 5, 1986 (TAB C)

(8) Brand-Rex Company letter dated March 30, 1981 (RIMS MED 831212 225) providing certified test data and electrical test report for cable supplied under TVA contract 80K6-825419-0 (Tab E)

(9) Brand-Rex Company Gas Ribbon Burner Tray Flame Test (Tab E)

(10) Analysis on Synergistic Effects of Radiation and Test Sequence (TAB C)

(1) MS-Multiconductor insulated signal cable (not paired) with shield and overall jacket.

EQP226.21

TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-012 PLANT WBN UNIT(S) 1 SHEET 2 OF 33

BINDER TITLE BRAND REX/SIGNAL CABLE COMPUTED [illegible] DATE 9-21-86 R ___ R ___

XLPE INS/TVA TYPE MS CHECKED HWH/[illegible] DATE 9/22/86

B. CONCLUSION OF REVIEW (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) Identify and reroute the subject cables that are subject to submergence inside containment (2) Irradiation qualification of cables for a combined dose of gamma plus beta radiation postulated in the lower compartment during normal and accident condition. (3) It is indeterminant if the leakage current and the IR value measured during the qualification testing are acceptable for the subject cables applications. (4) Reevaluate qualification data and TAB A listing, if required, due to certain cables being rerouted/repulled to new locations of their end devices.

COMMENTS/RECOMMENDATIONS The subject cable is qualified for the service conditions inside containment. It has a qualified life of 40 years at 68°C (154.4°F) conductor temperature and 100 days post accident operating time. List of other service parameters is given in section K of this Tab.

EQP226.21

BINDER NO. WBNEQ-CABL-012 PLANT WBN UNIT(S) 1 SHEET 3 OF 33

BINDER TITLE BRAND REX/SIGNAL CABLE COMPUTED Qm DATE 8-15-86 R R

XLPE INS/TVA TYPE MS CHECKED HWH DATE 8/15/86

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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 383-1974 and IEEE 323-1974

EQP226.21

BINDER NO. WBNEQ-CABL-012 PLANT WBN UNIT(S) 1 SHEET 4 OF 33

BINDER TITLE BRAND REX/SIGNAL CABLE COMPUTED Qu DATE 8-15-86 R ___ R ___

XLPE INS/TVA TYPE MS CHECKED HWH DATE 8/15/86

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 A cable of 300V grade insulation was tested for qualification (Reference 1, page 3) as against 600V grade insulation cable specified and supplied by the manufacturer (Reference 8, page 4 of 5). The qualification test on 300V grade cable is acceptable considering the tested cable met the following criteria:

(1) The insulation material used in manufacture of the test sample and the supplied cable is identical (this is confirmed in Reference 6).

(2) The test sample was tested for a high potential test voltage equivalent to 80V/mil insulation thickness as required by IEEE:383-1974, section 2.3.3.4 (the test sample was subjected to high potential test voltage of 80 x 0.02 x 1000 = 1600V AC for 5 minutes; Reference 1, pages 1 and 15).

In addition, the test sample was shown to withstand connected load of 300 Volts, 10 Amps during LOCA/HELB testing (Reference 1, page 11). Also, the test sample and the cable considered for qualification are both 2/C, #16AWG cables and both are with crosslinked polyethylene insulation material and chlorosulfonated polyethylene jacket material (Reference 8).

BINDER NO. WBNEQ-CABL-012 PLANT WBN UNIT(S) 1 SHEET 5 OF 33

BINDER TITLE BRAND REX/SIGNAL CABLE COMPUTED Qm DATE 8.15.86 R R

XLPE INS/TVA TYPE MS CHECKED HWH DATE 8/15/86

E. EQUIPMENT DESCRIPTION

Is the equipment identified in the qualification report identical to the plant equipment which requires qualification (yes/no/NA)? No (1)

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Signal Cable	Signal Cable	1, p 3
(2) Manufacturer	Brand-Rex	Brand-Rex	
(3) Model Number(s)	Type MS(2)	NA(2)	NA
(4) Serial Number(s)	NA	NA	NA

(5) Identify Component-Unique checksheet attached: Supplement 2, Component - Unique Checklist Cables/Splices

JUSTIFICATION/COMMENTS (1) See Supplement 2, page 26 for comparison of the installed and tested cables and justification/comment in section D. (2) No specific model number for this cable identified by the manufacturer. TVA "Type MS" indicates multi-conductor insulated signal cable (not paired) with shield and overall jacket.

EQP226.21

TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-012 PLANT WBN UNIT(S) 1 SHEET 6 OF 33

BINDER TITLE BRAND REX/SIGNAL CABLE COMPUTED Qy DATE 8-15-86 R ___ R ___

XLPE INS/TVA TYPE MS CHECKED AWH DATE 8/15/86

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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	NA		
Electrical Connections	NA		
Conduit Seals	NA		
Connector Seals	NA		
Orientation	NA		
Physical Configuration	NA		
Other	NA		

JUSTIFICATION/COMMENTS The cable-interfaces are not considered for cable qualification.

EQP226.21

TVA 19537 (OE-3-86)

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	1, p.9
(b) Baseline performance measurements taken	Yes	1, p.9
(c) Equipment aged:		
Thermal	Yes	1, p.9
Radiation	Yes	1, p.10
Wear	NA	See p.14
(d) Vibration/seismic testing conducted	NA	See p. 14
(e) Design basis event (DBE) exposure	Yes	1, p.10
(f) Post-DBE exposure	Yes	1, p.10
(g) Final inspection and disassembly	Yes	1, p.11

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference 1, Appx A).

JUSTIFICATION/COMMENTS

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference 1 pages 9 and 10).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	1, p.9
Radiation exposure	Yes	1, p.10
Vibration (non-seismic) aging	NA	See p.14
Operational (electrical/mechanical/process) stress aging	NA	See p.14

JUSTIFICATION/COMMENTS

(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)? No (Reference).

JUSTIFICATION/COMMENTS See Reference 10

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference 1, page 9).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: 1, page 3).

JUSTIFICATION/COMMENTS Primarily the cable insulation material is to be considered for thermal aging degradation. In addition, as required by IEEE 383-1974, the jacket material is also identified. The insulation material is flame-retardant crosslinked polyethylene and the jacket material is flame-retardant chlorosulfonated polyethylene (Reference 1, page 1).

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference 5).

JUSTIFICATION/COMMENTS

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference 1, page 9).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	120°F	136°C	68°C (154.4°F)
Time	40 years	168 hrs	40 years

JUSTIFICATION/COMMENTS The test sample was aged at 136°C temperature for 168 hours in comparison with the insulation failure test point of 136°C temperature and 1068 hours duration. See Reference 7 in Section A of this Tab for equivalent temperature calculation.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference 5).

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)? NA (Reference).

JUSTIFICATION/COMMENTS Regression line methodology was employed.

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)? Yes (Reference 5).

JUSTIFICATION/COMMENTS The aging test data furnished by the manufacturer (Reference 5) was used to perform linear regression by the method of least squares, programmed in "System 1000" (Reference 7). The activation energy calculated for the insulation material using "System 1000" is more accurate and conservative than the Arrhenius aging plot furnished by the manufacturer in Reference 5.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS The qualified life for the cable is calculated considering the expected conductor temperature at its rated or at operating load current. Therefore, energization of the test sample during accelerated thermal aging is not required.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference 1, page 10).

JUSTIFICATION/COMMENTS _____

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference 1, page 1).

JUSTIFICATION/COMMENTS The cable insulation material is the primary material to be considered for irradiation aging. The test specimen has the cross-linked polyethylene insulation and the chloro sulfonate polyethylene (Hypalon) jacket materials.

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS The test sample was tested underwater for IR values before and after the irradiation test (Reference 1, page 17). This is considered an acceptable basis for ascertaining the retention of cable insulation property on radiation aging.

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference 1, page 10).

Plant normal ambient radiation dose (rd) 1×10^8 (gamma)

Test exposure dose (rd) 2×10^8 (gamma)

Test exposure dose rate (rd/hr) $.53 \times 10^6$

Test exposure source type (e.g., Co-60 gamma) Co-60 (gamma)

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference See page 14).

JUSTIFICATION/COMMENTS

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA (Reference See page 14).

JUSTIFICATION/COMMENTS

H. AGING (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)? NA (Reference See page 14).

JUSTIFICATION/COMMENTS

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? NA (Reference).

JUSTIFICATION/COMMENTS

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference 7).
Qualified life (Document in QMDS) 40 years at 68°C (154.4°F) conductor temperature.

JUSTIFICATION/COMMENTS The subject cable is qualified for installation inside containment with exposure to one DBE condition parameters and for the 100 days post-DBE operating time, as listed in Section K of this Tab. The qualified life and the post-DBE operating time are calculated by using "System 1000" and it is given in Reference 7. The cable qualification at 68°C conductor temperature is considered acceptable in view of the following analysis.

The TVA "Type MS" cables are used in instrument signal circuits and the load current in these circuits is less than 1 ampere. Keeping in view that the 2/C, #16AWG subject cable is rated for 10 amperes, it's an engineering judgment that the conductor temperature in case of "Type MS" cable would be insignificantly above the normal maximum ambient temperature of 120°F (48.9°C) considered for the subject binder.

H. AGING (Continued)

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA
(Reference _____).

JUSTIFICATION/COMMENTS No replacement intervals were established or recommended. Cable is qualified for the design life of the plant at 68°C conductor temperature.

GENERIC COMMENT FOR G(1)(C)WEAR, G(1)(D)VIBRATION, H(2),H(6), AND H(7)

Normal Service-Related Stresses - In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards...". Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria". Included in the list that follows the above quote is the standard to which TVA purchased the subject cables:

IPCEA S-66-524 Cross-Linked-Polyethylene-Insulated Cable

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service.

GENERIC COMMENT FOR G(1)(D) SEISMIC:

Seismic events are natural phenomena which are not considered in 10CFR50.49. Specific seismic testing on the cables was not performed; however upon completion of the LOCA simulation, the cable samples were subjected to a mandrel rebend test and an in-water hipot test. IEEE 383-1974, paragraph 2.4.4, regards that the performance of this test demonstrates that the cables have retained considerable mechanical durability and would be more severe even than the application of two cycles of the environment. The retention of a high degree of flexibility at the end of life (plus an accident) demonstrates the cables ability to withstand significant mechanical stresses.

BINDER NO. WBNEQ-CABL-012 PLANT WBN UNIT(S) 1 SHEET 15 OF 33

BINDER TITLE BRAND REX/SIGNAL CABLE COMPUTED Qm DATE 8.15.86 R R

XLPE INS/TVA TYPE MS CHECKED HWH DATE 8/15/86

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 Threshold	Reference	Activation Energy	Reference
(a)	Flame-Retardant Cross-Linked Polyethylene	NA	NA	1.37eV	7
(b)					
(c)					
(d)					

JUSTIFICATION/COMMENTS

EQP226.21

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

(1) 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 1, pages 5 and 11).

Identify Acceptance Criteria: 1) Cable must remain energized at 300V and 10A current during HELB/LOCA testing with leakage/charging current not exceeding 1.0A (See J(1) in Section P) and 2) the cable shall pass the final bend and high-potential withstand tests (high potential equivalent to 80V/mil insulation thickness).

(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 1, page 17)

Identify baseline and functional testing: Insulation resistance test as a baseline test and all throughout qualification testing; Bend test and hi-pot test post HELB/LOCA exposure.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference 1, page 5).

JUSTIFICATION/COMMENTS 300 Volts AC and 10A current.

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? Yes (Reference _____).

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

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	135V DC/125VAC	See comment
Load	NA	NA
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		
	NA	NA

JUSTIFICATION/COMMENTS The subject cables are for instrumentation purpose where at Watts Bar the system nominal voltage for the instrument circuit during any condition would not be greater than the control supply voltage of 135V DC/125 VAC.

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	300VAC	1, p5
Load	10Amp	1, p5
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		
	NA	NA

JUSTIFICATION/COMMENTS The contract specifies cables of 600V insulation grade which is a nominal insulation level for all cables operated at 480V and less. The subject cables under qualification are for instrumentation purpose where the nominal system voltage at Watts Bar would be 135VDC/125VAC or less with a load current not exceeding 1 ampere. The test sample cable was 300V grade, and it was connected to 300V and 10 amperes load which is considered acceptable.

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-42 and See page 20.

(1) Normal Max

(a) Temperature (°F) 120

(b) Pressure (psia) 14.7

(c) Humidity (%) 80

(d) Radiation (rd) 1 x E8 (gamma)

(2) Abnormal Max

(a) Temperature (°F) 130

(b) Pressure (psia) 14.7

(c) Humidity (%) 100

(d) Radiation (rd) NA

(3) Process Interfaces: Not applicable in case of cable qualificaton.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Eight hours per excursion and will occur less than 1% of the life of the plant.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F) 327 Accident type LOCA/HELB

(b) Pressure (psia) 26.7 Accident type LOCA

(c) Humidity (%) 100 Accident type LOCA

(d) Radiation (rd) 4.7 x E8 (beta) 4.0 x E7 (gamma) Accident type LOCA

(e) Spray Type Chemical Accident type LOCA/HELB

K. REQUIRED OPERATING ENVIRONMENT (Continued)

The worst case postulated radiation dose during the plant normal and the accident condition is inside containment, lower compartment. The radiation values are given in the following references:

Plant Condition	Location	Reference
40 year normal	Lower Compartment	GENNAL3-001, Rev. 0 (RIMS B45 851117 235)
Accident	Lower Compartment	TI-RPS-48, Rev. 2 (RIMS B45 851105 235)
		WBNNAL3-004, Rev. 0 (RIMS B45 860205 235)

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

0.1844 molar H_3BO_3 (2000 ppm boron), 0.033 molar NaOH resulting in a pH of 8.35 at 25°C at .92 (gal/min)/ft^2 duration - 30 days.

(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 K(6) in Section P).

(7) Subject to submergence (yes/no/NA)? No (Reference See Open Item #1 in Section B).

Identify initiation time and duration of submergence: NA; The subject cables are not qualified for submergence.

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

Type	RIMS No.
NA	

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 days	30 days	1, p14
Temperature (°F)	327	390	1, p14
Pressure (psia)	26.7	109.7	1, p14
Relative Humidity (%)	100	100	1, p14
*Chemical Spray	See L(2) Comment	L(1) in Sect P	1, p14
**Radiation (rd)	4.7xE8 (beta) 1.4xE8 (gamma)	8 2x10 (gamma)	1, p13 & L(2) Comment
Submergence	NA	NA	See Comment K(7)

*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	1, p14
Pressure	Yes	1, p14
Relative Humidity	Yes	1, p14
Chemical Spray	NA	See Comment
Submergence	NA	See Sect K(7)

JUSTIFICATION/COMMENTS All cables inside the containment are routed through conduits and therefore any difference between the specified and the demonstrated chemical spray parameters is not of a concern. The subjection of chemical spray is in fact an exposure to a severe environmental condition. Also, the beta radiation inside the containment would be shielded off by the conduit except for the portion of cables that are routed through flexible conduit (see Open Item #2 in Section B).

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	63°F	Yes
Pressure: +10% but no more than 10 psig	63 psi	Yes
Radiation: +10% of accident dose	> 10%	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	NA	NA - See Comment 1
Voltage: ±10% of rated value	> +10%	No - See Comment 2
Frequency: ±5% of rated value	NA	NA - See Comment 3
Environmental Transient: the initial transient and the peak temperature applied twice	Yes	Yes
Vibration: +10% added to acceleration	NA	NA - See Comment 3

JUSTIFICATION/COMMENTS: 1) There is no explicit time margin; the test sample was tested for 30 days in a harsh environment which has been extrapolated to show 100 days operating time by a calculation, No. WAC-117 (Reference 7). This meets the specified operating time requirement.
2) The contract specifies cables of 600V insulation grade which is a nominal insulation level for all cables operated at 480V and less. The subject cables under qualification are for instrumentation purpose where the nominal system voltage at Watts Bar would be 135VDC or 125 VAC with a load current not exceeding 1 ampere. The test sample cable was connected to 300VAC which gives margin of greater than +10%.
3) Frequency and Vibration are not considered to have impact on the qualification of cable and therefore are not considered.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference _____).

JUSTIFICATION/COMMENTS Transmission of electrical signals between the safety-related devices. Cable must maintain circuit integrity during and after a LOCA/HELB.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference 1, p.15).

JUSTIFICATION/COMMENTS The test sample remained energized at 300V and 10 ampere load current. The cable also maintained the IR values between the conductor and the shield above 1.8xE7ohms (see Open Item 13 in Section B of this tab).

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference 1, p.15).

JUSTIFICATION/COMMENTS The test sample passed the bend test followed by high-potential test for 5 minutes and IR test under immersed in water condition.

(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 1, p.15 and Reference 7).

JUSTIFICATION/COMMENTS Tested for 30 days in a harsh environmental condition. This was extrapolated to show 100 days operating time by a calculation No. WAC-117 (Reference 7).

M. OPERABILITY TEST RESULTS (Continued)

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? NA
(Reference _____).

JUSTIFICATION/COMMENTS

There were no abnormal conditions cited.

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)? NA (Enter all requirements in Section G of the Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS No surveillance or maintenance requirements have been identified by the vendor or on review of the qualification document. However, TVA has an in-house maintenance and surveillance program for cables; see TAB G.

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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	Yes; See 0(2) in Sect P
(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?	See Comment 0(6)(a) in Sect. P
(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

0. SUMMARY 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) 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?	NA; See Comment L (2), p 22
(11) Criteria regarding submergence satisfied?	NA; See Sect K (7), p21
(12) Criteria regarding radiation where satistifed?	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

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA
(17) Test duration margin (1 hour + function time) satisfied?	NA - See Comment 1 Sect L(3)
(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?	Yes, See H(3) in Sect P
(18) Criteria regarding synergistic effects satisfied?	NA - See Comment for Sect. H(3)
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	NA; See Comment for Sect N

P. DISCUSSION

J(1) The leakage/charging current was found to be 2.0mA for aged and 2.2mA for unaged cable samples after the high potential test at 1600 volts for 5 minutes in an immersed condition (Reference 1, Section 6.5, page 15). See Open Item 3 in Section B of this tab.

P. DISCUSSION (Continued)

K(6) IEEE 383-1974 section 2.3.1 addresses the requirements for moisture resistance under normal operating conditions. The same would also apply under accident conditions since the basic design of inside containment is such that all cables are inside conduits or shielded from direct spray impingement. Cables are manufactured to IPCEA S-66-524 which assures moisture resistance during normal operations.

Also, in addition to the above justification, test sample was tested to withstand 300 volts, 10A load under the simulated accident conditions of 100% relative humidity, elevated temperature and pressure and chemical spray.

L(1) Chemical Spray composition: 6200 ppm boron as boric acid, 50 ppm hydrazine, sufficient sodium triphosphate to obtain a pH of 8.5, followed by a sufficient sodium hydroxide to obtain a pH of 10.0 at room temperature. The flow rate was 0.27 (gal/min)/ft^2 for a 30 day duration. (Reference 1, p 10).

O(2) The maximum conductor temperature for the subject cable is downrated to 68°C, contrary to 90°C cable design value by the manufacturer, to meet 40 years qualified life requirement. See Section K(8), Justification Comments for acceptability.

O(6)(a) Mechanical and/or cycle aging are not considered to be significant factors in establishing aging degradation in case of cable qualification.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No

Item	Plant (1)	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	XLPE	XLPE	Yes	F-5120-4, p 3
Size	16AWG	16AWG	Yes	F-5120-4, p 3
Stranding	7 strand	7 strand	Yes	F-5120-4, p 3
Coating	Tinned	Bare Copper	Yes	F-5120-4, p 3
Insulation Thickness	.024"	.020"	Yes (2)	F-5120-4 p 3
Number of conductors	2	2	Yes	F-5120-4, p 3
Arrangement of conductors	NA	NA	Yes	F-5120-4, p 3
(b) Shielding	Al/Mylar or Al/Polyester	Copper/ Polyester	Yes	F-5120-4, p 3
(c) Insulation jacket				
Material	NA	NA	Yes	F-5120-4, p 3
Thickness	NA	NA	Yes	F-5120-4, p 3
(d) Outer jacket				
Material	CSPE	CSPE	Yes	F-5120-4, p 3
Thickness	.030"	.045"	Yes	F-5120-4, p 3

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BINDER TITLE BRAND REX/SIGNAL CABLE XLPE INS/TVA TYPE MS COMPUTED Qy DATE 8.15.86 CHECKED HWH DATE 8/15/86 R R

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	600VAC(3)	300VAC(3)	Yes	F-C5120-4, p 3
(f) Rated current	1A	10AMP	Yes	F-C5120-4, p 5
(g) Operating temperature rating				
Normal	90°C	68°C (4)	Yes	F-C5120-4, p 3
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	NA	$2x10^6$	Yes	F-C5120-4, p17
(i) Splice				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: (1) The information listed under "Plant" is taken from the contract and from the routine test report for the cables. (2) .020" is the minimum specified and .024" is the average specified by the contract. The .020" test results are acceptable because it is the specified minimum and the cables have to pass a withstand test based on 80V/mil of insulation thickness. (3) See justification/comment for Section D, on p 4 of this tab. Per Reference 8, p 4, the cables supplied under TVA Contract 80K6-825419 are of 600V grade insulation. (4) See justification/comment for Section H(8), on p 12 of this tab.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference IEEE 383-1974, para. 2.3.1).

Comments: See K(6) in Section P.

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference 1, p15).

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Comments:

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EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference 1, p.15).

Comments: The cable withstood 1600 volts for 5 minutes (equivalent to 80V/mil insulation thickness).

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference 1, p.17).

Comments: _____

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference 1, p.15).

Comments: _____

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference 9).

Identify flame test standard: IEEE 383-1974

Comments: _____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-013
MANUFACTURER : CAROLINA W&C

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT ID	DEV NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BRM-09C-0041-A	1RM	41-A	SPESIG	WWK	VARIOUS	VARIOUS	O	80K8-826505-0	A	5 MIN	LOCA	CARRY VLTG/CURR
1-BRM-09C-0042-A	1RM	42-A	SPESIG	WWK	VARIOUS	VARIOUS	O	80K8-826505-0	A	5 MIN	LOCA	CARRY VLTG/CURR
1-BRM-09C-0043-A	1RM	43-A	SPESIG	WWK	VARIOUS	VARIOUS	O	80K8-826505-0	A	5 MIN	LOCA	CARRY VLTG/CURR
1-BRM-09C-0047-B	1RM	47-B	SPESIG	WWK	VARIOUS	VARIOUS	O	80K8-826505-0	A	5 MIN	LOCA	CARRY VLTG/CURR
1-BRM-09C-0048-B	1RM	48-B	SPESIG	WWK	VARIOUS	VARIOUS	O	80K8-826505-0	A	5 MIN	LOCA	CARRY VLTG/CURR
1-BRM-09C-0049-B	1RM	49-B	SPESIG	WWK	VARIOUS	VARIOUS	O	80K8-826505-0	A	5 MIN	LOCA	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

		R____	R____	R____
PREPARER/DATE	R.A. Weinstoff 9/22/86	_____	_____	_____
CHECKED/DATE	WBK 9/22/86	_____	_____	_____

BINDER NO. WBNEQ-CABL-013 PLANT WBN UNIT(S) 1 SHEET 1 OF 34

R R

BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR CAROLINA SIGNAL CABLE

COMPUTED AM.I DATE 7-11-86

CHECKED WWK DATE 7/17/86

A. DOCUMENTATION

Equipment Description: Special Signal Cable

Vendor/Manufacturer: Carolina Wire and Cable

Equipment Model No.(s): Tefzel/Tefzel - TVA Type ETFE, Mark Letter WWK*

TVA Contract: 80K8-826505

*TVA Mark WWK - See TAB B, Section E

QUALIFICATION REPORTS

(1) Title/Number/Revision Nuclear Environmental Qualification Test Program on Electrical Cables for Carolina Wire & Cable Company, Wyle Laboratories Report No. 46350-2, dated July 22, 1983, TAB D.

RIMS B70 860114 100

DATE July 22,1983

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(2) Title/Number/Revision DuPont letter to TVA, TAB E.

RIMS B43 850311 014

DATE March 5, 1985

(3) Title/Number/Revision Qualification of Okozel Insulated Wire and Cable for Nuclear Plant Service, Okonite Report No. K-0-1, Sept. 1979, TAB E.

RIMS B70 860114 102

DATE Sept. 1979

(4) Title/Number/Revision Nuclear Environmental Qualification Test Program on Electrical Cables for Carolina Wire & Cable Company, Wyle Laboratories Report No. 46350-1, dated April 10, 1983, TAB E.

RIMS B70 851011 100

DATE Apr 10, 1983

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(5) Continental letter to TVA dated October 29, 1985 (B70 851104 004), TAB E.

(6) Siecor (Carolina Wire and Cable) letter to TVA dated October 30, 1985 (B70 851104 005). Siecor letter to TVA dated January 28, 1986 (B70 860203 001). TVA letter to Siecor dated January 23, 1986 (B70 860123 001). TVA letter to Siecor dated February 25, 1986 (B70 860225 004). Siecor letter to TVA dated February 28, 1986 (B70 860305 001), TAB E.

(7) Teledyne letter to TVA dated October 10, 1985 (B70 851015 002), TAB E.

(8) Okonite letter to TVA dated October 11, 1985 (B70 851015 003), with attached DuPont letter dated September 10, 1979, and Okonite report, Qualification of Okozel Insulation for Nuclear Plant Service, Okonite Report No. NQRN-4, Rev. 3, dated February 16, 1984, TAB E.

(9) DuPont paper "Tefzel[R] ETFE Fluoropolymer: Temperature Rating and Functional Characterization," by J. C. Reed and J. R. Perkins, dated December 6, 1972 (B70 860114 101), TAB E.

(10) Contract 80K8-826505, dated October 31, 1979 (QEB 791116 137), TAB E.

(11) Routine test report, MED 840604 223, approved September 26, 1980, TAB E.

(12) TVA letter to Okonite dated January 23, 1986, RIMS No. B70 860123 003, Okonite letter to TVA dated February 18, 1986, RIMS No. B71 860225 005, TAB E.

BINDER NO. WBNEQ-CABL-013 PLANT WBN UNIT(S) 1 SHEET 3 OF 34

BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR CAROLINA SIGNAL CABLE

COMPUTED [illegible] DATE 7-17-86 R ___ R ___

CHECKED [illegible] DATE 7/17/86

B. CONCLUSION OF REVIEW (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

COMMENTS/RECOMMENDATIONS The cable on this contract is only used outside containment. It is a special signal cable used to provide service to radiation monitors in the auxiliary building from a panel in the control building. It has been qualified for a 40-year life at 78°C, plus DBE and post-accident, to environmental parameters (profiles) which exceed the required WBN operating environmental parameters. We have verified the exact route of this cable and the worst conditions the cable sees are 104°F (normal), 110°F (abnormal), 104°F (LOCA), 90% humidity, atmospheric pressure, and total radiation less than 2.2×10^5 rads. The cable does not have to operate in any steam environment. The representative Tefzel 280 (and 200) Carolina cable was aged to an equivalent of 9052 years at 104°F and was irradiated to more than $2.02^8 \times 10$ rads (almost 1000 times the expected service). They maintained 8.8×10^{11} for specimen 1.1.A (2.8×10^{12} for specimen 3.1.A) ohms insulation resistance after the thermal and radiation aging. They passed a two-transient LOCA for 30 days, with 356°F temperature, 70 psig, 100% humidity and chemical spray. All references to Tefzel 200 and specimen 3.1.A are included strictly as extra information to demonstrate the capabilities of Tefzel 200 in addition to Tefzel 280.

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TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-013 PLANT WBN UNIT(S) 1 SHEET 4 OF 34

BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR CAROLINA SIGNAL CABLE

COMPUTED AMT DATE 7-14-86 R ___ R ___

CHECKED WBK DATE 7/17/86

C. 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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

Test program for Report 1, Carolina's Report No. 46350-2, was in accordance with IEEE 323-1974 and IEEE 383-1974 guidelines.

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 Samples were tested which are representative of the contracted item. See TAB B, Section E, and TAB C, Section A. Contract 80K8-826505 does not have a qualification test report. However, because it is constructed from Tefzel 280 insulation, we are using a Carolina Tefzel 280 (and 200) qualification report with support from two other Tefzel 280 qualification documents. This report with the supporting documents shows clearly that this Tefzel cable is qualified for the application of this binder. In TAB E are referenced documents and also letters from DuPont, Okonite, Continental Wire and Cable, Seicor (Carolina Wire and Cable), and Teledyne Thermatics. These letters testify that Tefzel is the same chemical compound regardless of who manufactures the cable and that all manufacturers use the same guidelines for applying Tefzel. These guidelines are distributed by DuPont and are referenced in TAB E in some of the manufacturer's letters. Because we do not have a tested cable meeting Table 1 of IEEE 383-1974, we are using a 1/c, No. 20 AWG, Tefzel 280 (and 200) insulated conductor (Carolina Report No.

D. QUALIFICATION METHODOLOGY (Continued)

46350-2) to demonstrate the qualification of the 8-conductor combination, special signal cable (WWK) described in TAB B, Section E and installed in the plant.

Only four of the eight conductors of the WWK cable are used. The two coaxial cables are used as power cables for D.C. bias voltage and the twisted shielded pair serves for contact closure with D.C. power. This particular service, from a practical standpoint, makes them immune to leakage currents and when one examines the excellent insulation resistances maintained throughout the very severe LOCA testing and hi-pot testing, leakage currents are no concern. In essence each cable is acting as a single conductor within the WWK cable. All of the cables have the same insulation, so there can be no interaction between cables due to different insulations. There is no extremely high temperature to consider so there can be no problem of cables affecting each other due to swelling or one cable melting against another cable. The severity of the 1/c tested demonstrated the durability of the insulation and the capability of service. The report also included a 7/c, No. 14 AWG, Tefzel 280 (and 200) insulated cable and by the severity of the test demonstrated there was no interaction of conductors within the multiconductor cable. We, therefore, conclude there is no difference in the 1/c and 7/c cables tested and the 1/c cable demonstrates the qualification of the WWK cable.

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Report No.1 Reference
(1) Equipment Type	Cable	Cable	Carolina 46350-2 page iv
(2) Manufacturer	Carolina	Carolina	
(3) Model Number(s)	Special Signal Cable Tefzel 280	Tefzel 280 (and 200)	Specimen 1.1.A (and 3.1.A)
(4) Serial Number(s)		NA	
(5) Identify Component-Unique checksheet attached:	Supplement 2 - Cable/Splices		

JUSTIFICATION/COMMENTS Samples were tested which are representative of the contracted cable. This justification is applicable to TAB B Section D, TAB C Section A, and Item 1 of Supplement 2.

The purchased cable was procured under Contract 80K5-826505 and is described as: TVA Mark WWK;

Special Signal Cable, 8-conductor combination, constructed as follows:

2-single conductors No. 22 AWG (7 strands No. 30 AWG) with 10 ± 2 mils ETFE insulation.

ETFE as provided by Carolina for the contract in this binder is Tefzel 280 insulation material.

E. EQUIPMENT DESCRIPTION (Continued)

One twisted pair, No. 20 AWG (7 strands No. 28 AWG) conductors, each with 10 ± 2 mils ETFE insulation.

One twisted shielded pair, No. 22 AWG (7 strands No. 30 AWG) conductors, each with 10 ± 2 mils ETFE insulation, aluminum/mylar shield with No. 22 AWG (7 strands No. 30 AWG) drain wire.

Two coaxial cables, ETFE insulation, ETFE jacket, center conductor No. 27 AWG (7 strands No. 35 AWG), with No. 34 AWG copper, braided, tinned shield.

Overall shield is No. 34 AWG copper, braided, tinned.

Overall jacket over the 8-conductor combination is ETFE, (Tefzel 280) 15 mils minimum average thickness.

See TAB E for a copy of the contract and a description of the cable, WWK.

Per Qualification Report No. 1: The tested cable was described as follows: 1/c, No. 20 AWG, 600-volt 0.015 inch ETFE (Tefzel 200 and 280) insulation.

See TAB C, Section A, for justification discussion.

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CHECKED WMK DATE 7/18/86

F. INSTALLATION INTERFACES

Does the qualification program address all relevant interfaces of the equipment so that the installed design and configuration is similar or identical to the test configuration (yes/no/NA)? (note below)

Interface	Identify Interface Requirement	Acceptable? (Yes/No/NA)	Reference Test Report
Mounting Bolts		NA	
External Process Connections		NA	
Electrical Connections		NA	
Conduit Seals		NA	
Connector Seals		NA	
Orientation		NA	
Physical Configuration		NA	
Other		NA	

JUSTIFICATION/COMMENTS Not required for cable qualification.

G. TEST SEQUENCE - REPORT NO. 1

(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/NA	Report No. 1 Reference
(a) Equipment inspected for damage	Yes	page I-2, -3
(b) Baseline performance measurements taken	Yes	page I-2, -3
(c) Equipment aged:		
Thermal	Yes	page II-1
Radiation	Yes	page III-1
Wear	No**	--
(d) Vibration/seismic testing conducted	No**	--
(e) Design basis event (DBE) exposure	Yes	page IV-3
(f) Post-DBE exposure	Yes	See TAB C, Section B
(g) Final inspection and disassembly and functional test	Yes	page V-2

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes
(Reference Report No. 1, page v (pages I-18, I-19, II-18, II-19, III-14, IV-70 through 73, V-14).

JUSTIFICATION/COMMENTS

G. TEST SEQUENCE - REPORT NO. 1 (Continued)

**G(1)(c) Wear and G(1)(d) - See Comments Sheet 12 of TAB B. The test sequence for Report No. 1 is shown on Sheet 13A.

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CHECKED [illegible] DATE 7/17/86

GENERIC COMMENT FOR G(1)(C) WEAR, G(1)(D) VIBRATION, H(2), H(6), AND H(7)

Normal Service Related Stresses- In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards...". Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more industry standards or criteria.

The following are applicable industry standards to which TVA purchases ETFE insulated cables:

1. MIL-W-22759/16A, March 10, 1981, Military Specification Sheet, superseding MIL-W-22759/16 (AS), January 12, 1973.

2. MIL-W-22759D, Amendment 1, December 7, 1979, and MIL-W-22759D, Supplement 1B, May 27, 1980.

3. MIL-W-22759D, June 29, 1973: Military Specification - Wire, Electric, Fluoropolymer-Insulated, Copper or Copper Alloy.

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service.

GENERIC COMMENT FOR G(1)(D) SEISMIC:

Seismic testing is not required for USNRC NUREG-0588, Category II.

H. AGING

(1) Was aging considered in the qualification program (Yes/No/NA)? Yes (Reference Report No. 1, pages II-1, III-1, and III-4).

JUSTIFICATION/COMMENTS Thermally aged 100 hours at 159°C and radiation aged at 202.24 x 10^6 rads.

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	Report No. 1, page II-1,
Radiation exposure	Yes	Report No. 1, pages III-1, III-4
Vibration (non-seismic) aging	No	--
Operational (electrical/mechanical/process) stress aging	No	--

JUSTIFICATION/COMMENTS Vibration and Operational Stress Aging - See Comment Sheet 12 of TAB B.

(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)? Yes (Reference See Comments on Sheets 13A, 13B).

JUSTIFICATION/COMMENTS See Sheets 13A and 13B of TAB B.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page II-1).

JUSTIFICATION/COMMENTS See H.(1).

TEST SEQUENCE AND SYNERGISTIC EFFECTS

The test sequence was in accordance with IEEE 323-1974 as follows:

TEST PROGRAM	REPORT NO 1, PAGE ii
(a) Baseline functional test.	↓
(b) Thermal aging and functional.	↓
(c) Irradiation and functional.	↓
(d) DBE/LOCA and functional.	↓
(e) Voltage withstand test.	↓
(f) Flame test.	↓

(Continued on Sheet 13B)

TEST SEQUENCE AND SYNERGISTIC EFFECTS (Continued)

Under TAB D, Report No. 46350-2 by Wyle Lab for Carolina has an addendum report No. 46350-3, Section VIII. This addendum documents the requirements, procedures, and results of a test performed to determine the extent of the synergistic effects of varying the sequence of thermal aging and radiation exposure on Tefzel 200 and 280 insulation cables. There were no anomalies during this test program. All the test specimens successfully withstood the effects of the thermal aging, irradiation, and voltage withstand tests without compromising their functional integrity. Based on the results, it was concluded that test sequence had no detectable effect on the degradation of the Tefzel insulation used on the test specimens.

Also see Section VII-11.

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: Report No. 1, page VII-5).

JUSTIFICATION/COMMENTS Use of IEEE 383-1974 aging guidelines implicitly considers cable insulation/jacket materials susceptible to thermal degradation.

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page VII-12).

JUSTIFICATION/COMMENTS

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page II-1).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	104°F	159°C	78°C See TAB C Sec. A, p. 4
Time	40 yrs	100 hrs	40 yrs

JUSTIFICATION/COMMENTS

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference Report No. 1, pages VII-12 to VII-16).

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 Report No. 1, page VII-16; also see TAB C, Sec. A, page 4).

JUSTIFICATION/COMMENTS Activation energy was stated in the report. See Report No. 1, pages VII-12, and VII-23. Also see TAB C, Section A, page 4.

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)? No (Reference NA).

JUSTIFICATION/COMMENTS Vendor used activation energy. See H(4)(f). See TAB C, Section A.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS Not required. Thermal aging simulates 40-yr life for cable energized at 40°C ambient plus rise due to loading. WWK is a signal cable and the conductor temperature rise is negligible. Therefore, the equivalent aging temperature of 78°C is very conservative. See TAB B, H(4)(d). Also see TAB C, Sect. A, p. 4.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Ref Report No. 1, pages III-1, III-4).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page VII-5).

JUSTIFICATION/COMMENTS Use of IEEE 383-1974 aging guidelines implicitly considers cable insulation/jacket materials susceptible to radiation degradation.

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page VII-10).

JUSTIFICATION/COMMENTS IEEE 383-1974 guidelines were used. The aging and accident doses were combined when irradiated during the test.

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report No. 1, pages III-1, III-4).

Plant normal ambient radiation dose (rd) 2.1×10^5

*Test exposure dose (rd) 202.24×10^6

Test exposure dose rate (rd/hr) 0.50×10^6

Test exposure source type (e.g., Co-60 gamma) Co-60 gamma

JUSTIFICATION/COMMENTS *Test exposure envelops plant normal (2.1×10^5) plus accident (1×10^4) or 2.2×10^5.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Comments Sheet 12 of TAB B.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Comments Sheet 12 of TAB B.

(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)? No (Reference NA).

JUSTIFICATION/COMMENTS See Comments Sheet 12 of TAB B.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Sheet 12 of TAB B.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page VII-15, -16).

Qualified life (Document in QMDS) 40 years at 78°C. See TAB C, Section A.

JUSTIFICATION/COMMENTS

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA (Reference NA).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS Not required because cable is qualified for the design life of the plant.

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CHECKED [illegible] DATE 7/17/86

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)

	Material/Property/Function	Radiation Threshold	Reference	Activation Energy	Reference
(a)	Tefzel 280 (and 200)			1.33eV	See TAB C, Section A, page 4
(b)					
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS The testing was done in accordance with industry standards and is done to test the insulation and jacket materials. Thermal and radiation age-conditioning was performed as part of the test program.

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

(1) 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 Report No. 1, page VII-8).

Identify Acceptance Criteria: IEEE 383-1974, the criteria included functioning continuously at test specified voltage and current during the LOCA test, passing mandrel bend and high voltage withstand test of 80V/mil for five minutes, and passing flame test.

(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 Report No. 1, page (see parenthesis below)).

Identify baseline and functional testing: Insulation resistance, voltage, and current (I-8).

Before, during, and after: Before and after each exposure period and during the LOCA they did an insulation resistance test (II-12, III-8, IV-26, IV-38, IV-45, IV-55, IV-59, IV-63).

During: Cables energized @ 660VAC and 5.5 amps (IV-2).

After: High-voltage withstand test with cable immersed in water at 80V/mil for five minutes (V-10).

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report No. 1, page IV-2).

JUSTIFICATION/COMMENTS 660VAC and 5.5 amps current applied during DBE test. This includes 10% margin. The 5.5 amps was applied to our specimen of interest, 1.1.A (and 3.1.A).

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? Yes (Reference Report No. 1, page I-2).

JUSTIFICATION/COMMENTS Baseline testing consisted of insulation resistance measurements prior to and after each environmental exposure. Qualification for normal operation is established because cable was manufactured and tested in accordance with MIL-W-22759/16(AS).*

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

(a)

Parameter	Specific Accident Conditions	Reference
*Voltage	NA	NA
Load	NA	NA
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		
	NA	NA
	NA	NA

JUSTIFICATION/COMMENTS *Cable WWK does not have a specified voltage rating. This special signal cable, made up of 8 cables, is used to provide service to detectors 1-RE-90-106A, B, and C and 1-RE-90-112A, B, and C which are part of the lower compartment air monitor 1-RE-90-106-A and part of the upper compartment air monitor 1-RE-90-112-B, respectively. The WWK cable runs from the monitor in the auxiliary building to a panel, O-M-12, in the control building.

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

(5)(b) Parameter	Demonstrated Conditions	Report No. 1 Reference
*Voltage	660VAC	page IV-2
Load	5.5 amps	page IV-2
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		
	NA	NA
	NA	NA

JUSTIFICATION/COMMENTS The cable terminates to the detector's preamplifier on the monitor and to a readout module at the 0-M-12 panel in the control building. The following are circuit requirements for the WWK cable relative to the monitor.

The only conductors of the subject cable which are being utilized for the detector circuit of the radiation monitor are the two coaxial cables and the No. 22 AWG twisted, shielded pair. The remaining four conductors are spare conductors only.

The black coaxial conductor is a bias voltage conductor to the detector and can carry 500-1200 VDC at up to 2mA.

The white coaxial cable can carry detector outputs of 0-4 VDC negative pulses at a repetition rate of 0-10^7/minute, operating at essentially 0 VDC. These pulses are random in nature and are 1 micro-second in length.

The twisted, shielded pair provides a safety loop, maintaining 15 VDC -0.7 VDC at approximately 17mA (20 mA maximum). If contacts in the air monitor piping circuit are opened, the loop maintains 15 VDC at 0 current.

The output impedance of the preamp at the detector is 75 ohms, as is the impedance of the readout module at the 0-M-12 panel in the control building. The signal is carried to an upper or lower level discriminator in the readout module where it becomes a logic function. The signal pulses are counted only and their form is not significant.

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

The following are cable requirements and characteristics of the furnished WWK cable. The coaxial cables are 75 $\pm$ 3 ohms with a nominal capacitance of 20.5 pf/ft, with a 1500 VAC operating voltage rating. Note from the Carolina routine test report, the coax impedance was 72.10 ohms. The capacitance was 18.9 pf/ft. The insulation resistance, taken to show the lowest in the WWK cable group of eight cables, was 4734 megohms. The completed cable passed 1500 VAC for 5 minutes and 5 kV impulse test. The cables passed other electrical and physical tests as seen in the test report. The coax cables installed at WBN have 42.5 mils insulation and can carry 1200 VDC or 28 volts per mil. The twisted shielded pair can carry 15 VDC and has 10 mils insulation or 1.5 volts per mil.

The following cable characteristics are of the tested Carolina cable (46350-2). The cable was thermally aged to an equivalent of 9052 years at 104°F and was irradiated to more than 2.02×10^8 rads. After thermal aging, the IR was 2.4×10^{12} ohms and after radiation aging the IR was 8.8×10^{11} ohms for specimen 1.1.A.
It was tested continuously during the LOCA at 660 VAC with 15 mil insulation or 44 volts per mil. It was hi-potted at 80 volts per mil for 5 minutes after the LOCA. Note, the LOCA was very severe with

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

two transients, 30 days, 356°F temperature, 70 psig, 100 percent humidity, and chemical spray.

The worst conditions the installed cable can see are 104°F (normal), 110°F (abnormal), 104°F (LOCA) 90 percent humidity, atmospheric pressure, total radiation less than 2.2×10^5 rads, and the LOCA only lasts 5 minutes. There is no chemical spray. As can be seen, the tested conditions were much more severe than the required conditions. It is also pointed out that the signal cable coax only has approximately 0 VDC and the signal pulses' waveform is not significant.

Based on the evaluation of circuit requirements, the WWK cable characteristics, factory routine test results, and Carolina LOCA test results, it is demonstrated that the subject special signal cable is capable of maintaining the performance characteristics needed to support its end device. The cables' operation should not be affected by the conditions to which they will be exposed at Watts Bar.

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CHECKED [illegible] DATE 7/17/86

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-46 R0; see comments, Sheet 23

(1) Normal Max

(a) Temperature (°F) 104°F

(b) Pressure (psig) ATM

(c) Humidity (%) 80

(d) Radiation (rd) *2.1×10^5

(2) Abnormal Max

(a) Temperature (°F) 110°F

(b) Pressure (psig) ATM

(c) Humidity (%) 90

(d) Radiation (rd) NA

(3) Process Interfaces: None.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Could exist for up to 8 hours per excursion and will occur less than one percent of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	104°F	Accident type	LOCA
(b) Pressure (psig)	ATM	Accident type	LOCA
(c) Humidity (%)	80	Accident type	LOCA
(d) Radiation (rd)	$< 1 \times 10^4$	Accident type	LOCA
(e) Spray Type	NA	Accident type	NA

*See WBNNAL-26 (SQN TI-RPS-32) and WBNNAL3-025.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

The cables, 1RM41A, 42A, 43A, and 1RM47B, 48B, 49B, run from the control building to the auxiliary building, room A1, EL 737 and terminate at Col. A4U, EL 737. See TAB F for QIR No. WBNEEB86085, dated September 19 1986, RIMS No. B26 860919 044, for cable routing. The routing shows the environment in room A1 is the most severe. See drawing 47E235-46R0 for the environment at the monitor at Col. A4U, EL 737, room A1. The cable conductor temperature is essentially at ambient (40 °C), as there is no added temperature rise due to loading on signal cable. See TAB C, Section A.

(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)? No (Reference NA).

(7) Subject to submergence (yes/no/NA)? No - See QIR WBN EEB 86037 (B26 860310 004), dated March 10, 1986. (Reference NA).

Identify initiation time and duration of submergence: N/A

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

Type	RIMS No.
WBNNAL3-025	B45 860401 235
WBNNAL3-026	B45 860328 237
WBNOSG4-026	B45 860326 220

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Report No. 1 Reference
Operating Time	5 Min.	30D	Fig. IV-2
Temperature (°F)	110°F	356°F	Fig. IV-2
Pressure (psig)	ATM	70 psig	Fig. IV-2
Relative Humidity (%)	90	100	page IV-3
*Chemical Spray	***NA	***NA	pages IV-3 and IV-9
**Radiation (rd)	2.2×10^5 gamma	2.0224×10^8 gamma	page III-1
Submergence	****No	NA	NA

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

**Enter 40-year integrated normal dose plus integrated accident dose and specify type. Note, that Beta is not a concern due to the location being outside containment.

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Report No. 1 Reference
Temperature	Yes	Fig. IV-2
Pressure	Yes	Fig. IV-2
Relative Humidity	Yes	page IV-3
Chemical Spray	***NA	pages IV-1 and IV-3
Submergence	****No	NA

***See next page.
****See TAB B, K (7).

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

JUSTIFICATION/COMMENTS ***Chemical spray not required, but it was used as follows: Per IEEE 323, Appendix A, Table A-1, 0.28 molar H_3BO_3, 0.064 molar $Na_2S_2O_3$, NaOH to make a pH of 10.5 at 77°F dissolved in tap water, 0.15 gal/min/ft^2 of surface area of vessel.

(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) Report No. 1:

Suggested Margins per IEEE-323(74)	Margin Applied	Yes/No/NA
Temperature: +15 degrees F	> 15°F	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)	> 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	Two transients	Yes
Vibration: +10% added to acceleration	No	No**

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

JUSTIFICATION/COMMENTS:

*The LOCA is 104°F for 5 minutes. The cable was tested to 356°F and at more than 320°F for most of 6 hours, then tested at 244°F for 26 days. All of this considerable margin. See TAB C, Section B.

**See Sheet 12 of TAB B.

***See Sheet 20 of TAB B.

****See TAB C, Section B.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference See TAB A).

JUSTIFICATION/COMMENTS Cable to maintain rated voltage and current.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference Report No. 1, page IV-3).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference Report No. 1, page IV-3).

JUSTIFICATION/COMMENTS See TAB C, Section B.

(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 Report No. 1, page IV-3).

JUSTIFICATION/COMMENTS See TAB C, Section B.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference Report No. 1, pages IV-3 and V-2).

JUSTIFICATION/COMMENTS See TAB C, Section C.

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 EQC Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS No vendor required surveillance, maintenance, and inspection are necessary to maintain qualification. TVA storage and recommended surveillance requirements have been included in TAB G, QMDS. Purpose of surveillance requirements is to accumulate historical data and identify any potential cable degradation.

BINDER NO. WBNEQ-CABL-013 PLANT WBN UNIT(S) 1 SHEET 29 OF 34

BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR CAROLINA SIGNAL CABLE COMPUTED [illegible] DATE 7-11-86 R ___ R ___

CHECKED [illegible] DATE 7/17/86

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)?	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?	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

0. SUMMARY 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) 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?	*Yes
(11) Criteria regarding submergence satisfied?	NA
(12) Criteria regarding radiation satisfied?	Yes
(a) Was dose rate considered?	Yes
(b) Was beta radiation considered? Cables are outside containment.	NA
(13) Criteria regarding operability status/mode satisfied?	Yes
(14) Criteria regarding test failures or anomalies satisfied?	Yes

*Chemical spray was not required since cables are outside containment, but it would have satisfied the in containment requirements.

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied? (Relates to transmitters, etc.)	NA
(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. DISCUSSION

O.(17)(b) - No exception was taken.

O.(2) - No exceptions were taken.

O.(4)(a-d) - See TAB C, Section B.

O.(6)(a) - See TAB B, G.(1)(c) Wear, G.(1)(d)

O.(6)(c) - There was preaging.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No - See Section E

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Size	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Stranding	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Coating	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Insulation Thickness	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Number of conductors	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Arrangement of conductors	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
(b) Shielding	See TAB B Section E	NA	NA	
(c) Insulation jacket				
Material ___	See TAB B Section E	NA	NA	
Thickness ___	See TAB B Section E	NA	NA	
(d) Outer jacket				
Material ___	See TAB B Section E	NA	NA	
Thickness ___	See TAB B Section E	NA	NA	

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	-	660V	Yes	Report 1 page IV-2
(f) Rated current	-	5.5	Yes	Report 1 page IV-2
(g) Operating temperature rating				
Normal	104°F (40°C)	78°C	Yes	TAB C Section A
Emergency	NA	NA	NA	
Short circuit	NA	NA	NA	
(h) Insulation resistance	NA	NA	NA	
(i) Splice				
Material	NA	NA	NA	
Thickness	NA	NA	NA	
Identification	NA	NA	NA	

Comments: _____

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference Report No. 1, page IV-3).

Comments: Cable is qualified for temperature and moisture resistance for normal operation because it has been manufactured and routinely tested in accordance with MIL-W-22759/16(AS).

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference Report No. 1, page IV-2).

Comments: 660 Volts at 5.5 amps.

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report No. 1, pages V-1 and V-10).

Comments: See TAB B, J(2).

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference See TAB B, J(2)).

Comments: See TAB B, J(2).

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report No. 1, page V-1).

Comments: See TAB B, J(2).

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Report No. 1, pages VI-1, -2).

Identify flame test standard: UL44, FR-1

Comments:

PRINT DATE: 09/20/86

BINDER NO. : WBNEQ-CABL-015
MANUFACTURER : CYPRUS

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	* BM	** CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-APP-082-0378-A	OPP 378-A	PJJ	WFD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0426-A	OPP 426-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0495-A	OPP 495-A	PJJ	WGD	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0498-A	OPP 498-A	PJJ	WGD	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0615-B	OPP 615-B	PJJ	WGD	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0618-B	OPP 618-B	PJJ	WFD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0738-B	OPP 738-B	PJJ	WFD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-077-0422-A	OV 422-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0696-A	OV 696-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0712-A	OV 712-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0728-B	OV 728-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0736-B	OV 736-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0744-A	OV 744-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0776-A	OV 776-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0784-B	OV 784-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0792-A	OV 792-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0800-B	OV 800-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0856-A	OV 856-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0862-B	OV 862-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0870-A	OV 870-A	PJJ	WGE	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0878-B	OV 878-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0886-B	OV 886-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0894-A	OV 894-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1181-A	OV 1181-A	PJJ	WGC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1201-B	OV 1201-B	PJJ	WGC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1943-A	OV 1943-A	PJJ	WGG	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1950-A	OV 1950-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1974-A	OV 1974-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2063-B	OV 2063-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2064-B	OV 2064-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2066-B	OV 2066-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2067-B	OV 2067-B	PJJ	WGC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2068-B	OV 2068-B	PJJ	WGC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2083-B	OV 2083-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2084-B	OV 2084-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2085-B	OV 2085-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2402-A	1M 2402-A	PJJ	WFG	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.C. Souththorpe 9/24/86 ____ ____ ____

CHECKED/DATE N.M. Fenton 9/29/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@M-043-2403-A	1M 2403-A	PJJ	WFC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-043-2407-A	1M 2407-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-043-2411-B	1M 2411-B	PJJ	WGM	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-043-2412-B	1M 2412-B	PJJ	WFG	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-043-2413-B	1M 2413-B	PJJ	WFC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-043-2417-B	1M 2417-B	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-043-2620-A	1M 2620-A	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@M-043-2621-B	1M 2621-B	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-026-3801B-A	1PL3801-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-026-3811B-B	1PL3811-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-3826-A	1PL3826-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-067-3882B-A	1PL3882-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-067-3907B-B	1PL3907-B	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-067-3942B-B	1PL3942-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-067-3962A-A	1PL3962-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4565-A	1PL4565-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4581-A	1PL4581-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4589-B	1PL4589-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4600-B	1PL4600-B	PJJ	WHD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4605-B	1PL4605-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-070-4727-A	1PL4727-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-070-4744-B	1PL4744-B	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0430-B	1PP 430-B	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0440-A	1PP 440-A	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0450-A	1PP 450-A	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0454-A	1PP 454-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0456-B	1PP 456-B	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0460-B	1PP 460-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0462-A	1PP 462-A	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0468-B	1PP 468-B	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-211-0475-A	1PP 475-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-082-0483-B	1PP 483-B	PJJ	WGD	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-062-0554-A	1PP 554-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-074-0577-A	1PP 577-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-074-0578-A	1PP 578-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-074-0589-B	1PP 589-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PP-074-0590-B	1PP 590-B	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Bulthorpe 9/20/86 ____ ____ ____

CHECKED/DATE N.M. Beaston 9/20/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APP-063-0602-A	1PP 602-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-063-0603-A	1PP 603-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-063-0615-B	1PP 615-B	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-072-0628-A	1PP 628-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-072-0640-B	1PP 640-B	PJJ	WGK	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-003-0653-A	1PP 653-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-003-0655-A	1PP 655-A	PJJ	WGC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-003-0664-B	1PP 664-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-003-0665-B	1PP 665-B	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0677A-A	1PP 677-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0679-A	1PP 679-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0689A-A	1PP 689-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0691-A	1PP 691-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0702B-B	1PP 702-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0714B-B	1PP 714-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-212-0751-A	1PP 751-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-212-0754-B	1PP 754-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-212-0757-A	1PP 757-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-212-0760-A	1PP 760-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-212-0763-B	1PP 763-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-212-0766-B	1PP 766-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-068-0803-A	1PP 803-A	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-046-0227-S	1SG 227-S	PJJ	WGG	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-046-0232-S	1SG 232-S	PJJ	WGG	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ASG-046-0233-S	1SG 233-S	PJJ	WGG	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1021-A	1V 1021-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-1051-A	1V 1051-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1259-A	1V 1259-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1260-A	1V 1260-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1273-A	1V 1273-A	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1276-A	1V 1276-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1277-A	1V 1277-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1289-B	1V 1289-B	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1290-B	1V 1290-B	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1292-B	1V 1292-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1293-B	1V 1293-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1306-B	1V 1306-B	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D. L. Swift Wagner 9/20/86 ____ ____ ____

CHECKED/DATE N. W. Brewster 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-030-1307-B	1V 1307-B	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1310-B	1V 1310-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1325-A	1V 1325-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1326-A	1V 1326-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1343-A	1V 1343-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1344-A	1V 1344-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1356-B	1V 1356-B	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1357-B	1V 1357-B	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1359-B	1V 1359-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1360-B	1V 1360-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1373-B	1V 1373-B	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1374-B	1V 1374-B	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1375-B	1V 1375-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1377-B	1V 1377-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1378-B	1V 1378-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1396-B	1V 1396-B	PJJ	WGC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1436-B	1V 1436-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1464-A	1V 1464-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1473-A	1V 1473-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1482-A	1V 1482-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1500-A	1V 1500-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1626-A	1V 1626-A	PJJ	WGC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-1828A-A	1V 1828-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1953-A	1V 1953-A	PJJ	WHH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2399A-A	1V 2399-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2405-B	1V 2405-B	PJJ	WGH	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2652-A	1V 2652-A	PJJ	WHH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-3332B-B	1V 3332-B	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-087-3432-A	1V 3432-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3680-A	1V 3680-A	PJJ	WHG	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3720-B	1V 3720-B	PJJ	WHG	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3982-A	1V 3982-A	PJJ	WFH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3990-B	1V 3990-B	PJJ	WFH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3998-B	1V 3998-B	PJJ	WFH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-4007-A	1V 4007-A	PJJ	WFH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4352-A	1V 4352-A	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4353-A	1V 4353-A	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.C. Swalthorpe 9/20/86 ____ ____ ____

CHECKED/DATE N. M. Burston 9/20/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@V-062-4433-A	1V 4433-A	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-062-4435-A	1V 4435-A	PJJ	WHG	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-062-4446-A	1V 4446-A	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-062-4473-A	1V 4473-A	PJJ	WHG	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5862-A	1V 5862-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5872-A	1V 5872-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5905-B	1V 5905-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-061-5922-A	1V 5922-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-6259-A	1V 6259-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-6274-A	1V 6274-A	PJJ	WHD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-6309-A	1V 6309-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-6409-B	1V 6409-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-7600-A	1V 7600-A	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-7610-A	1V 7610-A	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-7620-A	1V 7620-A	PJJ	WGB	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-7623-A	1V 7623-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-7633-A	1V 7633-A	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-7643-B	1V 7643-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-7653-B	1V 7653-B	PJJ	WGE	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-8572-B	1V 8572-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-8592-B	1V 8592-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-8616-B	1V 8616-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-8636-B	1V 8636-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-8782-A	1V 8782-A	PJJ	WFH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-8789-B	1V 8789-B	PJJ	WFH	VARIOUS	VARIOUS	O	N74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-032-9105-A	1V 9105-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3763-B	2PL3763-B	PJJ	WHG	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3882B-A	2PL3882-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3907B-B	2PL3907-B	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3942B-B	2PL3942-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-211-0450-A	2PP 450-A	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-211-0456-B	2PP 456-B	PJJ	WGK	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-211-0460-B	2PP 460-B	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-211-0466-A	2PP 466-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0677B-A	2PP 677-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0679-A	2PP 679-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0689B-A	2PP 689-A	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Scullthorpe 9/20/86 ____ ____ ____

CHECKED/DATE N.M. Burston 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BR	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-BPP-067-0691-A	2PP 691-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPP-067-07028-B	2PP 702-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPP-067-07148-B	2PP 714-B	PJJ	WGD	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPP-212-0760-A	2PP 760-A	PJJ	WHC	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-23998-A	2V 2399-A	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-24058-B	2V 2405-B	PJJ	WGH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-3982-A	2V 3982-A	PJJ	WFH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-3990-B	2V 3990-B	PJJ	WFH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-3998-B	2V 3998-B	PJJ	WFH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-4007-A	2V 4007-A	PJJ	WFH	VARIOUS	VARIOUS	O	74C7-085069-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Scultthorpe 9/20/86 _____ _____ _____

CHECKED/DATE N.M. Bernstein 9/20/86 _____ _____ _____

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-APP-082-0300-A	OPP 300-A	PJJ	WFB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0302-A	OPP 302-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0306-A	OPP 306-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0312-A	OPP 312-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0313-A	OPP 313-A	PJJ	WHJ	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0330B-A	OPP 330-A	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0338B-A	OPP 338-A	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0375-A	OPP 375-A	PJJ	WGD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0420-A	OPP 420-A	PJJ	WFB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0422-A	OPP 422-A	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0432-A	OPP 432-A	PJJ	WHJ	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0433-A	OPP 433-A	PJJ	WHJ	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0450-A	OPP 450-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0458-A	OPP 458-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0540A-B	OPP 540-B	PJJ	WFB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0542-B	OPP 542-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0546-B	OPP 546-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0552-B	OPP 552-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0553-B	OPP 553-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0570B-B	OPP 570-B	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0578B-B	OPP 578-B	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0660B-B	OPP 660-B	PJJ	WFB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0662-B	OPP 662-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0666-B	OPP 666-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0672-B	OPP 672-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0673-B	OPP 673-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0690A-B	OPP 690-B	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0698A-B	OPP 698-B	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0735-B	OPP 735-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ARM-090-0032B-A	ORM 32-A	PJJ	WHD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ARM-090-0120-B	ORM 120-B	PJJ	WFB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ARM-090-0128-A	ORM 128-A	PJJ	WFB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0120-A	OSG 120-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0121-A	OSG 121-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0129-A	OSG 129-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0131-A	OSG 131-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0132-A	OSG 132-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.C. Leydthorn 9/20/86 ____ ____ ____

CHECKED/DATE R. M. Bardin 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-ASG-012-0134-A	OSG 134-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0151-B	OSG 151-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0156-B	OSG 156-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ASG-012-0165-B	OSG 165-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-077-0432-B	OV 432-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-077-0434-B	OV 434-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0601-A	OV 601-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0613-A	OV 613-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0614-A	OV 614-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0624-B	OV 624-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0625-B	OV 625-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-065-0636-B	OV 636-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0704-B	OV 704-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0710-A	OV 710-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0718-A	OV 718-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0720-A	OV 720-A	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0726-B	OV 726-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0734-B	OV 734-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0742-A	OV 742-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0745-A	OV 745-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0746-A	OV 746-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0747-A	OV 747-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0752-B	OV 752-B	PJJ	WGD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0760-A	OV 760-A	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0768-B	OV 768-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0769-B	OV 769-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0774-A	OV 774-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0776-A	OV 776-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0782-B	OV 782-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0785-B	OV 785-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0787-B	OV 787-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0790-A	OV 790-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0794-A	OV 794-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0798-B	OV 798-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0806-A	OV 806-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0808-A	OV 808-A	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-0816-B	OV 816-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Sculthorpe 9/20/86 ____ ____ ____

CHECKED/DATE R.M. Beaston 9/20/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-AV-030-C822-A	OV 822-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C824-A	OV 824-A	PJJ	WGE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C830-B	OV 830-B	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C832-B	OV 832-B	PJJ	WHB	VARIOUS	VARIOUS	O	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C838-A	OV 838-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C840-A	OV 840-A	PJJ	WGE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C846-B	OV 846-B	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C848-B	OV 848-B	PJJ	WGE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C854-A	OV 854-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C868-A	OV 868-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C884-B	OV 884-B	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-030-C892-A	OV 892-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1180-A	OV 1180-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1944-A	OV 1944-A	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1945-A	OV 1945-A	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1946-A	OV 1946-A	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1947-A	OV 1947-A	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1948-A	OV 1948-A	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1949-A	OV 1949-A	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1951-A	OV 1951-A	PJJ	WGK	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1953-A	OV 1953-A	PJJ	WGG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-1976-A	OV 1976-A	PJJ	WGM	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-026-1988B-A	OV 1988-A	PJJ	WGG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2020-A	OV 2020-A	PJJ	WGH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2038-A	OV 2038-A	PJJ	WGG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2062-B	OV 2062-B	PJJ	WGG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2069-B	OV 2069-B	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2070-B	OV 2070-B	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2071-B	OV 2071-B	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-AV-031-2080-B	OV 2080-B	PJJ	WGD	VARIOUS	VARIOUS	O	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-003-1450-A	1M 1450-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-2401-A	1M 2401-A	PJJ	WGM	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-2886-A	1PL2886-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-2887-A	1PL2887-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-2896-B	1PL2896-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-2897-B	1PL2897-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-2983-A	1PL2983-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Sundthorpe 9/20/86 _____ _____ _____

CHECKED/DATE W.M. Bruestle 9/20/86 _____ _____ _____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APL-030-2985-A	1PL2985-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-2993-B	1PL2993-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-2995-B	1PL2995-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3003-A	1PL3003-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3004-A	1PL3004-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3006-A	1PL3006-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3015-B	1PL3015-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3033-A	1PL3033-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3034-A	1PL3034-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3036-A	1PL3036-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3043-B	1PL3043-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3044-B	1PL3044-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3046-B	1PL3046-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3053-A	1PL3053-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3054-A	1PL3054-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3055-A	1PL3055-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3063-B	1PL3063-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3064-B	1PL3064-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3066-B	1PL3066-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3073-A	1PL3073-A	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3083-B	1PL3083-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3085-B	1PL3085-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3093-A	1PL3093-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3094-A	1PL3094-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3103-B	1PL3103-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3104-B	1PL3104-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3113-A	1PL3113-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3123-B	1PL3123-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3133-A	1PL3133-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3135-A	1PL3135-A	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3143-B	1PL3143-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3145-B	1PL3145-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3153-A	1PL3153-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3155-A	1PL3155-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3163-B	1PL3163-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3164-B	1PL3164-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3165-B	1PL3165-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Scottemp 9/20/86 ____ ____ ____

CHECKED/DATE R.A. Bernstein 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION ±BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APL-030-3193-A	1PL3193-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3195-A	1PL3195-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3203-B	1PL3203-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3205-B	1PL3205-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3242-A	1PL3242-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3250-B	1PL3250-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3302-A	1PL3302-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3309-B	1PL3309-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3472-A	1PL3472-A	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3482-A	1PL3482-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3490-B	1PL3490-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3497-B	1PL3497-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3521-A	1PL3521-A	PJJ	WHG	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3522-A	1PL3522-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3531-B	1PL3531-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-065-3532-B	1PL3532-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3603-A	1PL3603-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3613-B	1PL3613-B	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3781-A	1PL3781-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3796-B	1PL3796-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-026-3801A-A	1PL3801-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-026-3811A-B	1PL3811-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3821-A	1PL3821-A	PJJ	WFB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3823-A	1PL3823-A	PJJ	WFB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3882A-A	1PL3882-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3906-B	1PL3906-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3907A-B	1PL3907-B	PJJ	WGH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3921B-B	1PL3921-B	PJJ	WGB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3942A-B	1PL3942-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3961-A	1PL3961-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3962B-A	1PL3962-A	PJJ	WGH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4061-A	1PL4061-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4071-B	1PL4071-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4461-B	1PL4461-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4462-B	1PL4462-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4501-A	1PL4501-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4502-A	1PL4502-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D. L. Lubbers 9/20/86 ____ ____ ____

CHECKED/DATE N. M. Bunstin 9/29/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BR	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PL-078-4542-A	1PL4542-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-078-4543-A	1PL4543-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4569-A	1PL4569-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4577-A	1PL4577-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4588-B	1PL4588-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4592-B	1PL4592-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4593-B	1PL4593-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4601-B	1PL4601-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-4604-B	1PL4604-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-070-4738-A	1PL4738-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-070-4746-B	1PL4746-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4752-A	1PL4752-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4758-A	1PL4758-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4766-B	1PL4766-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4772-B	1PL4772-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4777-A	1PL4777-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4783-A	1PL4783-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4791-B	1PL4791-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4797-B	1PL4797-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4804-A	1PL4804-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4812-A	1PL4812-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4825-A	1PL4825-A	PJJ	WGM	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4833-A	1PL4833-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4843-B	1PL4843-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4850-B	1PL4850-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4861-B	1PL4861-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4870-B	1PL4870-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4879-A	1PL4879-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4881-A	1PL4881-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4889-B	1PL4889-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-030-4891-B	1PL4891-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-078-4897-B	1PL4897-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-026-5005-A	1PL5005-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-5201-B	1PL5201-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-5206-B	1PL5206-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-5261-A	1PL5261-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-212-5264-A	1PL5264-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	D.L. Sculthorpe 9/20/86	-----	-----	-----
CHECKED/DATE	K.M. Burstein 9/24/86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APL-212-5271-B	1PL5271-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-212-5274-B	1PL5274-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6109-A	1PL6109-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6111-A	1PL6111-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6115-B	1PL6115-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6117-B	1PL6117-B	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-6122-A	1PL6122-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-6123-A	1PL6123-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-6133-B	1PL6133-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-6134-B	1PL6134-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-063-6160-A	1PL6160-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-063-6161-A	1PL6161-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-063-6166-B	1PL6166-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-063-6168-B	1PL6168-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6171-A	1PL6171-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6172-A	1PL6172-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6177-B	1PL6177-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6183-A	1PL6183-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6189-B	1PL6189-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6245-A	1PL6245-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6250-A	1PL6250-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6255-B	1PL6255-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6260-B	1PL6260-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-082-0478-A	1PP 478-A	PJJ	WGD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-062-0552-A	1PP 552-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-062-0564-B	1PP 564-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-074-0580-A	1PP 580-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-074-0592-B	1PP 592-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-063-0614-B	1PP 614-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-063-0617-B	1PP 617-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-072-0627-A	1PP 627-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-072-0630-A	1PP 630-A	PJJ	WGD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-072-0639-B	1PP 639-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-072-0642-B	1PP 642-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-003-0652-A	1PP 652-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-06778-A	1PP 677-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APP-067-0681-A	1PP 681-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

	R____	R____	R____
PREPARER/DATE D. L. Southworth 9/20/86	_____	_____	_____
CHECKED/DATE N. B. Bracken 9/20/86	_____	_____	_____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BPP-067-0689B-A	1PP 689-A	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPP-067-0693-A	1PP 693-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPP-067-0702A-B	1PP 702-B	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPP-067-0714A-B	1PP 714-B	PJJ	WGD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-099-0164-A	1PS 164-A	PJJ	WHC	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-099-0184-B	1PS 184-B	PJJ	WHC	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPS-072-0220-A	1PS 220-A	PJJ	WHB	VARIOUS	VARIOUS	O	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0040-A	1RM 40-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0046-B	1RM 46-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0282-A	1RM 282-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0292-A	1RM 292-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0302-A	1RM 302-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0312-A	1RM 312-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0322-B	1RM 322-B	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0332-B	1RM 332-B	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0342-B	1RM 342-B	PJJ	WHE	VARIOUS	VARIOUS	O	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0362-B	1RM 362-B	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0372-B	1RM 372-B	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BSG-046-0231-S	1SG 231-S	PJJ	WHJ	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BSG-003-0538-B	1SG 538-B	PJJ	WHB	VARIOUS	VARIOUS	O	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BSG-003-0565-B	1SG 565-B	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-0016-A	1V 16-A	PJJ	WGC	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0780-A	1V 780-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0784-A	1V 784-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0791-A	1V 791-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0793-A	1V 793-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0796-A	1V 796-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0824-A	1V 824-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0828-A	1V 828-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0829-A	1V 829-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0830-A	1V 830-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0831-A	1V 831-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0834-A	1V 834-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0836-A	1V 836-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0839-A	1V 839-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0861-B	1V 861-B	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0862-B	1V 862-B	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	O.L. Souththorpe 9/20/86	-----	-----	-----
CHECKED/DATE	N.M. Brewster 9/22/86	-----	-----	-----

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BR	**CONTRACT	C A I*	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-077-C863-B	1V 863-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C865-B	1V 865-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C877-B	1V 877-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C878-B	1V 878-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C879-B	1V 879-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C880-B	1V 880-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C882-B	1V 882-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C893-B	1V 893-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C894-B	1V 894-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C895-B	1V 895-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C896-B	1V 896-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C898-B	1V 898-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C911-B	1V 911-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C912-B	1V 912-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C913-B	1V 913-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C914-B	1V 914-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C916-B	1V 916-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C940-A	1V 940-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C942-A	1V 942-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-077-C945-A	1V 945-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1031-B	1V 1031-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1041-B	1V 1041-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1062-A	1V 1062-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1065-A	1V 1065-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1082-A	1V 1082-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1085-A	1V 1085-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1100-B	1V 1100-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1101-B	1V 1101-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1102-B	1V 1102-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1105-B	1V 1105-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1120-B	1V 1120-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1121-B	1V 1121-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1122-B	1V 1122-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-1125-B	1V 1125-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-1161-A	1V 1161-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1220-A	1V 1220-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1222-A	1V 1222-A	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D. L. Sullivan 9/20/86 ____ ____ ____

CHECKED/DATE N. M. Gaston 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-030-1235-B	1V 1235-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1238-B	1V 1238-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1240-B	1V 1240-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1241-B	1V 1241-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1256-A	1V 1256-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1257-A	1V 1257-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1261-A	1V 1261-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1274-A	1V 1274-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1278-A	1V 1278-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1291-B	1V 1291-B	PJJ	WGB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1294-B	1V 1294-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1311-B	1V 1311-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1322-A	1V 1322-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1323-A	1V 1323-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1327-A	1V 1327-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1340-A	1V 1340-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1341-A	1V 1341-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1345-A	1V 1345-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1358-B	1V 1358-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1361-B	1V 1361-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1376-B	1V 1376-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1390-B	1V 1390-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1394-B	1V 1394-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1412-A	1V 1412-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1418-A	1V 1418-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1434-B	1V 1434-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1438-B	1V 1438-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1440-B	1V 1440-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1443-A	1V 1443-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1445-A	1V 1445-A	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1452-B	1V 1452-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1454-B	1V 1454-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1456-B	1V 1456-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1457-B	1V 1457-B	PJJ	WHD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1458-B	1V 1458-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1461-A	1V 1461-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1466-A	1V 1466-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	D.C. Southorn 9/20/86	-----	-----	-----
CHECKED/DATE	A.M. Lunstin 9/20/86	-----	-----	-----

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-030-1470-A	1V 1470-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1475-A	1V 1475-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1479-A	1V 1479-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1484-A	1V 1484-A	PJJ	WHD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1488-A	1V 1488-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1491-A	1V 1491-A	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1493-A	1V 1493-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1497-A	1V 1497-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1502-A	1V 1502-A	PJJ	WHD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1506-A	1V 1506-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1509-A	1V 1509-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1511-A	1V 1511-A	PJJ	WHD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1577-B	1V 1577-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1595-B	1V 1595-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1598-B	1V 1598-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1599-B	1V 1599-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1601-B	1V 1601-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1602-B	1V 1602-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1607-A	1V 1607-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1620-A	1V 1620-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1623-A	1V 1623-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1624-A	1V 1624-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1634-A	1V 1634-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1638-A	1V 1638-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1640-A	1V 1640-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1641-A	1V 1641-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1702-B	1V 1702-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1716-A	1V 1716-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-1718-A	1V 1718-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-1801-B	1V 1801-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-1802-B	1V 1802-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-1803-B	1V 1803-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-1811-A	1V 1811-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-1812-A	1V 1812-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-1813-A	1V 1813-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-1814-A	1V 1814-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-1821-A	1V 1821-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.C. Guthrie 9/20/86 _____ _____ _____

CHECKED/DATE R. M. Gunter 9/20/86 _____ _____ _____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-GV-026-1827-A	1V 1827-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-026-1828-A	1V 1828-A	PJJ	WGH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-001-1831-A	1V 1831-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-1851-B	1V 1851-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-1852-B	1V 1852-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-1853-B	1V 1853-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-1854-B	1V 1854-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-1871-A	1V 1871-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-1872-A	1V 1872-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-1873-A	1V 1873-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-1874-A	1V 1874-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1901-B	1V 1901-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1902-B	1V 1902-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1903-B	1V 1903-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1905-B	1V 1905-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1906-B	1V 1906-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1914-B	1V 1914-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1917-B	1V 1917-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1921-A	1V 1921-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1922-A	1V 1922-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1923-A	1V 1923-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1925-A	1V 1925-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1926-A	1V 1926-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1934-A	1V 1934-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1936-A	1V 1936-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1937-A	1V 1937-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-074-1938-A	1V 1938-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-070-1941-A	1V 1941-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-070-1942-A	1V 1942-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-070-1943-A	1V 1943-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-003-1951-A	1V 1951-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-003-1952-A	1V 1952-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-003-1961-A	1V 1961-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-003-1962-A	1V 1962-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-003-1963-A	1V 1963-A	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-070-1971-B	1V 1971-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-070-1972-B	1V 1972-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Sullivan 9/30/86 _____ _____ _____

CHECKED/DATE R.M. Hunter 9/30/86 _____ _____ _____

PRINT DATE: 09/20/86

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	* BM	** CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-aV-070-1973-B	1V 1973-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-1981-A	1V 1981-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-1982-A	1V 1982-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-1983-A	1V 1983-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-1991-A	1V 1991-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-1992B-A	1V 1992-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-1993-A	1V 1993-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2001-B	1V 2001-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2002-B	1V 2002-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2003-B	1V 2003-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2011-B	1V 2011-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2012-B	1V 2012-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2013-B	1V 2013-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2021-A	1V 2021-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2022-A	1V 2022-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2023-A	1V 2023-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2031-A	1V 2031-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2032-A	1V 2032-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2033-A	1V 2033-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2041-B	1V 2041-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2042-B	1V 2042-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2043-B	1V 2043-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2051-B	1V 2051-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2052-B	1V 2052-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2053-B	1V 2053-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2061-B	1V 2061-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2062B-B	1V 2062-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2063-B	1V 2063-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-2071-A	1V 2071-A	PJJ	WHH	VARIOUS	VARIOUS	O	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-2072-A	1V 2072-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-2073-A	1V 2073-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-2081-B	1V 2081-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-2082-B	1V 2082-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-2083-B	1V 2083-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2091-A	1V 2091-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2092-A	1V 2092-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2093-A	1V 2093-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Bullthorpe 9/20/86 _____ _____ _____

CHECKED/DATE W.D. Bruestle 9/20/86 _____ _____ _____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-aV-062-2101-B	1V 2101-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-2102-B	1V 2102-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-2103-B	1V 2103-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-2113-A	1V 2113-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-2114-A	1V 2114-A	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-2115-A	1V 2115-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-2121-A	1V 2121-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-2122-A	1V 2122-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-063-2123-A	1V 2123-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-2131-B	1V 2131-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-2132-B	1V 2132-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-003-2133-B	1V 2133-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-074-2142-A	1V 2142-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-074-2145-A	1V 2145-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-074-2152-B	1V 2152-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-074-2155-B	1V 2155-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2161-B	1V 2161-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2162-B	1V 2162-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2163-B	1V 2163-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2171-B	1V 2171-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2172-B	1V 2172-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2173-B	1V 2173-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2201-A	1V 2201-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2202-A	1V 2202-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2203-A	1V 2203-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2209-A	1V 2209-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2210-A	1V 2210-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-067-2211-A	1V 2211-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-070-2217-A	1V 2217-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-070-2218-A	1V 2218-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-070-2219-A	1V 2219-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-026-2225-A	1V 2225-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-026-2227-A	1V 2227-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-2233-A	1V 2233-A	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-2234-A	1V 2234-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-2235-A	1V 2235-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-062-2241-B	1V 2241-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Scudthorpe 9/24/86 ____ ____ ____

CHECKED/DATE R.M. Guastin 9/24/86 ____ ____ ____

W A T T S B A R N U C L E A R P L A N T

TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*SE	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-062-2242-B	1V 2242-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2243-B	1V 2243-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2248-A	1V 2248-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2249-A	1V 2249-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2250-A	1V 2250-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2256-B	1V 2256-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2257-B	1V 2257-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2258-B	1V 2258-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2263-A	1V 2263-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2266-A	1V 2266-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2268-A	1V 2268-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2274-B	1V 2274-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2277-B	1V 2277-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2280-B	1V 2280-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2282-B	1V 2282-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2285-B	1V 2285-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2288-B	1V 2288-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2293-A	1V 2293-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2294-A	1V 2294-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2295-A	1V 2295-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2321-B	1V 2321-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2322-B	1V 2322-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2323-B	1V 2323-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2327-A	1V 2327-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2328-A	1V 2328-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2329-A	1V 2329-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2333-B	1V 2333-B	PJJ	WHJ	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2334-B	1V 2334-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2335-B	1V 2335-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2339-A	1V 2339-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2340-A	1V 2340-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2341-A	1V 2341-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2345-B	1V 2345-B	PJJ	WHJ	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2346-B	1V 2346-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2347-B	1V 2347-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2351-B	1V 2351-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2352-B	1V 2352-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D. Dunthorpe 9/26/86 ____ ____ ____

CHECKED/DATE N. M. Jenkins 9/30/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-063-2353-B	1V 2353-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2357-B	1V 2357-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2358-B	1V 2358-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2359-B	1V 2359-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2363-A	1V 2363-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2364-A	1V 2364-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2365-A	1V 2365-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2369-B	1V 2369-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2370-B	1V 2370-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2371-B	1V 2371-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2375-A	1V 2375-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2376-A	1V 2376-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2377-A	1V 2377-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2381-B	1V 2381-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2382-B	1V 2382-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2383-B	1V 2383-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2387-A	1V 2387-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2388-A	1V 2388-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2389-A	1V 2389-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2393-B	1V 2393-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2394-B	1V 2394-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2395-B	1V 2395-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2399B-A	1V 2399-A	PJJ	WGH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2401-A	1V 2401-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2411-A	1V 2411-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2412-A	1V 2412-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2413-A	1V 2413-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2417-B	1V 2417-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2418-B	1V 2418-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2419-B	1V 2419-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2425-A	1V 2425-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2429-A	1V 2429-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2430-A	1V 2430-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2431-A	1V 2431-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2435-A	1V 2435-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2436-A	1V 2436-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2437-A	1V 2437-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Southerner 9/20/86 ____ ____ ____

CHECKED/DATE N.W. Dunstein 9/24/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-067-2441-B	1V 2441-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2442-B	1V 2442-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2443-B	1V 2443-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-2449-B	1V 2449-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-2453-A	1V 2453-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-2455-A	1V 2455-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2461-A	1V 2461-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2462-A	1V 2462-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2463-A	1V 2463-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2467-B	1V 2467-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2468-B	1V 2468-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2469-B	1V 2469-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2473-A	1V 2473-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2474-A	1V 2474-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2475-A	1V 2475-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2479-A	1V 2479-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2480-A	1V 2480-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2481-A	1V 2481-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2485-B	1V 2485-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2486-B	1V 2486-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2487-B	1V 2487-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2491-A	1V 2491-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2492-A	1V 2492-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2493-A	1V 2493-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2503-B	1V 2503-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2504-B	1V 2504-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2505-B	1V 2505-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2509-B	1V 2509-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2510-B	1V 2510-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2511-B	1V 2511-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2515-B	1V 2515-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2516-B	1V 2516-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2517-B	1V 2517-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2521-A	1V 2521-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2522-A	1V 2522-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2523-A	1V 2523-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2527-A	1V 2527-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE [signature] 9/20/86 ____ ____ ____

CHECKED/DATE [signature] 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A T	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-070-2528-A	1V 2528-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2529-A	1V 2529-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2533-B	1V 2533-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2534-B	1V 2534-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2535-B	1V 2535-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2539-B	1V 2539-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2540-B	1V 2540-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2541-B	1V 2541-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2545-B	1V 2545-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2546-B	1V 2546-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2547-B	1V 2547-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2551-B	1V 2551-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2552-B	1V 2552-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2553-B	1V 2553-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2557-B	1V 2557-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2558-B	1V 2558-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2559-B	1V 2559-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2563-A	1V 2563-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2564-A	1V 2564-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2565-A	1V 2565-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2569-A	1V 2569-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2570-A	1V 2570-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2571-A	1V 2571-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2575-A	1V 2575-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2576-A	1V 2576-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2577-A	1V 2577-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2582-A	1V 2582-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2583-A	1V 2583-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2607-A	1V 2607-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2608-A	1V 2608-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2609-A	1V 2609-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2613-B	1V 2613-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2614-B	1V 2614-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2615-B	1V 2615-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-2625-A	1V 2625-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-2632-B	1V 2632-B	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-2635-B	1V 2635-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Sutherland 9/20/86 ----- ----- -----

CHECKED/DATE R.M. Austin 9/20/86 ----- ----- -----

PRINT DATE: 09/20/86

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±BM	**CONTRACT	C A I *	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-070-2641-B	1V 2641-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2643-B	1V 2643-B	PJJ	WHG	VARIOUS	VARIOUS	I	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2649-B	1V 2649-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2651-A	1V 2651-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2653-A	1V 2653-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2661-A	1V 2661-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2662-A	1V 2662-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2663-A	1V 2663-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2671-B	1V 2671-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2672-B	1V 2672-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2673-B	1V 2673-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2681-A	1V 2681-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2682-A	1V 2682-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2683-A	1V 2683-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2688-B	1V 2688-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2689-B	1V 2689-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2690-B	1V 2690-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2696-A	1V 2696-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2697-A	1V 2697-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2698-A	1V 2698-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2704-B	1V 2704-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2705-B	1V 2705-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2706-B	1V 2706-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2712-A	1V 2712-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2714-A	1V 2714-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2721-B	1V 2721-B	PJJ	WHJ	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2723-B	1V 2723-B	PJJ	WHJ	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2731-A	1V 2731-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2734-A	1V 2734-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2745-A	1V 2745-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2746-A	1V 2746-A	PJJ	WHB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2747-A	1V 2747-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2748-A	1V 2748-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2754-B	1V 2754-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2756-B	1V 2756-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2757-B	1V 2757-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2761-A	1V 2761-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D. Southorn 9/20/86 ____ ____ ____

CHECKED/DATE [illegible] 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	* BM	** CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-062-2764-A	1V 2764-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2765-A	1V 2765-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2771-B	1V 2771-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2774-B	1V 2774-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2775-B	1V 2775-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2782-A	1V 2782-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2787-A	1V 2787-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2794-A	1V 2794-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2801-A	1V 2801-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2802-A	1V 2802-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2803-A	1V 2803-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2810-B	1V 2810-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2813-B	1V 2813-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2821-A	1V 2821-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2822-A	1V 2822-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2823-A	1V 2823-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2831-B	1V 2831-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2832-B	1V 2832-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-072-2833-B	1V 2833-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2842-B	1V 2842-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2847-B	1V 2847-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2856-B	1V 2856-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2859-B	1V 2859-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2862-B	1V 2862-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2868-A	1V 2868-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2869-A	1V 2869-A	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2870-A	1V 2870-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2879-A	1V 2879-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2880-A	1V 2880-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2881-A	1V 2881-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2889-B	1V 2889-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2890-B	1V 2890-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2891-B	1V 2891-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2901-A	1V 2901-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2904-A	1V 2904-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2905-A	1V 2905-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2909-B	1V 2909-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Seyldtberger 9/30/86a ----- ----- -----

CHECKED/DATE N.M. Gunstein 9/30/86 ----- ----- -----

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-AV-063-2911-B	1V 2911-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-2912-B	1V 2912-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-2913-B	1V 2913-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-2921-B	1V 2921-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-2923-B	1V 2923-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-2924-B	1V 2924-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-2925-B	1V 2925-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2931-A	1V 2931-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2934-A	1V 2934-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2935-A	1V 2935-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2941-B	1V 2941-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2944-B	1V 2944-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2945-B	1V 2945-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2951-A	1V 2951-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2953-A	1V 2953-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2954-A	1V 2954-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2961-B	1V 2961-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2963-B	1V 2963-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2964-B	1V 2964-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-2969-A	1V 2969-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-2971-A	1V 2971-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-2972-A	1V 2972-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-062-2976-B	1V 2976-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-062-2977-B	1V 2977-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-062-2978-B	1V 2978-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2981-A	1V 2981-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2991-A	1V 2991-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-2994-A	1V 2994-A	PJJ	WHJ	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-3001-B	1V 3001-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-003-3011-B	1V 3011-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-3021-A	1V 3021-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-3023-A	1V 3023-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-3024-A	1V 3024-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-3029-B	1V 3029-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-3031-B	1V 3031-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-3032-B	1V 3032-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-3036-A	1V 3036-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D. L. Smith 9/26/86 ____ ____ ____

CHECKED/DATE R. M. Gaston 9/26/86 ____ ____ ____

W A T T S B A R N U C L E A R P L A N T

TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±BM	CONTRACT	C A I *	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-067-3038-A	1V 3038-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3039-A	1V 3039-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3044-B	1V 3044-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3046-B	1V 3046-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3047-B	1V 3047-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3052-B	1V 3052-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3054-B	1V 3054-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3055-B	1V 3055-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3061-A	1V 3061-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3063-A	1V 3063-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3064-A	1V 3064-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3070-B	1V 3070-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3072-B	1V 3072-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3073-B	1V 3073-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3079-A	1V 3079-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3080-A	1V 3080-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3082-A	1V 3082-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3088-A	1V 3088-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3090-A	1V 3090-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3098-A	1V 3098-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3100-A	1V 3100-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3108-B	1V 3108-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3110-B	1V 3110-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3122-B	1V 3122-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3124-B	1V 3124-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3131-A	1V 3131-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3132-A	1V 3132-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3133-A	1V 3133-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3135-A	1V 3135-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3136-A	1V 3136-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3141-B	1V 3141-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3142-B	1V 3142-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3143-B	1V 3143-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3144-B	1V 3144-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3145-B	1V 3145-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3146-B	1V 3146-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-3151-B	1V 3151-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE A.C. Sullivan 9/20/86 _____ _____ _____

CHECKED/DATE N.M. Austin 9/20/86 _____ _____ _____

WATTS BAR NUCLEAR PLANT

TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*SM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-GV-072-3154-B	1V 3154-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-3155-B	1V 3155-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-3161-A	1V 3161-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-3164-A	1V 3164-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-072-3165-A	1V 3165-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3171-A	1V 3171-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3173-A	1V 3173-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3174-A	1V 3174-A	PJJ	WHC	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3175-A	1V 3175-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3177-A	1V 3177-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3186-B	1V 3186-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3188-B	1V 3188-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3189-B	1V 3189-B	PJJ	WHC	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3190-B	1V 3190-B	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3191-B	1V 3191-B	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3192-B	1V 3192-B	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3202-B	1V 3202-B	PJJ	WHJ	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-063-3205-B	1V 3205-B	PJJ	WHJ	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-067-3212-A	1V 3212-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-067-3215-A	1V 3215-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-067-3217-A	1V 3217-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-070-3221-B	1V 3221-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-070-3222-B	1V 3222-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-070-3223-B	1V 3223-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-087-3302-A	1V 3302-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-087-3303-A	1V 3303-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-026-3321-B	1V 3321-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-026-3322-B	1V 3322-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-026-3323-B	1V 3323-B	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-026-3331-B	1V 3331-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-026-3332A-B	1V 3332-B	PJJ	WGH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-026-3341-A	1V 3341-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-026-3342-A	1V 3342-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-026-3343-A	1V 3343-A	PJJ	WHH	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-067-3351-B	1V 3351-B	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-087-3422-A	1V 3422-A	PJJ	WGE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-GV-087-3442-B	1V 3442-B	PJJ	WGE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D. Deuthorpe 9/24/86 ____ ____ ____

CHECKED/DATE D.M. Brewster 9/24/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-087-3452-B	1V 3452-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-087-3462-B	1V 3462-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3564-A	1V 3564-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3570-A	1V 3570-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3580-A	1V 3580-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3614-B	1V 3614-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3620-B	1V 3620-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3627-B	1V 3627-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3657-A	1V 3657-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3660-A	1V 3660-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3666-A	1V 3666-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3697-B	1V 3697-B	PJJ	WHJ	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3700-B	1V 3700-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3706-B	1V 3706-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3741-A	1V 3741-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3742-A	1V 3742-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3743-A	1V 3743-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3771-A	1V 3771-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3792-B	1V 3792-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3793-B	1V 3793-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3826-B	1V 3826-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3834-B	1V 3834-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-4000-B	1V 4000-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-4009-A	1V 4009-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-4021-B	1V 4021-B	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-4022-B	1V 4022-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-4024-B	1V 4024-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-4051-B	1V 4051-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-4052-B	1V 4052-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-4054-B	1V 4054-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4222-B	1V 4222-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4223-B	1V 4223-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4225-B	1V 4225-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4227-B	1V 4227-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4240-A	1V 4240-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4241-A	1V 4241-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-4243-A	1V 4243-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Souththorpe 9/20/86 _____ _____ _____

CHECKED/DATE A.M. Bauestein 9/20/86 _____ _____ _____

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BR	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-2V-062-4260-A	1V 4260-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4262-A	1V 4262-A	PJJ	WGE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4265-A	1V 4265-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4279-A	1V 4279-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4281-A	1V 4281-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4295-A	1V 4295-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4297-A	1V 4297-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4331-A	1V 4331-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4332-A	1V 4332-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4333-A	1V 4333-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4334-A	1V 4334-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4336-A	1V 4336-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4354-A	1V 4354-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4355-A	1V 4355-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4356-A	1V 4356-A	PJJ	WHE	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4359-A	1V 4359-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4423-A	1V 4423-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4425-A	1V 4425-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4432-A	1V 4432-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4434-A	1V 4434-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4437-A	1V 4437-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4445-A	1V 4445-A	PJJ	WGB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4447-A	1V 4447-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4448-A	1V 4448-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4449-A	1V 4449-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4459-B	1V 4459-B	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4460-B	1V 4460-B	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4461-B	1V 4461-B	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4470-A	1V 4470-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4471-A	1V 4471-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4472-A	1V 4472-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4477-A	1V 4477-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4485-A	1V 4485-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4486-A	1V 4486-A	PJJ	WHB	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4487-A	1V 4487-A	PJJ	WHD	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4488-A	1V 4488-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4492-A	1V 4492-A	PJJ	WHG	VARIOUS	VARIOUS	O	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.C. Southerland 9/20/86 ____ ____ ____

CHECKED/DATE R. M. Gunter 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION ±2M	**CONTRACT	C A I*	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-2V-062-4500-A	1V 4500-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4501-A	1V 4501-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4502-A	1V 4502-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4503-A	1V 4503-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4507-A	1V 4507-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4572-B	1V 4572-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4573-B	1V 4573-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4574-B	1V 4574-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4593-A	1V 4593-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4594-A	1V 4594-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4595-A	1V 4595-A	PJJ	WHE	VARIOUS	VARIOUS	I	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4596-A	1V 4596-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-062-4597-A	1V 4597-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4742-A	1V 4742-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4743-A	1V 4743-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4745-A	1V 4745-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4746-A	1V 4746-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4747-A	1V 4747-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4748-A	1V 4748-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4767-B	1V 4767-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4770-B	1V 4770-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4782-B	1V 4782-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4783-B	1V 4783-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4785-B	1V 4785-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4788-B	1V 4788-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4795-B	1V 4795-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4796-B	1V 4796-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4798-B	1V 4798-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4801-B	1V 4801-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4827-A	1V 4827-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4828-A	1V 4828-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4830-A	1V 4830-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4833-A	1V 4833-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4918-A	1V 4918-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4927-A	1V 4927-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4928-A	1V 4928-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-2V-063-4977-B	1V 4977-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.C. Squibbs 9/20/86 ____ ____ ____

CHECKED/DATE M.M. Gunter 9/20/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±BM	**CONTRACT	C A I *	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-063-4980-B	1V 4980-B	PJJ	WHD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5502-A	1V 5502-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5505-A	1V 5505-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5507-A	1V 5507-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5508-A	1V 5508-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5552-A	1V 5552-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5553-A	1V 5553-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5556-A	1V 5556-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5557-A	1V 5557-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5558-A	1V 5558-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5559-A	1V 5559-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5567-B	1V 5567-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5568-B	1V 5568-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5570-B	1V 5570-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5595-B	1V 5595-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5596-B	1V 5596-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5609-A	1V 5609-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5612-A	1V 5612-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-5740-B	1V 5740-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-5741-B	1V 5741-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-5742-B	1V 5742-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-5743-B	1V 5743-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-5745-B	1V 5745-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-5747-B	1V 5747-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5885-B	1V 5885-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5932-A	1V 5932-A	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5945-B	1V 5945-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5965-B	1V 5965-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6223-A	1V 6223-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6224-A	1V 6224-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6225-A	1V 6225-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6244-A	1V 6244-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6245-A	1V 6245-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6257-A	1V 6257-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6273-A	1V 6273-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6275-A	1V 6275-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6293-A	1V 6293-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	D. Seybthorpe 9/20/86	-----	-----	-----
CHECKED/DATE	N.M. Gunter 9/20/86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-067-6294-A	1V 6294-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6295-A	1V 6295-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6307-A	1V 6307-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6323-B	1V 6323-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6324-B	1V 6324-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6325-B	1V 6325-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6344-B	1V 6344-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6345-B	1V 6345-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6357-B	1V 6357-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6359-B	1V 6359-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6374-B	1V 6374-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6375-B	1V 6375-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6394-B	1V 6394-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6395-B	1V 6395-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6407-B	1V 6407-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6561-A	1V 6561-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6571-A	1V 6571-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6580-B	1V 6580-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6581-B	1V 6581-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6591-B	1V 6591-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6601-A	1V 6601-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6604-A	1V 6604-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6611-B	1V 6611-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6614-B	1V 6614-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6621-B	1V 6621-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6629-A	1V 6629-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6640-A	1V 6640-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6665-B	1V 6665-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6667-B	1V 6667-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6695-A	1V 6695-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6712-B	1V 6712-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7142-B	1V 7142-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7150-B	1V 7150-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7151-B	1V 7151-B	PJJ	WHB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7167-A	1V 7167-A	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7175-A	1V 7175-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7192-A	1V 7192-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Swetlanger 9/20/86 ____ ____ ____

CHECKED/DATE N.M. Fuentes 9/20/86 ____ ____ ____

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BR	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-031-7200-A	1V 7200-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7217-B	1V 7217-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7226-B	1V 7226-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7521-A	1V 7521-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7523-A	1V 7523-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7537-A	1V 7537-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7539-A	1V 7539-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7568-B	1V 7568-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7570-B	1V 7570-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7582-B	1V 7582-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7584-B	1V 7584-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7601-A	1V 7601-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7603-A	1V 7603-A	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7611-A	1V 7611-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7613-A	1V 7613-A	PJJ	WHB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7621-A	1V 7621-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7631-A	1V 7631-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7641-B	1V 7641-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7651-B	1V 7651-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7661-B	1V 7661-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7663-B	1V 7663-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7671-B	1V 7671-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7673-B	1V 7673-B	PJJ	WGE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7965-A	1V 7965-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7967-A	1V 7967-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7973-B	1V 7973-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7974-B	1V 7974-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8044 B-A	1V 8044-A	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8045-A	1V 8045-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8047-A	1V 8047-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8053-B	1V 8053-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8054-B	1V 8054-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8063-B	1V 8063-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8064-B	1V 8064-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8072-A	1V 8072-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8078-A	1V 8078-A	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8079-A	1V 8079-A	PJJ	WHG	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	[illegible] 9/20/86	-----	-----	-----
CHECKED/DATE	[illegible] 9/20/86	-----	-----	-----

PRINT DATE: 09/20/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±BM	**CONTRACT	C A I*	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-aV-001-8034-A	1V 8034-A	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8035-A	1V 8085-A	PJJ	WHG	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8087-A	1V 8087-A	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8093-B	1V 8093-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8094-B	1V 8094-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8402B-A	1V 8402-A	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8404-A	1V 8404-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8424-B	1V 8424-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8429-B	1V 8429-B	PJJ	WHE	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8431-B	1V 8431-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8562-A	1V 8562-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8565-A	1V 8565-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8575-B	1V 8575-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8582-A	1V 8582-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8585-A	1V 8585-A	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8595-B	1V 8595-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8602-A	1V 8602-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8605-A	1V 8605-A	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8619-B	1V 8619-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8622-A	1V 8622-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8625-A	1V 8625-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-001-8639-B	1V 8639-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-043-8783-A	1V 8783-A	PJJ	WGG	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-043-8790-B	1V 8790-B	PJJ	WGG	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-043-8791-B	1V 8791-B	PJJ	WGG	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-032-9102-A	1V 9102-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-032-9111-A	1V 9111-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-032-9113-A	1V 9113-A	PJJ	WGK	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-032-9125-B	1V 9125-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-032-9128-B	1V 9128-B	PJJ	WGG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-026-9150-A	1V 9150-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-026-9157-B	1V 9157-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-026-9158-B	1V 9158-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-026-9167-A	1V 9167-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-026-9168-A	1V 9168-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-026-9172-B	1V 9172-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-aV-026-9173-B	1V 9173-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	D.L. Sylthorpe 9/20/86	-----	-----	-----
CHECKED/DATE	R.M. Gunstin 9/20/86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±BM	**CONTRACT	C A I *	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-026-9177-A	1V 9177-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-026-9178-A	1V 9178-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-081-9242-A	1V 9242-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-081-9243-A	1V 9243-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-081-9244-A	1V 9244-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-081-9247-A	1V 9247-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-026-9362-A	1V 9362-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-026-9363-A	1V 9363-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9606-A	1V 9606-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9607-A	1V 9607-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9615-A	1V 9615-A	PJJ	WHB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9616-A	1V 9616-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9624-A	1V 9624-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9625-A	1V 9625-A	PJJ	WHB	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9633-A	1V 9633-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9639-A	1V 9639-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9725-A	1V 9725-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9726-A	1V 9726-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9727-A	1V 9727-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9728-A	1V 9728-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9737-A	1V 9737-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9738-A	1V 9738-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9739-A	1V 9739-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9748-A	1V 9748-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9749-A	1V 9749-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9750-A	1V 9750-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9759-A	1V 9759-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9760-A	1V 9760-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9761-A	1V 9761-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9842-B	1V 9842-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9849-B	1V 9849-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9857-B	1V 9857-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9865-B	1V 9865-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-031-2896-B	2PL2896-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-031-2897-B	2PL2897-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-030-3073-A	2PL3073-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-030-3075-A	2PL3075-A	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Southerland 9/20/86 ____ ____ ____

CHECKED/DATE R.M. Hunter 9/20/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-@PL-030-3083-B	2PL3083-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3085-B	2PL3085-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3094-A	2PL3094-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3103-B	2PL3103-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3113-A	2PL3113-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3114-A	2PL3114-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3123-B	2PL3123-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3124-B	2PL3124-B	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3133-A	2PL3133-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3134-A	2PL3134-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3135-A	2PL3135-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3143-B	2PL3143-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3145-B	2PL3145-B	PJJ	WHC	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3203-B	2PL3203-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3205-B	2PL3205-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3472-A	2PL3472-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3482-A	2PL3482-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3490-B	2PL3490-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3497-B	2PL3497-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3603-A	2PL3603-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3613-B	2PL3613-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3749-A	2PL3749-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3751-A	2PL3751-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3761-B	2PL3761-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3776-A	2PL3776-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3778-A	2PL3778-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-032-3786-A	2PL3786-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3826-A	2PL3826-A	PJJ	WFB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3827-A	2PL3827-A	PJJ	WFB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3882A-A	2PL3882-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3906-B	2PL3906-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3907A-B	2PL3907-B	PJJ	WGH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3921A-B	2PL3921-B	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3942A-B	2PL3942-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3961-A	2PL3961-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3962-A	2PL3962-A	PJJ	WGH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3982-B	2PL3982-B	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.L. Sullivan 9/20/86 ____ ____ ____

CHECKED/DATE A.M. Brewster 9/20/86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-@PL-031-3995-B	2PL3995-B	PJJ	WFB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3996-B	2PL3996-B	PJJ	WFB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4002-A	2PL4002-A	PJJ	WHC	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4061-A	2PL4061-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4071-B	2PL4071-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4441-B	2PL4441-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4462-B	2PL4462-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4502-A	2PL4502-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4521-A	2PL4521-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-078-4897-A	2PL4897-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-5121-A	2PL5121-A	PJJ	WHJ	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0677A-A	2PP 677-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0681-A	2PP 681-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0689A-A	2PP 689-A	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0693-A	2PP 693-A	PJJ	WGB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0702A-B	2PP 702-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0714B-B	2PP 714-B	PJJ	WGD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-077-C862-B	2V 862-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-077-C863-B	2V 863-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-077-C865-B	2V 865-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-077-C879-B	2V 879-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-077-C880-B	2V 880-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-070-1941-A	2V 1941-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-070-1942-A	2V 1942-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2003-B	2V 2003-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2021-A	2V 2021-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2022-A	2V 2022-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2023-A	2V 2023-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2161-B	2V 2161-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2162-B	2V 2162-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2163-B	2V 2163-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2171-B	2V 2171-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2172-B	2V 2172-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2173-B	2V 2173-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2201-A	2V 2201-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2202-A	2V 2202-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2203-A	2V 2203-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	D.C. Spurlin 9/20/86	-----	-----	-----
CHECKED/DATE	H.M. Pinnell 9/20/86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	*RM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
2-QV-067-2209-A	2V 2209-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-2210-A	2V 2210-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-2211-A	2V 2211-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-2399A-A	2V 2399-A	PJJ	WGH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-2405A-B	2V 2405-B	PJJ	WGH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-063-2681-A	2V 2681-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-063-2682-A	2V 2682-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-063-2683-A	2V 2683-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-063-2688-B	2V 2688-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-063-2689-B	2V 2689-B	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-030-2953-A	2V 2953-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-2969-A	2V 2969-A	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-2971-A	2V 2971-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-2972-A	2V 2972-A	PJJ	WHH	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-3989-B	2V 3989-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-3997-B	2V 3997-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-4000-B	2V 4000-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-067-4009-A	2V 4009-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-070-4051-B	2V 4051-B	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-070-4052-B	2V 4052-B	PJJ	WHH	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-070-4054-B	2V 4054-B	PJJ	WHG	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6560-A	2V 6560-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6561-A	2V 6561-A	PJJ	WHD	VARIOUS	VARIOUS	0	N75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6570-A	2V 6570-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6581-B	2V 6581-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6591-B	2V 6591-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6600-A	2V 6600-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6601-A	2V 6601-A	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6604-A	2V 6604-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6611-B	2V 6611-B	PJJ	WHE	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6614-B	2V 6614-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6621-B	2V 6621-B	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6628-A	2V 6628-A	PJJ	WHB	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-QV-065-6629-A	2V 6629-A	PJJ	WHD	VARIOUS	VARIOUS	0	75K7-086150-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D. Southerne 9/20/86 ____ ____ ____

CHECKED/DATE R. M. Smalter 9/20/86 ____ ____ ____

BINDER NO. WBNEQ-CABL-015 PLANT WBN UNIT(S) 1 SHEET 1 OF 31

BINDER TITLE CYPRUS/LOW VOLTAGE POWER AND CONTROL - PE INS/TVA TYPE PJJ

COMPUTED DLS DATE 9/9/86 R ___ R ___

CHECKED B DATE 9/11/86

A. DOCUMENTATION

Equipment Description 600 Volt Power and Control Cable

Vendor/Manufacturer Cyprus Cable (Rome Cable)

Equipment Model No.(s) TVA Type PJJ (1)
TVA Contracts 75K7-86150-1 and 74C7-85069-1

QUALIFICATION REPORTS

(1) Title/Number/Revision Nuclear Environmental Qualification Test Program on Various Cables Used Outside Containment (Profiles) for Tennessee Valley Authority for Use in Sequoyah & Watts Bar Nuclear Generating Stations - Wyle # 17732-1, Rev. C

RIMS B70 860228 100

DATE 2-24-86

(2) Title/Number/Revision Nuclear Environmental Qualification Test Program on Various Cables for Use in Sequoyah Nuclear Plant East & West Steam Valve Rooms & East & Team Valve Vault Instrument Rooms & WBNP North & South Steam Valve Vault Rooms & North Steam Valve Vault Instrument Rooms. Wyle Lab No. 17740-1, Rev. D.

RIMS B43 860409 500

DATE 3-4-86

(3) Title/Number/Revision _____

RIMS _____

DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(1) PJJ - Multiple - conductor cable with a core of the specified number of type PJ Single-conductors covered with a polyvinyl-chloride outer jacket.

PJ - Single-conductor wire or cable with polyethylene insulation and a polyvinyl-chloride jacket over the insulation.

EQP174.41

TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-015 PLANT WBN UNIT(S) 1 SHEET 2 OF 31

BINDER TITLE CYPRUS/LOW VOLTAGE POWER AND CONTROL - PE INS/TVA TYPE PJJ

COMPUTED DLD DATE 9/20/86 R ___ R ___

CHECKED B DATE 9/20/86

B. CONCLUSION OF REVIEW (Check only one block)

X Equipment Qualified (Pending satisfactory 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) CACTAT

2) Unverified contract and mark numbers "N" Prefix.

3) Submergence

4) Field Verification for cables 3 to 3 1/2 feet from ABGTS HEPA filter.

5) Location shown for two cables is incorrect.

COMMENTS/RECOMMENDATIONS See Summary in TAB A. Beginning at the issue date of this binder, the cable must not be used for any future installations.

EQP174.41

BINDER NO. WBNEQ-CABL-015 PLANT WBN UNIT(S) 1 SHEET 3 OF 31

BINDER TITLE CYPRUS/LOW VOLTAGE POWER AND CONTROL - PE INS/TVA TYPE PJJ COMPUTED DJ DATE 9/8/86 R ___ R ___

CHECKED B DATE 9/11/86

C. QUALIFICATION CRITERIA

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

___ USNRC DOR Guidelines, "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactor," November 1979.

X USNRC NUREG-0588, Revision 1, "Interim Staff Position on Environmental Qualification of Safety-related Electrical Equipment," July 1981.

CATEGORY I ___ , CATEGORY II X

___ 10CFR50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," February 22, 1983.

JUSTIFICATION/COMMENTS Cable on Contract 75K7-86150-1 was originally purchased for Bellefonte Nuclear Plant, but Contract Change 2 diverted shipment to Watts Bar Nuclear Plant. Cable on Contract 74C7-85069-1 was purchased for and shipped to Watts Bar Nuclear Plant. See TAB E for copy of selected sheets from these contracts.

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 323-1971

The general guidelines of IEEE 323-1974 were used as the basis for developing the qualification programs of the Wyle test reports.

EQP174.41

TVA 19537 (OE-3-86)

BINDER NO. WBNEQ-CABL-015 PLANT WBN UNIT(S) 1 SHEET 4 OF 31

BINDER TITLE CYPRUS/LOW VOLTAGE POWER AND CONTROL - PE INS/TVA TYPE PJJ

COMPUTED [illegible] DATE 9/8/86 R ___ R ___

CHECKED [illegible] DATE 9/11/86

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 tested cables were a 3-conductor No. 14 AWG and a 12-conductor No. 14 AWG from Contracts 75K7-86150-1 and 74C7-85069-1, respectively. In accordance with Table 1 of IEEE 383-1974, these cables are representative samples of the cables on those contracts. See TAB B, Section E, for comparison of tested specimens to installed cables.

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E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Insulated Conductors	Insulated Conductors	17732-1 Page I-2
(2) Manufacturer	Cyprus Cable	Cyprus Cable	"
(3) Model Number(s)	PJJ	PJJ	"
		Specimens 7&9	"
(4) Serial Number(s)	NA	NA	NA

(5) Identify Component-Unique checksheet attached: Supplement 2, Cables/Splices

JUSTIFICATION/COMMENTS See comments on page 4.

All cable descriptions which follow are extracted from vendor routine test reports in contract files (copies of contract front sheets and list of purchased cables are provided in TAB E):

Tested sample for Contract 75K7-86150-1 (Test Specimen No. 7A) (TVA Mark No. WHC):

3/c, 600 Volt, #14 AWG copper conductor, with .020" polyethylene insulation, .010 pvc conductor jacket, with .045" pvc overall jacket.

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Purchased and Installed Cables from Contract 75K7-86150-1:

2/c, 600 Volt, #10 AWG copper conductor, with .020" polyethylene insulation, .010" pvc conductor jacket, and .048 pvc overall jacket (TVA Mark No. WFB).

2/c, 3/c, 4/c, 5/c, 600 volt, and 7/c, 600 Volt, #14 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .045" minimum pvc overall jacket (TVA Mark Nos. WHB, WHC, WHD, WHE, and WHG).

9/c and 12/c, 600 Volt, #14 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .065" minimum pvc overall jacket (TVA Mark Nos. WHH, WHJ).

2/c, 3/c, 4/c, and 5/c, 600 Volt, #12 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .045" minimum pvc overall jacket (TVA Mark Nos. WGB, WGC, WGD, and WGE).

7/c and 12/c, 600 Volt, #12 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .060" minimum pvc overall jacket (TVA Mark Nos. WGG and WGK).

16/c, 600 Volt, #12 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .080" minimum pvc overall jacket (TVA Mark No. WGM).

Tested Sample for Contract 74C7-85069-1 (Test Specimen No. 9A) (TVA Mark No. WHJ):

12/c, 600 Volt, #14 AWG copper conductor, with .020" polyethylene insulation, .010" pvc conductor jacket and .060" pvc overall jacket.

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Purchased and Installed Cables From Contract 74C7-85069-1:

2/c, 3/c, and 7/c, 600 Volt, #14 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .045" pvc overall jacket (TVA Mark Nos. WHB, WHC, and WHG).

9/c, 600 Volt, #14 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .060" minimum pvc overall jacket (TVA Mark No. WHH).

2/c, 3/c, 4/c, and 5/c, 600 Volt, #12 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .045" pvc overall jacket (TVA Mark Nos. WGB, WGC, WGD, and WGE).

5/c, 7/c, and 9/c, 600 Volt, #12 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .060" pvc overall jacket (TVA Mark Nos. WGB, WGC, WGD, and WGE).

2/c, 600 Volt, #10 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .045" pvc overall jacket (TVA Mark No. WFC).

4/c, 7/c, and 9/c, 600 Volt, #10 AWG copper conductor with .020" polyethylene insulation, .010" pvc conductor jacket, and .060" pvc overall jacket (TVA Mark No. WFE, WFG, and WFH).

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F. INSTALLATION INTERFACES

Does the qualification program address all relevant interfaces of the equipment so that the installed design and configuration is similar or identical to the test configuration (yes/no/NA)? (note below)

Interface	Identify Interface Requirement	Acceptable? (Yes/No)	Reference Test Report
Mounting Bolts	NA	Yes	
External Process Connections	NA	Yes	
Electrical Connections	NA	Yes	
Conduit Seals	NA	Yes	
Connector Seals	NA	Yes	
Orientation	NA	Yes	
Physical Configuration	NA	Yes	
Other	NA	Yes	

JUSTIFICATION/COMMENTS This section is not required for cables.

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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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	17732-1 Page I-1
(b) Baseline performance measurements taken	Yes	17732-1 Page I-5, I-31 & I-33
(c) Equipment aged:		
* Thermal	Yes	17732-1 Page IV-1
* Radiation	Yes	17732-1 Page II-1
Wear	NA	See Page 15
(d) Vibration/seismic testing conducted	NA	See Page 15
(e) Design basis event (DBE) exposure	Yes	17740-1 Pages I-4, I-5, & I-18
(f) Post-DBE exposure	Yes	17740-1 Pages I-3 & I-18
(g) Final inspection and disassembly	Yes	17740-1 Page IV-1

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes
(Reference 17732-1, p xiii & 17740-1, p vi).

JUSTIFICATION/COMMENTS *Cable was radiation aged first followed by thermal aging per test reports of this binder.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference 17732-1, Pages II-1 & IV-1).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	17732-1 Page IV-1
Radiation exposure	Yes	17732-1 Page II-1&2
Vibration (non-seismic) aging	NA	See Page 15
Operational (electrical/mechanical/process) stress aging	NA	See Page 15

JUSTIFICATION/COMMENTS

(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)? No (Reference NA).

JUSTIFICATION/COMMENTS NUREG-0588 Category II evaluation.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference 17732-1, Pages VII-16, -17, & -38 thru -45).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: 17732-1, Page VII-17, -25 & -26).

JUSTIFICATION/COMMENTS

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, Page VII-17).

JUSTIFICATION/COMMENTS Aging was performed on samples for type test in accordance with IEEE 383-1974, para. 2.2 and accepted industry methods.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, page IV-1).

Parameter	Plant Maximum Normal	Test	Equivalent *
Temperature	130°F (54.4°C)	120°C	54.4°C
Time	40 years	329 hrs	40.44 years

JUSTIFICATION/COMMENTS See TAB C for additional discussion.

*Worst-case cable loading will increase temperature to 54.8°C and decrease time to 38.43 years.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference 17732-1, Page VII-17).

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 17732-1, Pages VII-25 & VII-26).

PAGE B-11

JUSTIFICATION/COMMENTS

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)? NA (Reference 17732-1, Page VII-17).

JUSTIFICATION/COMMENTS No regression line was used.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS Energizing during thermal aging was not required because the age-conditioning simulates a 40-year cable life including conductor temperature rise.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference 17732-1, Page II-1).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, Pages VII-25 & 26).

JUSTIFICATION/COMMENTS

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, Page VII-15).

JUSTIFICATION/COMMENTS Although test plan identifies the radiation dose for Specimens 7A and 9A as a 20-year dose of 6.5×10^7 rads, this is sufficient to envelop WBN 40-year dose plus accident dose (with 10% margin).

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference 17732-1, Page II-1). DLS 9/11/86 B 9/11

Plant normal ambient radiation dose (rd) 1.9×10^7

Test exposure dose (rd) 6.5×10^7 (Specimens 7A & 9A)

Test exposure dose rate (rd/hr) Specimen 7A-.0356 x 10^6
Specimen 9A-0.582 x 10^6

Test exposure source type (e.g., Co-60 gamma) Co-60 gamma

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? Yes (Reference See Page 15).

JUSTIFICATION/COMMENTS

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? Yes (Reference See Page 15).

JUSTIFICATION/COMMENTS

(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)? Yes (Reference See Page 15).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? NA (Reference See Page 15).

JUSTIFICATION/COMMENTS

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference 17732-1, Page x).

Qualified life (Document in QMDS) 38.43 years at 54.8°C and 40.44 years at 54.4°C

JUSTIFICATION/COMMENTS See TAB C - for qualified life discussion.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA (Reference).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS Cables qualified for the design life of the plant. The maximum conductor temperature for cables in this binder is 54.8°C. This is determined by the CACTAT (Cable Average Conductor Temperature and Aging Time) System. The CACTAT System is a computer program which calculates maximum conductor temperatures based on actual circuit loads and installed ambient temperatures.

GENERIC COMMENT FOR G(1)(C)WEAR, G(1)(D)VIBRATION, H(2),H(6), AND H(7)

Normal Service Related Stresses - In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards...". Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria". Included in the list that follows the above quote is one of the standards to which TVA purchased the cable in this binder: IPCEA S-19-81 Rubber-Installed Cable.

TVA also purchased the cable on Standard S-61-402, "ICEA/NEMA Standard Publication, Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electric Energy." Although not listed in IEEE 383-1974, we believe this is an acceptable and appropriate standard as it is a joint ICEA/NEMA standard. Since Paragraph 1.3.4.1 based acceptance on compliance with appropriate industry standards, all the above comments also apply to S-61-402.

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service.

GENERIC COMMENT FOR G(1)(D) SEISMIC:

Seismic testing is not required for environmental qualification by 10CFR50.49.

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COMPUTED DLB DATE 9/8/86 R ___ R ___

CHECKED [illegible] DATE 9/11/86

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)

	Material/Property/Function	Radiation Threshold	Reference 17732-1 Pages	Activation Energy	Reference 17732-1 Pages
(a)	Polyethylene	1×10^6	VII-25&26	1.18	VII-25&26
(b)	Polyvinyl Chloride	5×10^5	"	1.15	"
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS Specimens 7A and 9A have the same radiation thresholds and activation energy. DLB 9/8/86 9/11

A search was conducted of other sources to determine the acceptability of the activation energy, 1.18 eV, used by Wyle Labs. The activation energy from Digital 1000 library is 0.56 eV. The activation energies from EPRI 1558 cover a range from 1.14 eV to 1.51 eV. The 0.56 eV listed by Digital 1000 is from a Sandia Laboratories paper titled "Radiation-Thermal Degradation of PE and PVC: Mechanism of Synergism and Dose Rate Effects." This activation energy is not valid because it was calculated from material samples that had first been irradiated. Valid activation energies are those calculated on virgin materials. The value can therefore be eliminated from consideration. Based on the range of activation energies, it is our judgment that the 1.18 eV activation energy used by Wyle is acceptable.

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

(1) 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 See below).

Identify Acceptance Criteria: Cable must demonstrate ability to maintain, as a minimum, a current of 1 ampere at 132 VAC during accident simulation.

(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 See below).

Identify baseline and functional testing: Insulation resistance of 500 VDC: baseline 17732-1, Pages I-5 & I-31 & I-33; pre-HELB 17740-1, Pages I-38 and I-39. Current of 1 ampere at 132VAC maintained throughout HELB. The maximum leakage current recorded during HELB was 16.5 mA with Specimens 6, 7, 9, 11, and 39 all connected in series.

JUSTIFICATION/COMMENTS Even if all 16.5 mA could be attributed to Specimens 7A or 9A, this value of leakage current is not detrimental to power and control cable circuit performance (refer to generic binder power and control cable discussion).

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference 17740-1, Page I-1).

JUSTIFICATION/COMMENTS The loads applied during DBE for 17740-1 are on Pages I-4 and I-12.

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference 17732-1, Pages I-31 & 33).

JUSTIFICATION/COMMENTS Only insulation resistance was taken during baseline testing. The IR's were taken with a 500 VDC megger. Normally the cable is loaded at 125 VDC or 120 VAC and 1 amp.

(5) Identify electrical characteristics:

Parameter	Specified	Reference	Demonstrated	Reference
Voltage	600 VAC	75K7-86150-1 74C7-85069-1	132 VAC	17740-1 Page I-4
Load	NA	NA	1 amp	"
Frequence	NA	NA	NA	NA
Accuracy	NA	NA	NA	NA
Other(s)				

JUSTIFICATION/COMMENTS The specified information is taken from the contracts. The cables are used at 120 VAC or 125 VDC.

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BINDER TITLE CYPRUS/LOW VOLTAGE POWER AND CONTROL - PE INS/TVA TYPE PJJ COMPUTED DGS DATE 9/8/86 CHECKED B DATE 9/11/86 R R

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. See page 20 for additional discussion.

(1) Normal Max

(a) Temperature (°F) 130

(b) Pressure (psig) 14.4 psia

(c) Humidity (%) 80

(d) Radiation (rd) 1.9×10^7**

(2) Abnormal Max

(a) Temperature (°F) 140

(b) Pressure (psig) 14.4 psia

(c) Humidity (%) 90

(d) Radiation (rd) -

(3) Process Interfaces: None required.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Up to eight hours per excursion and will occur less than 1% of the life of the plant.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F) 325°F Accident type HELB

(b) Pressure (psig) 25.18 psia Accident type HELB

(c) Humidity (%) DGS 9/8/86 100% Accident type HELB

(d) Radiation (rd) B 9/11 5.9×10^7** Accident type LOCA/HELB

(e) Spray Type NA Accident type NA

**Beta radiation is not included because all cables in this binder except those in the Annulus are installed outside containment where they are not subject to Beta radiation. The beta radiation dose for cables in the annulus is 6×10^5 rads per OE Calculation WBNNAL3-004 (B45 860205 235). The total accident dose in the Annulus is only 1.26×10^7 rads (1.2×10^7 rads gamma plus 6×10^5 rads beta) and this is considerably less than the worst case dose shown above.

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OPERATING ENVIRONMENT DRAWING NUMBERS

Temperature - Normal & Abnormal Max	47E235-76R3
Temperature - Accident	47E235-76R3
Pressure - Normal & Abnormal Max	47E235-76R3
Pressure - Accident	47E235-76R3
Humidity - Normal & Abnormal Max	47E235-76R3
Humidity - Accident	47E235-76R3
Radiation - Normal & Abnormal Max	See Below
Radiation - Accident	See Below

Per OE Calculation WBNNAL3-025, worst-case normal dose is 1.9×10^7 rads.

There are cables covered by this binder in the following rooms: EGTS, ANN, ABGTS, SVR and NVR. The cables in the ABGTS are no closer than 1-1/2 feet to the HEPA filters where the maximum dose is 4.6×10^7 rads per OE Calculation TI-RPS-194 (NEB 850118 235). The total integrated dose (see L(1)) is not the sum of normal and accident doses listed in K(1) and K(5) but is the TID appearing in a particular area.

Cables in the EGTS from contracts in this binder are qualified for maximum of 5.9×10^7 rads. Cables from these contracts cannot be located any closer to the HEPA filters than 3-1/2 feet. (QIR NEB86101 - See TAB E).

Per OE Calculation WBNOSG4-003 R2 (B45 851112 218), all cables entering the Valve Vaults terminate at devices in the Valve Vaults and all these devices (except PAM devices) perform their required function to mitigate a MSLB within 9.7 seconds. This is prior to any significant superheat. Per this OE calculation, subsequent failure of cables due to higher temperatures (535°F superheat) does not have any adverse effect on the mitigation of an MSLB.

Therefore, qualification to the higher superheat temperatures is not required. No cable in this binder is used in any PAM circuits.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH margin, etc.):

NA

(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)? No (Reference IPCEA S-61-402 & S-19-81).

(7) Subject to submergence (yes/no/NA)? No
(Reference NA).

Identify initiation time and duration of submergence:

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

Type	RIMS No.
Radiation (OE Calc TI-RPS-194)	NEB 850118 235
"Post LOCA Dose Rates Around EGTS & ABGTS"	
Radiation (OE Calc WBNNAL3-023)	B45 860401 235
"Normal Operation Dose for Equipment Qualification Outside the Shield Building"	
Radiation (OE Calc WBNNAL3-004) "Accident Dose Inside Reactor Building"	B46 860205 235

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 days	319 hours	17732-1 P. VII-22
Temperature (°F)	325	340	17740-1 P. I-18
Pressure (psia)	25.18	30.4	"
Relative Humidity (%)	100	100	"
*Chemical Spray	NA	NA	NA
**Radiation (rd)	5.9×10^7	6.5×10^7	17732-1 P. II-1
Submergence	See P. 21	-	-

*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	17740-1 P. I-18
Pressure	Yes	"
Relative Humidity	Yes	"
Chemical Spray	NA	"
Submergence	See P. 21	-

JUSTIFICATION/COMMENTS For calculation on operating time, see TAB C Material Aging Calculation Report WAC-148 - Accident Degradation Equivalency.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	+15°F	Yes
Pressure: +10% but no more than 10 psig	20.7%	Yes
Radiation: +10% of accident dose	+10%	Yes
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		No
Vibration: +10% added to acceleration	NA	NA

JUSTIFICATION/COMMENTS: Frequency and vibration are not considered to be significant test parameters for cable qualification; therefore, they were not monitored. See Material Aging Calculation Report WAC-148 for verification of data that states that 319 hours is equivalent to 100 days at the specified temperature. The 10% margin on voltage is +10% of 120 VAC.

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M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference 17740-1, Page III-8).

JUSTIFICATION/COMMENTS See also TAB A. Capable of maintaining rated voltage and connected equipment required current.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference 17740-1, Page I-5).

JUSTIFICATION/COMMENTS Maintained test specified voltage and current throughout the simulated DBE.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference 17740-1, Page I-5).

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 17740-1, Page I-5).

JUSTIFICATION/COMMENTS See Material Aging Calculation Report No. 1 in TAB C.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference 17740-1, Page I-9).

JUSTIFICATION/COMMENTS All anomalies were resolved for specimens 7A and 9A addressed in this binder.

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BINDER TITLE CYPRUS/LOW VOLTAGE POWER AND CONTROL - PE INS/TVA TYPE PJJ

COMPUTED DJL DATE 9/8/86 R ___ R ___

CHECKED [illegible] DATE 9/11/86

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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS There were no maintenance or surveillance requirements identified as the results of review and evaluation of vendor and test documentation. However, TVA does have a recommended maintenance and surveillance program. (See TAB G)

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BINDER TITLE CYPRUS/LOW VOLTAGE POWER AND CONTROL - PE INS/TVA TYPE PJJ

COMPUTED DLB DATE 9/8/86 R ___ R ___

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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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	Yes
(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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TVA 19537 (OE-3-86)

0. SUMMARY 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) 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?	NA
(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

O. SUMMARY OF REVIEW (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?	Yes
(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 1-hour minimum operating time was taken, was adequate justification provided?	NA
(18) Criteria regarding synergistic effects satisfied?	NA
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

O(6)(a) See page ~~12K~~ 15, DKJ 9/11/86 BJ 9/11

O(17) Operability established for 100 days.

O(10)(a) and (b) All cables are outside containment. Therefore, chemical spray is not a consideration.

O(18) Category II qualification.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No (See Tab B, Section E).

Item	Plant TAB B Section E	Report TAB B Section E	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	"	"	Yes	17732-1 P. I-2
Size	"	"	Yes	"
Stranding	"	"	Yes	"
Coating	"	"	Yes	"
Insulation Thickness	"	"	"	"
Number of conductors	"	"	"	"
Arrangement of conductors	-	-	"	"
(b) Shielding	-	-	NA	NA
(c) Insulation jacket				
Material ---	TAB B Sec E	TAB B Sec E	Yes	17732-1 p I-2 "
Thickness ---	"	"	"	"
(d) Outer jacket				
Material ---	"	"	"	"
Thickness ---	"	"	"	"

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	* 600 VAC	132 VAC	Yes	17740-1, p I-4 & I-12
(f) Rated current	NA	1 AMP	Yes	
(g) Operating temperature rating				
	Rated Conductor Temperature			17732-1
Normal	75°C **	60°C	Yes	p VII-18
Emergency	NA	NA	NA	NA
Short circuit	"	"	"	"
(h) Insulation resistance	"	"	"	"
(i) Splice				
Material	"	"	"	"
Thickness	"	"	"	"
Identification	"	"	"	"

Comments: See TAB B, Section E. Actual cable construction was determined by TVA from contract routine test reports using mark number and contract number shown in Wyle Qualification Report.
* Rated voltage of installed cable is 600 V; however, PJJ type cable is only installed in 120 VAC or 125 VDC or less circuits.
** Qualified life is based on 54.4°C or 54.8°C max conductor temperature. See Tab C.

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(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference contracts).

Comments: Cable is qualified for temperature and moisture resistance for normal operation because it has been manufactured and routine tested in accordance with S-61-402.

(3) Was the cable energized during test (yes/no/NA)? Yes
(Reference 17740-1, P. I-4 & I-12).

Comments:

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference 17740-1, P. II-8).

Comments: Specimen 7A had a maximum of 180 microamps leakage current at 240 VAC and specimen 9A had a maximum of 223 microamps at 240 VAC. These values of leakage current are not detrimental to circuit performance for 120VAC/125VDC power and control cables. Refer to Generic Binder discussion for power and control cables.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference 17740-1, P. I-38 & 39).

Comments:

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? No (Reference).

Comments: Mandrel bend and voltage withstand test was not part of the test program. The 4.37 x OD (specimen 7A) and 4 x OD (specimen 9A) bend radii applied to the tested cables is considerably smaller than the 40 x OD bend radius applied to cables tested in accordance with IEEE 383-1974.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference IPCEA S-19-81).

Identify flame test standard: IPCEA S-19-81

Comments:

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-017
MANUFACTURER : EATON

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@CR-264-1701-A	1CR1701-A	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@CR-264-1702-B	1CR1702-B	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@NM-092-0209-E	1NM 209-E	MS	WVC	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@NM-092-0210-E	1NM 210-E	MS	WVC	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-033-1065-A	1PL1065-A	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0495-E	1PM 495-E	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0507-D	1PM 507-D	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0516-D	1PM 516-D	MS	WVC	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0517-D	1PM 517-D	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0590-D	1PM 590-D	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0591-D	1PM 591-D	MS	WVC	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0594-D	1PM 594-D	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0616-E	1PM 616-E	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0636-E	1PM 636-E	MS	WVC	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0647-E	1PM 647-E	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0685-D	1PM 685-D	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0686-D	1PM 686-D	MS	WVC	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0690-D	1PM 690-D	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0706-E	1PM 706-E	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0725-F	1PM 725-F	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0727-F	1PM 727-F	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0740-F	1PM 740-F	MS	WVC	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0742-F	1PM 742-F	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0777-E	1PM 777-E	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0784-E	1PM 784-E	MS	WVC	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0801-E	1PM 801-E	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0871-D	1PM 871-D	MS	WVC	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0891-E	1PM 891-E	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0933-F	1PM 933-F	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0941-G	1PM 941-G	MS	WVC	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0942-G	1PM 942-G	MS	WVC	VARIOUS	VARIOUS	0	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0988-E	1PM 988-E	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-1071-E	1PM1071-E	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-1313B-D	1PM1313-D	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-1325-E	1PM1325-E	MS	WVA	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-1326-E	1PM1326-E	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-1360-G	1PM1360-G	MS	WVA	VARIOUS	VARIOUS	0	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	[illegible] 9/21/86	____	____	____
CHECKED/DATE	R.C. White 9/22/86	____	____	____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APM-003-1381-G	1PM1381-G	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1416-E	1PM1416-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1453-D	1PM1453-D	MS	WVA	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1465B-E	1PM1465-E	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1466-E	1PM1466-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1480-E	1PM1480-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1506-G	1PM1506-G	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1535B-D	1PM1535-D	MS	WVA	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1572B-D	1PM1572-D	MS	WVA	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1585B-E	1PM1585-E	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1586-E	1PM1586-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1607-E	1PM1607-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1626-G	1PM1626-G	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1655B-D	1PM1655-D	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1693B-D	1PM1693-D	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1705B-E	1PM1705-E	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1706-E	1PM1706-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1741-G	1PM1741-G	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1771-E	1PM1771-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-2238-A	1PM2238-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2240-A	1PM2240-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2244-A	1PM2244-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2440-B	1PM2440-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2442-B	1PM2442-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2546-B	1PM2546-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2547-B	1PM2547-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-3195A-A	1PM3195-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-3320-A	1PM3320-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-3322-A	1PM3322-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-3324-A	1PM3324-A	MS	WVA	VARIOUS	VARIOUS	O	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-3330-B	1PM3330-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-3332-B	1PM3332-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-3334-B	1PM3334-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-4360-B	1PM4360-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-067-4370-A	1PM4370-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4453-B	1PM4453-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-4463-A	1PM4463-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	L. [illegible] 9/21/86	-----	-----	-----
CHECKED/DATE	R.K. White 9/22/86	-----	-----	-----

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	*IM	**CONTRACT	CA I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PM-003-4468-A	1PM4468-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4473-B	1PM4473-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4478-A	1PM4478-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4483-A	1PM4483-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4490B-A	1PM4490-A	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4493-A	1PM4493-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4495B-B	1PM4495-B	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4497-B	1PM4497-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4498-B	1PM4498-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4500B-B	1PM4500-B	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4502-B	1PM4502-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4505B-A	1PM4505-A	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-063-4781-D	1PM4781-D	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-063-4790-E	1PM4790-E	MS	WVA	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-063-4791-E	1PM4791-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-063-4800-F	1PM4800-F	MS	WVA	VARIOUS	VARIOUS	I	N77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5146-E	1PM5146-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5147-E	1PM5147-E	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5148-E	1PM5148-E	MS	WVA	VARIOUS	VARIOUS	I	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0053-A	1RM 53-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0056-B	1RM 56-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0381-B	1RM 381-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0393-B	1RM 393-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0397-A	1RM 397-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0422-A	1RM 422-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0427-B	1RM 427-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0431-A	1RM 431-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0435-B	1RM 435-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0256-S	1SG 256-S	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-0980-A	1V 980-A	MS	WVC	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1010-B	1V 1010-B	MS	WVC	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PM-067-3320-A	2PM3320-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PM-067-3322-A	2PM3322-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PM-067-3324-A	2PM3324-A	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PM-067-3330-B	2PM3330-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PM-067-3332-B	2PM3332-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PM-067-3334-B	2PM3334-B	MS	WVA	VARIOUS	VARIOUS	O	77K5-821722-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	____	____	____
CHECKED/DATE	R.K. White 9/22/86	____	____	____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-017
MANUFACTURER : EATON

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APM-068-0605-D	1PM 605-D	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0615-E	1PM 615-E	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0625-F	1PM 625-F	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0695-D	1PM 695-D	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0705-E	1PM 705-E	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0710-F	1PM 710-F	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0790-D	1PM 790-D	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0800-E	1PM 800-E	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0810-F	1PM 810-F	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0880-D	1PM 880-D	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0890-E	1PM 890-E	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-0900-F	1PM 900-F	MS	WVA	VARIOUS	VARIOUS	I	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5420-D	1PM5420-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-068-5430-E	1PM5430-E	MS	WVA	VARIOUS	VARIOUS	O	79K5-824860-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

		R____	R____	R____
PREPARER/DATE	[illegible] 9/21/86	____	____	____
CHECKED/DATE	R.K. White 9/22/86	____	____	____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-017
MANUFACTURER : EATON

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EGIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PM-062-0031-G	1PM 31-G	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0949-D	1PM 949-D	MS	WVA	VARIOUS	VARIOUS	I	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-0987-E	1PM 987-E	MS	WVA	VARIOUS	VARIOUS	I	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-1007-F	1PM1007-F	MS	WVA	VARIOUS	VARIOUS	I	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-1040-D	1PM1040-D	MS	WVA	VARIOUS	VARIOUS	I	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-1305-E	1PM1305-E	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-1445-E	1PM1445-E	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-1474-D	1PM1474-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-1490-F	1PM1490-F	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-1563-E	1PM1563-E	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-1595-D	1PM1595-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-1613-F	1PM1613-F	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-1635-E	1PM1685-E	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-4420-A	1PM4420-A	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-4425-B	1PM4425-B	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-001-4435-B	1PM4435-B	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4470-B	1PM4470-B	MS	WVA	VARIOUS	VARIOUS	O	N79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-063-4780-D	1PM4780-D	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5133-E	1PM5133-E	MS	WVB	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5139-E	1PM5139-E	MS	WVB	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5141-E	1PM5141-E	MS	WVB	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5143-E	1PM5143-E	MS	WVB	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5145-E	1PM5145-E	MS	WVB	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5169-D	1PM5169-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5170-D	1PM5170-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-068-5171-D	1PM5171-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-090-0202-A	1PS 202-A	MS	WVA	VARIOUS	VARIOUS	O	79K5-825852-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	_____	_____	_____
CHECKED/DATE	R.K. White 9/22/86	_____	_____	_____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-017
MANUFACTURER : EATON

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*PM	**CONTRACT	CA I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APM-062-0007-D	1PM 7-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-062-0494B-E	1PM 494-E	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1222B-F	1PM1222-F	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1231B-G	1PM1231-G	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1240B-G	1PM1240-G	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1289-D	1PM1289-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1335-D	1PM1335-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1347-E	1PM1347-E	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1380B-G	1PM1380-G	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1400B-F	1PM1400-F	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1415B-E	1PM1415-E	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1429-D	1PM1429-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1505B-G	1PM1505-G	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1520B-F	1PM1520-F	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1547-D	1PM1547-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1625B-G	1PM1625-G	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1640B-F	1PM1640-F	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1667-D	1PM1667-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1715-D	1PM1715-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1723-E	1PM1723-E	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-001-1729-G	1PM1729-G	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1740B-G	1PM1740-G	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1755B-F	1PM1755-F	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-1770B-E	1PM1770-E	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-030-1834-G	1PM1834-G	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-030-1840-F	1PM1840-F	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-030-1854-D	1PM1854-D	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-077-2080-B	1PM2080-B	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-072-2232-F	1PM2232-F	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-2236-A	1PM2236-A	MS	WVA	VARIOUS	VARIOUS	O	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-2235-A	1PM2285-A	MS	WVA	VARIOUS	VARIOUS	O	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-072-2430-G	1PM2430-G	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-2444-B	1PM2444-B	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-3805-B	1PM3805-B	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-3810-A	1PM3810-A	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-070-3811-A	1PM3811-A	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APM-003-3926-B	1PM3926-B	MS	WVA	VARIOUS	VARIOUS	O	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	____	____	____
CHECKED/DATE	R.K. White 9/22/86	____	____	____

PRINT DATE: 09/21/86

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PM-003-3990-A	1PM3990-A	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-3995-A	1PM3995-A	MS	WVA	VARIOUS	VARIOUS	0	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4450-B	1PM4450-B	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4455B-B	1PM4455-B	MS	WVA	VARIOUS	VARIOUS	I	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4456-B	1PM4456-B	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4458-B	1PM4458-B	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4460-A	1PM4460-A	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4480-A	1PM4480-A	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4485B-B	1PM4485-B	MS	WVA	VARIOUS	VARIOUS	I	N79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4486-B	1PM4486-B	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4488-B	1PM4488-B	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4496-B	1PM4496-B	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PM-003-4501-B	1PM4501-B	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-099-0163-A	1PS 163-A	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-099-0166-A	1PS 166-A	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-099-0168-A	1PS 168-A	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-099-0187-B	1PS 187-B	MS	WVA	VARIOUS	VARIOUS	0	79K5-825874-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	[illegible] 9/21/86	_____	_____	_____
CHECKED/DATE	R. L. White 9/22/86	_____	_____	_____

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 1 OF 30

BINDER TITLE EATON SIGNAL CABLE - XLPO INS/TVA TYPE MS COMPUTED LAQ DATE 9/21/86 R R

CHECKED RKW DATE 9/22/86

A. DOCUMENTATION

Equipment Description Signal Cable

Vendor/Manufacturer Eaton Corporation (formerly Samuel Moore)

Equipment Model No.(s) TVA Type MS* Mark Nos.** (WVA, WVB & WVC)

TVA Contracts: 77K5-821722***, 79K5-824860, 79K5-825852, & 79K5-825874

QUALIFICATION REPORTS

(1) Title/Number/Revision Edited Version of Qualification Test on Electric Cables, No. 558-1088C RIMS B70 860522 003 DATE Jan. 12, 1982

(2) Title/Number/Revision _____ RIMS _____ DATE _____

(3) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

1. TAB E-1 Eaton's letter to TVA regarding jacket material dated 6-25-1986 (B70 86 0625 005).
2. TAB E-2 Excerpts from NUREG-CR-3588.
3. TAB E-3 Samuel Moore's letter to TVA transmitting the Arrhenius evaluation dated 3-28-1978 (EEB 78 0403 022).
4. TAB E-4 Memorandum from T. B. Northern Jr. to R. M. Pierce dated 5-9-1978 (WBN 78 0524 011).
5. TAB E-5 Memorandum from R. M. Pierce to T. B. Northern Jr. dated 5-9-1978 (EEB 78 0516 924).
6. TAB E-6 Eaton's letter to TVA in ragard of Contract 79K5-825852 dated 5-8-1986 (B43 860512 004).
7. TAB E-7 TVA's letter to Eaton in regard of contract 79K5-825852 dated 5-28-1986 (B43 86 0528 924).
8. TAB E-8 TVA's letter to Eaton dated 7-5-1983 (EEB 83 0707 006).
9. TAB E-9 TVA's letter to Samuel Moore dated 1-2-1979 (EEB 79 0104 904).
10. TAB E-10 Samuel Moore's letter to TVA dated 12-5-1978 (B70 851002 101).
11. TAB E-11 Samuel Moore's letter to TVA dated 11-27-1978 (EEB 78 1201 003).

12. TAB E-12 Samuel Moore's letter to TVA dated 9-14-1977 (B70 851002 102).
13. TAB E-13 Samuel Moore's letter to TVA dated 9-13-1977 (B70 851002 103).
14. TAB E-14 Samuel Moore's letter to TVA dated 6-14-1977 (B70 851002 104).
15. TAB E-15 Memorandum from J. L. Parris to F. W. Chandler dated 10-31-1977 (QEB 771031 160).
16. TAB E-16 Eaton's letter to TVA dated 5-14-1986 (R01 860522 003).

*MS - Multiconductor signal cable with shield and overall jacket.

**WVA - 2/C No. 16 AWG, cross-linked polyethylene insulation, color coded, shielded, and 90°C conductor temperature, light stabilized chlorosulfonated polyethylene jacket.

WVB - 3/C No. 16 AWG, same as WVA.

WVC - 4/C No. 16 AWG, same as WVA.

***Reel numbers 7134, 7135, 7136, 7137, 7138 & 7139 were manufactured by using dechlorane insulation. Cables from these reels don't have to be qualified in this binder since they are identified being connected to Category C circuits.

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 3 OF 30

BINDER TITLE EATON SIGNAL CABLE - XLPO INS/TVA TYPE MS COMPUTED MAQ DATE 9/21/86 R ___ R ___

CHECKED RKW DATE 9/22/86

B. CONCLUSION OF REVIEW (Check only one block)

X Equipment Qualified (Pending 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. Ensure that agreement between design and installation records is established and documented.

2. Rerouting of cables subject to submergence inside the primary containment.

3. The measured values documented in this binder must be evaluated to ensure acceptable performace.

4. Rerouting of cables as a result of non-EQ design changes.

5. Calculation of beta radiation attenuation in flexible conduits inside containment.

COMMENTS/RECOMMENDATIONS Current and future installations of cables represented by this binder are subject to the limitations stated below.

1. Cables inside containment shall not be routed through or terminated in areas that have a 40-year TID & accident dose greater than 200 Megarads.

2. Cables are not qualified for submergence.

3. These cables have not been qualified for use at continuous conductor temperature greater than 89°C.

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 4 OF 30

BINDER TITLE EATON SIGNAL CABLE - XLPO INS/TVA TYPE MS

COMPUTED YAQ DATE 9/21/86 R ___ R ___

CHECKED RLW DATE 9/22/86

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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 323-1974

IEEE 383-1974

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 5 OF 30

BINDER TITLE EATON SIGNAL CABLE - COMPUTED YAQ DATE 9/21/86 R ___ R ___

XLPO INS/TVA TYPE MS CHECKED RLW DATE 9/22/86 ___ ___

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 For qualification purposes, the tested cable is representative of the TVA cables based on the guidelines in IEEE Standard 383-1974, Table 1, "Representative Cables for Type Tests."

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 6 OF 30

BINDER TITLE EATON SIGNAL CABLE - XLPO INS/TVA TYPE MS COMPUTED [illegible] DATE 9/21/86 R ___ R ___

CHECKED [illegible] DATE 9/22/86

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Induction Signal Cable	Signal Cable	Test Rpt., p.2
(2) Manufacturer	Eaton (Samuel Moore)	Eaton (Samuel Moore)	Test Rpt., p.2
(3) Model Number(s)	*TVA Type MS		
(4) Serial Number(s)	Schedule 8E-2	Schedule 8E-2	Test Rpt., p.2

(5) Identify Component-Unique checksheet attached: See Supplement 2, TAB B

JUSTIFICATION/COMMENTS *TVA Type MS cable is a multiconductor insulated signal cable (not paired) with shield and overall jacket.

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 7 OF 30

BINDER TITLE EATON SIGNAL CABLE - COMPUTED YAQ DATE 9/21/86 R ___ R ___

XLPO INS/TVA TYPE MS CHECKED RKW DATE 9/22/86

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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	NA		
Electrical Connections	NA		
Conduit Seals	NA		
Connector Seals	NA		
Orientation	NA		
Physical Configuration	NA		
Other			

JUSTIFICATION/COMMENTS Not applicable to cable qualification.

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 8 OF 30

BINDER TITLE EATON SIGNAL CABLE - XLPO INS/TVA TYPE MS COMPUTED SAQ DATE 9/21/86 R ___ R ___

CHECKED RKW DATE 9/22/86

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	*No	Test Rpt. IR measurement, p 8
(b) Baseline performance measurements taken	Yes	Test Rpt., p 7
(c) Equipment aged:		
Thermal	Yes	Test Rpt., pp 1-4
Radiation	Yes	Test Rpt., pp 1-4
Wear	No	TAB C, Sect. B
(d) Vibration/seismic testing conducted	NA	TAB C, Sect. B
(e) Design basis event (DBE) exposure	Yes	Test Rpt., pp 4-5
(f) Post-DBE exposure	Yes	Test Rpt., pp 4-5
(g) Final inspection and disassembly	Yes	Test Rpt., pp 6-9

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes
(Reference Test Report, Appendix B).

JUSTIFICATION/COMMENTS *The test report did not state if an inspection was performed; however, it is highly unlikely a damaged specimen was tested since the specimen successfully completed the 100-day LOCA simulation and HI-POT Test and periodic IR measurements.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference Report, pp 1-4).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	Report, pp 1-4
Radiation exposure	Yes	Report, pp 1-4
Vibration (non-seismic) aging	NA	TAB C, Section B
Operational (electrical/mechanical/process) stress aging	NA	TAB C, Section B

JUSTIFICATION/COMMENTS

(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)? Yes (Reference TAB C, Section C).

JUSTIFICATION/COMMENTS

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report, pp 1-4).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: Report, Table 1).

JUSTIFICATION/COMMENTS

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Report, pp 3-4).

JUSTIFICATION/COMMENTS See Ref. TAB E (B43 860 512 004).

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference Report, pp 3-4).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	130°F	164°C/ 121°C	90°C
Time	40 years	143.9/ 168 hrs	40 years

JUSTIFICATION/COMMENTS See TAB C, Section D.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section D.

(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)? NA (Reference).

JUSTIFICATION/COMMENTS Vendor specific regression curve used.

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)? Yes (Reference TAB C, Section D).

JUSTIFICATION/COMMENTS Vendor used 40 percent loss of elongation as end point.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS Accelerated aging temperature more than accounts for expected energized heat rise. Heat rise is negligble for instrument cables since the load current is in the milliamps.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Report, p 3).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Report, p 2).

JUSTIFICATION/COMMENTS

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report, p 1).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report, Appendix A).

Plant normal ambient radiation dose (rd) 1.0E+08

Test exposure dose (rd) 2E+08

Test exposure dose rate (rd/hr) 0.45 Mrads/hr to 35 Mrads
0.54 Mrads/hr to 165 Mrads

Test exposure source type (e.g., Co-60 gamma) Cobalt 60

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section B.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section B.

H. AGING (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)? No (Reference ___).

JUSTIFICATION/COMMENTS See TAB C, Section B.

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? NA (Reference ___).

JUSTIFICATION/COMMENTS See TAB C, Section B.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference Test Report, pp 7 & 8).

Qualified life (Document in QMDS) 40 years

JUSTIFICATION/COMMENTS See TAB C, Section D.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? No (Reference ___).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS No replacement intervals are required since the cable was qualified for the life of the plant.

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 14 OF 30

BINDER TITLE EATON SIGNAL CABLE - XLPO INS/TVA TYPE MS

COMPUTED [illegible] DATE 9/21/86 R ___ R ___

CHECKED RKW DATE 9/22/86

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 Threshold	Reference	Activation Energy	Reference
(a)	Cross-Linked Polyolefin (8E-2)	3.8×10^5	Insulation	1.43	Test Report p 2.
(b)					
(c)					
(d)					

JUSTIFICATION/COMMENTS

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

(1) 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 C, Section E).

Identify Acceptance Criteria: Cable functioned throughout the LOCA simulation within the test specified conditions (600 VAC; 0.5 A), and successfully passed a post-LOCA mandrel bend and voltage withstand test (at 80 VAC/mil). These conditions meet IEEE 383-1974 requirements.

(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 TAB C, Section E).

Identify baseline and functional testing: IR measurements were performed at the beginning of the test program, after each aging period, periodically during the DBA steam exposure, and at the conclusion of the test. Cables were energized throughout the LOCA simulation except during the IR testing.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report, p 4).

JUSTIFICATION/COMMENTS Cable was energized at 600 VAC at 0.5 A throughout the DBA steam/spray exposure.

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference Report, pp 7-9).

JUSTIFICATION/COMMENTS Initial check was for IR and continuity only. Qualification for normal operation established through manufacturing and testing per IPCEA S-66-524.

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	52V dc (transmitters)	Binder WBNEQ-XMTR-001
Load	10 ma	Binder WBNEQ-XMTR-001
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	600 VAC	Rpt., p 4
Load	0.5 A	Rpt., p 4
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-42 R2 & -76 R3

(1) Normal Max

(a) Temperature (°F) 130

(b) Pressure (psig) 14.7 psia

(c) Humidity (%) 80

(d) Radiation (rd) 1.0E+08

(2) Abnormal Max

(a) Temperature (°F) 140

(b) Pressure (psig) 14.7 psia

(c) Humidity (%) 100

(d) Radiation (rd) NA

(3) Process Interfaces: None.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Abnormal service condition duration is less than 8 hours per occurrence and total time does not exceed 1 percent of the plant life. This will have no significant impact on cable qualification.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	327**	Accident type LOCA/HELB
(b) Pressure (psig)	25.6	Accident type LOCA/HELB
(c) Humidity (%)	100	Accident type LOCA/HELB
(d) Radiation (rd)	*4.0E+07 gamma 4.7E+08 beta	Accident type LOCA
(e) Spray Type	Chemical spray	Accident type LOCA/HELB

*See TAB C, Section F, for explanation of radiation values.

**The cable peak temperature was calculated for the cable inside conduits in the valve vaults (WBNNAL6-001) after a postulated MSLB. With TSI fireproof insulation of the conduit carrying the electrical cable, the peak temperature was calculated to be 220.2°F at 5500 seconds.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Spray durations is 30 days at 0.92 gpm/ft^2. Chemical composition is 0.1847 molar $HaBO_3$ in solution (2000 ppm boron) with 0.033 molar NaOH with an overall pH of 8.3. See TAB C, Section G, for spray considerations.

(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)? No (Reference IEEE 383-1974 & MFR testing).

(7) Subject to submergence (yes/no/NA)? No

(Reference See TAB C, Section H).

Identify initiation time and duration of submergence: _____

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

Type	RIMS No.
Temperature (WBNNAL6-001)	B45 850912 235
Superheat Steam (WBNOSG4-003)	B45 851112 218

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BINDER TITLE EATON SIGNAL CABLE - COMPUTED HAQ DATE 9/21/86 R ___ R ___

XLPO INS/TVA TYPE MS CHECKED RKW DATE 9/22/86

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 days	100 days	Rpt., Fig.1
Temperature (°F)	327	375	Rpt., Fig. 1
Pressure (psig)	25.6 psia	72 psig	Rpt., Fig. 1
Relative Humidity (%)	100	100	Rpt., p 5
*Chemical Spray	See K(5) Comments	See TAB C, Section G	Rpt., p 5
**Radiation (rd)	1.4E+08 gamma & 4.7E+08 beta	2.0E+08	Rpt., pp 3 & 4
Submergence	See TAB C, Section H	5 min.	Rpt., p 8

*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	Rpt., Fig. 1
Pressure	Yes	Rpt., Fig. 1
Relative Humidity	Yes	Rpt., p 5
Chemical Spray	Yes	Rpt., p 5
Submergence	*Yes	Rpt., p 8

JUSTIFICATION/COMMENTS *See TAB C, Section H.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	>15°F	Yes
Pressure: +10% but no more than 10 psig	>10 psig	Yes
Radiation: +10% of accident dose	**	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	None	*
Voltage: ±10% of rated value	>10%	Yes
Frequency: ±5% of rated value	NA	Not applicable to instr. cable
Environmental Transient: the initial transient and the peak temperature applied twice	Two Transients	Yes
Vibration: +10% added to acceleration	NA	See TAB C, Section B

JUSTIFICATION/COMMENTS: Test condition margins applied to postulated profile and plant conditions.

*Test time acceptable as equivalant degradation received is much greater than required (see TAB C, Section D).

** Beta radiation is an open item.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment:
(Reference See TAB A.)

JUSTIFICATION/COMMENTS To maintain continuity and integrity of voltage and current to Class 1E equipment.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes
(Reference Report, pp 8 & 9).

JUSTIFICATION/COMMENTS Cable maintained electrical integrity at 600 VAC and 0.5 A lead throughout the test. See TAB C, Section E.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes
(Reference Report, pp 8 & 9).

JUSTIFICATION/COMMENTS Electrical and mechanical integrity was demonstrated with post-test mandrel bend and voltage withstand tests in accordance with IEEE 383-1974.

(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 Report, pp 8 & 9).

JUSTIFICATION/COMMENTS See TAB C Section D.

M. OPERABILITY TEST RESULTS (Continued)

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes
(Reference Report, Appendix C).

JUSTIFICATION/COMMENTS We have reviewed the anomalies addressed in this report and determined they have no effect on the qualification of these cables to the WBN requirements.

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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS See TAB G. There are no surveillance or maintenance requirements identified from the vendor or test documentations however, TVA does have a maintenance and surveillance program at the plant.

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 25 OF 30

BINDER TITLE EATON SIGNAL CABLE - XLPO INS/TVA TYPE MS

COMPUTED YAQ DATE 9/21/86 R ___ R ___

CHECKED RLW DATE 9/22/86

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)?	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?	No See TAB C, Section B
(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

0. SUMMARY 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) 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?	Yes
(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

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA for Cable
(17) Test duration margin (1 hour + function time) satisfied?	Yes See TAB C, Section D
(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. DISCUSSION

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	XLPO	XLPO	Yes	Table 1
Size	16 AWG	16 AWG	Yes	Table 1
Stranding	7	7	Yes	Table 1
Coating	tinned copper	tinned copper	Yes	Table 1
Insulation Thickness	25 mil	25 mil	Yes	Table 1
Number of conductors	2, 3, or 4	2	Yes	Table 1
Arrangement of conductors	twisted	twisted	Yes	Table 1
(b) Shielding	2 mil al/mylar tape	2 mil al/mylar tape	Yes	per contracts
(c) Insulation jacket				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
(d) Outer jacket				
Material	Hypalon	Hypalon	Yes	Table 1
Thickness	45 mil	45 mil	Yes	Table 1

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 29 OF 30

BINDER TITLE EATON SIGNAL CABLE - XLPO INS/TVA TYPE MS COMPUTED LAQ DATE 9/21/86 R ___ R ___

CHECKED RWW DATE 9/22/86

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	___	600 V	Yes	Test Rpt., p 4
(f) Rated current	*	.5 amp	Yes	p 4
(g) Operating temperature rating				
Normal	54.45°C	90°C	Yes	per contract
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	___	___	Yes	Table 2
(i) Splice				
Material	___	NA	___	___
Thickness	___	NA	___	___
Identification	___	NA	___	___

Comments: *See TAB C, Section A.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference Contract Requirements).

Comments: Cable is manufactured to IPCEA-NEMA Std. S-66-524.

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference Test Report, p 4).

Comments: ___

BINDER NO. WBNEQ-CABL-017 PLANT WBN UNIT(S) 1 SHEET 30 OF 30

BINDER TITLE EATON SIGNAL CABLE - XLPO INS/TVA TYPE MS COMPUTED YAQ DATE 9/21/86 R ___ R ___

CHECKED RKW DATE 9/22/86

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report, pp 7-9).

Comments: 40 x mandrel bend and 5 minutes - 80V/mil (2000 VAC) hi-pot while immersed in water.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference Report, pp 7-9).

Comments: Periodic IR measurements were made and recorded throughout the test at 500 VDC.

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report, pp 7-9).

Comments: Mandrel bend and voltage withstand tests were performed at the end of the 100-day LOCA test.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference ___).

Identify flame test standard: IEEE 383-1974, paragraph 2.5.4.

Comments: Flame test data is included in TAB E.

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-022
MANUFACTURER : ESSEX

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	*BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-APP-082-0540B-B	OPP 540-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	N76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-APP-082-0660A-B	OPP 660-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	N76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-268-3381-B	1M 3381-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AM-043-3485-B	1M 3485-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-078-6381-B	1PL6381-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-078-6386-A	1PL6386-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-090-0021-A	1PV 21-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	N76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-003-0102-A	1PV 102-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-065-0104-A	1PV 104-A	PXMJ	WFB-1	VARIOUS	VARIOUS	O	N76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-090-0139B-B	1PV 139-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	N76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-003-0182-B	1PV 182-B	PXMJ	WFB-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-068-0604-E	1PV 604-E	PXMJ	WFB-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-068-0605-D	1PV 605-D	PXMJ	WFB-1	VARIOUS	VARIOUS	O	N76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5641-A	1V 5641-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-068-5661-B	1V 5661-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-7606-A	1V 7606-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-7616-A	1V 7616-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-7646-B	1V 7646-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-001-7656-B	1V 7656-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-8772-B	1V 8772-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-8778-B	1V 8778-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-8780-B	1V 8780-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-8781-B	1V 8781-B	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9595-A	1V 9595-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9604-A	1V 9604-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9613-A	1V 9613-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9622-A	1V 9622-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-043-9631-A	1V 9631-A	PXMJ	WHE-1	VARIOUS	VARIOUS	O	76K5-820013-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	K.R. Fleischer	9-21-86	____	____
CHECKED/DATE	R.K. White 9/22/86	[illegible] 9/22/86	____	____

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 1 OF 27

BINDER TITLE ESSEX/LOW VOLTAGE POWER & CONTROL-XLPE INS./TVA TYPE PXMJ COMPUTED K DATE 9-20-86 CHECKED RKW DATE 9/22/86 R R

A. DOCUMENTATION

Equipment Description: Cable (600 Volt Power or Control)

Vendor/Manufacturer: Essex Group, Power Conductor Division

Equipment Model No.(s): TVA Type PXMJ (XLPE/CSPE)*

TVA Contract No.: 76K5-820013

QUALIFICATION REPORTS

(1) Title/Number/Revision Isomedix Report Performed for Essex Qualification Test of Thermally Aged Electric Cables under a Simulated LOCA/DBE by Sequential Exposure to Environments of Radiation, Steam, and Chemical Spray RIMS B70 851005 104 DATE Feb. 1976

(2) Title/Number/Revision _____ RIMS _____ DATE _____

(3) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(2) Essex letter to TVA dated February 9, 1984 (EEB 840221 009)
(3) Pages VIII-48 and VIII-35 of Wyle Test Report No. 17513-1.
(4) WBPE VAR8604005 Data for Class 1E Cables and Splices in Harsh Environments 10CFR50.49, Rev. 1, (B26 860708 005), dated July 7, 1986
(5) Watts Bar Cable Average Conductor Temperature Analysis Testing (CACTAT) Study dated 08/07/86, pages 29 & 30
(6) TVA Contract 76K 5-820013 dated November 28, 1975
(7) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WFB-1, dated October 29, 1976
(8) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WFB-1, dated November 4. 1976
(9) Essex Certification of Compliance for Contract 75K5-820013, Mark No. WFB-1, dated December 10,1976
(10) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WFB-1, dated July 13, 1977
(11) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WHE-1, dated September 6, 1977
(12) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WHE-1, dated October 6, 1977

(13) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WHE-1, dated February 16, 1978
(14) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WHE-1, dated May 12, 1977
(15) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WHE-1, dated June 15, 1977
(16) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WHE-1, dated April 19, 1977
(17) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WHE-1, dated February 12, 1977
(18) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WHE-1, dated March 10, 1977
(19) Essex Certification of Compliance for Contract 76K5-820013, Mark No. WHE-1, dated January 12, 1977

*PXMJ - TVA type designation for 600 volt power or control cable, multiple-conductor conductor cable with a core of the specified number of PX single conductors (flame retardent cross-linked polyethylene) and covered with a chlorosulfonated polyethylene outer jacket.

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 2 OF 27

R R

BINDER TITLE ESSEX/LOW VOLTAGE POWER COMPUTED K DATE 9-22-86

& CONTROL-XLPE INS./TVA TYPE PXMJ CHECKED RHW DATE 9/22/86

B. CONCLUSION OF REVIEW (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

Open Item #1: Submergence of Class 1E cables in the South Vault Room (SVR).

Open Item #2: Confirmation is required from vendor that tested cable sample is similar to installed cable.

Open Item #3: Reroute of cables as a result of non-EQ design changes.

Open Item #4: Reference to CACTAT using preliminary load and duty cycle data without supporting formal OE Calculation.

Open Item #5: Ensure that agreement between design and installation records is established and documented.

COMMENTS/RECOMMENDATIONS Cables furnished on Contract 76K5-820013 have been demonstrated to be qualified for 40-year life at 44.3°C (excluding SVR cables 1V-7606-A, 1V-7616-A, 1V-7646-B & 1V-7656-B which are qualified for 10.93 years at 130°F (54.44°C)), including one DBA and 100-day post-accident operating time to environmental parameters (profiles) which exceed WBN's worst case outside containment (where cables are installed) operating parameters. The intention of this binder is to document qualification only for those cables that were installed as of Revision 0 of this binder. These cables are not considered suitable for future installation. See Open Item #1.

C. 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

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

The qualification program generally adhered to the guidelines of IEEE 383-1974 and IEEE 323-1974. The requirements of IEEE 323-1974 have been met.

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 4 OF 27

BINDER TITLE ESSEX/LOW VOLTAGE POWER COMPUTED K DATE 9-20-86 R ___ R ___

& CONTROL-XLPE INS./TVA TYPE PXMJ CHECKED RKW DATE 9/22/86

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 Tested representative sample in accordance with IEEE 383-1974 (see TAB B, Section E).

The applicable sample is identified in Tab D as Isomedix Tag No. 28 and Essex Tag No. 63-780. Sample identification along with specific construction details are in accordance with the May 14, 1986 telecon between Essex's Bob Schoolcraft (317-447-9464) and TVA's K. W. Brown. See Open Item #2.

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 5 OF 27

BINDER TITLE ESSEX/LOW VOLTAGE POWER COMPUTED K DATE 9-20-86 R ___ R ___

& CONTROL-XLPE INS./TVA TYPE PXMJ CHECKED RKW DATE 9/20/86

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Report 1	Isomedix, 2/76 Rpt for Essex
(2) Manufacturer	Essex	Report 1	"
(3) Model Number(s)	PXMJ	Report 1	"
(4) Serial Number(s)			

(5) Identify Component-Unique checksheet attached: Supplement 2 - Cables/Splices

JUSTIFICATION/COMMENTS Tested samples are as follows: 7/C - #12AWG with flame retardent cross-linked polythylene conductor insulation and chlorosulfonated polyethylene jacket.

The tested samples are representative samples in accordance with IEEE 383-1974, Table 1 Guidelines for purchased cable (see sheet 5A).

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 5A OF 27

BINDER TITLE ESSEX LOW VOLTAGE POWER COMPUTED K DATE 9-20-86 R ___ R ___

& CONTROL-XLPE INS./TVA TYPE PXMJ CHECKED RLW DATE 9/22/86

JUSTIFICATION/COMMENTS (Continued)

At present TVA Mark Nos. WFB-1 and WHE-1 are installed in harsh environments outside containment. WFB-1 is a 2 conductor 10 AWG with 0.030" XLPE insulation and a 0.045" hypalon (CSPE) jacket. WHE-1 is 5 conductor 14 AWG with .030" XLPE insulation and a 0.045" hypalon (CSPE) jacket.

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 6 OF 27

BINDER TITLE ESSEX LOW VOLTAGE POWER & CONTROL-XLPE INS./TVA TYPE PXMJ COMPUTED K DATE 9-20-86 R ___ R ___

CHECKED RKW DATE 9/22/86

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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	NA		
Electrical Connections	NA		
Conduit Seals	NA		
Connector Seals	NA		
Orientation	NA		
Physical Configuration	NA		
Other	NA		

JUSTIFICATION/COMMENTS Not required for cable.

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)

	Yes/No/NA	Report 1 Reference
(a) Equipment inspected for damage	No	p. 3 (Sect.2)
(b) Baseline performance measurements taken	Yes	pp. 1, 9 & 15
(c) Equipment aged:		
Thermal	Yes	pp. 4 & 11
Radiation	Yes	pp. 4 & 11
Wear	NA	See Below
(d) Vibration/seismic testing conducted	NA	See Below
(e) Design basis event (DBE) exposure	Yes	pp. 5 & 11-13
(f) Post-DBE exposure	Yes	pp. 5 & 11-13
(g) Final inspection and disassembly	Yes	p. 14

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? No*
(Reference NA).

JUSTIFICATION/COMMENTS G(1)(a) - Section 2, page 3 of Report 1 describes three cable samples as they were received from Essex. Since nowhere in the report is there any mention of damaged cables, it is assumed that cables were received undamaged. G(1)(c) - Cable is a static device not subject to mechanical wear. G(1)(d) - Vibration is not a significant aging mechanism. *G(3) - The test (Report #1) did not include a list of test equipment, test equipment accuracies, or calibration data. However, the test report (Report #1) states on page 1, section 1, of the report that the test was performed in accordance with IEEE 323-1974 and IEEE 383-1974. (Comments continued on sheet 7A of Tab B.

Since Isomedix stated that Report #1 tests were conducted in accordance with IEEE 323-1974, it is assumed that they complied with IEEE 323-1974 paragraph 6.3.1.4 and had calibrated test equipment that was calibrated against auditable calibration standards and that this was documented at the time, but the documentation was not included in the test report.

There was a radiation exposure certification letter (last page of Report #1) that included the manufacturer and model number of radiation measuring equipment and satisfactorily addressed the calibration data for that equipment.

To address test equipment accuracies we will make a conservative assumption and demonstrate that the cable in this binder would be qualified even if test equipment accuracies were ±5% (-10°F for thermal aging). This is a conservative assumption because other testing laboratories conducting this type of environmental testing typically use test equipment with accuracies of ±2% or less.

Report 1, Section 3.2.1, page 4 states that the test temperature was maintained at 250 ± 10°F during thermal aging. For the cable qualified life assessment, 240°F was utilized as the most conservative temperature.

An accuracy of -5% on tested values of 345°F and 110 psig would result in a tested peak temperature of 327.8°F and a tested peak pressure of 104.5 psig. For an additional margin of conservatism, the peak thermal transient was applied twice. The worst-case accident temperature that this cable must see is 323°F. Maximum pressure rise in the subject areas is less than or equal to 25.18 psia (10.78 psig).

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 7B OF 27

BINDER TITLE ESSEX/LOW VOLTAGE POWER COMPUTED K DATE 9-20-86 R ___ R ___

& CONTROL-XLPE INS./TVA TYPE PXMJ CHECKED RWW DATE 9/22/86

A minus 5% accuracy on voltage and current measuring test equipment would result in demonstrated cable loads of 14.25 amps (95% of tested 15 amps) and 570 volts AC (95% of tested 600 volts AC). Both of these values exceed the installed maximum load of 5 amps and 250 VDC for these cables. The continuous current and voltage applied during the test far exceeds the maximum installed load of these cables.

Temperatures during the test were maintined by injecting saturated steam into the test chamber. Therefore, humidity would have been 100% regardless of instrument accuracy of equipment measuring it.

The fluid characteristics (concentration of spray chemicals, spray flow rate, spray disposition, and spray temperature) test equipment accuracies are irrelevant because cable in this binder is located outside containment where it is not subjected to chemical spray.

In view of the above, it has been demonstrated that even if test equipment accuracy was ±5% (highly unlikely), the test would still have demonstrated qualification for the cables of this binder to values that exceed those required.

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 7C OF 27

BINDER TITLE ESSEX/LOW VOLTAGE POWER COMPUTED K DATE 9-20-86 R ___ R ___

& CONTROL-XLPE INS./TVA TYPE PXMJ CHECKED RLW DATE 9/22/86

GENERIC COMMENT FOR G(1)(C) WEAR, G(1)(D)VIBRATION, H(2),H(6), AND H(7)

Normal Service Related Stresses- In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stressses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards...". Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria". Included in the list that follows the above quote is the standard to which TVA routinely purchases cross-linked-polyethylene-insulated power, control and signal cables.

- IPCEA S-66-524 Cross-Linked-Polyethylene-Insulated Cable

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference Report 1, pp. 4 & 11).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Report 1 Reference
Thermal aging	Yes	pp. 4&11
Radiation exposure	Yes	pp. 4&11
Vibration (non-seismic) aging	NA	--
Operational (electrical/mechanical/process) stress aging	No	See Sheet 7C of TAB B

JUSTIFICATION/COMMENTS

(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 NA).

JUSTIFICATION/COMMENTS 0588 Category II qualification.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report 1, pp. 4 & 11).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes
(Reference: Rpt. 1, p. 3 and Essex Letter EEB 840221 009 and Wyle Test Report 17513-1, pages VIII-35 and VIII-48. See TAB C, Section B).
JUSTIFICATION/COMMENTS See Open Item #2

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, pp. 4 & 11).

JUSTIFICATION/COMMENTS Aging was performed on sample for type test in accordance with IEEE 383-1974 para. 2.2 and accepted industry methods.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? No (Reference Report 1, p. 4 & Fig.3).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	110°F/130°F*	121°C	44.3°C/54.4°C*
Time	40 Years	168 Hrs	40 Years/ 10.93 Years*

JUSTIFICATION/COMMENTS *Qualified life for the South Vault Room (SVR) cables 1V-7606-A, 1V-7616-A, 1V-7646-B & 1V-7656-B is 10.93 years at 130°F. All other cables covered by this binder for Contract 76K5-820013 are qualified for 40 years. See QMDS, TAB G.

Report 1 did not identify activation energy or provide Arrhenius plot. Activation energy 1.14eV used for equivalent life (see TAB C, Section B for calculation).

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference pp. VIII-35 & -48 of Wyle Report 17513-1 (see TAB E)).

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 pp. VIII-35 & -48 Wyle Report 17513-1 (see TAB E)).

JUSTIFICATION/COMMENTS Activation energy (conservative for XLPE) of 1.14eV used for aging determination in H(4)(d) above.

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)? NA (Reference NA).

JUSTIFICATION/COMMENTS

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS Accelerated aging temperature accounts for expected energized heat rise.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Rpt 1, pp. 4 & 11).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Rpt. 1, p. 3 & Essex Letter EEB 840221 009 and Wyle Test Report 17513-1, pages VIII-35 and VIII-48. See TAB C, Section B).

JUSTIFICATION/COMMENTS See Open Item #2

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 4 & 11).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report 1, p. 11, Fig. 3 & App. A).

Plant normal ambient radiation dose (rd) 1.0×10^6 rads

Test exposure dose (rd) 2×10^8 rads

Test exposure dose rate (rd/hr) 0.75×10^6 rad/hr

Test exposure source type (e.g., Co-60 gamma) Co-60 gamma

JUSTIFICATION/COMMENTS Test exposure dose envelops WBN total integrated dose (see sheet 18 of 27 in TAB B).

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? Yes (Reference G(1)(d)).

JUSTIFICATION/COMMENTS See sheet 7C of TAB B.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? No (Reference G(1)(d)).

JUSTIFICATION/COMMENTS See sheet 7C of TAB B.

(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)? No (Reference TAB B, sheet 7C).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference TAB B, sheet 7C).

JUSTIFICATION/COMMENTS

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? No (Reference).

Qualified life (Document in QMDS) 40 years at 44.3°C/10.93 years @ 54.44°C*

JUSTIFICATION/COMMENTS *Qualified life for the South Vault Room (SVR) cables 1V-7606-A, 1V-7616-A, 1V-7646-B & 1V-7656-B is 10.93 years at 130°F. All other cables covered by this binder for Contract 76K5-820013 are qualified for 40 years.

Qualified life determined by TVA based on activation energy, test program aging, and plant specific conditions.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? Yes (Reference Tab C, Sect. B).

Replacement Intervals (Document in QMDS) South Vault Room (SVR) cables 1V-7606-A, 1V-7616-A, 1V-7646-B & 1V-7656-B must be replaced after 10.93 years (or sooner).

JUSTIFICATION/COMMENTS Normal maximum normal temperature in South Vault Room is 130°F (54.44°C).

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 13 OF 27

BINDER TITLE ESSEX/LOW VOLTAGE POWER & CONTROL-XLPE INS./TVA TYPE PXMJ COMPUTED K DATE 9-20-86 R ___ R ___

CHECKED RLW DATE 9/22/86

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 Threshold	Reference	Activation Energy	Reference
(a)	Cross-Linked Polyethylene	5.0×10^6	TAB E-Wyle Rpt 17513-1 Specimen 1.4.2	1.14eV	TAB E-Wyle Rpt 17513-1 Specimen 1.4.2
(b)	Hypalon-Chlorosulfonated Polyethylene	5.0×10^7	TAB E-Wyle Rpt 17513-1 Specimen 1.4.3	1.07eV	TAB E-Wyle Rpt 17513-1 Specimen 1.4.3
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 14 OF 27

BINDER TITLE ESSEX/LOW VOLTAGE POWER & CONTROL-XLPE INS./TVA TYPE PXMJ COMPUTED K DATE 9-20-86 R ___ R ___

CHECKED RKW DATE 9/22/86

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

(1) 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 Report 1, pp. 5, 10, &14).

Identify Acceptance Criteria: Maintain specified current and voltage during entire LOCA simulation and pass a post-LOCA 40 times cable diameter mandrel bend test immersed in tap water at twice rated voltage plus 1000 VAC (ie., 2200 VAC). See discussion Tab C, Section D.

(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 See below).

Identify baseline and functional testing:

Before, during, and after - Insulation resistance @ 500 VDC for 1 minute (Report 1, pp. 1, 9, and 10).

During - Maintain 600 VAC and 15 amps and Insulation Resistance (Report 1, pp. 1 & 14).

After - 40 times cable diameter mandrel bend and hi-pot in water (Report 1, pp. 5, 10, and 14).

JUSTIFICATION/COMMENTS See discussion TAB C, Section D.

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report 1, p. 1 & 14).

JUSTIFICATION/COMMENTS 600 VAC at 15 amps.

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? Yes (Reference Report 1, pp 9 & 14).

JUSTIFICATION/COMMENTS Baseline testing was insulation resistance at 500 VDC prior to aging. Cable is qualified for normal operation per IPCEA S-66-524 in accordance with IEEE 383, paragraph 2.3.1. Cable was manufactured and tested in accordance with IPCEA S-66-524.

(5) Identify electrical characteristics:

Parameter	Specified	Reference	Demonstrated	Reference
Voltage	600 volts	76K5-820013	600VAC	Rpt 1, pp. 1 & 14
Load	NA	NA	15a	Rpt 1, pp. 1 & 14
Frequency	NA	NA	60 Hz	Not stated*
Accuracy	NA	NA	NA	NA
Other(s)				
	NA	NA	NA	NA
	NA	NA	NA	NA

JUSTIFICATION/COMMENTS Contract specifies voltage, wire size, and temperature rating only.

*There is no reason not to assume that frequency was 60Hz during test.

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 16 OF 27

BINDER TITLE ESSEX/LOW VOLTAGE POWER & CONTROL-XLPE INS./TVA TYPE PXMJ COMPUTED K DATE 9-20-86 R ___ R ___

CHECKED RKW DATE 9/22/86

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-44 R1, and -76 R3

(1) Normal Max

(a) Temperature (°F) 110°F/130°F*

(b) Pressure (psig) ATM

(c) Humidity (%) 80%

(d) Radiation (rd) 1.0E06

(2) Abnormal Max

(a) Temperature (°F) 120°F/140°F*

(b) Pressure (psig) ATM

(c) Humidity (%) 90%

(d) Radiation (rd) NA

(3) Process Interfaces: None required

(4) State anticipated occurrence frequency and duration of abnormal conditions: Could exist up to 8 hours duration per excursion and will occur less than 1% of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F) 133.7°F/323°F* Accident type HELB

(b) Pressure (psig) 25.18 psia Accident type HELB

(c) Humidity (%) 100% Accident type HELB

(d) Radiation (rd) 1.2E07 rads Accident type LOCA

(e) Spray Type NA Accident type NA

*These temperatures are for the South Vault Room (SVR) cables.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

(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)? No (Reference NA).

(7) Subject to submergence (yes/no/NA)? Yes
(Reference TAB C, Section A and Open Item #1).

Identify initiation time and duration of submergence: SVR cables from this contract are located in a harsh environment which is subject to submergence. See TAB C, Section A and Open Item #1.

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

Type	RIMS No.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	CAT A 100 days	30 day	Rpt 1, p. 11-13
Temperature (°F)	133.7°F/ 323°F(SVR)	345°F	Rpt 1, p. 11-13
Pressure (psig)	25.18 psia	110 psig	Rpt 1, p. 11-13
Relative Humidity (%)	100%	100%	Rpt 1, p. 11-13
*Chemical Spray	NA	***	Rpt 1, p. 5, 13
**Radiation (rd)	1.3E07 rads gamma	2E08	Rpt 1, p. 11, 1 & 4
Submergence	Yes	No	See Open Item #1 and Tab C. Sect. A

*Includes spray concentration, flowrate, density, duration, and pH.
**Enter 40-year integrated normal dose plus integrated accident dose and specify type.
***Chemical Spray - 3000 ppm boron as boric acid in solution with 0.064 molar sodium thiosulfate buffered with sodium hydroxide to a pH between 9 and 11 at room temperature. Flow rate was 0.15 gpm/ft^2.

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	Rpt 1, p. 11-13
Pressure	Yes	Rpt 1, p. 11-13
Relative Humidity	Yes	Rpt 1, p. 11-13
Chemical Spray	Yes	Rpt 1, p. 11-13
Submergence	See below	TAB C, Section A

JUSTIFICATION/COMMENTS Cables from this contract may be subject to submergence. See Open Item #1 for submergence of SVR cables.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	> +15°F	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)	> +10%	Yes-See Tab C, Sect. C
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	Yes	Yes
Vibration: +10% added to acceleration	NA	NA-See Sheet 7C of TAB B

JUSTIFICATION/COMMENTS: *Test voltage applied was 600 VAC whereas normal maximum operating voltage is 250 V or less. Therefore, adequate margin was applied.

For vibration see TAB B, sheet 7C.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference Tab A).

JUSTIFICATION/COMMENTS This Category A cable must maintain voltage & current for 100 days following an accident.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference Report 1, p. 14).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference Report 1, pp. 2 & 14).

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 Report 1, p. 14).

JUSTIFICATION/COMMENTS See TAB C, Sections B and D.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? No (Reference Report 1, p. 2).

JUSTIFICATION/COMMENTS Test report does not provide detailed discussion of specimen 28's inability to hold more than 1300 volts during the post-LOCA mandrel rebend hipot. For discussion of this anomaly, see Tab C, Section D.

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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS The South Vault Room (SVR) cables 1V-7606-A, 1V-7616-A, 1V-7646-B & 1V-7656-B must be replaced after 10.93 years (or sooner); however, all other cables covered by this binder (contract 76K5-820013) are qualified for 40 years.

No vendor required surveillance, maintenance, and inspection parameters are necessary to maintain qualification. TVA storage and recommended surveillance requirements have been included in TAB G of QMDS. Purpose of surveillance requirements is to accumulate historical data and identify any potential cable degradation.

BINDER NO. WBNEQ-CABL-022 PLANT WBN UNIT(S) 1 SHEET 22 OF 27

BINDER TITLE ESSEX/LOW VOLTAGE POWER & CONTROL-XLPE INS./TVA TYPE PXMJ COMPUTED K DATE 9-20-86 R ___ R ___

CHECKED RKW DATE 9/22/86

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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	Yes
(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?	Yes
(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?	NA (See Sheet 7C of TAB B)
(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

O. SUMMARY 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) 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?	NA
(11) Criteria regarding submergence satisfied?	Yes (See Section P)
(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-See TAB C, Sect. D

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	See G(3)
(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?	Yes
(18) Criteria regarding synergistic effects satisfied?	NA
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

O(1) - Pending resolution of Open Items nos. 1, 2, 3 & 4.
O(5) - Pending resolution of Open Item no. 2.
O(6)(c) - Preaging was done.
O(11) - Pending resolution of Open Item #1.
O(16) - Test report did not state instrument accuracies. See G(3) of TAB B.
O(17) - Test 30 days/specified 100 days. See TAB C, Section C.
O(17)(b) - Accident extrapolation performed in TAB C, Section C, plant profile enveloped with margin.
O(18) - See H(3) of TAB B.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? NA - See Below: Items 4 & 17 of contract 820013 respectively.

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor	EQ Checklist	EQ Checklist		
Insulation material	XLPE	XLPE	Yes	Report 1 p. 3
Size	14 & 10 AWG	12 AWG	Yes	Report 1 p. 3
Stranding	7 Strand	Not Stated	Yes	NA
Coating	Bare	Not Stated	Yes	NA
Insulation Thickness	.030	.030	Yes	See Sheet 4
Number of conductors	5 & 2	7	Yes	Report 1 p. 3
Arrangement of conductors	Twisted and Twisted or Parallel	Not Stated	Yes	Report 1 pp. 1&2
(b) Shielding	NA	NA	NA	--
(c) Insulation jacket				
Material	NA	NA	NA	--
Thickness	NA	NA	NA	--
(d) Outer jacket				
Material	CSPE	CSPE	Yes	See Sheet 4
Thickness	.045	.045	Yes	See Sheet 4

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	600	600	Yes	Report 1 pp. 1&2
(f) Rated current	NA	NA	NA	NA
(g) Operating temperature rating				
Normal	90 °C Contract	Not Stated	Yes--Same Material & Const.	NA
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance (ohms)	NA	MIN. 1.0E03	See Tab C, Section D NA	Report 1 p. 15
(i) Splice				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: _____

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference Routine Test Reports).

Comments: Cable is qualified for temperature and moisture resistance for normal operation because it has been manufactured and tested (routine) in accordance with IPCEA S-66-524 per the contract requirements.

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference Report 1, p. 14).

Comments: Cable was energized at 600 Volts AC and 15 amperes.

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report 1, pp. 1, 14 & 16).

Comments: Applied voltage was 2.2 KVAC with max leakage current of 3.1 milliamps for specimens 26 and 27 and conductors 1, 2, 4, 6, and 7 of specimen 28. Conductors 3 and 5 of specimen 28 held 1300 KVAC with 100 milliamp leakage current. See Tab C, Section D.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference Report 1, p. 15).

Comments:

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report 1, pp. 1, 10, 14, & 16).

Comments: 40 times diameter mandrel bend test followed by 2.2 KVAC voltage withstand test.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Routine Test Reports).

Identify flame test standard: IEEE 383-1974

Comments:

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-027
MANUFACTURER : OKONITE

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-PPP-082-0470A-A	OPP 470-A	EPSJ	WNC-1	VARIOUS	VARIOUS	0	N81K5-827750-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-PPP-082-0471A-A	OPP 471-A	EPSJ	WNC-1	VARIOUS	VARIOUS	0	N81K5-827750-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-PPP-082-0590A-B	OPP 590-B	EPSJ	WNC-1	VARIOUS	VARIOUS	0	N81K5-827750-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-PPP-082-0591B-B	OPP 591-B	EPSJ	WNC-1	VARIOUS	VARIOUS	0	81K5-827750-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-PPP-082-0711A-B	OPP 711-B	EPSJ	WNC-1	VARIOUS	VARIOUS	0	N81K5-827750-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-PPP-067-0712B-B	2PP 712-B	EPSJ	WNB-1	VARIOUS	VARIOUS	0	N81K5-827750-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	K.R. Tyrpcher	9-21-86	____	____
CHECKED/DATE	H.W. Vorburger	9-21-86	____	____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-027
MANUFACTURER : OKONITE

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-0PP-082-05908-B	OPP 590-B	EPSJ	WNC-1	VARIOUS	VARIOUS	O	N78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-0PP-082-05914-B	OPP 591-B	EPSJ	WNC-1	VARIOUS	VARIOUS	O	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-0PP-052-07110-B	OPP 711-B	EPSJ	WNC-1	VARIOUS	VARIOUS	O	N78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	K. R. Fleischer	9-21-86		
CHECKED/DATE	F. W. Vaughn	9-21-86		

BINDER NO. WBNEQ-CABL-027 PLANT WBN UNIT(S) 1 SHEET 1 OF 28

BINDER TITLE OKONITE/MEDIUM VOLTAGE POWER-EPR INS./TVA TYPE EPSJ COMPUTED K DATE 9-23-86 CHECKED [illegible] DATE 7/23/86 R R

A. DOCUMENTATION

Equipment Description 8-kV Power Cable

Vendor/Manufacturer Okonite

Equipment Model No.(s) TVA-Type EPSJ, Mark WNC-1, WNB-1*

QUALIFICATION REPORTS

(1) Title/Number/Revision Okonite Report NQRN-3 Nuclear Environmental Qualification Report for Okoguard Insulated CABLES and T-95 and No. 35 Splicing Tapes/Rev. 2 RIMS B43 850904 501 DATE Feb. 16, 1984

(2) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

2. WBPE VAR8604005 Data for Class 1E Cables and Splices in Harsh Environments 10CFR50.49, Rev. 1, (B26 860708 005), dated July 7, 1986

3. WBNNAL3-025 Normal Operation Dose for Equipment Qualification Outside the Shield Building (B45 860401 235), dated March 28, 1986

4. TI-RPS-32 Shield Design Review and Equipment Qualification Study (B45 860407 237), Rev. 2, dated December 17, 1980

5. Okonite letter to TVA dated January 3, 1986 (B70 860106 012)

6. TVA letter to Okonite dated December 18, 1985 (B70 851218 001)

7. Okonite letter to TVA dated January 14, 1985 (EEB 850117 010)

8. Okonite Certified Test Report 5794 dated February 18, 1981

9. Okonite Certified Test Report 3496 dated January 8, 1979

10. QIR EQP86066 dated June 18, 1986 (B71 860620 250)

11. OE Calculation QIR WBNEEB86046 dated July 7, 1986 (B26 860707 016)

12. QIR EQP-86070 dated July 9, 1986 (B71 860715 250)

13. QIR NEB-86125 dated August 19, 1986 (B45 860825 252)

14. Okonite letter to TVA dated January 21, 1986 (B70 860127 004)

15. Okonite letter to TVA dated April 10, 1986 (B70 860616 001)

16. Watts Bar Technical Specification, Section 4.8.1.1.2 (final draft)

17. Watts Bar Design Criteria WB-DC-30-5, Rev. 2, dated June 5, 1985 (B42 850619 502)

18. Electrical Design Standard DS-E12.1.4, dated June 27, 1977

19. Identification of Harsh Routing for Cable 2PP-712-B.

20. Essential Raw Cooling Water System (67) NUREG 0588 Category and Operating Times. WBNOSG4-016, Rev. 8 (B45 860320 218), dated March 19, 1986.

*TVA type EPSJ is defined as: Single conductor, high-voltage cable with extruded strand shield, ethylene-propylene rubber insulation with metallic electrostatic shielding and a chlorosulfonated-polyethylene jacket. Mark WNC-1 is defined as No. 4/0 AWG copper cable, 8KV, EPSJ, Class 1E. Mark WNB-1 is defined as No. 2/0 AWG copper cable, 8KV, EPSJ, Class 1E. See TAB B Supplement 2, Item 1 for description of cable procured under Contracts 78K5-824443-1 and 81K5-827750.

BINDER NO. WBNEQ-CABL-027 PLANT WBN UNIT(S) 1 SHEET 2 OF 28

BINDER TITLE OKONITE/MEDIUM VOLTAGE COMPUTED K DATE 9-23-86 R ___ R ___

POWER-EPR INS./TVA TYPE EPSJ CHECKED fuw DATE 9/23/86

B. CONCLUSION OF REVIEW (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) Ensure that agreement between design and installation records is established and documented.

COMMENTS/RECOMMENDATIONS Cables furnished have been qualified for a 40-year life plus DBA and post-accident operating time requirements to environmental parameters (profiles) which exceed the required operating environments for the cables application outside containment. Cables from this binder may not be used in 10CFR50.49 circuits inside of primary containment or in areas subject to flooding.

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BINDER TITLE OKONITE/MEDIUM VOLTAGE COMPUTED K DATE 9-8-86 R ___ R ___

POWER-EPR INS./TVA TYPE EPSJ CHECKED FW DATE 9-8-86

C. 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 (IEEE 323-1974)

___ Components are Qualified to the Criteria of NUREG-0588 Category II or the DOR Guidelines of IE bulletin No. 79-01B (IEEE 323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 383-1974

IEEE 323-1974

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BINDER TITLE OKONITE/MEDIUM VOLTAGE COMPUTED K DATE 9-8-86 R R

POWER-EPR INS./TVA TYPE EPSJ CHECKED FW DATE 9-8-86

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 Tested representative sample in accordance with Table 1 of IEEE 383-1974.

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BINDER TITLE OKONITE/MEDIUM VOLTAGE COMPUTED K DATE 9-8-86 R R

POWER-EPR INS./TVA TYPE EPSJ CHECKED FW DATE 9-8-86

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Cable	Okonite Rpt NQRN-3 (Rpt 1)
(2) Manufacturer	Okonite	Okonite	Okonite Rpt NQRN-3 (Rpt 1)
(3) Model Number(s)	EPSJ	Okoguard	Okonite Rpt NQRN-3 (Rpt 1)
		NA	
		NA	
		NA	
(4) Serial Number(s)		NA	
		NA	
		NA	
		NA	

(5) Identify Component-Unique checksheet attached: Supplement 2 - Cables/Splices

JUSTIFICATION/COMMENTS Tested representative sample in accordance with Table 1 of IEEE-383-1974 (see TAB B, sheets 25-27). Installed cable is Okonite's Okoguard and is chemically identical to that tested.

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R R

BINDER TITLE OKONITE/MEDIUM VOLTAGE COMPUTED K DATE 9-8-86

POWER-EPR INS./TVA TYPE EPSJ CHECKED FW DATE 9-8-86

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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		No	
External Process Connections		No	
Electrical Connections		No	
Conduit Seals		No	
Connector Seals		No	
Orientation		No	
Physical Configuration		No	
Other		No	

JUSTIFICATION/COMMENTS Not required for cable qualification.

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BINDER TITLE OKONITE/MEDIUM VOLTAGE COMPUTED K DATE 9-8-86 R ___ R ___

POWER-EPR INS./TVA TYPE EPSJ CHECKED FW DATE 9-8-86

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	Rpt 1, p 4, Sect. 1.4.1.5
(b) Baseline performance measurements taken	Yes	Rpt 1, p 4, Sect. 1.4.1.5
(c) Equipment aged:		
Thermal	Yes	Rpt 1, p 4, Sect. 1.4.1.5
Radiation	Yes	Rpt 1, p 4, Sect. 1.4.1.5
Wear	NA	See Below
(d) Vibration/seismic testing conducted	NA	See Below
(e) Design basis event (DBE) exposure	Yes	Rpt 1, pp 4 Sect. 1.4.1.5
(f) Post-DBE exposure	Yes	Rpt 1, pp 4 Sect. 1.4.1.5
(g) Final inspection and disassembly	Yes	Rpt 1, p 4, Sect. 1.4.1.5

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference Report 1 Appendix 6).

JUSTIFICATION/COMMENTS Cable is a static device not subject to mechanical wear. Vibration is not a significant aging mechanism.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference Report 1, p 3).

JUSTIFICATION/COMMENTS See H(4)(d) and H(5)(d).

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	Rpt 1, p 4, Sect. 1.4.1.5
Radiation exposure	Yes	Rpt 1, p 4, Sect. 1.4.1.5
Vibration (non-seismic) aging	NA	
Operational (electrical/mechanical/process) stress aging	No	See TAB C, Section B

JUSTIFICATION/COMMENTS

(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)? Yes (Reference).

JUSTIFICATION/COMMENTS See TAB C Section A.4

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report 1, p 4, Sect. 1.4.1.5).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: Report 1, p 3, Sect. 1.4.1.1).

JUSTIFICATION/COMMENTS

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, p 3 Sect. 1.4.1.3, App 2).

JUSTIFICATION/COMMENTS

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, pp 1 & 2).

Parameter	Conductor Maximum Normal	Test	Equivalent
Temperature	90°C	150°C	90°C
Time	40 Years	3 Wks	40 Years

JUSTIFICATION/COMMENTS See TAB C, Section A.2 and Report 1, Section 1.4.1.3 and Appendix 2.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference Report 1, App. 2 and TAB C, Section A.2).

JUSTIFICATION/COMMENTS Aging is based on Arrhenius Methodology plus supporting analysis.

(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)? NA (Reference ___).

JUSTIFICATION/COMMENTS Activation energies were not stated in the report. Cable insulation specific regression curve was used for aging. See H(4)g.

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)? Yes (Reference Report 1, App. 2).

JUSTIFICATION/COMMENTS Vendor supplied Arrhenius plot for 40 percent retention of elongation.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS Not required. Thermal aging simulates the 40-year life of the cable (ambient plus conductor rise) See TAB C, Section A.2 and H(4)(d).

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Report 1, p 4). Sect. 1.4.1.5 & Sect. 1.4.2.3

JUSTIFICATION/COMMENTS _____

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, p 3 Sect. 1.4.1.1).

JUSTIFICATION/COMMENTS _____

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, pp 1 and 2).

JUSTIFICATION/COMMENTS _____

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report 1, Appendix 3).

Plant normal ambient radiation dose (rd) 2.1E05

Test exposure dose (rd) 2E08

Test exposure dose rate (rd/hr) .50 to .58E06

Test exposure source type (e.g., Co-60 gamma) Co-60 gamma

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference).

JUSTIFICATION/COMMENTS Vibration is not an aging stress for cables.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA (Reference).

JUSTIFICATION/COMMENTS Vibration is not an aging stress for cables.

(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)? No (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section B & TAB E, Certified Test Reports.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference See below).

JUSTIFICATION/COMMENTS See TAB C, Section B.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference Rpt. 1, Sect. 1.4.1.3).

Qualified life (Document in QMDS) 40 Years at 90°C

JUSTIFICATION/COMMENTS See TAB C, Section A.2

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? No (Reference _____).

Replacement Intervals (Document in QMDS) None.

JUSTIFICATION/COMMENTS Not required. No replacement intervals recommended since the cables were qualified for the design life of the plant.

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R ___ R ___

BINDER TITLE OKONITE/MEDIUM VOLTAGE COMPUTED K DATE 9-8-86

POWER-EPR INS./TVA TYPE EPSJ CHECKED KW DATE 9-8-86

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)

	Material/Property/Function	Radiation Threshold	Reference	Activation Energy	Reference
(a)	See Below (Okoguard)	NA	NA	1.07	See TAB C, Section A.2, Material Aging Rpt. No. WAC-152
(b)	See Below (Okolon)	NA	NA	1.07	Digital System 1000
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS Insulation material is Okonite's "Okoguard". An ethylene-propylene-rubber insulation. Jacket material is Okonite's "Okolon". It is a chlorosulfonated polyethylene also known as Hypalon (see TAB E(12)).

EQP199.41

TVA 19537 (OE-3-86)

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

(1) 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 Report 1, p 4 Sect. 1.4.1.4).

Identify Acceptance Criteria: 80V/mil proof test. The criteria also included functioning continuously at rated voltage and current and passing 40X OD mandrel bend and voltage withstand tests at the conclusion of the test.

(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 Report 1, pp 4, 5, & 6 and Appendix 4).

Identify baseline and functional testing: Insulation resistance (IR)- taken prior to aging and periodically during initial transients and first 4 days, then IR, voltage, and current, measurements taken weekly during testing and biweekly during post-accident simulation. Cable was energized with rated voltage and current at all other times during test. Proof test of 80V/mil on 40x mandrel bend while immersed in water performed at days 30 and 130 during DBE.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report 1, p 6, Sect. 1.4.2.4).

JUSTIFICATION/COMMENTS 5 kV/80 amps

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference See below).

JUSTIFICATION/COMMENTS Qualification for normal operation established through manufacturing and testing to IPCEA S-68-516 (See TAB E, Certified Test Reports).

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	6.9-kV	WB-DC-30-5 (B42 850619 502) Watts Bar Cable Data Sheets
Load	230 Amps	
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	5-kV	Rpt. 1, p 6, Sect. 1.4.2.4
Load	Rated (80 amps)	Rpt. 1, p 6, Sect. 1.4.2.4
Frequency	60 Hz	Not stated See below
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS See TAB C, Sections A.2 and A.4. Final evaluation of sample demonstrated an IR reading of approximately 5000 megohms-1000 ft. (see Report 1, page 7, Section 1.4.4.). There is no reason to assume frequency was other than 60 Hz during testing.

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-46R0, -47R1 (Room 737-A1).

(1) Normal Max

(a) Temperature (°F) 104°F

(b) Pressure (psig) ATM(14.4psia)

(c) Humidity (%) 80%

(d) Radiation (rd) * 2.1E05 gamma

(2) Abnormal Max

(a) Temperature (°F) 110°F

(b) Pressure (psig) ATM(14.4psia)

(c) Humidity (%) 90%

(d) Radiation (rd) NA

(3) Process Interfaces: NA

(4) State anticipated occurrence frequency and duration of abnormal conditions: Could exist up to eight hours duration per excursion and will occur less than one percent of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	129°F	Accident type HELB
(b) Pressure (psig)	14.43 psia	Accident type HELB
(c) Humidity (%)	100%	Accident type HELB
(d) Radiation (rd) **	1.0E04 gamma	Accident type LOCA
(e) Spray Type	NA	Accident type NA

*OE CALC WBNNAL3-025.
**See TAB C, Section A.2.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Location is outside containment; therefore, beta radiation and chemical spray is not a concern.

(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)? No (Reference Manufacturer's Standard Tests to ICEA S-68-516.

(7) Subject to submergence (yes/no/NA)? No
(Reference See TAB C, Section C).

Identify initiation time and duration of submergence:

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

Type	RIMS No.
OE CALC WBNNAL3-025	B45 860401 235
(Normal Radiation Values)	
OE CALC TI-RPS-32	B45 860407 237
(Accident Radiation Values)	
OE CALC WBNNAL3-026	B45 860328 237
(Application of TI-RPS-32 to WBN)	

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 Days	130 Days	Rpt 1, App. 4
Temperature (°F)	129	345	Rpt 1, App. 4
Pressure (psig)	0.03	114	Rpt 1, App. 4
Relative Humidity (%)	100	100	Rpt 1, p 6 Sect. 1.4.2.3 Appendix 4
*Chemical Spray	NA	Per IEEE 323-1974	Rpt 1, p 3 Sect. 1.4.1.3 Outside Containment
**Radiation (rd)	2.2E05 rads gamma (See TAB C, Sect. A.2)	2E+08 rads gamma	Rpt 1, p 3 Sect. 1.4.1.3 & Appendix 3
Submergence	NA	NA	See TAB C Section C

*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	Rpt 1, App. 4
Pressure	Yes	Rpt 1, App. 4
Relative Humidity	Yes	Rpt 1, p 6, Sect. 1.4.2.3, App. 4
Chemical Spray	NA *	Outside Containment
Submergence	NA	See TAB C Section C

JUSTIFICATION/COMMENTS *Chemical spray, per IEEE 323-1974 requirements, was included in test; however, TVA type EPSJ is used exclusively outside containment at WBN and, therefore, not subject to this parameter.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	> 15	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)	> 10%	Yes
Voltage: ±10%	>10%	Yes-See TAB C Sect. A.2
Frequency: ±5% of rated value		NA - See below
Environmental Transient: the initial transient and the peak temperature applied twice	2 transients	Yes
Vibration: +10% added to acceleration		NA - See TAB C, Section B

JUSTIFICATION/COMMENTS: Not applicable to power cable since frequency effects are insignificant at normal operating frequencies.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment:
(Reference NA).

JUSTIFICATION/COMMENTS Capable of maintaining current and voltage to the connected equipment. (See also TAB A.)

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes
(Reference Rpt 1, p 5, Sect. 1.4.1.6 & p 7, Sect. 1.4.3 & 1.4.4).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes
(Reference Rpt 1, p 5, Sect. 1.4.1.6 & p 7, Sect. 1.4.3 & 1.4.4).

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 Rpt 1, p 5, Sect. 1.4.1.6 & p 7, Sect. 1.4.3 & 1.4.4).

JUSTIFICATION/COMMENTS

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes
(Reference See Below).

JUSTIFICATION/COMMENTS Report paragraph 1.4.3.1, and TAB C, Section D.

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 EQC Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS See TAB G. There were no surveillance or maintenance requirements identified from the vendor or test documentation; however, TVA does have a maintenance and surveillance program at the plant.

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BINDER TITLE OKONITE/MEDIUM VOLTAGE POWER-EPR INS./TVA TYPE EPSJ COMPUTED K DATE 9-8-86 R R

CHECKED FW DATE 9-8-86

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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	None taken
(3) Choice of qualification methodology adequately justified?	Yes
(4) If analysis was performed, complete the following:	
(a) Were equipment performance requirements identified?	NA (Type Test)
(b) Were specific features and failure modes and effects analyzed?	NA (Type Test)
(c) Were assumptions and mathematical models used together with appropriate justification for their use?	NA (Type Test)
(d) Were environmental parameters which affect equipment performance identified?	NA (Type Test)
(5) Adequate similarity between equipment and test specimen established?	Yes
(6) Aging degradation evaluated adequately?	Yes
(a) Mechanical and/or cycle aging addressed?	NA (See TAB C Section B)
(b) Equipment aged to end of life condition prior to application of DBE conditions?	Yes
(c) Absence of preaging in test/analysis justified?	NA (Aging Performed)
(d) Materials susceptible to thermal/radiation aging identified?	Yes

O. SUMMARY 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) 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?	NA-Outside Containment
(11) Criteria regarding submergence satisfied?	NA
(12) Criteria regarding radiation satisfied?	Yes
(a) Was dose rate considered?	Yes
(b) Was beta radiation considered?	NA-Outside Containment
(13) Criteria regarding operability status/mode satisfied?	Yes
(14) Criteria regarding test failures or anomalies satisfied?	Yes

O. SUMMARY OF REVIEW (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 - (See Sect G)
(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?	NA
(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. DISCUSSION

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No . Installed cable is TVA type EPSJ, Mark WNC-1 and WNB-1 (see TAB B, sheet 1 for definitions).

Item	Plant	Report	Acceptable Yes/No/NA	Report Page
(a) Conductor				
Insulation material	Okoguard EPR*	Okoguard EPR*	Yes	p 3, Sect. 1.4.1.1
Size	#4/0 & # 2/0	#6	Yes	p 3, Sect. 1.4.1.1
Stranding	19	7	Yes	p 3, Sect. 1.4.1.1
Coating	Tinned	Bare Copper	Yes	p 3, Sect. 1.4.1.1
Insulation Thickness	.140"	.090"	Yes	p 3, Sect. 1.4.1.1
Number of conductors	1	1	Yes	p 3, Sect. 1.4.1.1
Arrangement of conductors	NA	NA	Yes	p 3, Sect. 1.4.1.1
(b) Shielding	Cu.tape	Cu.tape	Yes	p 3, Sect. 1.4.1.1
(c) Insulation jacket				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
(d) Outer jacket				
Material	Okolon* (CSPE)	None	Yes	p 3, Sect. 1.4.1.1.
Thickness	.080"	NA	Yes	NA

*See Okonite's definitions from Bulletin OSL-'82 in TAB E.

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Page
(e) Voltage	6.9-kV	5-kV	Yes	p 3, Sect. 1.4.1.1*
(f) Current	230 Amps	80 amps	Yes	p 6, Sect. 1.4.2.4*
(g) Operating temperature (Conductor/40-Yrs)				
Normal	90 °C Allowed 40 °C	90 °C	Yes	See TAB C Sect. A.2
Emergency	NA	NA		
Short circuit	NA	NA		
(h) Insulation resistance	NA	NA		
(i) Splice				
Material	NA	NA		
Thickness	NA	NA		
Identification	NA	NA		

Comments: *Also see TAB C, Section A.2 Plant application data obtained from letter EEB 850117 010, contracts 78K5-824443-1 and 81K5-827750 and vendor certified test report in TAB E.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference Rpt 1, App. 7).

Comments: Qualified for normal operation through manufacturing to IPCEA S-68-516.

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference Report 1, p 6, Sect. 1.4.2.4).

Comments: 5kV at 80 amps.

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report 1, Sect. 1.4.4).

Comments: Greater than 40kV.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference Report 1, p 4, Sect. 1.4.1.5). and p 7, Sect. 1.4.4

Comments:

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report 1, pp 4 through 6).

Comments: 40X mandrel bend and 5 minute 80V/mil withstand test in water after 30 and 130 days.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Report 1, App. 8).

Identify flame test standard: IEEE 383-1974

Comments:

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-032
MANUFACTURER : TRIANGLE PWC

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ARM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PL-030-3201-B	1PL3201-B	CPJJ	WMB	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-067-39138-A	1PL3913-A	CPJJ	WLO	VARIOUS	VARIOUS	0	N72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-215-4982C-B	1PL4982-B	CPJ	WDO	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-215-4983-B	1PL4983-B	CPJ	WDO	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0223-S	1SG 223-S	CPJJ	WLJ	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0224-S	1SG 224-S	CPJJ	WLK	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0226-S	1SG 226-S	CPJJ	WLJ	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0229-S	1SG 229-S	CPJJ	WLH	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-3980A-A	1V 3980-A	CPJJ	WMB	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-4005A-A	1V 4005-A	CPJJ	WMB	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-39138-A	2PL3913-A	CPJJ	WLO	VARIOUS	VARIOUS	0	N72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-3980A-A	2V 3980-A	CPJJ	WMB	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-4005A-A	2V 4005-A	CPJJ	WMB	VARIOUS	VARIOUS	0	72C7-075228-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Randy John Board 9/21/86	____	____	____
CHECKED/DATE	Gary Cash 9/21/86	____	____	____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-032
MANUFACTURER : TRIANGLE PWC

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-ARM-090-0117-A	ORM 117-A	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-ARM-090-0118-B	ORM 118-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-090-0020-A	1PV 20-A	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-090-0023-A	1PV 23-A	CPJJ	WLN	VARIOUS	VARIOUS	O	N72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-090-0024-A	1PV 24-A	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-065-0026-A	1PV 26-A	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-099-0029-A	1PV 29-A	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-099-0080-A	1PV 80-A	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-278-0083-A	1PV 83-A	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-090-0139A-B	1PV 139-B	CPJJ	WLN	VARIOUS	VARIOUS	O	N72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-090-0141-B	1PV 141-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-090-0142-B	1PV 142-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-065-0145-B	1PV 145-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-099-0148-B	1PV 148-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-068-0163-B	1PV 163-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-065-0180-B	1PV 180-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-099-0200-B	1PV 200-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-235-0203-B	1PV 203-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0200-A	1RM 200-A	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0205-B	1RM 205-B	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3380-D	1V 3380-D	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3382-D	1V 3382-D	CPJJ	WLS	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3384-D	1V 3384-D	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3385-D	1V 3385-D	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3386-D	1V 3386-D	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3390-E	1V 3390-E	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3392-E	1V 3392-E	CPJJ	WLS	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3394-E	1V 3394-E	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3395-E	1V 3395-E	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3396-E	1V 3396-E	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3400-F	1V 3400-F	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3402-F	1V 3402-F	CPJJ	WLS	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3410-G	1V 3410-G	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3412-G	1V 3412-G	CPJJ	WLS	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-087-3416-G	1V 3416-G	CPJJ	WLN	VARIOUS	VARIOUS	O	72C7-083483-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE Ronald John Pearson 9/21/86 _____ _____ _____

CHECKED/DATE [illegible] 9/21/86 _____ _____ _____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-032
MANUFACTURER : TRIANGLE PWC

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APL-033-1061-A	1PL1061-A	CPJ	WDJ	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-033-1081-B	1PL1081-B	CPJ	WDJ	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-3760-B	1PL3760-B	CPJJ	WLN	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-026-3810B-B	1PL3810-B	CPJJ	WLO	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3905A-B	1PL3905-B	CPJ	WDK	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3920B-B	1PL3920-B	CPJJ	WLO	VARIOUS	VARIOUS	O	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3960B-A	1PL3960-A	CPJ	WDK	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-078-4541-S	1PL4541-S	CPJ	WDH	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4725-A	1PL4725-A	CPJ	WDN	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4726-A	1PL4726-A	CPJ	WDN	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4735-S	1PL4735-S	CPJ	WDK	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4736-S	1PL4736-S	CPJ	WDK	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4750-A	1PL4750-A	PXMJ	WMQ	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4764-B	1PL4764-B	PXMJ	WMQ	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4775-A	1PL4775-A	PXMJ	WMQ	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4789-B	1PL4789-B	PXMJ	WMQ	VARIOUS	VARIOUS	O	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4800-A	1PL4800-A	CPJ	WDH	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4820-A	1PL4820-A	CPJ	WDH	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4839-B	1PL4839-B	CPJ	WDH	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4856-B	1PL4856-B	CPJ	WDH	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4875-A	1PL4875-A	CPJ	WDK	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4885-B	1PL4885-B	CPJ	WDK	VARIOUS	VARIOUS	O	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-078-4895-B	1PL4895-B	CPJ	WDK	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-215-4975-A	1PL4975-A	CPJ	WDO	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-215-4976-A	1PL4976-A	CPJ	WDO	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-215-4978-A	1PL4978-A	CPJ	WDO	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-215-4979-A	1PL4979-A	CPJ	WDO	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-037-6254-B	1PL6254-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-062-0075-A	1PV 75-A	CPJJ	WLN	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-062-0076-A	1PV 76-A	CPJJ	WLN	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-062-0077-B	1PV 77-B	CPJJ	WLN	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-065-0100-A	1PV 100-A	CPJJ	WLN	VARIOUS	VARIOUS	O	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APV-067-0101-A	1PV 101-A	CPJJ	WLN	VARIOUS	VARIOUS	O	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-070-1940-A	1V 1940-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-2010-B	1V 2010-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-067-2060-B	1V 2060-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-063-2112-A	1V 2112-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Ronald John Johnson 9/21/86	____	____	____
CHECKED/DATE	[illegible] 9/21/86	____	____	____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-074-2140-A	1V 2140-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-074-2150-B	1V 2150-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-2200-A	1V 2200-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2326-A	1V 2326-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2338-A	1V 2338-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2460-A	1V 2460-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2472-A	1V 2472-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2478-A	1V 2478-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2490-A	1V 2490-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2508-B	1V 2508-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2556-B	1V 2556-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2562-A	1V 2562-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2568-A	1V 2568-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2574-A	1V 2574-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-2580-A	1V 2580-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-2791-A	1V 2791-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-074-2840-B	1V 2840-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2900-A	1V 2900-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-3069-B	1V 3069-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-072-3160-A	1V 3160-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-026-3330B-B	1V 3330-B	CPJJ	WLO	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-4020-B	1V 4020-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-030-3697-A	2PL3697-A	CPJJ	WMT	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-030-3748-A	2PL3748-A	CPJJ	WMT	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-031-3770-A	2PL3770-A	CPJJ	WLN	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-030-3868-B	2PL3868-B	CPJJ	WMT	VARIOUS	VARIOUS	O	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-067-3905-B	2PL3905-B	CPJ	WDK	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-067-3920B-B	2PL3920-B	CPJJ	WLO	VARIOUS	VARIOUS	O	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-067-3960B-A	2PL3960-A	CPJ	WDK	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-031-4440A-B	2PL4440-B	CPJ	WDO	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-070-1940-A	2V 1940-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-2160-B	2V 2160-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-2170-B	2V 2170-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-2200-A	2V 2200-A	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-067-2791-B	2V 2791-B	CPJJ	WLC	VARIOUS	VARIOUS	O	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	____	____	____
CHECKED/DATE	9/21/86	____	____	____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-032
MANUFACTURER : TRIANGLE PWC

W A T T S B A R N U C L E A R P L A N T
TAB 4 - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-QV-026-1980-A	QV 1980-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QV-026-1987-A	QV 1987-A	CPJJ	WLC	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QV-026-1995-B	QV 1995-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QV-026-2005-B	QV 2005-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-003-1452-A	1M 1452-A	CPJJ	WMJ	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-043-2400-A	1M 2400-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-043-2410-B	1M 2410-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-031-2885-A	1PL2885-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-031-2895-B	1PL2895-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-2981-A	1PL2981-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-2991-B	1PL2991-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3001-A	1PL3001-A	CPJJ	WLO	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3031-A	1PL3031-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3041-B	1PL3041-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3051-A	1PL3051-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3061-B	1PL3061-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3081-B	1PL3081-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3091-A	1PL3091-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3101-B	1PL3101-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3121-B	1PL3121-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3131-A	1PL3131-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3141-B	1PL3141-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3151-A	1PL3151-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-3161-B	1PL3161-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-090-3584-A	1PL3584-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-090-3587-B	1PL3587-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-228-3716-B	1PL3716-B	CPJJ	WMT	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-090-3780-A	1PL3780-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-031-3787-A	1PL3787-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-026-3800-A	1PL3800-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-026-3810A-B	1PL3810-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-031-3820-A	1PL3820-A	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-031-3825-A	1PL3825-A	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-090-3877-B	1PL3877-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-067-3880-A	1PL3880-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-067-3913A-A	1PL3913-A	CPJJ	WLO	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-067-3920A-B	1PL3920-B	CPJJ	WLO	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Rodney Jones 9/21/86	-----	-----	-----
CHECKED/DATE	D.J. Cyo 9/21/86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PL-067-3940-B	1PL3940-B	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-4460-B	1PL4460-B	CPJJ	WMT	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-026-5003A-A	1PL5003-A	CPJ	WDP	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-026-5004B-A	1PL5004-A	CPJ	WDP	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-062-6114-B	1PL6114-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-062-6145-A	1PL6145-A	CPJJ	WLC	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-063-6159-A	1PL6159-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-063-6165-B	1PL6165-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-062-6170-A	1PL6170-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-062-6182-A	1PL6182-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-087-6249-A	1PL6249-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-087-6259-B	1PL6259-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PV-068-0043-A	1PV 43-A	CPJJ	WLN	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PV-052-0078-B	1PV 78-B	CPJJ	WLN	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PV-275-0157-B	1PV 157-B	CPJJ	WLN	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@RM-090-0352-B	1RM 352-B	CPJJ	WLO	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0225-S	1SG 225-S	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-072-1800-B	1V 1800-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-072-1810-A	1V 1810-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-1820-A	1V 1820-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-026-1826-A	1V 1826-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-1830-A	1V 1830-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-072-1850-B	1V 1850-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-072-1870-A	1V 1870-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-074-1935-A	1V 1935-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1950-A	1V 1950-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1960-A	1V 1960-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-070-1970-B	1V 1970-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-1980-A	1V 1980-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-1990-A	1V 1990-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-2000-B	1V 2000-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-2020-A	1V 2020-A	CPJJ	WLC	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-2030-A	1V 2030-A	CPJJ	WLC	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-2040-B	1V 2040-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-2050-B	1V 2050-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-062-2070-A	1V 2070-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-2080-B	1V 2080-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	____	____	____
CHECKED/DATE	9/21/86	____	____	____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-067-2090-A	1V 2090-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2100-B	1V 2100-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2120-A	1V 2120-A	CPJJ	WLO	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-003-2130-B	1V 2130-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2160-B	1V 2160-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2170-B	1V 2170-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2208-A	1V 2208-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2216-A	1V 2216-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-026-2224-A	1V 2224-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2232-A	1V 2232-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2240-B	1V 2240-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2247-A	1V 2247-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2255-B	1V 2255-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2261-A	1V 2261-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2275-B	1V 2275-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2283-B	1V 2283-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2292-A	1V 2292-A	CPJJ	WLC	VARIOUS	VARIOUS	O	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2320-B	1V 2320-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2332-B	1V 2332-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2343-B	1V 2343-B	CPJJ	WLC	VARIOUS	VARIOUS	O	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2350-B	1V 2350-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2356-B	1V 2356-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2362-A	1V 2362-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2368-B	1V 2368-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2374-A	1V 2374-A	CPJJ	WMJ	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2380-B	1V 2380-B	CPJJ	WMJ	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2386-A	1V 2386-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2392-B	1V 2392-B	CPJJ	WLO	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2398-A	1V 2398-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2404-B	1V 2404-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2410-A	1V 2410-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2416-B	1V 2416-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2422-A	1V 2422-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2428-A	1V 2428-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2434-A	1V 2434-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2440-B	1V 2440-B	CPJJ	WLC	VARIOUS	VARIOUS	O	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-068-2445-B	1V 2445-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Randolph Brown 9/21/86	____	____	____
CHECKED/DATE	D.I. Cox 9/21/86	____	____	____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-068-2451-A	1V 2451-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2466-B	1V 2466-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2484-B	1V 2484-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2502-B	1V 2502-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2514-B	1V 2514-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2520-A	1V 2520-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2526-A	1V 2526-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2532-B	1V 2532-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2538-B	1V 2538-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2544-B	1V 2544-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2550-B	1V 2550-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-074-2606-A	1V 2606-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-074-2612-B	1V 2612-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-001-2620-A	1V 2620-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-001-2630-B	1V 2630-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2640-B	1V 2640-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2650-A	1V 2650-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2660-A	1V 2660-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2670-B	1V 2670-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2680-A	1V 2680-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2687-B	1V 2687-B	CPJJ	WLO	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2695-A	1V 2695-A	CPJJ	WLO	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2703-B	1V 2703-B	CPJJ	WLO	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2710-A	1V 2710-A	CPJJ	WMJ	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2720-B	1V 2720-B	CPJJ	WMJ	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-2728-A	1V 2728-A	CPJJ	WMJ	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-072-2743-A	1V 2743-A	CPJJ	WLO	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-072-2752-B	1V 2752-B	CPJJ	WLO	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-2760-A	1V 2760-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-2770-B	1V 2770-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-074-2780-A	1V 2780-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-2800-A	1V 2800-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-2808-B	1V 2808-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-072-2820-A	1V 2820-A	CPJJ	WLO	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-072-2830-B	1V 2830-B	CPJJ	WLO	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2854-B	1V 2854-B	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2867-A	1V 2867-A	CPJJ	WLC	VARIOUS	VARIOUS	O	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/24/86	-----	-----	-----
CHECKED/DATE	9/24/86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-070-2878-A	1V 2878-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2888-B	1V 2888-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2908-B	1V 2908-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-2920-B	1V 2920-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2930-A	1V 2930-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2940-B	1V 2940-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2950-A	1V 2950-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2960-B	1V 2960-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-2968-A	1V 2968-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-2975-B	1V 2975-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3020-A	1V 3020-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3028-B	1V 3028-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3035-A	1V 3035-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3043-B	1V 3043-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3051-B	1V 3051-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3060-A	1V 3060-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3078-A	1V 3078-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3086-A	1V 3086-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3096-A	1V 3096-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3106-B	1V 3106-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3120-B	1V 3120-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3130-A	1V 3130-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3140-B	1V 3140-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-3150-B	1V 3150-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3170-A	1V 3170-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3185-B	1V 3185-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-063-3200-B	1V 3200-B	CPJJ	WMJ	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3210-A	1V 3210-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-3220-B	1V 3220-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-3320-B	1V 3320-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-3330A-B	1V 3330-B	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-3340-A	1V 3340-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-087-3381-D	1V 3381-D	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-087-3383-D	1V 3383-D	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-087-3391-E	1V 3391-E	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-087-3393-E	1V 3393-E	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-087-3413-G	1V 3413-G	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	Randy Lee Graves 9/21/86	____	____	____
CHECKED/DATE	D.F. Cope 9/21/86	____	____	____

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@V-067-3980B-A	1V 3950-A	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-3988-B	1V 3988-B	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-3996-B	1V 3996-B	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-4005B-A	1V 4005-A	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-070-4050-B	1V 4050-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-026-9147-A	1V 9147-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-026-9165-A	1V 9165-A	CPJJ	WLC	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-026-9170-B	1V 9170-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-026-9360-A	1V 9360-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-2895-B	2PL2895-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3091-A	2PL3091-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3121-B	2PL3121-B	CPJJ	WLO	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3760-B	2PL3760-B	CPJJ	WMT	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3880-A	2PL3880-A	CPJJ	WLO	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3913A-A	2PL3913-A	CPJJ	WLO	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3920A-B	2PL3920-B	CPJJ	WLO	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3940-B	2PL3940-B	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4460-B	2PL4460-B	CPJJ	WMT	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4500-A	2PL4500-A	CPJJ	WMT	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2020-A	2V 2020-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2208-A	2V 2208-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2398-A	2V 2398-A	CPJJ	WLC	VARIOUS	VARIOUS	0	N75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2404-B	2V 2404-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-063-2680-A	2V 2680-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2968-A	2V 2968-A	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-3980B-A	2V 3980-A	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-3988-B	2V 3988-B	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-3996-B	2V 3996-B	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-4005B-A	2V 4005-A	CPJJ	WMB	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-070-4050-B	2V 4050-B	CPJJ	WLC	VARIOUS	VARIOUS	0	75K7-086150-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	____	____	____
CHECKED/DATE	9/21/86	____	____	____

A. DOCUMENTATION

Equipment Description: Cable

Vendor/Manufacturer: Plastic Wire and Cable*

Equipment Model No.(s): TVA Type CPJ, CPJJ

TVA Contracts:
75K7-86150-2
74C7-85069-2
72C7-83483
72C7-75228-1

All contracts were officially let to Plastic Wire and Cable (PWC). They are owned/controlled by Triangle Industries. Triangle Industries also owned/controlled Triangle Conduit & Cable Company (Triangle). Each company (Triangle/PWC) manufactured cables for these contracts (TAB C.1) at their own respective plants, one located in New Jersey (N) (Triangle) and the other in Connecticut (C) (PWC). Throughout this binder, "Plastic Wire and Cable" shall also refer to Triangle Conduit & Cable Company.

QUALIFICATION REPORTS

(1) Title/Number/Revision "Nuclear Environmental Qualification Test Program on Various Cables used Outside Containment (Profile 3) for Tennessee Valley Authority for Use in Sequoyah and Watts Bar Nuclear Generating Stations," 17732-1, Revision C — RIMS B43 860402 500 — DATE February 24, 1986

(2) Title/Number/Revision "Nuclear Environmental Qualification Test Program on Various Cables for Use in Sequoyah Nuclear Plant East and West Steam Valve Rooms and East Steam Valve Vault Instrument Rooms and Watts Bar Nuclear Plant North and South Steam Valve Rooms and North Steam Valve Vault Instrument Rooms." 17740-1, Revision D — RIMS B43 860409 500 — DATE March 4, 1986

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(3) Wyle letter to TVA on Selection of Activation Energy, RIMS: B70 851230 001; Date: 12/16/85 (TAB E, Sec. E.1)
(4) TVA General Construction Specification No. G-38 for Installing Insulated Cable Rated up to 15,000 Volts R8, RIMS: B42 860318 503; Date: 3/17/86

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

(5) Class 1E Cables and Junction Boxes Below 10CFR50.49 Flood Level in Auxiliary Building, RIMS: B26 860310 004; Date: 3/10/86.
(6) Class 1E Conduit and Cable Walkdown for Selected Areas within the Aux. & Reactor Bldg., Cal. # WBPEVAR8606004, RIMS: B26 860618 020; Date: 6/18/86.
(7) Electrical Design Standard DS-12.7.1, Cable and Conduit Schedule-Key Letters and Material Designations, R1, RIMS: ESS 800430 204: Date: 4/18/80.
(8) Electrical Design Standard DS-E13.2.1, Cable Trays-Designations and Labeling for Computer Cable Routing, R2, RIMS: ESS 801212 204; Date: 12/8/80.
(9) WBNP-Unit 1, (WBEL, Cables) Data for Class 1E Cables and Splices in Harsh Environments 10CFR50.49, RIMS: B26 860708 005; Date: 7/7/86.
(10) Safety Evaluation of Superheated Steam in the Valve Vaults Caused by a Main Steam Line Break, WBNOSG4-003, RIMS: B45 851112 218; Date: 11/25/85.
(11) Post-LOCA Dose Rates and Doses Around EGTS and ABGTS Filters, TI-RPS-194, RIMS: NEB 850118 235; Date: 1/18/85.
(12) 100-Day Loss of Coolant Accident Dose to Electrical Equipment in the EGTS Filter Train Room; RIMS: B45 860529 237; Date: 5/28/86.
(13) Radiation Dose from EGTS Filters for Cable Qualification, QIR NEB86101, RIMS: B45 860723 261; Date: 7/23/86.
(14) Flood Levels in the North and South Valve Vault, QIR NEB86082, RIMS: B45 860627 267; Date: 6/27/86.
(15) Letter from Triangle-PWC to TVA indicating lack of cable documentation for TVA Contracts 75K7-86150-2, 74C7-85069-2, 72C7-75228-1, 72C7-83483-00, RIMS: B71 860626 001; Date: 6/17/86 (TAB E, Sec. E.2).
(16) Qualified Life Calculation, Material Aging Calculation Report, Digital System 1000, WAC-210 Date: 9/8/86 (TAB C, Sec. C.10).
(17) Accident Degradation Equivalency Material Aging Calculation Report, Digital System 1000, WAC-209 Date: 9/8/86 (TAB C, Sec. C.11).
(18) TVA Contract 72C7-75228-1, Specification, and Routine Cable Test Reports (TAB E, Sec. E.3)
(19) TVA Contract 72C7-83483-0, Specification, and Routine Cable Test Reports (TAB E, Sec. E.4)
(20) TVA Contract 75C7-85069-2, Specification, and Routine Cable Test Reports (TAB E, Sec. E.5)
(21) TVA Contract 75K7-86150-2, Specification, and Routine Cable Test Reports (TAB E, Sec. E.6)

BINDER NO. WBNEQ-CABL-032 PLANT WBN UNIT(S) 1 SHEET 3 OF 34

BINDER TITLE EQ DOCUMENTATION PLASTIC WIRE AND CABLE, CPJ AND CPJJ

COMPUTED RJJ DATE 9/22/86 R ___ R ___

CHECKED DC DATE 9/23/86

B. CONCLUSION OF REVIEW (Check only one block)

X Equipment Qualified for Installed Circuits (pending resolution of open items) , No More Cable from this Binder is to be Installed in Class 1E Circuits Located in Harsh Environments

___ 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) It is an unverified assumption that cable (conductor insulation) similarity exists between and among the cables identified in TAB A, test samples 3b, 4b, 5b, 31b, and 33b in the Wyle Test Report 17732-1 (Ref: #1, TAB B, Section A), and test sample 4b in Wyle Test Report 17740-1 (Ref: #2, TAB B, Section A).

(2) The temperature rating of the cable qualified by this binder has been reduced below the manufacturer's rating and/or that requested by the contract specifications. It is assumed that the present applications and installations will not exceed this temperature for the specified qualified life.

(3) It is an unverified assumption that all system 87 cables installed at Watts Bar Unit 1 associated with the Upper Head Injection (UHI) System have been removed for the purpose of this EQ evaluation.

B. CONCLUSION OF REVIEW (Continued)

(4) Numerous cables are being rerouted as a result of non-EQ design changes (i.e., instrument relocation, senseline slope, Appendix "R" separation criteria, etc.).

CABLE #	DESIGN DOCUMENT
1M--1452-A	ECN 6016
1PV-0139-B	ECN 5958

(5) Discrepancies exist between design and installation documentation pertaining to mark number, reel number, contract number, etc.

COMMENTS/RECOMMENDATIONS

Note: The TVA Cable types represented in this binder are obsolete. No future cable will be pulled from any of the contracts represented by this binder.

BINDER NO. WBNEQ-CABL-032 PLANT WBN UNIT(S) 1 SHEET 5 OF 34

BINDER TITLE EQ DOCUMENTATION PLASTIC WIRE AND CABLE, CPJ AND CPJJ

COMPUTED RJJ DATE 9/22/86 R ___ R ___

CHECKED DC DATE 9/23/86

C. 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 (IEEE 323-1974)

__X__ Components are Qualified to the Criteria of NUREG-0588 Category II or the DOR Guidelines of IE Bulletin No. 79-01B (IEEE 323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 323-1971. Test was conducted in accordance with the general guidelines of IEEE 323-1974.

Certain sections of IEEE 383-1974, identified when applicable.

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 tested cables are representative of the cables used in the plant which are listed in TAB A. See TAB C, Section C.1, "Similarity: Tested Cable Vs. Installed Cable" for justification.

NOTE: The following test reports and test specimens are used to determine qualification for areas noted:

Test Report	Specimen	Area(s)	Qualification
Reference #1 17732-1	4b, 5b, 31b, 33b 3b	All outside containment areas except MSVV room.	40 Years
Reference #2 17740-1 (Specimens in this report were exposed to the more severe accident of the MSVV room after being exposed to all other outside containment environment in report 17732-1	4b	MSVV room.	40 Years

MSVV - Main Steam Valve Vault

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Cable	#1: pp xi-xiii & VII-6 to VII-8; #2: p iv
(2) Manufacturer	Plastic Wire & Cable	Plastic Wire & Cable	#1: pp xi-xiii & VII-6 to VII-8; #2: p iv
(3) Model Number(s)	TVA Type CPJ & CPJJ[1]	TVA Type CPJ & CPJJ[1]	#1: pp xi-xiii & VII-6 to VII-8; #2: p iv
	TVA Mark Nos. WDK WLS WLC WLH WLO WLK WLJ WMB WDE WDJ WMJ WDN WMQ WDO WMT WDP WDH WLN	TVA Mark Nos. WMB WDE WLB WLN WDH WDG	#1: pp xi-xiii & VII-6 to VII-8; #2: p iv
(4) Serial Number(s)	NA	NA	NA
(5) Identify Component-Unique checksheet attached:	Supplement 2 component-unique checklist cables/splices		

JUSTIFICATION/COMMENTS Test specimens in the Wyle test reports 17732-1 (Ref. 1) and 17740-1 (Ref. 2) were taken from the same TVA contracts as the 50.49 cables installed in the plant. Their physical characteristics, conductor size, number, etc., are representative of the cables purchased on the contract and installed at Watts Bar. See TAB C, Section C.1 for a further discussion.

E. EQUIPMENT DESCRIPTION (Continued)

JUSTIFICATION/COMMENTS

[1] CPJ: Single-conductor wire or cable with cross-linked polyethylene (XLPE) insulation and a polyvinyl-choride (PVC) jacket over the insulation.

CPJJ: Multiple-conductor cable with a core of the specified number or type CPJ single conductors covered with a PVC outer jacket.

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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		NA	
Electrical Connections		NA	
Conduit Seals		NA	
Connector Seals		NA	
Orientation		NA	
Physical Configuration		NA	
Other			

JUSTIFICATION/COMMENTS This section is not required for cable. As a note, the electrical connections for the cables in this binder are made in accordance with TVA Specification G-38 (Ref: 4, TAB B, Section A).

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	#1: p I-1, VII-9, #2: p III-6, III-9
(b) Baseline performance measurements taken	Yes	#1: Sect I
(c) Equipment aged:		
Thermal	Yes[1]	#1: Sect IV
Radiation	Yes	#1: Sect II
Wear	NA	See TAB C, Section C.2
(d) Vibration/seismic testing conducted	NA	See TAB C, Sections C.2 and C.3
(e) Design basis event (DBE) exposure	Yes[1]	#1: Sect V & #2: Sect I
(f) Post-DBE exposure	Yes[1]	#1: pp V-3 & VII-22
(g) Final inspection and disassembly	Yes	#1: Sect VIII & #2: Sect IV

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes
(Reference TAB C, Section C.8).

JUSTIFICATION/COMMENTS

[1] See TAB C.6 for further discussion.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference #1: Sect II & IV).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	#1: Sect IV
Radiation exposure	Yes	#1: Sect II
Vibration (non-seismic) aging	NA	
Operational (electrical/mechanical/process) stress aging	NA	

JUSTIFICATION/COMMENTS Vibration and operational stress aging.

See TAB C, Sections C.2 and C.3.

(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)? Yes (Reference #1: p VII-16).

JUSTIFICATION/COMMENTS See TAB C, Section C.4.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference #1: Sect IV).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: #1: pp VII-17, VII-25, & VII-29).

JUSTIFICATION/COMMENTS

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference #1: pp VII-16 thru VII-18).

JUSTIFICATION/COMMENTS Aging was performed on sample for type test in accordance with IEEE-383-1974, and accepted industry standards.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference *).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	104°F **	*	60°C
Time	40 years	*	40 years

JUSTIFICATION/COMMENTS *Various, see TAB C, Section C.6.

**Excepting the following:

PLT LOC	TEMP (°F)	ENV DRAWINGS	ROOM ID
Annulus	110	47E235-44 R1	---------
MSVV	130	47E235-76 R3	729-A01
		47E235-76 R3	729-A11
		47E235-76 R3	729-A02
		47E235-76 R3	729-A10

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference #1: p VII-17 and VII-38 to VII-45).

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 #1: pp VII-25, VII-29, VII-31).
(Reference #3: TAB B, Section A).

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)? NA (Reference).

JUSTIFICATION/COMMENTS A regression line was not used.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS Conductor temperature (60°C: ambient plus heat rise) was used as a baseline for computing accelerated aging, thus powering during thermal aging was not required.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference #1: Sect II).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference #1: pp VII-15, VII-25, and VII-29).

JUSTIFICATION/COMMENTS

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference #1: pp VII-15, VII-16).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference #1: p VII-16, Sect II).

Plant normal ambient radiation dose (rd) 1.9E7 (See TAB C, Section C.5.2)

Test exposure dose (rd) #1: 7.5E7, p II-1**
Between .346E6 and .674E6

Test exposure dose rate (rd/hr) #1: p II-1

Test exposure source type (e.g., Co-60 gamma) Co-60 gamma (#1: p II-1)

JUSTIFICATION/COMMENTS *40-year dose.

**Includes normal plus accident.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS See TAB C, Section C.2.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA
(Reference _____).

JUSTIFICATION/COMMENTS See TAB C, Section C.2.

(7) Operational Stress Aging:

(a) Were the effects of electrical, mechanical, and process operational stresses induced during normal and abnormal operation addressed in the qualificaton program (yes/no/NA)? NA

JUSTIFICATION/COMMENTS See TAB C, Section C.2.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? NA (Reference _____).

JUSTIFICATON/COMMENTS See TAB C, Section C.2.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference #1: p VII-15, VII-16).

Qualified life (Document in QMDS) 40 years based on a maximum conductor temperature of 60°C. (See Open Item, #2 TAB B, Section B).

JUSTIFICATION/COMMENTS See TAB C, Section C.10.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA (Reference _____).

Replacement Intervals (Document in QMDS) All cables covered by this binder are qualified for the 40 year life of the plant, pending resolution of Open Items (TAB B, Section B).

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 Threshold	Reference	Activation Energy	Reference
(a)	XLPE/Electrical/Insulation	1.0E6 RADS	#1:PP VII-25 VII-29	1.11eV	#1: pp VII-25, VII-29
(b)	PVC/Mechanical/Jacket	1.0E6 RADS	#1:PP VII-25 VII-29	1.15eV	#1: pp VII-25, VII-29
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS The testing was done in accordance with industry standards and was done to test the cable insulation. The jacket materials are considered sacrificial since their only functions are to protect the insulation during pre-installation handling and during installation. Therefore, only the insulation is considered during the qualification program.

The activation energy of 1.11 eV for XLPE used in the Wyle test report 17732-1 (Ref: #1) page VII-17, paragraph 3.3.2 and pages VII-25 through VII-31, is considered the best available data as referenced in a Wyle letter to TVA dated December 16, 1985 (RIMS B70 851230 001)(Ref: #3). While this value is the most conservative entry in the Wyle aging library data base, two XLPE entries of lower values are in the Digital 1000 data base used by TVA. One entry is for Raychem cable insulation with a .89 eV.

I. MATERIALS ANALYSIS (Continued)

This is the lowest. Since this is unique, applying only to Raychem compounds, it can be excluded as not being the best available data. The other entry is 1.09 eV representing a composite set of data including four EP compounds and two XLPE compounds produced by Okonite. This is also not considered the best available data because of its uniqueness. For these reasons 1.11 eV is used as the most conservative and best available activation energy for cross-linked polyethylene.

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

(1) 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 #1: p VII-11 and VII-12).

Identify Acceptance Criteria: During the accident simulation, the cables must demonstrate integrity sufficient to maintain as a minimum 528VAC, 60Hz, 18 amps in a fused circuit. See also TAB C, Section C.7 for further discussion.

(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)? No (Reference _____).

Identify baseline and functional testing: Insulation resistance testing was performed for information only during functional tests before and after each major test. Performance tests performed during the accident test are described in J(1) above. Performance characteristics are defined in TAB C, Section C.7.

JUSTIFICATION/COMMENTS _____

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference #1: pp V-1 through V-4).

JUSTIFICATION/COMMENTS _____

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference _____

JUSTIFICATION/COMMENTS Baseline testing and subsequent functional tests consisted of insulation resistance measurements which provide an indication of the condition of the cable but are not the actual voltage and load carried by the cable in service in the plant. The demonstration of the cable to perform its intended safety function was accomplished during the accident test. See TAB C, Section C.7 for further discussion.

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	480V(1)	#12 (TAB B, Section A)
Load	Full Load Current(3)	#13 (TAB B, Section A)
Frequency	NA(2)	
Accuracy	NA(2)	
Other(s)	NA	

JUSTIFICATION/COMMENTS (1) All cables are installed at Watts Bar Nuclear Power Plant in this binder are installed in cable trays with voltage designators/node voltage levels (NV) of V-3 or V-4 which have a maximum voltage of 480 volts (Ref: #8 & #9; TAB B, Section A).

(2) These cables are not frequency sensitive, and they have no specific accuracy requirements.

(3) Full load current is dependent on a maximum conductor temperature of 60°C which is dependent on cable size, type of cable installation and plant location. (See TAB B, Section B, Open Item No. 2)

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	528 VAC (1)	#1, p V-34, V-35
	531 VAC (1)	#2, p I-12
Load	18.0 to 18.4 amps	#1, p V-34
	1.0 amps	#2, p I-12
Frequency	NA	
Accuracy	NA	
Other(s)		
	NA	
	NA	

JUSTIFICATION/COMMENTS See TAB C, Section C.7.

K. REQUIRED OPERATING ENVIRONMENT (OUTSIDE CONTAINMENT, HARSH, ONLY)

Reference Environmental Drawing No. (See footnotes below)

(1) Normal Max (Worst Case)

(a) Temperature (°F) 130 [1]

(b) Pressure (psig) Atmospheric (14.4 psia) [2]

(c) Humidity (%) 80 [2]

(d) Radiation (rd) 1.9E7 [3]

(2) Abnormal Max (Worst Case)

(a) Temperature (°F) 140 [1]

(b) Pressure (psig) Atmospheric (14.4 psia) [2]

(c) Humidity (%) 100 [1]

(d) Radiation (rd) NA [2]

1) 47E235-76 R3 (MSVV) (TAB C, Section C.5.1).
2) All areas outside containment listed as harsh: Dwg series 47E235.
3) 47E235-40R3 (Valve Gallery (692-A16)) (TAB C, Section C.5.2).

(3) Process Interfaces: None required for cable.

(4) State anticipated occurrence frequency and duration of abnormal conditions: It could exist for up to eight hours duration per excursion and will occur less than 1 percent of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F) 325 [1] Accident type HELB

(b) Pressure (psig) 25.18 psia [1] Accident type HELB

(c) Humidity (%) 100 [1] Accident type HELB

(d) Radiation (rd) 6.75E7 [2] Accident type LOCA

(e) Spray Type None Accident type ---

1) 47E235-76 R3 (MSVV) (See TAB C, Section C.5.1)
2) 47E235-78 R3 (EGTS) (See TAB C, Section C.5.2)

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

All conditions are worst case outside primary containment. Spray is not required for outside primary containment.

(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 C, Section C.5.3).

(7) Subject to submergence (yes/no/NA)? No
(Reference See TAB C, Section C.5.4).

Identify initiation time and duration of submergence: NA

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

Type	RIMS No.
Radiation	NEB 850118 235 (Ref: #11, TAB B, Section A)
Radiation	B45 860529 237 (Ref: #12, TAB B, Section A)
Radiation	B45 860723 261 (Ref: #13, TAB B, Section A)
Submergence	B45 860627 267 (Ref: #14, TAB B, Section A)
Temperature	B45 851112 218 (Ref: #10, TAB B, Section A)

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 Days (Max) ****	13 Days Note 1	#1, p V-25
Temperature (°F)	325 (MSVV)	330 (MSVV)	#2, p I-18
	219 (Other)	240 (Other)	#1, p V-25
Pressure (psig)	10.0 (MSVV)	13.0 (MSVV)	#2, p I-18
	1.5 (Other)	1.9 (Other)	#1, p V-25
Relative Humidity (%)	100	95-100	#1, p VII-23, Section 3.4.9
*Chemical Spray	NA	NA	---
**Radiation (rd)	6.75E7 Gamma ***	7.5E7 Gamma	#1, p II-1
Submergence	None	None	See TAB C Section C.5.4

*Includes spray concentration, flowrate, density, duration, and pH.
**Enter 40-year integrated normal dose plus integrated accident dose and specify type.
***See TAB C, Section C.5.2
****See TAB C, Section C.5.1

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes (See TAB C, Section C.5.1)	#2, p I-18 #1, p V-25
Pressure	Yes	#2, p I-18 #1, p V-25
Relative Humidity	Yes	#1, p VII-23
Chemical Spray	NA	Note 2
Submergence	None	See TAB C Section C.5.4

JUSTIFICATION/COMMENTS Notes:

1) See TAB C, Section C.6 for extrapolation.

2) The cables are located outside of primary containment and are not exposed to chemical spray.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	15°F	Yes (See TAB C, Section C.5.1)
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)	None Note 1	NA
Voltage: ±10% of rated value	10% Note 2	Yes
Frequency: ±5% of rated value	NA	NA
Environmental Transient: the initial transient and the peak temperature applied twice	No	NA
Vibration: +10% added to acceleration	NA	NA

JUSTIFICATION/COMMENTS: ° Frequency (electrical): Cables are not frequency sensitive. ° Vibration: See TAB C, Section C.2. ° Environmental Transient: The application of two initial transients in an accident test is to add margin. Since margin is applied in other ways (+15°F on accident temperature, +10 percent on accident pressure), margin need not be applied twice. Therefore, an additional initial transient is not required.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

JUSTIFICATION/COMMENTS:

1) There is no time margin. Extrapolation from 13 days to 100 days is explained in TAB C, Section C.6 using data from TAB C, Section C.11.

2) The cables were testd at 528 VAC (Ref #1: p V-34, V-35) and 531 VAC (Ref #2: p I-12). The voltage rating for the cables in the plant is 480V (See TAB B, Section J(5)(a); comments).

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference #1 VII-11, -12 and #2, III-8).

JUSTIFICATION/COMMENTS Auxiliary power and control cables in 480V or less applications outside containment, that will demonstrate, during an accident simulation, sufficient integrity to maintain as a maximum of 528 VAC at an operating conductor temperature (ambient plus heat rise) of less than 60°C for all areas outside containment. (See TAB C, Section C.7).

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference #1, p x and #2, p iv).

JUSTIFICATION/COMMENTS See TAB C, Section C.7.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference #1, p x and #2, p iv).

JUSTIFICATION/COMMENTS See TAB C, Section C.7 for discussion.

(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 #1, pp VII-22, VII-23, and V-45).

JUSTIFICATION/COMMENTS The test duration was 13.54 days. An extrapolation to 100 days is demonstrated in TAB C, Section C.6 using data from TAB C, Section C.11.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference #1, pp ii, thru x & #2, p iv).

JUSTIFICATION/COMMENTS See TAB C, Section C.9 for discussion of the anomalies which apply to these test specimens.

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)? No (Enter all requirements in Section G of the Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS There were no surveillance or maintenance requirements identified from the review of the test report; however, TVA has initiated a maintenance and surveillance program as described in TAB G.

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)?	Yes (Pending resolution of Open Items in TAB B, Section B)
(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?	Yes
(b) Were specific features and failure modes and effects analyzed?	Yes
(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 (Pending resolution of Open Item No. 1 in TAB B, Section B)
(6) Aging degradation evaluated adequately?	Yes (See Section P)
(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

0. SUMMARY OF REVIEW (Continued)

	Yes/No/NA
(e) Normally operating state of device (e.g., normally energized) considered?	Yes (Pending resolution of Open Item No. 2 on CACTAT; TAB B, Section B)
(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	No (See Section P)
(d) Required profile enveloped adequately	No (See Section P)
(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?	NA
(11) Criteria regarding submergence satisfied?	Yes
(12) Criteria regarding radiation satisfied?	Yes
(a) Was dose rate considered?	Yes
(b) Was beta radiation considered?	Yes (See TAB C, Section C.5.2)
(13) Criteria regarding operability status/mode satisfied?	Yes
(14) Criteria regarding test failures or anomalies satisfied?	Yes (See TAB C, Section C.9)

O. SUMMARY OF REVIEW (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 baseline test done to establish required performance characteristics?	Yes
(c) Has the test/analysis demonstrated that performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?	Yes (Pending Resolution of Open Item No. 2 on CACTAT; TAB B, Section B)
(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 1-hour minimum operating time was taken, was adequate justification provided?	NA
(18) Criteria regarding synergistic effects satisfied?	NA See TAB C Section C.4
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

O.(6)(a) Mechanical and/or cycle aging are not required for cable per IEEE 383-1974.

O.(8)(c) & (d) The test profile adequately envelops the WBN requirements and although the test profile does not envelop the post-DBE requirement by virtue of the test having a shorter post-DBE duration, discussion in TAB C, Section C.6 demonstrates that the shorter post-DBE duration is equal to the 100-day post-DBE requirement through use of the Arrhenius technique.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				#1 pp VII-6, VII-8, VII-25 VII-29
Insulation material	XLPE	XLPE	Yes	
Size	See TAB C Sect. C.1	See TAB C Sect. C.1	Yes	#1 pp VII-6, VII-8, VII-25 VII-29
Stranding	See TAB C Sect. C.1	See TAB C Sect. C.1	Yes	#1 pp VII-6, VII-8, VII-25 VII-29
Coating	--	--	NA	
Insulation Thickness	See TAB C Sect. C.1	See TAB C Sect. C.1	Yes	#1 pp VII-6, VII-8, VII-25 VII-29
Number of conductors	See TAB C Sect. C.1	See TAB C Sect. C.1	Yes	#1 pp VII-6, VII-8, VII-25 VII-29
Arrangement of conductors	See TAB C Sect. C.1	See TAB C Sect. C.1	Yes	#1 pp VII-6, VII-8, VII-25 VII-29

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(b) Shielding	None	None	NA	
(c) Insulation jacket				
Material	* PVC	PVC	Yes	#1 pp VII-6, VII-8, VII-25 VII-29
Thickness	See TAB C Sect. C.1	See TAB C Sect. C.1	Yes	#1 pp VII-6, VII-8, VII-25 VII-29
(d) Outer jacket				
Material	* PVC	PVC	Yes	#1 pp VII-6, VII-8, VII-25 VII-29
Thickness	See TAB C Sect. C.1	See TAB C Sect. C.1	Yes	#1 pp VII-6, VII-8, VII-25 VII-29
(e) Rated voltage	*** 480V		Yes	#1 p VII-12
(f) Rated current	NA	528VAC Stated	NA	---
(g) Operating temperature rating				
Normal	** 60°C	60°C	Yes	#1 VII-17, VII-18
Emergency	Not Stated	Not Stated	Yes	---
Short circuit	Not Stated	Not Stated	Yes	---

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(h) Insulation resistance	Not Stated	See TAB C, Sect. C.7	Yes	See TAB C, Sect. C.7
(i) Splice				
Material	NA	NA	NA	---
Thickness	NA	NA	NA	---
Identification	NA	NA	NA	---

Comments: *From cable contracts. (TAB E).

**TVA's rating for this cable.
***Ref: #8 & #9, TAB B, Section A.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? No (Reference -----).

Comments: See TAB C, Section C.5.3.

(3) Was the cable energized during test (yes/no/NA)? Yes
(Reference #1, p V-34 & #2, p I-12).

Comments:

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference #1, Sect. VI).
#2, Sect. II

Comments:

EQUIPMENT IDENTIFICATION (Continued)

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference *See below).

Comments: #1, Sections I, III, & V-76, V-77, V-83, V-84, V-90 & V-91.

#2, I-38.

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? No (Reference ----).

Comments: Not required for NUREG-0588, Category II qualification.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? NA (Reference).

Identify flame test standard:

Comments: Reviewing cable for flame test is outside the scope of this 10CFR50.49 review. It is part of TVA's 10CFR50.49, Appendix R review for Watts Bar.

PRINT DATE: 09/21/85

BINDER NO. : WBN5Q-CABL-033
MANUFACTURER : TRIANGLE PWC

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT OPV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-BPP-082-04708-A	BPP 470-A	CPSJ	WNC	VARIOUS	VARIOUS	0	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-BPP-082-04718-A	BPP 471-A	CPSJ	WNC	VARIOUS	VARIOUS	0	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-BPP-082-05900-B	BPP 590-B	CPSJ	WNC	VARIOUS	VARIOUS	0	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-BPP-082-07110-B	BPP 711-B	CPSJ	WNC	VARIOUS	VARIOUS	0	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPP-062-0550-A	1BP 550-A	CPSJ	WNB	VARIOUS	VARIOUS	0	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPP-072-0625-A	1BP 625-A	CPSJ	WNB	VARIOUS	VARIOUS	0	74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPP-067-0675A-A	BPP 675-A	CPSJ	WNB	VARIOUS	VARIOUS	0	N74C7-085069-2	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

	R____	R____	R____
PREPARER/DATE D.C. Souththorpe 9/21/86	____	____	____
CHECKED/DATE N.M. Bernstein 9/21/86	____	____	____

BINDER NO. WBNEQ-CABL-033 PLANT WBN UNIT(S) 1 SHEET 1 OF 27

BINDER TITLE PWC/MEDIUM VOLTAGE COMPUTED DLS DATE 9/21/86 R R

POWER-XLPE INS./TVA TYPE CPSJ CHECKED B DATE 9/21/86

A. DOCUMENTATION

Equipment Description Insulated Conductors

Vendor/Manufacturer Plastic Wire and Cable

Equipment Model No.(s) TVA Type - CPSJ(1)

TVA Contract: 74C7-85069-2

QUALIFICATION REPORTS

(1) Title/Number/Revision Nuclear Environmental Qualification Test Report-Wyle Lab No. 17732-1 Revision C RIMS B70 860228 100 DATE 2/24/86

(2) Title/Number/Revision _____ RIMS _____ DATE _____

(3) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(1) CPSJ - Single-conductor high voltage cable, with extruded strand shield, with cross-linked polyethylene insulation, extruded insulation shield with metallic electrostatic shielding, and a polyvinyl chloride jacket.

BINDER NO. WBNEQ-CABL-033 PLANT WBN UNIT(S) 1 SHEET 2 OF 27

BINDER TITLE PWC/MEDIUM VOLTAGE COMPUTED DLS DATE 9/23/86 R ___ R ___

POWER-XLPE INS./TVA TYPE CPSJ CHECKED B DATE 9/23/86

B. CONCLUSION OF REVIEW (Check only one block)

X Equipment Qualified (pending satisfactory 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. CACTAT
2. Verify routing and load and duty cycle information.
3. Unverified contract and mark No. "N" prefix.
4. ECN reroutes

COMMENTS/RECOMMENDATIONS The cable in this binder is qualified for 40 years at 60°C in its installed environment. (See Summary in front of binder for additional comments). Beginning at the issue date of this binder, the cable must not be used for any future installation.

BINDER NO. WBNEQ-CABL-033 PLANT WBN UNIT(S) 1 SHEET 3 OF 27

BINDER TITLE PWC/MEDIUM VOLTAGE COMPUTED DLS DATE 9/23/86 R R

POWER-XLPE INS./TVA TYPE CPSJ CHECKED B DATE 9/23/86

C. 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

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 323-1971.

The general guidelines of IEEE 323-1974 were used as the basis for developing the qualification program of Wyle Test Report No. 17732-1, Revision C.

BINDER NO. WBNEQ-CABL-033 PLANT WBN UNIT(S) 1 SHEET 4 OF 27

R ___ R ___

BINDER TITLE PWC/MEDIUM VOLTAGE COMPUTED DLB DATE 9/23/86

POWER-XLPE INS./TVA TYPE CPSJ CHECKED B DATE 9/23/86

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 See page 25 for information concerning installed and tested cable.

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Insulated Conductor	Insulated Conductor	17732-1 page I-2
*(2) Manufacturer	Plastic Wire and Cable	Plastic Wire and Cable	17732-1 page I-2
(3) Model Number(s)	TVA Type CPSJ	TVA Type CPSJ	17732-1 page I-2
		Specimens 20A and 20B	17732-1 page I-2
(4) Serial Number(s)	NA	NA	NA
(5) Identify Component-Unique checksheet attached:	Supplement 2, Cable/Splices		

JUSTIFICATION/COMMENTS Specimens 20A and 20B were entered into test program. Specimen 20B is the 40-year sample and all data and references will apply to specimen 20B only. Specimen 20B is a TVA mark No. WNB which is a 1/c, No. 2/0 type CPSJ.

*The contractor for the cable in this binder is Plastic Wire and Cable Corporation but the manufacturer is Triangle Conduit and Cable (See TAB E, Contract 85069-2, page 4).

F. INSTALLATION INTERFACES

Does the qualification program address all relevant interfaces of the equipment so that the installed design and configuration is similar or identical to the test configuration (yes/no/NA)? (note below)

Interface	Identify Interface Requirement	Acceptable? (Yes/No)	Reference Test Report
Mounting Bolts	NA		
External Process Connections	NA		
Electrical Connections	NA		
Conduit Seals	NA		
Connector Seals	NA		
Orientation	NA		
Physical Configuration	NA		
Other	NA		

JUSTIFICATION/COMMENTS This section is not required for cable.

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	17732-1 page I-1
(b) Baseline performance measurements taken	Yes	17732-1 page I-5 and I-28
(c) Equipment aged:		
Thermal	Yes	17732-1 page IV-2 through 3
Radiation	Yes	17732-1 page II-1
Wear	NA	See page 12A
(d) Vibration/seismic testing conducted	NA	See page 12A
(e) Design basis event (DBE) exposure	Yes	17732-1, page V-3 and Figure V-5 on p. V-16
(f) Post-DBE exposure	Yes	17732-1 and Figure V-5, p. V-16
(g) Final inspection and disassembly	Yes	17732-1 page VIII-5

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference 17732-1, page xiii).

JUSTIFICATION/COMMENTS

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference 17732-1, page II-2; page IV-2 & 3).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	17732-1 page IV-2 and 3
Radiation exposure	Yes	17732-1 page II-2
Vibration (non-seismic) aging	NA	See page 12A
Operational (electrical/mechanical/process) stress aging	NA	See page 12A

JUSTIFICATION/COMMENTS

(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 17732-1, page VII-16).

JUSTIFICATION/COMMENTS NUREG-0588, Category II evaluation

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference 17732-1, page IV-2 and -3).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: 17732-1, page VII-17 and 27).

JUSTIFICATION/COMMENTS

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, page VII-16, -17 and -38 thru -44).

JUSTIFICATION/COMMENTS Aging was performed on sample for type test in accordance with IEEE 383-1974 para. 2.2 and accepted industry methods.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, page IV-2 and 3).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	104°F	*	60°C
Time	40 years	*	40 years

JUSTIFICATION/COMMENTS *See Material Aging Calculation Report WAC-206 in TAB C

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference 17732-1, page VII-17).

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 17732-1, page VII-27).

JUSTIFICATION/COMMENTS

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)? NA (Reference 17732-1, page VII-17).

JUSTIFICATION/COMMENTS No regression line was used.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS Energization during thermal aging was not required because age-conditioning and evaluation was based on consideration of temperature rise associated with energizing at rated current.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference 17732-1, page II-2).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, page VII-27).

JUSTIFICATION/COMMENTS

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference 17732-1, page VII-15).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference 17732-1, page II-2).

Plant normal ambient radiation dose (rd) 3.6×10^6

Test exposure dose (rd) 7.5×10^7

Test exposure dose rate (rd/hr) $.234 \times 10^6$

Test exposure source type (e.g., Co-60 gamma) Co-60

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference See page 12A).

JUSTIFICATION/COMMENTS

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA (Reference See page 12A).

JUSTIFICATION/COMMENTS

(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)? NA (Reference See page 12A).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? NA (Reference See page 12A).

JUSTIFICATION/COMMENTS

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes
(Reference 17732-1, page VII-16, -17, -38 thru -44).

Qualified life (Document in QMDS) 40 years at 60°C

JUSTIFICATION/COMMENTS See Aging Calculation Report WAC-206 in TAB C.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA
(Reference ___).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS Cable qualified for 40 years; therefore, no replacement interval established. 40 years is the design life of the plant.

GENERIC COMMENT FOR G(1)(C)WEAR, G(1)(D)VIBRATION, H(2),H(6), AND H(7)

Normal Service Related Stresses- In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards...". Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria". Included in the list that follows the above quote are two standards to which TVA routinely purchases power, control and signal cables. They are as follows:

1. IPCEA S-19-81 Rubber-Insulated Cable

2. IPCEA S-66-524 Cross-Linked-Polyethylene-Insulated Cable

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service.

GENERIC COMMENT FOR G(1)(D) SEISMIC:

Seismic testing is not required for environmental qualification by 10CFR50.49.

BINDER NO. WBNEQ-CABL-033 PLANT WBN UNIT(S) 1 SHEET 13 OF 27

BINDER TITLE PWC/MEDIUM VOLTAGE POWER-XLPE INS./TVA TYPE CPSJ COMPUTED DLS DATE 9/2/86 CHECKED B DATE 9/2/86 R R

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 Threshold	Reference	Activation Energy	Reference
(a)	Cross-linked Polyethylene	$1x10^6$	17732-1 p. VII-27	1.11	17732-1 p. VII-27
(b)	Polyvinyl Chloride	$5x10^5$	17732-1 p. VII-27	1.15	17732-1 p. VII-27
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS Thermal and radiation age-conditioning were performed as part of the test program so that the complete equipment item was accounted for and thus, precludes the need to separately test the component parts.

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

(1) 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 17732-1, page VII-11&12).

Identify Acceptance Criteria: Cable shall maintain sufficient electrical integrity during, DBE, to maintain current and voltage in a fused circuit Cable shall maintain 7590 VAC 60 Hz and 18 amps.

(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 See below).

Identify baseline and functional testing: Insulation resistance at 500 VDC; baseline 17732-1, page I-5 and I-28; Pre-HELB 17732-1, page V-99; During HELB 17732-1, page V-105; post HELB 17732-1 page V-110. Specimen 20 was also energized at 7590 VAC and 18 ampere, 17732-1, page V-4 during HELB. Specimens were energized as specified on page V-2, 17732-1, paragraph 1.5. Also See TAB C, Section C.

JUSTIFICATION/COMMENTS Although the first IR measurement was not taken until 26.4 hours into the test, the cable was energized at 7590 VAC and 18 amps for that period of time. The power cable maintained the applied load for that time. When hi-potted later at 11200 VAC the leakage current was 8.0 mA. A leakage current of this magnitude is insignificant for 2/0 and 4/0 medium voltage power cables.

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference 17732-1, page V-4).

JUSTIFICATION/COMMENTS

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS Cable was manufactured and successfully tested in accordance with IPCEA Standard S-66-524. Per IEEE-383, 1974, this ensures that the cable performance will be within normal operating conditions.

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	8000 Volts	74C7-85069-2
Load	NA	NA
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS _____

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	7590 Volts	17732-1 page V-4
Load	18 Amps	17732-1 page V-4
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. See page 17

(1) Normal Max

(a) Temperature (°F) 104°F

(b) Pressure (psig) 14.4 psia

(c) Humidity (%) 80%

(d) Radiation (rd) 3.6×10^6

(2) Abnormal Max

(a) Temperature (°F) 110°F

(b) Pressure (psig) 14.4 psia

(c) Humidity (%) 90%

(d) Radiation (rd) --

(3) Process Interfaces: None required.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Up to eight hours per excursion and will occur less than 1% of the life of the plant.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	128°F	Accident type LOCA/HELB
(b) Pressure (psig)	14.43 psia	Accident type LOCA/HELB
(c) Humidity (%)	100%	Accident type LOCA/HELB
(d) Radiation (rd)	1.0×10^7 *	Accident type LOCA/HELB
(e) Spray Type	NA	Accident type NA

* Cables in this binder are not subject to BETA radiation because all cables are located outside containment and none are installed in the annulus.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Worst case accident radiation and humidity shown on Dwg 47E235-79 R1.

Worst case normal radiation is shown on Dwg 47E235-79 R1. Worst case temperature and pressure are shown on 47E235-46 R1.

(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)? No (Reference S-66-524 & IPCEA Standards).

(7) Subject to submergence (yes/no/NA)? No
(Reference See TAB C, Section A.).

Identify initiation time and duration of submergence: _____

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

Type	RIMS No.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
(See comment) Operating Time	30 days	319 hours	17732-1 page V-46
Temperature (°F)	128°F	240°F	17732-1, pp V-3 & V-46
Pressure (psig)	14.43 psia	16.4 psia	17732-1 pp V-3 & V-46
Relative Humidity (%)	100%	100%	17732-1 pp V-3 & V-42
*Chemical Spray	NA	NA	NA
**Radiation (rd)	1.36×10^7	7.5×10^7	17732-1 pp II-1 and 2
Submergence	See K(7) page 17	--	--

*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	17732-1 page V-26
Pressure	Yes	17732-1 page V-26
Relative Humidity	Yes	17732-1 page V-22
Chemical Spray	NA	NA
Submergence	See K(7), page 17	--

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JUSTIFICATION/COMMENTS See TAB C, Sections B and D for Qualification Analysis. Cables OPP470-A, OPP471-A, OPP590-B, OPP711-B, 2PP675A, ~~and 2PP687A~~ are required Category A for 100 days, but due to their location their environment does not exceed normal conditions during the LOCA and their radiation during LOCA is 1×10^4. Cable 1PP550-A is required Category A for 100 days for LOCA but its worst case temperature is only 100°F for up to 30 days and maximum of 104°F thereafter. Therefore, the 30 day worst case accident parameters are shown and are the results of HELB.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	15°F	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)	None	No
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	NA	NA
Vibration: +10% added to acceleration	NA	NA (See Sht. 12A)

JUSTIFICATION/COMMENTS: Frequency and vibration were not considered to be significant aging mechanisms; therefore, they were not included in the test program.

For additional information see TAB C, Section D.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference 17732-1, page VII-11).

JUSTIFICATION/COMMENTS See also TAB A.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference 17732-1, page V-4 and 5).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference 17732-1, page V-4 and 5).

JUSTIFICATION/COMMENTS Also see TAB C, Section D.

(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 17732-1, page V-4 and 5).

JUSTIFICATION/COMMENTS See also Material Aging Calculation Report WAC-206 in TAB C.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference 17732-1, page V-4 and 5 and 12, IV-9 and 10).

JUSTIFICATION/COMMENTS No anomalies were observed with specimen 20B. See anomaly No. 8, 17732-1, page V-16 thru -19 for discussion of failures in other 7.6 kV specimens.

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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS There were no surveillance or maintenance requirements identified from the review and evaluation of vendor and test documentation; however, TVA does have a maintenance and surveillance program at the plant. See TAB G.

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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	Yes
(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

O. SUMMARY 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) 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?	NA
(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

O. SUMMARY OF REVIEW (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?	Yes
(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 1-hour minimum operating time was taken, was adequate justification provided?	NA
(18) Criteria regarding synergistic effects satisfied?	NA
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

0(4) No analyses were performed.

0(6)(c) Cables were preaged prior to HELB.

0(10) No spray was included in the test program.

0(18) Category II qualification.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? Yes

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	XLPE	*	Yes	17732-1 p I-2
Size	2/0 & 4/0	*	Yes	17732-1 p I-2
Stranding	19 strand	*	Yes	17732-1 p I-2
Coating	coated	*	Yes	17732-1 p I-2
Insulation Thickness	.140"	*	Yes	17732-1 p I-2
Number of conductors	1	*	Yes	17732-1 p I-2
Arrangement of conductors	NA	*	Yes	17732-1 p I-2
(b) Shielding (conductor) .012" Shielding (insulation) .020"		*	Yes	17732-1 p I-2
(c) Insulation jacket				
Material	--	*	Yes	17732-1 p I-2
Thickness	--	*	Yes	17732-1 p I-2
(d) Outer jacket				
Material	PVC	*	Yes	17732-1 p I-2
Thickness	.080"	*	Yes	17732-1 p I-2

*See 17732-1, page I-2. The 2/0 (TVA mark No. WNB) cables are identical and come from same contract. The 4/0 (TVA Mark No.WNC) cables are the same construction except for the conductor size and are therefore qualified by similarity to the tested representative sample.

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	8000 VAC	7590 VAC	Yes	17732-1 p V-4
(f) Rated current	*	18 amp	Yes	17732-1 p V-4
(g) Operating temperature rating				
Normal	90°C	60°C	Yes	17732-1 p IV-3
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	NA	NA	NA	NA
(i) Splice				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: Parameters listed under plant were taken from the contract and certified test reports. *Cables are derated during the design process in accordance with Design Standard DS-E12.6.3 if they are installed in ambient temperatures greater than 40°C.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? NA (Reference IPCEA Std S-66-524).

Comments: _____

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference 17732-1, page V-4).

Comments: _____

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference 17732-1, page VI-13).

Comments: The cable had 5.5 mA of leakage current at 6900 VAC and 8.0 mA leakage current at 11,200 VAC (see comments)*.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference 17732-1, page V-105 & V-111).

Comments:

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? No (Reference 17732-1, page VI-1).

Comments: Cable was subjected to a dielectric withstand test but not a mandrel bend test prior to the dielectric test. The 11.9 x OD bend radius of the test specimen is more severe than the 40 x OD mandrel bend of IEEE 323-1974.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference 74C7-85069-2 and Certified Test Report - TAB E).

Identify flame test standard: IPCEA S-19-81, Section 6.13.2 and 6.19.6

Comments:

*The leakage current of 5.5ma will pose no problem for cable operation. The cables are installed in a 6900 VAC motor supply and diesel generator to 6900-V shutdown board supply circuits.

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-036
MANUFACTURER : ROCKBESTOS

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BM	**CONTRACT	CAT	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APL-030-4805-A	1PL4805-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4807-A	1PL4807-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4809-A	1PL4809-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4826-A	1PL4826-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4828-A	1PL4828-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4830-A	1PL4830-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4848-B	1PL4848-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4862-B	1PL4862-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4864-B	1PL4864-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4866-B	1PL4866-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0323-B	1RM 323-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0343-B	1RM 343-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0346-B	1RM 346-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-ARM-090-0353B-B	1RM 353-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-062-1163-A	1V 1163-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-062-1164-A	1V 1164-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-062-1165-A	1V 1165-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1242-B	1V 1242-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1243-B	1V 1243-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1244-B	1V 1244-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1262-A	1V 1262-A	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1279B-A	1V 1279-A	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1295-B	1V 1295-B	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1312-B	1V 1312-B	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1328-A	1V 1328-A	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1346-A	1V 1346-A	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1397-B	1V 1397-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1398-B	1V 1398-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1399-B	1V 1399-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1419-A	1V 1419-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1447-A	1V 1447-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1448-A	1V 1448-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1449-A	1V 1449-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1584-B	1V 1584-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1585-B	1V 1585-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1587-B	1V 1587-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-AV-030-1588-B	1V 1588-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	____	____	____
CHECKED/DATE	9-21-86	____	____	____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	*BM	**CONTRACT	CA I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-030-1610-A	1V 1610-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1611-A	1V 1611-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1612-A	1V 1612-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1614-A	1V 1614-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1615-A	1V 1615-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1629-A	1V 1629-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1703-B	1V 1703-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2141-A	1V 2141-A	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2151-B	1V 2151-B	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2153-B	1V 2153-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2262-A	1V 2262-A	SROAJ	WPA	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2264-A	1V 2264-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2265-A	1V 2265-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2276-B	1V 2276-B	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2284-B	1V 2284-B	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2286-B	1V 2286-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2287-B	1V 2287-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2454A-A	1V 2454-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2456-A	1V 2456-A	SROAJ	WPA	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2647-B	1V 2647-B	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2713-A	1V 2713-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2716-A	1V 2716-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2722-B	1V 2722-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2726-B	1V 2726-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2729-A	1V 2729-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-2730-A	1V 2730-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2779-A	1V 2779-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2781-A	1V 2781-A	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2783-A	1V 2783-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2784-A	1V 2784-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2790-A	1V 2790-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2812-B	1V 2812-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2841-B	1V 2841-B	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2851-B	1V 2851-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2852-B	1V 2852-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2855-B	1V 2855-B	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3087-A	1V 3087-A	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	-----	-----	-----
CHECKED/DATE	9-21-86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	**CONTRACT	CAT.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-067-3092-A	1V 3092-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3097-A	1V 3097-A	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3101-A	1V 3101-A	SROAJ	WPA	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3125-B	1V 3125-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3126-B	1V 3126-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-3203-B	1V 3203-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-3204-B	1V 3204-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3211-A	1V 3211-A	SROAJ	WPB	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3213-A	1V 3213-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3214-A	1V 3214-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-087-3424-A	1V 3424-A	SROAJ	WPB	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-087-3425-A	1V 3425-A	SROAJ	WPB	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-087-3426-A	1V 3426-A	SROAJ	WPB	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-087-3434-A	1V 3434-A	SROAJ	WPB	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-087-3435-A	1V 3435-A	SROAJ	WPB	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-087-3436-A	1V 3436-A	SROAJ	WPB	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4426-A	1V 4426-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4427-A	1V 4427-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4428-A	1V 4428-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4429-A	1V 4429-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4439-A	1V 4439-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4440-A	1V 4440-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4441-A	1V 4441-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4463-B	1V 4463-B	SROAJ	WPA	VARIOUS	VARIOUS	I	N76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4464-B	1V 4464-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4465-B	1V 4465-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4478-A	1V 4478-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4493-A	1V 4493-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4494-A	1V 4494-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4495-A	1V 4495-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4496-A	1V 4496-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4508-A	1V 4508-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4509-A	1V 4509-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4510-A	1V 4510-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4511-A	1V 4511-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4575-B	1V 4575-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4576-B	1V 4576-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE D.R. Keagan 9/21/86 _____ _____ _____

CHECKED/DATE [illegible] 9-21-86 _____ _____ _____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	*BM	**CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-062-4577-B	1V 4577-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4578-B	1V 4578-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4598A-A	1V 4598-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-4921A-A	1V 4921-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-068-5613-A	1V 5613-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-068-5635-A	1V 5635-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-068-5638-B	1V 5638-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5887-B	1V 5887-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5888-B	1V 5888-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5889-B	1V 5889-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5907-B	1V 5907-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5908-B	1V 5908-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5909-B	1V 5909-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6276-A	1V 6276-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6296-A	1V 6296-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6310-A	1V 6310-A	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6376-B	1V 6376-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6377-B	1V 6377-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6396-B	1V 6396-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6398-B	1V 6398-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6410-B	1V 6410-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-031-7227-B	1V 7227-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-7664-B	1V 7664-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-7674-B	1V 7674-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-043-9551-B	1V 9551-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-043-9573A-B	1V 9573-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-043-9532-B	1V 9532-B	SROAJ	WPA	VARIOUS	VARIOUS	I	76K5-087235-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	D.E. Morgan 9/21/86	____	____	____
CHECKED/DATE	[illegible] 9-21-86	____	____	____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-036
MANUFACTURER : ROCKBESTOS
PAGE 1 OF 1

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION SEM	CONTRACT	CA I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BPL-030-4876-A	1PL4876-A	SROAJ	WPJ	VARIOUS	VARIOUS	I	77K5-821042-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4886-B	1PL4886-B	SROAJ	WPJ	VARIOUS	VARIOUS	I	N77K5-821042-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0920-B	1V 920-B	SROJJ	WRA-2	VARIOUS	VARIOUS	I	N77K5-821042-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1623-A	1V 1623-A	SROJJ	WRA-2	VARIOUS	VARIOUS	I	N77K5-821042-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7168-A	1V 7168-A	SROJJ	WRA-2	VARIOUS	VARIOUS	I	N77K5-821042-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7176-A	1V 7176-A	SROJJ	WRA-2	VARIOUS	VARIOUS	I	N77K5-821042-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

PREPARER/DATE R.R. Neag 9/21/86 R____ R____ R____
CHECKED/DATE H. Fuson 9-21-86 _____ _____ _____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-036
MANUFACTURER : ROCKBESTOS

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

SQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±RM	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QPL-030-4753-A	1PL4753-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-4767-B	1PL4767-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-4778-A	1PL4778-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-4792-B	1PL4792-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-4844-B	1PL4844-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-4880-A	1PL4880-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QPL-030-4890-B	1PL4890-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0324-B	1RM 324-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0326-B	1RM 326-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0334-B	1RM 334-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0336-B	1RM 336-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0356-B	1RM 356-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0364-B	1RM 364-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0366-B	1RM 366-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0374-B	1RM 374-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-0069-A	1V 69-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-0070-A	1V 70-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-0074-A	1V 74-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-0075-A	1V 75-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-0079-B	1V 79-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-0095-B	1V 95-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-0099-B	1V 99-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-001-0105-B	1V 105-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-077-0867-B	1V 867-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-077-0868-B	1V 868-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-077-0869-B	1V 869-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-077-0885-B	1V 885-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-077-0886-B	1V 886-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1223-A	1V 1223-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1224-A	1V 1224-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1225-A	1V 1225-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1226-A	1V 1226-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1420-A	1V 1420-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1421-A	1V 1421-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-030-1446-A	1V 1446-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2143-A	1V 2143-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2144-A	1V 2144-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

		R____	R____	R____
PREPARER/DATE	D.E. Meg 9/21/86	____	____	____
CHECKED/DATE	Hen Fuston 9-21-86	____	____	____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QV-074-2154-B	1V 2154-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2278-B	1V 2278-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-2279-B	1V 2279-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2809-B	1V 2809-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-2811-B	1V 2811-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-074-2844-B	1V 2844-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2857-B	1V 2857-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-070-2858-B	1V 2858-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3102-A	1V 3102-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-3112-B	1V 3112-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-087-3423-A	1V 3423-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-087-3433-A	1V 3433-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4438-A	1V 4438-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4450-A	1V 4450-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4462-B	1V 4462-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4598-A	1V 4598-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4599-A	1V 4599-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4600-A	1V 4600-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-062-4601-A	1V 4601-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-4919-A	1V 4919-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-4920-A	1V 4920-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-4921-A	1V 4921-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-063-4922-A	1V 4922-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-068-5571-B	1V 5571-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-068-5642-A	1V 5642-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-068-5643-A	1V 5643-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5886-B	1V 5886-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5906-B	1V 5906-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5946-B	1V 5946-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-061-5966-B	1V 5966-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6226-A	1V 6226-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6246-A	1V 6246-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6247-A	1V 6247-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6248-A	1V 6248-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6249-A	1V 6249-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6260-A	1V 6260-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QV-067-6261-A	1V 6261-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

PREPARER/DATE [signature] 9/21/86 R____ R____ R____

CHECKED/DATE [signature] 9-21-86 _____ _____ _____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*RM	CONTRACT	CAT	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-067-6262-A	1V 6262-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6263-A	1V 6263-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6297-A	1V 6297-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6298-A	1V 6298-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6299-A	1V 6299-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6311-A	1V 6311-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6312-A	1V 6312-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6313-A	1V 6313-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6326-B	1V 6326-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6327-B	1V 6327-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6328-B	1V 6328-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6329-B	1V 6329-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6346-B	1V 6346-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6347-B	1V 6347-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6348-B	1V 6348-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6349-B	1V 6349-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6360-B	1V 6360-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6361-B	1V 6361-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6362-B	1V 6362-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6363-B	1V 6363-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6378-B	1V 6378-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6379-B	1V 6379-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6397-B	1V 6397-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6399-B	1V 6399-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6411-B	1V 6411-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6412-B	1V 6412-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6413-B	1V 6413-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-001-7624-A	1V 7624-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-001-7634-A	1V 7634-A	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9553-B	1V 9553-B	SROAJ	WPA	VARIOUS	VARIOUS	I	77K5-821729-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

		R____	R____	R____
PREPARER/DATE	D.E. Morgan 9/24/86	____	____	____
CHECKED/DATE	[illegible] 9-24-86	____	____	____

PRINT DATE: 09/21/86

SINDER NO. : WBNEQ-CABL-036
MANUFACTURER : ROCKBESTOS

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *BM	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BPL-083-1062-A	1PL1062-A	SROAJH	WPH-1	VARIOUS	VARIOUS	I	78K5-823428-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

PREPARER/DATE [signature] 9/21/86 R____ R____ R____

CHECKED/DATE [signature] 9-21-86 _____ _____ _____

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	±3M	CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BPL-063-1082-B	1PL1082-B	SROAJH	WPH-1	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4755-A	1PL4755-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4757-A	1PL4757-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4769-B	1PL4769-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4771-B	1PL4771-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4780-A	1PL4780-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4732-A	1PL4732-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4794-B	1PL4794-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4796-B	1PL4796-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-4846-B	1PL4846-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0333-B	1RM 333-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0344-B	1RM 344-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0334-B	1RM 353-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0354-B	1RM 354-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0363-B	1RM 363-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0373-B	1RM 373-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BRM-090-0376-B	1RM 376-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0866-B	1V 866-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0883-B	1V 883-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0884-B	1V 884-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0899-B	1V 899-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0900-B	1V 900-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0901-B	1V 901-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0902-B	1V 902-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0917-B	1V 917-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0918-B	1V 918-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-077-0919-B	1V 919-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1263-A	1V 1263-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1264-A	1V 1264-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1265-A	1V 1265-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1279A-A	1V 1279-A	SROAJ	WPB	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1280-A	1V 1280-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1281-A	1V 1281-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1282-A	1V 1282-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1296-B	1V 1296-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1297-B	1V 1297-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1298-B	1V 1298-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

PREPARER/DATE R.E. Meagen 9/21/86 R____ R____ R____

CHECKED/DATE Hen Fuston 9-21-86 _____ _____ _____

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *PM	CONTRACT	C A T	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-030-1313-B	1V 1313-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1314-B	1V 1314-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1315-B	1V 1315-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1329-A	1V 1329-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1330-A	1V 1330-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1331-A	1V 1331-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1347-A	1V 1347-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1348-A	1V 1348-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1349-A	1V 1349-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1363-B	1V 1363-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1364-B	1V 1364-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1365-B	1V 1365-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1379-B	1V 1379-B	SROAJ	WPB	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1380-B	1V 1380-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1381-B	1V 1381-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1382-B	1V 1382-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1583-B	1V 1583-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1627-A	1V 1627-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1704-B	1V 1704-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-030-1705-B	1V 1705-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-2446-B	1V 2446-B	SROAJ	WPB	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-2448-B	1V 2448-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-2450-B	1V 2450-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-2452-A	1V 2452-A	SROAJ	WPB	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-2454B-A	1V 2454-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2642-B	1V 2642-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-070-2648-B	1V 2648-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-074-2843-B	1V 2843-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-3091-A	1V 3091-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-3107-B	1V 3107-B	SROAJ	WPB	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-3111-B	1V 3111-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-3121-B	1V 3121-B	SROAJ	WPB	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-4451-A	1V 4451-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-4452-A	1V 4452-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-4453-A	1V 4453-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-5572-B	1V 5572-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5573-B	1V 5573-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

PREPARER/DATE [signature] 9/21/86 R____ R____ R____

CHECKED/DATE [signature] 9-21-86 _____ _____ _____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *RM	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-068-5574-B	1V 5574-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5599-B	1V 5599-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5600-B	1V 5600-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5613A-A	1V 5613-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5614-A	1V 5614-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5662-B	1V 5662-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-068-5663-B	1V 5663-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5947-B	1V 5947-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5948-B	1V 5948-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5949-B	1V 5949-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5967-B	1V 5967-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5968-B	1V 5968-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-061-5969-B	1V 5969-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6227-A	1V 6227-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6228-A	1V 6228-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6229-A	1V 6229-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6277-A	1V 6277-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6278-A	1V 6278-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-067-6279-A	1V 6279-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7169-A	1V 7169-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7170-A	1V 7170-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7171-A	1V 7171-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7177-A	1V 7177-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7178-A	1V 7178-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7179-A	1V 7179-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7218-B	1V 7218-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7219-B	1V 7219-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7220-B	1V 7220-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7221-B	1V 7221-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7228-B	1V 7228-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7229-B	1V 7229-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-031-7230-B	1V 7230-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-001-7627-A	1V 7627-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-001-7637-A	1V 7637-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-001-7667-B	1V 7667-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-001-7677-B	1V 7677-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-8768-A	1V 8768-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

PREPARER/DATE R. J. Reagan 9/21/86 R____ R____ R____

CHECKED/DATE [illegible] 9-21-86 _____ _____ _____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *RM	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-043-8779-B	1V 8779-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9552-B	1V 9552-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9554-B	1V 9554-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9562-B	1V 9562-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9563-B	1V 9563-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9564-B	1V 9564-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9565-B	1V 9565-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9571-B	1V 9571-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9572-B	1V 9572-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9573-B	1V 9573-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9574-B	1V 9574-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9580-B	1V 9580-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9581-B	1V 9581-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9583-B	1V 9583-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9589-B	1V 9589-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9590-B	1V 9590-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9591-B	1V 9591-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9592-B	1V 9592-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9841-B	1V 9841-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9843-B	1V 9843-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9844-B	1V 9844-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9845-B	1V 9845-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9848-B	1V 9848-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9850-B	1V 9850-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9851-B	1V 9851-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9852-B	1V 9852-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9856-B	1V 9856-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9858-B	1V 9858-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9859-B	1V 9859-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9860-B	1V 9860-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9864-B	1V 9864-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9866-B	1V 9866-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9867-B	1V 9867-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9868-B	1V 9868-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9943-A	1V 9943-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9944-A	1V 9944-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9945-A	1V 9945-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT

		R____	R____	R____
PREPARER/DATE	D. Rhees 9/21/86	-----	-----	-----
CHECKED/DATE	[illegible] 9-21-86	-----	-----	-----

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BR	CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-043-9946-A	1V 9946-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9953-A	1V 9953-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9954-A	1V 9954-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9955-A	1V 9955-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9956-A	1V 9956-A	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9963-B	1V 9963-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9964-B	1V 9964-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9965-B	1V 9965-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9966-B	1V 9966-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9973-B	1V 9973-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9974-B	1V 9974-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9975-B	1V 9975-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-9976-B	1V 9976-B	SROAJ	WPA	VARIOUS	VARIOUS	I	80K7-826542-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

		R	R	R
PREPARER/DATE	9/21/86			
CHECKED/DATE	9-21-86			

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-036
MANUFACTURER : ROCKBESTOS
PAGE 1 OF 1

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-BV-062-1162-A	1V 1162-A	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-4479-A	1V 4479-A	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-4480-A	1V 4480-A	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-062-4481-A	1V 4481-A	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-5482-A	1V 5482-A	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-063-5492-B	1V 5492-B	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-3762-A	1V 3762-A	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-043-3773-B	1V 3773-B	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-077-0868-B	2V 868-B	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BV-077-0869-B	2V 869-B	SROAJ	WPA	VARIOUS	VARIOUS	I	81K5-830078-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

		R	R	R
PREPARER/DATE	D. L. Hogan 9/23/86			
CHECKED/DATE	Ken Fulton 9-26-86			

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 1 OF 27

BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED [illegible] DATE 9/4/86 R ___ R ___

CHECKED [illegible] DATE 9-8-86

A. DOCUMENTATION

Equipment Description: Electrical Cable

Vendor/Manufacturer: The Rockbestos Company

Equipment Model No.(s): Firewall SR (TVA - SROAJ - Silicone Rubber Insulation with Overall Asbestos or Aramid Fiber braided Jacket, 125°C; SROAJH - Same except 200°C).

QUALIFICATION REPORTS

(1) Title/Number/Revision Qualification of Firewall SR, Class 1E Cables - the Rockbestos Company (Revised Feb. 13, 1980) RIMS B70 851031 101 DATE March 2, 1978

(2) Title/Number/Revision _____ RIMS _____ DATE _____

(3) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

TAB C

1. Material Aging Calculation Report WAC-200.

2. Material Aging Calculation Report WAC-132.

OTHER REFERENCES INCLUDED IN THIS BINDER (Continued):

TAB E

1. Letter from Rockbestos to TVA dated September 27, 1984 (EEB841001 036)
2. Letter from Rockbestos to TVA dated October 21, 1985 (B70 851025 001)
3. Letter from Rockbestos to TVA dated November 5, 1985 (B70 851108 004)
4. Letter from Rockbestos to TVA dated March 7, 1986 (B43 860310 018)

TAB J

1. USNRC Information Notice 84-44 dated June 8, 1984 (NEB 840619 600)
2. Material Aging Calculation Report WAC-201
3. Letter from Rockbestos to TVA dated August 15, 1984 (EEB 840817 001)
4. Letter from Rockbestos to TVA dated September 27, 1984 (EEB 841001 036)
5. Letter from USNRC to Rockbestos dated October 18, 1985 (B70 851031 100)

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 3 OF 27

BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED [illegible] DATE 9/21/86 R ___ R ___

CHECKED HWL DATE 9-21-86

B. CONCLUSION OF REVIEW (Check only one block)

X Equipment Qualified Pending 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. Contract 81K5-830078 not qualified to Category I.

2. Relocate 10CFR50.49 cables to above flood levels.

3. TAB A (cable list) not inclusive of all 10CFR50.49 cables.

4. Replacement of cables 1V920-B, 1V1628-A, 1V7168-A, and 1V7176-A by cable from contract 75K5-821042. (ECN 6625)

COMMENTS/RECOMMENDATIONS The cable is installed inside containment. Qualification review done against test parameters which envelop conditions to be experienced in this area.

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 4 OF 27

BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED [illegible] DATE 9/6/86 R ___ R ___

CHECKED [illegible] DATE 9-8-86

C. 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 Contract 81K5-830078 material evaluated in this binder can not be qualified to NUREG-0588 Category I although the purchase date was after May 23, 1980. Refer to SCR WBNEQP8640.

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

The test program was developed in accordance with conditions described by IEEE 383-1974. Although not part of the test program or required for environmental qualification, the contracts required that the Firewall SR cables meet flame test requirements.

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 5 OF 27

BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED [illegible] DATE 9/6/86 R ___ R ___

CHECKED [illegible] DATE 9-8-86

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 Test samples are representative to the purchased cables in accordance with Table 1 of IEEE 383-1974. Also see TAB C, Section A.

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Cable	Test Report No. 1
(2) Manufacturer	Rockbestos	Rockbestos	Test Report No. 1
(3) Model Number(s)	Firewall SR (SROAJ & SROAJH)	Firewall SR (SROAJ)	Test Report No. 1
(4) Serial Number(s)	NA		
(5) Identify Component-Unique checksheet attached:	NA		

JUSTIFICATION/COMMENTS See TAB C, Section A.

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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	No	
External Process Connections	NA	No	
Electrical Connections	NA	No	
Conduit Seals	NA	No	
Connector Seals	NA	No	
Orientation	NA	No	
Physical Configuration	NA	No	
Other	NA	No	

JUSTIFICATION/COMMENTS No interface requirements are applicable to cable qualification.

G. TEST SEQUENCE - REPORT NO. 1

(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/NA	Reference
(a) Equipment inspected for damage	No	See TAB J Discussion
(b) Baseline performance measurements taken	No	See TAB J Discussion
(c) Equipment aged:		
Thermal	Yes	Report 1, pg. 2
Radiation	Yes	Report 1, pg. 2
Wear	No	See TAB C Section E.A
(d) Vibration/seismic testing conducted	No	See TAB C Section E.B
(e) Design basis event (DBE) exposure	Yes	Report 1, pg. 2
(f) Post-DBE exposure	Yes (26 Days Total)	Report 1, pg. 7
(g) Final inspection and disassembly	NA	Post Test Functionals Performed, See Report 1, pg. 3

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? No
(Reference See TAB J Discussion).

JUSTIFICATION/COMMENTS

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference Report No. 1, Page 2).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	Report 1, pg. 2
Radiation exposure	Yes	Report 1, pg. 2
Vibration (non-seismic) aging	No	*
Operational (electrical/mechanical/process) stress aging	No	*

JUSTIFICATION/COMMENTS *See TAB C, Section E.A.

(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)

JUSTIFICATION/COMMENTS NUREG 0588 Cat II evaluation.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, Page 2,)

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: Report No. 1, Page 1.).

JUSTIFICATION/COMMENTS All insulation materials are susceptible to aging.

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, Page 2.)

JUSTIFICATION/COMMENTS Aging was performed on sample for type test in accordance with IEEE 383-1974 para. 2.2 and accepted industry methods.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, Page 2 and 6.)

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	60°C	180°C	130°C
Time	40 yrs	1400hrs	40 yrs

JUSTIFICATION/COMMENTS See TAB C, Section B.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference Report No. 1, Page 6.)

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)? NA (Reference).

JUSTIFICATION/COMMENTS See H (4)(g).

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)? Yes (Reference Report No. 1, Page 6.)

JUSTIFICATION/COMMENTS Test points identified.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS Thermal aging equivalent included temperature rise for loading.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, Page 2.)

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, Page 1.).

JUSTIFICATION/COMMENTS All insulation materials are considered susceptible to radiation.

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, Page 2.).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report No. 1, Page 2.)

Plant normal ambient radiation dose (rd) 1E + 08

Test exposure dose (rd) 2E + 08

Test exposure dose rate (rd/hr) 5E + 05

Test exposure source type (e.g., Co-60 gamma) Co-60 gamma

JUSTIFICATION/COMMENTS Source and rate acceptable in accordance with IEEE-383-1974, paragraph 2.3.3.3 (See also Report 1, pg. 8) and represent acceptable limits for service conditions.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? No (Reference _____)

JUSTIFICATION/COMMENTS See TAB C, Section E.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? No (Reference _____)

JUSTIFICATION/COMMENTS See TAB C, Section E.

(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)? No (Reference _____)

JUSTIFICATION/COMMENTS See TAB C, Section E.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section E.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, Page 2.).

Qualified life (Document in QMDS) Mark Nos. WPA and WRA-2, 8 yrs; WPB, 22 yrs and WPH, 1 and WPJ, 30.4 yrs.

JUSTIFICATION/COMMENTS See TAB C, Section B and Section G for clarification and explanation of reduced life.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? No (Reference).

Replacement Intervals (Document in QMDS) Mark Nos. WPA and WRA-2, 8 yrs; WPB, 22 yrs; WPH-1 and WPJ, 30.4 yrs.

JUSTIFICATION/COMMENTS See TAB C, Section B and Section G.

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 14 OF 27

BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED BRL DATE 9/4/86 R ___ R ___

CHECKED [illegible] DATE 8-8-86

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)

	Material/Property/Function	Radiation Threshold	Reference	Activation Energy	Reference
(a)	Rockbestos KS-500	NA	NA	1.7381	TAB E, Ref. No.1
	Silicone Rubber				
	Cable Insulation				

JUSTIFICATION/COMMENTS

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

(1) Acceptance Criteria: Does the report/analysis identify the limiting values of performance characteristics which would constitute failure if not met (yes/no/NA)? No (Reference _____).

Identify Acceptance Criteria: Although specific criteria is not given, test was performed to IEEE-383-1974 standards. See TAB J Discussion.

(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)? No (Reference _____)

Identify baseline and functional testing: Although specific performance characteristics were not defined, the test was performed to IEEE-383-1974 standards.

JUSTIFICATION/COMMENTS See TAB J Discussion.

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report No. 1, Page 3, 10).

JUSTIFICATION/COMMENTS _____

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference -).

JUSTIFICATION/COMMENTS See TAB C, Section E.A.

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

(a)

Parameter	Specified Accident Conditions	Reference
Voltage	480VAC Max	See Tab C, Sect. A
Load	See Tab C, Sect. A	
Frequence	NA	
Accuracy	NA	

Other(s)

JUSTIFICATION/COMMENTS Frequency and Accuracy is not applicable to power and control cable.

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 17 OF 27

BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED [illegible] DATE 9/6/86 R ___ R ___

CHECKED [illegible] DATE 9-8-86

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	600 VAC	Report 1, pg 3
Load	30 AMPS	Report 1, pg 3
Frequency	NA	
Accuracy	NA	
Other(s)		

JUSTIFICATION/COMMENTS

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-42R2. This drawing represents limiting values where cable is installed

(1) Normal Max

(a) Temperature (°F) 120
(b) Pressure 14.7psia
(c) Humidity (%) 80
(d) Radiation (rd) See TAB C, Sect. G

(2) Abnormal Max

(a) Temperature (°F) 130
(b) Pressure 14.7psia
(c) Humidity (%) 100
(d) Radiation (rd) NA

(3) Process Interfaces: NA

(4) State anticipated occurrence frequency and duration of abnormal conditions: Abnormal service condition duration is less than 8 hours per occurrence and total time does not exceed 1 percent of plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	327	Accident type HELB
(b) Pressure	26.4 psia	Accident type LOCA
(c) Humidity (%)	100	Accident type LOCA/HELB
(d) Radiation (rd)	See TAB C, Sect. G	Accident type LOCA
(e) Spray Type	Boron (See L(2) Comments)	Accident type LOCA/HELB

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

See 47E235 -42R1

(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)? No (Reference IEEE-383-1974 & See TAB C, Section E.A).

(7) Subject to submergence (yes/no/NA)? No (Reference Open Item until resolution of SCR WBNEEB8568 and completion of ECN 5993 - See TAB C, Section F.)

Identify initiation time and duration of submergence:

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

Type	RIMS No.
TI-RPS-62 (Beta Radiation)	NEB 820618 236

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS
Specified conditions are to IEEE-383-1974

(1) Comparison of worst-case maximum parameters: (Comparison done against plant conditions).

Parameter	Plant Conditions (See K(1)&K(5))	Demonstrated	Reference
Operating Time	100D	30Days	See TAB C, Section C Report No. 1, pp 2,7
Temperature (°F)	327	Both tests on same specimen LOCA 340/450 SLB	See TAB C, Section C Report No. 1 page 7, 10
Pressure	26.4 psia	118.7 psia	See TAB C, Section C Report No. 1 page 7
Relative Humidity (%)	100	100 Sat.Steam	See TAB C, Section C Report No. 1 page 7
*Chemical Spray	Yes (See L(2) Comments)	IEEE-383-1974 Yes	See TAB C, Section C Report No. 1 page 7
Radiation (rd)	**1.8E+ 08	2E + 08 gamma	See TAB C, Section C Report No. 1 page 8
Submergence	No	No	NA

*Includes spray concentration, flowrate, density, duration, and pH.
**See TAB C, Section G.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes (See TAB C Section B)	Report No. 1 pages 2 & 7
Pressure	Yes	Report No. 1 page 7
Relative Humidity	Yes (Saturated Steam)	Report No. 1 page 7
Chemical Spray	Yes (See Below)	Report No. 1 page 7
Submergence	NA	See TAB B, Sect. K(7)

JUSTIFICATION/COMMENTS All cables in containment are in conduit and therefore not subject to direct impingement of chemical spray. Test spray composition was in accordance with IEEE 323-1974, Table A1 (.28 molar H_3BO_3 (3000 ppm boron) + .064 molar $Na_2S_2O_3$ and NaOH for a pH of 9-11 at 77°F) and envelops WBN requirements (.19 molar H_3BO_3 (2000 ppm boron) + .033 NaOH for pH of 8.3 at 25°C) in case of leakage through conduit fittings. (See Environmental Data Drawing 47E235-42 R1).

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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) See Note Below.

Suggested Margins per IEEE-323(74)	Margin Applied	Yes/No/NA
Temperature: +15 degrees F	≥15°F	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)	See TAB C Section C	Yes
Voltage: ±10%	+10%	Yes
Frequency: ±5% of rated value	NA	NA (Does not apply to low voltage cables)
Environmental Transient: the initial transient and the peak temperature applied twice	Two transients	Yes
Vibration: +10% added to acceleration	NA	See TAB C, Section E.A

JUSTIFICATION/COMMENTS: No specific margin was applied during tests. Evaluation is done in accordance with CAT. II NUREG 0588. Specified and test conditions are to IEEE-383-1974 and IEEE 323-1974 parameters. Margins noted are applied to plant conditions (Refer to L (1).) and values shown are the difference between plant requirements and test conditions.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment:
(Reference See Comments).

JUSTIFICATION/COMMENTS To maintain electrical continuity and integrity during and following a DBE.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes
(Reference Report No. 1, Page 4).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes
(Reference Report No. 1, Page 4.).

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 Report No. 1, Page 4).

JUSTIFICATION/COMMENTS 30-day test extrapolated to 100 days.

See TAB C, Section C.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? No
(Reference).

JUSTIFICATION/COMMENTS See TAB J Discussion.

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BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED BGR DATE 9/6/86 R ___ R ___

CHECKED [illegible] DATE 9-8-86

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 EQC Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS See TAB G. Although there are no surveillance or maintenance requirements identified from the vendor or test documentation, TVA does have a maintenance and surveillance program at the plant.

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 25 OF 27

BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED [illegible] DATE 9/6/86 R ___ R ___

CHECKED [illegible] DATE 9-8-86

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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	No
(3) Choice of qualification methodology adequately justified?	Yes
(4) If analysis was performed, complete the following:	
(a) Were equipment performance requirements identified?	NA - Type test
(b) Were specific features and failure modes and effects analyzed?	NA - Type test
(c) Were assumptions and mathematical models used together with appropriate justification for their use?	NA - Type test
(d) Were environmental parameters which affect equipment performance identified?	NA - Type test
(5) Adequate similarity between equipment and test specimen established?	Yes
(6) Aging degradation evaluated adequately?	Yes
(a) Mechanical and/or cycle aging addressed?	No-See Tab C, Sect. E
(b) Equipment aged to end of life condition prior to application of DBE conditions?	Yes
(c) Absence of preaging in test/analysis justified?	NA - Aging Referenced
(d) Materials susceptible to thermal/radiation aging identified?	Yes

0. SUMMARY 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) 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?	Yes
(11) Criteria regarding submergence satisfied?	Yes, Pending resolution of Open Item
(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?	NA
(14) Criteria regarding test failures or anomalies satisfied?	No, See TAB J-Discussion

O. SUMMARY OF REVIEW (Continued)

	Yes/No/NA
(15) Criteria regarding functional testing satisfied?	No - See TAB J Discussion
(a) Does the test plan/report specify an acceptance criteria for equipment performed?	No - See TAB J Discussion
(b) Was an initial base line test done to establish required performance characteristics?	No - See TAB J Discussion
(c) Has the test/analysis demonstrated that performance performance specifications and characteristics (e.g., voltage, load frequency, and other electrical characteristics) can be ensured?	Yes
(16) Criteria regarding instrument accuracy satisfied? (Relates to transmitters, etc.)	NA
(17) Test duration margin (1 hour + function time) satisfied?	Yes (By Analysis - See TAB C Sect. 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?	NA - See O(17)(a)
(18) Criteria regarding synergistic effects satisfied?	NA-CAT II
(19) Criteria regarding margins satisfied?	Yes
(20) Maintenance and surveillance requirements adequately identified?	Yes

P. DISCUSSION

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 1 OF 3

BINDER TITLE EQ DOCUMENTATION OF COMPUTED [illegible] DATE 9/21/86 R ___ R ___

ROCKBESTOS FIREWALL SR CHECKED [illegible] DATE 9-21-86

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/N/a)? No

Item	Plant	Report	Acceptable Yes/No/NA	Reference
(a) Conductor				
Insulation material	KS-500 Silicone Rubber	Same	Yes	Rpt 1 p 1
Size	#1/0, #2,#12,#14 AWG	#14AWG	Yes	Rpt 1 p 1
Stranding	19 and 7	un-known	Yes	
Coating	Tinned		NA	
Insulation Thickness	72, 54, and 40 mils minimum	30 mil	Yes	Rpt 1 p 1
Number of conductors	1 and 2 (WRA-2 only)	1	Yes	Rpt 1 p 1
Arrangement of conductors			NA	
(b) Shielding			NA	
(c) Insulation jacket				
Material			NA	
Thickness			NA	
(d) Outer jacket				
Material	*	None	Yes	Rpt 1 p 1
Thickness			NA	

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 2 OF 3

BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED BEL DATE 9/6/86 R R

CHECKED [illegible] DATE 8-8-86

EQUIPMENT IDENTIFICATION (Continued) Page 2 of 3

Item	Plant	Report	Acceptable Yes/No/NA	Reference
(e) Rated voltage	600 VAC	600 VAC	Yes	Rpt 1 p 2
(f) Rated current	Various	30A	Yes	Rpt 1 p 2
(g) Operating temperature rating				
Normal	125/200°C	125°C	Yes	Rpt 1 p 2
Emergency			NA	
Short circuit			NA	
(h) Insulation resistance	No	No	Yes	See Supplement 2, Item 5
(i) Splice				
Material			NA	
Thickness			NA	
Identification			NA	

Comments: *Jacket materials are either Asbestos braid or Aramid fiber braid.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference IEEE 383-1974, Sect. 2.3.1).

Comments: Cable is manufactured to IPCEA S-19-81 and IEEE 383-1974.

(3) Was the cable energized during test (yes/no/NA)? Yes
(Reference Report No.1, p. 3).

Comments:

BINDER NO. WBNEQ-CABL-036 PLANT WBN UNIT(S) 1 SHEET 3 OF 3

BINDER TITLE EQ DOCUMENTATION OF ROCKBESTOS FIREWALL SR COMPUTED BSR DATE 9/6/86 R ___ R ___

CHECKED [illegible] DATE 9-8-86

EQUIPMENT IDENTIFICATION (Continued) Page 3 of 3

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report 1, p 3).

Comments: See item 6 below.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? No (Reference See Comments below).

Comments: IR or leakage currents have little effect on circuit performance. Power systems are fused or otherwise protected based on the cable limits or rating; therefore, acceptable performance is demonstrated by maintaining a load, commensurate with the application, throughout the DBE simulation and successfully passing post-test functionals.

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report 1, p 3).

Comments: 40X Mandrel and 80V/mil 5 minute Hi-pot while immersed in tap water.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Contract Reports).

Identify flame test standard: IEEE-383-1974

Comments:

PRINT DATE: 09/20/86

BINDER NO. : WBNEQ-CABL-037
MANUFACTURER : ROCKBESTOS

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION SBE	** CONTRACT	C A I *	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-*NM-092-0029-D	1NM 29-D	MS	WVC	VARIOUS	VARIOUS	O	78K5-823577-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-*PL-083-1064-A	1PL1064-A	MS	WVB	VARIOUS	VARIOUS	O	78K5-823577-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-*PV-090-0138-B	1PV 138-B	MS	WVA-1	VARIOUS	VARIOUS	O	N78K5-823577-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-*V-003-1000-B	1V 1000-B	MS	WVC	VARIOUS	VARIOUS	O	78K5-823577-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/20/86	____	____	____
CHECKED/DATE	9/20/86 (FOR IET DEGLAP)	____	____	____

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 1 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III (CHEMICAL XLPE) INS./TVA TYPE MS COMPUTED LAQ DATE 9/20/86 CHECKED FW FOR ETD DATE 9/20/86 R R

A. DOCUMENTATION

Equipment Description Electrical Cable

Vendor/Manufacturer The Rockbestos Company

Equipment Model No.(s) Flame Retardent XLPE, Type MS*, Firewall III - Chemically Cross-Linked Polyethylene, TVA Mark WVA-1*** WVB*** and WVC***
Insulation Type EXL-760-D

QUALIFICATION REPORTS

Report No. (1)

Title/Number/Revision "Report on Qualification Tests for Firewall III Chemically Cross-Linked Polyethylene Constructions for Class IE Service in Nuclear Generating Stations". RIMS B70851029103

No. QR5804, Revised 9/13/85 DATE Aug. 1, 1985

OTHER (ANALYSIS, VENDOR DATA, ETC.) *MS - Multiconductor signal cable with shield and overall jacket.

***WVA -1 - 2/C, twisted, stranded, No. 18 AWG, 7/STR T. C. 25 Mils Flame Resistant insulation, color coded, shielded and 90°C conductor temperature. Minimum black light stabilized chlorosulfonated polyethylene jacket, Class 1E.

***WVB 3/C twisted No. 16 AWG 7/STR T.C. 25 Mils/Ditto WVA-1

***WVC 4/C twisted No. 16 AWG 7/STR T.C. 25 Mils/Ditto WVA-1

1. TAB E, Rockbestos letter to TVA - insulated conductor material verification dated 3-7-86 (B43 860310 018).

2. Rockbestos Company's routine test report dated 4-2-79 (QEB 790402 020)

3. Rockbestos Company's routine test report dated 1-15-80 (QEB 800115 007)

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 2 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III COMPUTED YAQ DATE 9/19/86 R ___ R ___

(CHEMICAL XLPE) INS./TVA TYPE MS CHECKED ERD DATE 9.19.86

B. CONCLUSION OF REVIEW (Check only one block)

X Equipment Qualified (pending 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. The measured values documented in this binder must be evaluated to ensure acceptable performance.

2. Rerouting of cables as a result of non-EQ design changes.

COMMENTS/RECOMMENDATIONS Qualification review was done against test parameters which envelop conditions to be experienced plant-wide. This includes the valve vaults, ABGTS areas, and to within 2 feet of the HEPA filters in the EGTS and ABGTS filter rooms. Cables covered by this binder are qualified for all areas in the auxiliary building except the EGTS and the valve vault rooms. However, the test parameters qualify this cable for use in future design providing the following criteria is met:

(1) Cables must be sized, installed, and loaded such that the maximum continuous conductor temperature does not exceed 57°C.

(2) Cables must be routed such that they are above the postulated flood levels for all accidents for which they required to operate

(3) Cables must be routed such that the total 40-year normal plus accident radiation dose (gamma plus Beta) does not exceed 2×10^8 rads (including margin).

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 3 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III (CHEMICAL XLPE) INS./TVA TYPE MS COMPUTED SAQ DATE 9/19/86 R ___ R ___

CHECKED ETW DATE 9.19.86

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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 323-1974, IEEE 383-1974, NUREG 0588

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 4 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III COMPUTED [illegible] DATE 9/18/86 R ___ R ___

(CHEMICAL XLPE) INS./TVA TYPE MS CHECKED [illegible] DATE 9.15.86

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 See TAB C, Section A. Tested representative sample in acordance with Table 1 of IEEE 383-1974.

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 5 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III COMPUTED [illegible] DATE 9/19/86 R ___ R ___

(CHEMICAL XLPE) INS./TVA TYPE MS CHECKED [illegible] DATE 9.19.86

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Cable	QR # 5804 (Rpt 1)p5
(2) Manufacturer	Rockbestos	Rockbestos	
(3) Model Number(s)	Firewall III	Firewall III	
	KXL-760-D	KXL-760-D	
(4) Serial Number(s)	Product Code # I46-3502	Product Code # E41-0108	
	I03-3503		
	I03-3504		
(5) Identify Component-Unique checksheet attached:	TAB B, Supplement 2		

JUSTIFICATION/COMMENTS (See TAB C, Section A also)

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 6 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III (CHEMICAL XLPE) INS./TVA TYPE MS COMPUTED YAQ DATE 9/19/86 CHECKED ERD DATE 9.19.86 R ___ R ___

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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	NA		
Electrical Connections	NA		
Conduit Seals	NA		
Connector Seals	NA		
Orientation	NA		
Physical Configuration	NA		
Other	NA		

JUSTIFICATION/COMMENTS Not applicable for cable qualification.

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)

	Yes/No/NA	Rpt. No. 1 Reference
(a) Equipment inspected for damage	Yes	pg. 8 & 43
(b) Baseline performance measurements taken	Yes	pg. 8 & pgs. 43-47
(c) Equipment aged:		
Thermal	Yes	pgs. 8,9,&11, 49-54
Radiation	Yes	pg. 10 & 54
Wear	No	See TAB C, Section E
(d) Vibration/seismic testing conducted	NA	See TAB C, Section E
(e) Design basis event (DBE) exposure	Yes	pgs. 11-13
(f) Post-DBE exposure	Yes	pg. 13-14
(g) Final evaluation	Yes	pgs. 13-16

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference Report No. 1, Section 9).

JUSTIFICATION/COMMENTS See TAB C, Section D & E, for test sequence and synergism discussion, and seismic evaluation.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference Report No. 1, PP. 8-11, 49-54).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	See H(1)
Radiation exposure	Yes	See H(1)
Vibration (non-seismic) aging	No	See TAB C, Section E
Operational (electrical/mechanical/process) stress aging	No	See TAB C, Section E

JUSTIFICATION/COMMENTS

(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)? Yes (Reference Report No. 1, P.8.).

JUSTIFICATION/COMMENTS See TAB C, Section D.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report No. 1 pp 8, 9, 11, 49-50).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: Report No. 1 p. 5).

JUSTIFICATION/COMMENTS Refer to sample TP-4804-D2

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Rpt No 1, p. 9 and Sect 3, p. 49)

JUSTIFICATION/COMMENTS Aging was performed on the test specimen in accordance with IEEE 383-1974 para. 2.2 and accepted industry practice

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference Rpt No 1, pg 11, and Sect 3).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	40°C (130°F)	121°C	57°C
Time	40 Years	168 hrs	40 Years

JUSTIFICATION/COMMENTS See TAB C, Section B.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference Report No. 1, Section 3 p.49).

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)? NA (Reference).

JUSTIFICATION/COMMENTS See H (4)(g)

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)? Yes (Reference Report No. 1, Section 3 p. 49).

JUSTIFICATION/COMMENTS Test points identified corresponding to 60% retention of elongation.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference Report 1, page 9).

JUSTIFICATION/COMMENTS See TAB C, Section B.1

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Report No. 1 pp. 10 & 54).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1 p 5).

JUSTIFICATION/COMMENTS

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, pg. 11).

JUSTIFICATION/COMMENTS Normal and accident service dose was consistent with IEEE 383-1974 recommendation.

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report No. 1, pg. 54).

Plant normal ambient radiation dose (rd) 1.8E + 07 (See TAB C, Sect A.2)

Test exposure dose (rd) 200.97E + 06

Test exposure dose rate (rd/hr) 4.7E + 05

Test exposure source type (e.g.. Co-60 gamma) Co - 60 gamma

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section E.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section E.

(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)? No (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section E.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section E

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? No (Reference).

Qualified life (Document in QMDS) 40 Years at 57°C

JUSTIFICATION/COMMENTS See TAB C, Section B.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA (Reference).

Replacement Intervals (Document in QMDS) Cable qualified for 40 years.

JUSTIFICATION/COMMENTS Qualification program was done to IEEE 383-1974 guidelines. Qualified life established in TAB C, Section B, as 40 years.

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 13 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III COMPUTED GAQ DATE 9/15/86 R ___ R ___

(CHEMICAL XLPE) INS./TVA TYPE MS CHECKED [illegible] DATE 9.17.86

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)

	Material/Property/Function	Radiation Threshold	Reference	Activation Energy	Reference
(a)	Chemically cross-linked Polyethylene KXL-760-D	NA	NA	1.3412	Report 1, Page 49
(b)					
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 14 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III (CHEMICAL XLPE) INS./TVA TYPE MS COMPUTED YAQ DATE 9/19/86 CHECKED ERC DATE 9.19.86 R ___ R ___

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

(1) 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 Report No. 1, pg. 16).

Identify Acceptance Criteria: Successful withstand of continuous voltage and current for 100 day environmental exposure and five minute 80v/mil AC withstand test after 40X diameter bend.

(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 Report No. 1, pg. 16

Identify baseline and functional testing: Baseline test was continuity and IR measurements at 500 Vdc. Cable was energized at 300 Vac and 10 amps during accident simulation, thus, continuity was demonstrated. IR measurements were done at specified intervals for additional data and five minute 80v/mil Hipot on 40X mandrel bend on end of DBE simulation.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report No. 1, pg. 85).

JUSTIFICATION/COMMENTS 300 VAC/10 Amps

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS Initial check was for IR and continuity only. Qualification for normal operation established through manufacturing and testing per IPCEA S-66-524

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	80 VDC	*
Load	10 ma	*
Frequency	NA	
Accuracy	NA	
Other(s)		

JUSTIFICATION/COMMENTS See TAB C, Section B.1

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 16 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III (CHEMICAL XLPE) INS./TVA TYPE MS COMPUTED [illegible] DATE 9/19/86 CHECKED [illegible] DATE 9.19.86 R ___ R ___

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	300 VAC	Report No. 1
Load	10 amps	Page 8-5
Frequency	NA	Report No. 1 Page 85
Accuracy	NA	
Other(s)		

JUSTIFICATION/COMMENTS Demonstrated voltage and load applied are in accordance with IEEE 383-1974 Section 2.4.3.

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. *47E235-75 R2, & -48 R3 & OE Calc TI-RPS-194

(1) Normal Max		(2) Abnormal Max	
(a) Temperature (°F)	104	(a) Temperature (°F)	110
(b) Pressure (psig)	14.4 psia	(b) Pressure (psig)	14.4 psia
(c) Humidity (%)	80	(c) Humidity (%)	90
(d) Radiation (rd)	*8.8E+05	(d) Radiation (rd)	NA

*The cables are qualified for all areas in the auxiliary building except the EGTS and the valve vaults rooms.

(3) Process Interfaces: None

(4) State anticipated occurrence frequency and duration of abnormal conditions: Abnormal service condition duration is less than 8 hours per occurrence and total time does not exceed 1 percent of plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	216,F	Accident type	HELB
(b) Pressure (psig)	15.85 psia	Accident type	LOCA
(c) Humidity (%)	100	Accident type	HELB
(d) Radiation (rd)	*1.2E+08	Accident type	LOCA
(e) Spray Type	NA	Accident type	NA

*See TAB C, Section A2.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

(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)? No (Reference Manufacturers Std Test to IPCEA-66-524).

(7) Subject to submergence (yes/no/NA)? No (Reference See K(8) below 1&2).

Identify initiation time and duration of submergence:

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

Type	RIMS No.
1. OE calculation WBN OSG4-44	B45 860110 218
2. QIR WBNEEB86037	B26 860310 004
3. TI-RPS-194	NEB 850118 235

BINDER NO. WBNEQ-CABL-037 PLANT WBN UNIT(S) 1 SHEET 19 OF 28

BINDER TITLE ROCKBESTOS FIREWALL III COMPUTED [illegible] DATE 9/19/86 R R

(CHEMICAL XLPE) INS./TVA TYPE MS CHECKED [illegible] DATE 9.19.86

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(Specified Conditions were to IEEE 383-1974.)

(1) Comparison of worst-case maximum parameters: (Comparison done against plant conditions)

Parameter	Specified	Demonstrated	Reference
Operating Time	100days	105days	Report No. 1 pgs 13, 74-77
Temperature (°F)	216°F	341	Report No. 1 pg 74
Pressure (psig)	15.85 psia	121.9 psia	Report No. 1 pg 74
Relative Humidity (%)	100	100	Report No. 1 pg. 28
*Chemical Spray	NA	(See below)	Report No. 1 Section 6
Radiation (rd) *	1.2E+08	2E+08 gamma	Report No. 1 pgs. 10 & 54
Submergence	NA	NA	See TAB C, Section F

*Includes spray concentration, flowrate, density, duration, and pH.
**Enter 40-year integrated normal dose plus integrated accident dose and specify type.
***See TAB C, Section A.2

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	Report No 1 page 74
Pressure	Yes	Report No 1 page 74
Relative Humidity	Yes (Saturated Steam)	Report No 1 page 28
Chemical Spray	NA (See Comments Below)	Report No 1 Section 6
Submergence	NA	See TAB C, Section F

JUSTIFICATION/COMMENTS Cables qualified in this binder are not subjected to chemical spray although they are qualified for it.

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(CHEMICAL XLPE) INS./TVA TYPE MS CHECKED [illegible] DATE 9.19.86

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	>15°F	Yes
Pressure: +10%	>10%	Yes
Radiation: +10% of accident dose	> 10%	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	None	*
Voltage: +10%	> 10%	Yes
Frequency: +5% of rated value	NA	NA
Environmental Transient: the initial transient and the peak temperature applied twice	2 transients	Yes
Vibration: +10% added to acceleration	NA	NA

JUSTIFICATION/COMMENTS: Note: Test conditions are to IEEE 383-1974 and IEEE 323-1974 requirements. Margins noted are applied to plant conditions (Refer to L(1)) and difference shown is between plant requirements and test conditions.

* Accident simulation included 2 transients, each spike remained at 340°F+ for longer than 2 hours, whereas the WBN profile peaks to 216°F.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment:
(Reference NA).

JUSTIFICATION/COMMENTS To maintain continuity and integrity for use in instrumentation circuits during and following a DBE.

(See also TAB A)

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes
(Reference Report No. 1, pg. 16 and 21).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes
(Reference Report No. 1, pg. 16 and 21).

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 Report No. 1, pg. 16 and 21).

JUSTIFICATION/COMMENTS See also TAB C, Section B.3

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes
(Reference Report No. 1, pg. 18-29).

JUSTIFICATION/COMMENTS See TAB C, Section C.

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(CHEMICAL XLPE) INS./TVA TYPE MS CHECKED ETD DATE 9.19.86

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 EQC Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS See TAB G. There were no surveillance or maintenance requirements identified from the vendor or test documentation; however, TVA does have a maintenance and surveillance program at the plant.

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BINDER TITLE ROCKBESTOS FIREWALL III COMPUTED [illegible] DATE 9/19/86 R ___ R ___

(CHEMICAL XLPE) INS./TVA TYPE MS CHECKED [illegible] DATE 9.19.86

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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	None Taken
(3) Choice of qualification methodology adequately justified?	Yes
(4) If analysis was performed, complete the following:	
(a) Were equipment performance requirements identified?	NA (Type test)
(b) Were specific features and failure modes and effects analyzed?	NA (Type test)
(c) Were assumptions and mathematical models used together with appropriate justification for their use?	NA (Type test)
(d) Were environmental parameters which affect equipment performance identified?	NA (Type test)
(5) Adequate similarity between equipment and test specimen established?	Yes
(6) Aging degradation evaluated adequately?	Yes
(a) Mechanical and/or cycle aging addressed?	No - See TAB C Section E
(b) Equipment aged to end of life condition prior to application of DBE conditions?	Yes
(c) Absence of preaging in test/analysis justified?	NA-Aging performed
(d) Materials susceptible to thermal/radiation aging identified?	Yes

0. SUMMARY 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) 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?	Yes
(11) Criteria regarding submergence satisfied?	NA
(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

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA
(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. DISCUSSION

None.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	C XLPE	C XLPE	Yes	Report 1 pg. 5
Size	#16 & 18 AWG	#16 AWG	Yes	Report 1 pg. 5
Stranding	7 Strand	7 Strand	Yes	Report 1 pg. 5
Coating	Tinned	Tinned	Yes	Report 1 pg. 5
Insulation Thickness	20 mil/ min	20 mil	Yes	Report 1 pg. 5
Number of conductors	2, 3 & 4*	2*	Yes	Report 1 pg. 5
Arrangement of conductors	Twisted	Twisted	Yes	Report 1 pg. 5
(b) Shielding	Al/ Mylar	Al/ Mylar	Yes	Report 1 pg. 5
(c) Insulation jacket				
Material NA				
Thickness NA				
(d) Outer jacket				
Material	Hypalon	Neoprene	Yes	Report 1 pg. 5
Thickness	45 mil	45 mil	Yes	Report 1 pg. 5

*With #18 AWG drain wire

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	300 Vac	300 Vac	Yes	Report 1 pg. 5
(f) Rated current	NA*	10 Amps	Yes	Report 1 pg. 83
(g) Operating temperature rating				
Normal	40°C	57°C	Yes	See TAB C, Sect B
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	NA	NA	NA	See TAB C Sect A.
(i) Splice				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: * See TAB C, Section A.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference Report 1, pg. 18).

Comments: Cable is manufactured to IEEE 383-1974, Section 2.3.1.

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference Report No. 1, pg. 85).

Comments: 300 Vac/10 Amps

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EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report 1, pg. 13, 14).

Comments:

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference Report 1, pg. 14).

Comments:

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report 1, pg. 13, 14).

Comments:

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Contract Specs.).

Identify flame test standard: IEEE 383 1974, Section 2.5.6.

Comments:

BINDER NO. WBNEQ-CABL-042 PLANT WBN UNIT(S) 1 SHEET 1 OF 1

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JDJ DATE 9-19-86 R ___ R ___

INS./TVA TYPE COAX CHECKED RKW DATE 9/19/86

TAB A

Only the Category "A" cables are qualified in this binder. The Category "C" cables will experience environmental conditions of the DBE's, but they need not function for mitigation of these events. The Category "C" cables failure in any mode is not deemed detrimental to plant safety or accident mitigation.

See the Open Item in the front of TAB A concerning cable 1RM-446-A.

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MANUFACTURER : BRAND REX
PAGE 1 OF 1

WATTS BAR NUCLEAR PLANT
TAB 2 - EQUIPMENT IDENTIFICATION MATRIX

EQUIPMENT	UNIT DEV ID NO.	CABLE	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION *IN	** CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-QRM-090-0441-A	1RM 441-A	COAX	WTK	VARIOUS	VARIOUS	I	81K9-828797-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0443-A	1RM 443-A	COAX	WTK	VARIOUS	VARIOUS	I	81K9-828797-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0445-A	1RM 445-A	COAX	WTK	VARIOUS	VARIOUS	I	81K9-828797-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0446-A	1RM 446-A	COAX	WTK	VARIOUS	VARIOUS	O	N81K9-828797-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0447-A	1RM 447-A	COAX	WTK	VARIOUS	VARIOUS	I	81K9-828797-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QRM-090-0454-B	1RM 454-B	COAX	WTK	VARIOUS	VARIOUS	O	81K9-828797-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* (I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

PAGE A-1

PREPARER/DATE J.D. Jackson 9-21-86 R____ R____ R____

CHECKED/DATE R.K. White 9/22/86

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R R
BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JOJ DATE 9-19-86
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References

1. WBNP Class 1E Equipment List (WBEL) Harsh Environments Only, Rev 2 (RIMS B26 860414 016)

2. QIR WBNEEB 86046 (RIMS B26 860415 026), Data for Class 1E Cables and Splices in Harsh Environments for Watts Bar Unit 1, dated 4/15/86

3. TVA Environmental Drawing Series 47E235

4. OE Calculation "Equipment Submergence Requirements in the Reactor Building," WBN-OSG4-048, RIMS B45 860210 218 (TAB E)

5. WBNNAL3-004 "Accident Dose Inside Reactor Building," Validates use of TI-RPS-48 for WBN, RIMS B45 860205 235 (TAB E)

6. TI-RPS-48 "Integrated Accident Dose Inside Primary Containment," RIMS B45 851105 235 (TAB E)

7. TI-RPS-194 "Post-LOCA Dose Rates Around EGTS and ABGTS Filters," NEB 850118 235 (TAB E)

8. Cable Average Conductor Temperature Analysis Testing (CACTAT) System, dated 8-15-86

9. Digital Engineering System 1000 - Material Aging Calculation Report WAC-145 (TAB C)

10. OE Calculation, GENNAL3-002 (RIMS B45 851210 235) "Reduction of Beta Dose by Sheet Steel" Including Table 2 from ANSI C80.1-1983 "Dimensions and Weights of Rigid Steel Conduit" (TAB E)

The above references represent the guidelines for determining the cables and environmental parameters for 10CFR50.49 equipment evaluation. References 1 and 2 define the Class 1E cables to be addressed. Reference 3 establishes the environmental parameters for which the cables must be evaluated. References 4 through 7 address areas with particularly harsh environments. References 8, 9, and 10 are TVA programs used in evaluating specific qualification parameters.

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R R

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JDJ DATE 9-19-86

INS./TVA TYPE COAX CHECKED RZW DATE 9/19/86

A. DOCUMENTATION

Equipment Description Coaxial Cable

Vendor/Manufacturer Brand-Rex Company

Equipment Model No.(s) RG-59B/U (XLPE/CSPE)

TVA Contract No. 81K9-828797

QUALIFICATION REPORTS

(1) Title/Number/Revision Qualification Tests of Coaxial-Type Cables in a Simulated Steam Line Break (SLB) and Loss-of-Coolant Accident Environment, FIRL No: F-C5120-2. RIMS B70 851010 101 DATE Sept 2, 1980

(2) Title/Number/Revision _____ RIMS _____ DATE _____

(3) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.)

1. Information from Brand-Rex catalog describing RG-59B/U coaxial cable (TAB H).

2. Brand-Rex aging data using elongation as the end point criterion. Transmitted by letter to Kent Brown via letter dated March 10, 1986 (B70 860315 002), see TAB D.

3. Information from instruction manual giving specifications on the General Atomics radiation monitoring equipment and its cable loading (TAB H).

4. General Atomics Report, E-255-998. Simplified Testing of LOCA Qualified Coaxial Testing, August 1981 (TAB E).

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BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JDJ DATE 9-19-86 R ___ R ___

INS./TVA TYPE COAX CHECKED [illegible] DATE 9/19/86

B. CONCLUSION OF REVIEW (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 (See front of TAB A).

1. Cable documentation discrepancies between design and as-built (i.e., reel, contract, mark No., in TAB A).

COMMENTS/RECOMMENDATIONS

BINDER NO. WBNEQ-CABL-042 PLANT WBN UNIT(S) 1 SHEET 3 OF 28

R R

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JDJ DATE 9-19-86

INS./TVA TYPE COAX CHECKED RKW DATE 9/19/86

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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 323-1974 and IEEE 383-1974

BINDER NO. WBNEQ-CABL-042 PLANT WBN UNIT(S) 1 SHEET 4 OF 28

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JOJ DATE 9-19-86 R ___ R ___

INS./TVA TYPE COAX CHECKED RLW DATE 9/19/86

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 Unaged samples are identified as C5120-9-1 and C5120-9-2. Aged cables are specimens C5120-9-3 and C5120-9-4. Reference Report F-C5120-2, page 2-1, Table 1.

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E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Coaxial Cable	Coaxial Cable	F-C5120-2 p. 2-1
(2) Manufacturer	Brand-Rex Company	Brand-Rex Company	F-C5120-2 p. 2-1
(3) Model Number(s)	RG-59B/U	RG-59B/U	F-C5120-2 p. 2-1
	CS-75146	CS-75146	F-C5120-2 p. 2-1
(4) Serial Number(s)	NA	NA	NA

(5) Identify Component-Unique checksheet attached: Supplement 2 Component-Unique Checklist Cables/Splices (pp. 26 thru 28 of TAB B)

JUSTIFICATION/COMMENTS

BINDER NO. WBNEQ-CABL-042 PLANT WBN UNIT(S) 1 SHEET 6 OF 28

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JDJ DATE 9-19-86 R R

INS./TVA TYPE COAX CHECKED RKW DATE 9/19/86

F. INSTALLATION INTERFACES

Does the qualification program address all relevant interfaces of the equipment so that the installed design and configuration is similar or identical to the test configuration (yes/no/NA)? (note below)

Interface	Identify Interface Requirement	Acceptable? (Yes/No/NA)	Reference Test Report
Mounting Bolts	NA	NA	NA
External Process Connections	NA	NA	NA
Electrical Connections	Amphenol 82-816-1000 connector at detector-cable interface	Yes	See Binder No. WBNEQ-IRE-001
Conduit Seals	NA	NA	NA
Connector Seals	Raychem WCSF-N Heat Shrinkable Sleeves	Yes	See Binder No. WBNEQ-IRE-001
Orientation	NA	NA	NA
Physical Configuration	NA	NA	NA
Other			

JUSTIFICATION/COMMENTS Electrical connections and connector seals are both addressed in the referenced binder, Tab B, sheet 6 of 26. This binder only addresses the cable involved in the installation. The reference is made to the connectors to complete the circuit from connector to connector, with the connectors being addressed with the equipment.

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	F-C5120-2 p. 4-1
(b) Baseline performance measurements taken	Yes	F-C5120-2 p. 4-1
(c) Equipment aged:		
Thermal	Yes	F-C5120-2 p. 4-1
Radiation	Yes	F-C5120-2 p. 4-1
Wear	NA	See p. 12A
(d) Vibration/seismic testing conducted	NA	See p. 12A
(e) Design basis event (DBE) exposure	Yes	F-C5120-2 p. 4-2, p. 4-3
(f) Post-DBE exposure	Yes	F-C5120-2 p. 4-2, p. 4-3
(g) Final inspection and disassembly	Yes	F-C5120-2 p. 4-4

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference F-C5120-2, Appendix A).

JUSTIFICATION/COMMENTS

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference F-C5120-2, p. 4-1).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	F-C5120-2 p. 4-1
Radiation exposure	Yes	F-C5120-2 p. 4-1
Vibration (non-seismic) aging	NA	See p.12A
Operational (electrical/mechanical/process) stress aging	NA	See p.12A

JUSTIFICATION/COMMENTS

(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)? No (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section B, Discussion

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference F-C5120-2, p. 4-1).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: F-C5120-2, p. 2-1).

JUSTIFICATION/COMMENTS Use of IEEE 383-1974 guidelines implicitly considers cable insulation/jackets material susceptible to thermal degradation.

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference F-C5120-2, p. 4-1).

JUSTIFICATION/COMMENTS Also see TAB C, Section A.

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference F-C5120-2, p. 4-1).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	120°F	136°C	48.9°C
Time	40 years	168 hrs	710 yrs

JUSTIFICATION/COMMENTS There will be no temperature rise above ambient. See TAB C, Section A.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference F-C5120-2, Arrhenius plot).

JUSTIFICATION/COMMENTS Also see TAB C, Section A.

(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)? NA (Reference _____).

JUSTIFICATION/COMMENTS Regression line analysis was used.

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)? Yes (Reference F-C5120-2, Arrhenius plot).

JUSTIFICATION/COMMENTS Also see TAB C, Section A.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS Not required. There is no additional heat rise associated with operation of this coaxial cable.

(5) Radiation Aging Exposure:

(a) Was radiation aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference F-C5120-2, p. 5-1).

JUSTIFICATION/COMMENTS _____

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS All materials were assumed to be subject to radiation degradation. Aging was done on a completed cable specimen.

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS See H(5)(b).

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference F-C5120-2, p. 4-1).

Plant normal ambient radiation dose (rd) 2×10^7

Test exposure dose (rd) 2×10^8

Test exposure dose rate (rd/hr) 0.63×10^6

Test exposure source type (e.g., Co-60 gamma) Co-60 gamma

JUSTIFICATION/COMMENTS

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? NA (Reference See p. 12A).

JUSTIFICATION/COMMENTS

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? NA (Reference See p. 12A).

JUSTIFICATION/COMMENTS

(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)? NA (Reference See p. 12A).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS See H(7)(a).

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference F-C5120-2 Arrhenius plot).

Qualified life (Document in QMDS) 40 years at 48.9°C. Note this cable is used in signal applications only. There will be no internal heat rise and will see ambient conditions only.

JUSTIFICATION/COMMENTS See H(4)(d). See TAB C, Section A.

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA (Reference _____).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS Cable qualified for 40 years; therefore, no replacement intervals were established.

GENERIC COMMENT FOR G(1)(c)WEAR, G(1)(d)VIBRATION, H(2),H(6), AND H(7)

Normal Service Related Stresses- In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards...". Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria". Included in the list that follows the above quote are three standards which Brand-Rex uses in the manufacture of coax cables (see TAB I).

1. IPCEA S-19-81 Rubber-Insulated Cable

2. IPCEA S-66-524 Cross-Linked-Polyethylene-Insulated Cable

In addition to the above, TVA specified on contract 81K9-828797 (see TAB E) that the subject cable was to be made and tested in accordance with MIL-C-17D. While not a part of the list of standards from paragraph 2.3.1, it is the "appropriate published industry standard" (paragraph 1.3.4.1).

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service.

GENERIC COMMENT FOR G(1)(d) SEISMIC:

Seismic events are natural phenomena which are outside the scope of 10CFR50.49; however, upon completion of the LOCA simulation, the cable samples were subjected to a mandrel rebend test and an in-water hipot test. IEEE 383-1974, paragraph 2.4.4, regards that the performance of this test demonstrates that the cables have retained considerable mechanical durability and would be more severe even than the application of two cycles of the environment. The retention of a high degree of flexibility at the end of life (plus an accident) demonstrates the cables' ability to withstand significant mechanical stresses.

BINDER NO. WBNEQ-CABL-042 PLANT WBN UNIT(S) 1 SHEET 13 OF 28

R R

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JOJ DATE 9-19-86

INS./TVA TYPE COAX CHECKED RKC DATE 9/19/86

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 Threshold	Reference	Activation Energy	Reference
(a)	Cross-Linked Polyethylene (Insulation)	NA	NA	1.37	TAB C, Section A
(b)	Chlorosulfonated Polyethylene, Hypalon (Jacket)	NA	NA	1.47	TAB D Section D.6

JUSTIFICATION/COMMENTS

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

(1) 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 F-C5120-2, p. 4-4).

Identify Acceptance Criteria: Cables were to remain energized with rated potential during steam/chemical spray exposure and pass the final bend and high-potential-withstand tests, with total leakage current/charging current less than 1 amp.

(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 F-C5120-2, p. 5-3).

Identify baseline and functional testing: Insulation resistance measurements were used for baseline and functional testing. IR measurements were made pre- and post-thermal aging; post-irradiation; pre-, during, and post-steam and chemical spray exposure. The cables were also energized during the steam-spray exposure.

JUSTIFICATION/COMMENTS See TAB C, Section H, for performance evaluation.

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference F-C5120-2, p. 4-2).

JUSTIFICATION/COMMENTS

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference F-C5120-2, p. 3-2).

JUSTIFICATION/COMMENTS Baseline tests consisted of insulation resistance measurements only at 500 Vdc. The cable is qualified for its normal service on the basis of its fabrication in accordance with various national standards (see TAB B, page 12A).

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	See Below	81K9-828797
Load	NA	NA
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS The contract did not specify any voltage or current values; however, the bias voltage cables for the General Atomics radiation monitors is 875 Vdc. All other circuits are 18Vdc or less. Test voltage through the accident cycle was 600Vac followed by a 4800Vac hipot test after the mandrel rebend. Nominal cable rating is 2200V (see TAB H.2).

BINDER NO. WBNEQ-CABL-042 PLANT WBN UNIT(S) 1 SHEET 15A OF 28

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JDJ DATE 9-19-86 R R

INS./TVA TYPE COAX CHECKED [illegible] DATE 9/19/86

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	600 VAC	F-C5120-2 p. 3-2
Load	NA	NA
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS

BINDER NO. WBNEQ-CABL-042 PLANT WBN UNIT(S) 1 SHEET 16 OF 28

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JDJ DATE 9-19-88 R R

INS./TVA TYPE COAX CHECKED RCC DATE 9/19/88

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-42 Lower Compartment

(1) Normal Max

(a) Temperature (°F) 120°F

(b) Pressure (psig) 14.7 psia

(c) Humidity (%) 80%

(d) Radiation (rd) 2×10^{7}***

(2) Abnormal Max

(a) Temperature (°F) 130°F

(b) Pressure (psig) 14.7 psia

(c) Humidity (%) 100%

(d) Radiation (rd) NA

(3) Process Interfaces: NA

(4) State anticipated occurrence frequency and duration of abnormal conditions: Eight hours per excursion and will occur less than 1% of the life of the plant.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	327°F	Accident type LOCA/HELB
(b) Pressure (psig)	26.4 psia	Accident type LOCA/HELB
(c) Humidity (%)	100%	Accident type LOCA/HELB
(d) Radiation (rd)	4.0E07 Gamma* 4.9E07 Beta**	Accident type LOCA/HELB
(e) Spray Type	Chemical (See comments, p 17)	Accident type LOCA/HELB

*Gamma Accident Radiation value for Lower Compartment (Ref. Drawing 47E235-42) obtained from QIR NEB85071 R1, B45 851116 253, located in TAB E.13.

**See TAB C, Section F

***See TAB C, Section F.2.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Spray composition: 0.1847 molar H_3BO_3 (2000 PPM Boron) 0.033 molar NaOH resulting in a pH of 8.3 at 25°C, rate 0.92 (gal/min)/ft^2, duration 30 days. Adverse conditions resulting from inadvertent containment spray will exist for up to 1 hour then return to normal linearly within 9 hours. This event should be considered to occur no more than 5 times during plant life. (Ref. Drawing 47E235-42 Notes 19 & 22)

(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)? No (Reference See TAB C, Section A, for discussion of jacket integrity. Also, see "Two-Year Moisture Absorption Tests," TAB D).

(7) Subject to submergence (yes/no/NA)? No
(Reference TAB C, Sections C, D, and E.).

Identify initiation time and duration of submergence: _____

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

Type	RIMS No.
Radiation	B45 851105 235
Radiation	NEB 850118 235
Submergence	B45 860210 218
Submergence	B26 860310 004

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 days	30 days ***	F-C5120-2 p. 5-2
Temperature (°F)	327°F	385°F	F-C5120-2 p. 4-3
Pressure (psig)	26.4 psia	113 psig	F-C5120-2 p. 4-3
Relative Humidity (%)	100	100	F-C5120-2 p. 4-3
*Chemical Spray	See K(5) comments	See TAB B, p. 25, L(1)	F-C5120-2 p. 4-3
**Radiation (rd)	4.9E7 Beta 6.0E7 Gamma	2E8 (Co-60)	F-C5120-2 p. 4-1 TAB C, Sec. F
Submergence	NA	NA	

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

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

***TAB C, Section A, and Material Aging Calculation Report WAC-145 demonstrate the post-accident extrapolation of the 30 day demonstrated accident conditions to the 100 day required operating time for the accident profile.

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	F-C5120-2 p. 1-1
Pressure	Yes	F-C5120-2 p. 1-1
Relative Humidity	Yes	F-C5120-2 p. 1-1
Chemical Spray	See comments below	F-C5120-2 p. 1-1
Submergence	NA	See K(7) p. 17

JUSTIFICATION/COMMENTS All cables inside containment are routed in conduit and are therefore not subject to direct impingement of the chemical spray solution.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (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	Yes/No/NA
Temperature: +15 degrees F	>15°F	Yes
Pressure: +10% but no more than 10 psig	>10 psig	Yes
Radiation: +10% of accident dose	>10%	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	>10%	Yes
Voltage: ±10% of rated value	See Comments	Yes
Frequency: ±5% of rated value	NA	NA
Environmental Transient: the initial transient and the peak temperature applied twice	Two Transients	Yes
Vibration: +10% added to acceleration	NA	NA

JUSTIFICATION/COMMENTS: Margin applied is much greater than 10% for all service applications of this coax except for the bias cable used with the General Atomics radiation monitor. The nominal voltage for that circuit is 875Vdc. Since the cable is rated at 2200Vac and is manufactured in accordance with a number of national standards, it is considered qualified for normal service per paragraph 2.3.1 of IEEE 383-1974. While only 600Vac was applied throughout the accident exposure, the successful application of 4800Vac during the mandrel rebend test provides a sufficient degree of confidence in the coax for this duty. Leakage currents at this level were only 2.4 ma; and, as noted above, the application at 875Vdc is in a bias circuit and not as a signal cable.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference F-C5120-2, p. 6-1).

JUSTIFICATION/COMMENTS Safety function of cable is to maintain electrical integrity and load throughout normal and accident conditions of it's installed life. See TAB C, Section H.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference F-C5120-2, p. 6-1).

JUSTIFICATION/COMMENTS See performance writeup, TAB C, Section H.

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference F-C5120-2, p. 6-1).

JUSTIFICATION/COMMENTS See performance writeup, TAB C, Section H.

(4) Did the test demonstrate the operability requirements for the required time interval for which the equipment is required to operate (yes/no/NA)? No (Reference See Tab C).

JUSTIFICATION/COMMENTS Test demonstrated operability for 30 days; requirements are for 100 days. See TAB C, Section A, and WAC-145.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference F-C5120-2, p. 5-2).

JUSTIFICATION/COMMENTS We have reviewed test anomalies and concur that those cables of TAB A of this binder meet and exceed all requirements for their installed environment.

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R R

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JOJ DATE 9-19-86

INS./TVA TYPE COAX CHECKED RKW DATE 9/19/86

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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS There were no surveillance or maintenance requirements identified from the review and evaluation of vendor and test documentation; however, TVA does have a maintenance and surveillance program at the plant. See Tab G.

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BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JOJ DATE 9-19-86 R ___ R ___

INS./TVA TYPE COAX CHECKED [illegible] DATE [illegible] ___ ___

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)?	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 See Sheet 12A
(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

0. SUMMARY 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) 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?	See Comment L(1)
(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

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA
(17) Test duration margin (1 hour + function time) satisfied?	See TAB C, Section A
(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. DISCUSSION

P. DISCUSSION (Continued)

L(1) Demonstrated chemical spray: 6200 PPM boron as boric acid, 50 PPM hydrazine, sodium triphosphate to obtain a pH of 8.5, sufficient sodium hydroxide to get a pH of 10.0 at room temperature at a flow-rate of 3.5 gpm providing a spray intensity of 0.27 (gal/min)/ft.^{2} Duration of the spray was 30 days and followed the profile shown in Figure 4 of the test report (F-C5120-2, p. 4-3).

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? Yes

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	XLPE	XLPE	Yes	F-C5120-2 p. 2-1
Size	24 AWG	24 AWG	Yes	F-C5120-2 p. 2-1
Stranding	16 Strand	16 Strand	Yes	F-C5120-2 p. 2-1
Coating	Tinned	Tinned	Yes	F-C5120-2 p. 2-1
Insulation Thickness	.062"	.060"	Yes	F-C5120-2 p. 2-1
Number of conductors	1	1	Yes	F-C5120-2 p. 2-1
Arrangement of conductors	NA	NA	NA	NA
(b) Shielding	Tin Copper	Tin Copper	Yes	F-C5120-2 p. 2-1
(c) Insulation jacket				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
(d) Outer jacket				
Material	Hypalon	Hypalon	Yes	F-C5120-2 p. 2-1
Thickness	.033"	.033"	Yes	F-C5120-2 p. 2-1

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	2200 VAC	2200 VAC	Yes	Vendor Manual TAB H
(f) Rated current	NA	NA	NA	NA
(g) Operating temperature rating				
Normal	*90°C	90°C	Yes	NA
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	NA	1.1E+06 Min	Yes, See TAB C, Sect. H	F-C5120-2 5-3
(i) Splice (See comment below)				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: The information under plant was taken from contract and routine test reports. *Cable is rated at 90°C but the maximum application temperature is 48.9°C. According to the WBEL, there are no Category A cables in this binder which have splices.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference F-C5120-2, p. 4-1).

Comments: See TAB C, Section A.

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference F-C5120-2, p. 5-2).

Comments:

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R R

BINDER TITLE BRAND-REX/COAX-XLPE COMPUTED JOJ DATE 9-19-86

INS./TVA TYPE COAX CHECKED Rao DATE 9/19/86

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference F-C5120-2, p. 4-4, p. 5-4).

Comments: Withstand voltage was 80 volts per mil for 5 minutes.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference F-C5120-2, p. 5-3).

Four test specimens had recorded post-test IRs from 8.2E12 to 1.0E13 ohms.

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference F-C5120-2, p. 4-4, p. 5-4).

Comments: Maximum leakage current at 4800Vac was 2.4 ma (sample 9-4).

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference F-C5120-2).

Identify flame test standard: IEEE 383-1974 and Reg. Guide 1.131

Comments: Flame tests were for RG-11/U and RG-58/U which are representative samples for RG-59B/U. They have the same type insulation and jacket.

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-043
MANUFACTURER : OKONITE

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	*BR	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PL-067-3914-A	1PL3914-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	N81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0221-B	1SG 221-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0241-B	1SG 241-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-0033-B	1V 33-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-0042-B	1V 42-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-4030-A	1V 4080-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-4031B-B	1V 4081-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3914-A	2PL3914-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	N81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0706-B	2PP 706-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	N81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PP-067-0718-B	2PP 718-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-4030-A	2V 4080-A	PXMJ	WGB-1	VARIOUS	VARIOUS	O	N81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-4031-B	2V 4081-B	PXMJ	WGB-1	VARIOUS	VARIOUS	O	N81K5-827928-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	J.D. Jackson 9-21-86	____	____	____
CHECKED/DATE	P.V. White 9/22/86	____	____	____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-043
MANUFACTURER : OKONITE

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/GZ	LOCATION ELEV	LOCATION ±3M	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-BV-030-0702-B	OV 702-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-BV-030-0750-B	OV 750-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-BV-030-0766-B	OV 766-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-BV-030-0814-B	OV 814-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-BV-030-0860-B	OV 860-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-030-3191-A	1PL3191-A	PXMJ	WMB	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-065-3520-A	1PL3520-A	PXMJ	WMB	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-065-3530-B	1PL3530-B	PXMJ	WMB	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-062-6108-A	1PL6108-A	PXMJ	WMB	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-070-6120-A	1PL6120-A	PXMJ	WMB	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPL-070-6131-B	1PL6131-B	PXMJ	WMB	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPP-082-0479-A	1PP 479-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BPP-082-0484-B	1PP 484-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-003-2980-A	1V 2980-A	PXMJ	WMQ	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-003-3010-B	1V 3010-B	PXMJ	WMQ	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-087-3464-B	1V 3464-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-032-9120-B	1V 9120-B	PXMJ	WGB-1	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-BV-026-9149-A	1V 9149-A	PXMJ	WGB-1	VARIOUS	VARIOUS	0	N78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-032-3785-A	2PL3785-A	PXMJ	WMB	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-031-3825-A	2PL3825-A	PXMJ	WMB	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-031-3980-B	2PL3980-B	PXMJ	WMB	VARIOUS	VARIOUS	0	N78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-BPL-031-4000-A	2PL4000-A	PXMJ	WMB	VARIOUS	VARIOUS	0	78K5-824443-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	J.D. Jackson 9-21-86	____	____	____
CHECKED/DATE	R.K. White 9/22/86	____	____	____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-043
MANUFACTURER : OKONITE

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±3M	**CONTRACT	C A I *	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PL-065-3540-A	1PL3540-A	PXMJ	WFA-4	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-065-3550-B	1PL3550-B	PXMJ	WFA-4	VARIOUS	VARIOUS	0	N78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-3830-B	1PL3830-B	PXMJ	WFA-4	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-3835-B	1PL3835-B	PXMJ	WFA-4	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-031-4030-B	1PL4030-B	PXMJ	WFA-4	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-078-6380-B	1PL6380-B	PXMJ	WFA-4	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PL-078-6385-A	1PL6385-A	PXMJ	WFA-4	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-2792-A	1V 2792-A	PXMJ	WHL-1	VARIOUS	VARIOUS	0	N78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-067-2793-A	1V 2793-A	PXMJ	WHL-1	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-063-2903-A	1V 2903-A	PXMJ	WHL-1	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-063-3172-A	1V 3172-A	PXMJ	WHL-1	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-343-9724-A	1V 9724-A	PXMJ	WHL-1	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3830-B	2PL3830-B	PXMJ	WFA-4	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4020-A	2PL4020-A	PXMJ	WFA-4	VARIOUS	VARIOUS	0	78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2792-B	2V 2792-B	PXMJ	WHL-1	VARIOUS	VARIOUS	0	N78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-2794-B	2V 2794-B	PXMJ	WHL-1	VARIOUS	VARIOUS	0	N78K5-824749-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	J.D. Jackson 9-21-86	_____	_____	_____
CHECKED/DATE	R.T. White 9/22/86	_____	_____	_____

BINDER NO. WBNEQ-CABL-043 PLANT WBN UNIT(S) 1 SHEET 1 OF 1

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JDJ DATE 9-21-86 R R

CHECKED RZW DATE 9/22/86

TAB B

TABLE OF CONTENTS

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Component-Unique Checklist:		
Cables/Splices	Supplement 2	-

BINDER NO. WBNEQ-CABL-043 PLANT WBN UNIT(S) 1 SHEET 1 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JDJ DATE 9-24-86 R ___ R ___

CHECKED RTW DATE 9/22/86

A. DOCUMENTATION

Equipment Description 600 Volt Power & Control Cable

Vendor/Manufacturer Okonite TVA Contracts: 81K5-827928, 78K5-824443-1 78K5-824749

Equipment Model No.(s) TVA Type PXMJ (Multiple - Conductor Cable with FREPR Insulation and Overall CSPE Jacket)

QUALIFICATION REPORTS (See TAB D)

* (1) Title/Number/Revision Okonite Report No. NQRN-2 Rev. 5, "Qualification of Okonite - FMR Insulated Cable for Nuclear Plant Service" RIMS B70 850926 004 DATE 2/16/84

** (2) Title/Number/Revision Okonite Eng. Report #355 Main Steam Line Break Qualification Test on Okonite, Okonite-FMR, X-Olene-FMR, and Okoguard Insulations RIMS B70 850910 100 DATE 9/12/81

(3) Title/Number/Revision _____ RIMS _____ DATE _____

OTHER (ANALYSIS, VENDOR DATA, ETC.) *TAB C, section A.1.

**This report is included for information only (not required to meet WBN's HELB) to show that this cable has been qualified for an MSLB of 455°F, 32 psig, and 0.55E08 rads.

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 2 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JDJ DATE 9-2-86 R R

CHECKED RXW DATE 9/12/86

B. CONCLUSION OF REVIEW (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. Resolution of SCRs WBNEQP8624,-28,-48.
2. Verify removal of System 87 cable 1V-3464-B.
3. Cables below 10CFR50.49 flood level.

COMMENTS/RECOMMENDATIONS The evaluated cable is qualified for its application for 40 years plus accident time requirement (see TAB C, Section A.3).

BINDER NO. WBNEQ-CABL-043 PLANT WBN UNIT(S) 1 SHEET 3 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JDJ DATE 9-22-86 R ___ R ___

CHECKED RKW DATE 9/22/86

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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

IEEE 323-1974

IEEE 383-1974

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 4 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JOJ DATE 9-21-86 R ___ R ___

CHECKED KMW DATE 9/22/86

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 Tested representative samples in accordance with Table 1 of IEEE 383-1974, see Supplement 2 for comparison of tested to purchased cables.

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 5 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JDJ DATE 9-21-86 R ___ R ___

CHECKED RKW DATE 9/22/86

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Cable	Okonite NQRN-2 (Report #1)
(2) Manufacturer	Okonite	Okonite	Okonite NQRN-2 (Report #1)
(3) Model Number(s)	Okonite-FMR	Okonite-FMR	Okonite NQRN-2 (Report #1)
(4) Serial Number(s)	NA		
	NA		
	NA		
	NA		
(5) Identify Component-Unique checksheet attached:	Supplement 2 - Cables/Splices		

JUSTIFICATION/COMMENTS Tested single conductor, No. 12 AWG as representative sample in accordance with Table 1 of IEEE 383-1974.

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 6 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JOJ DATE 9-21-86 R ___ R ___

CHECKED RLW DATE 9/22/86

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report and/or equivalent 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		NA	
Electrical Connections		NA	
Conduit Seals		NA	
Connector Seals		NA	
Orientation		NA	
Physical Configuration		NA	
Other		NA	

JUSTIFICATION/COMMENTS Not required for cable.

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 7 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JDJ DATE 9-2-86 R ___ R ___

CHECKED RKW DATE 9/22/86

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)

	Yes/No/NA	Reference
(a) Equipment inspected for damage	Yes	See Comment G(1)a below
(b) Baseline performance measurements taken	Yes	Rpt 1, p. 3
(c) Equipment aged:		
Thermal	Yes	Rpt 1, p. 3
Radiation	Yes	Rpt 1, p. 3
Wear	No	See TAB C, Section B
(d) Vibration/seismic testing conducted	No	See TAB C, Section B
(e) Design basis event (DBE) exposure	Yes	Rpt 1, pp. 2 & 5 & Appendix 1
(f) Post-DBE exposure	Yes	Rpt 1, p. 5
(g) Final inspection and disassembly	Yes	Rpt 1, p. 5

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (see comment G(3) below) (Reference Report 1, App 5, page 1).

JUSTIFICATION/COMMENTS G(1)a The Okonite test report does not specifically state that the cable was inspected for damage prior to testing, however, it is doubtful that the cable was damaged due to the cable successfully passing the DBE test. In the event the cable was damaged, this would provide for a more severe test. G(3) Specific calibration data are not provided; however, page 1 of Report 1, Appendix 5, certifies M&TE traceability to the National Bureau of Standards (NBS).

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 8 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JDJ DATE 9-2-86 R ___ R ___

CHECKED RKW DATE 9/22/86

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference Report 1, p. 3 & Appendix 2).

JUSTIFICATION/COMMENTS

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	Report 1, p. 3
Radiation exposure	Yes	Report 1, p. 3
Vibration (non-seismic) aging	No	See TAB C, Section B
Operational (electrical/mechanical/process) stress aging	No	See TAB C Section B

JUSTIFICATION/COMMENTS

(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)? No (Reference ___).

JUSTIFICATION/COMMENTS See TAB C, Section A.4

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 3).

JUSTIFICATION/COMMENTS

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: Report 1, p. 2).

JUSTIFICATION/COMMENTS

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 3, and Appendix 2).

JUSTIFICATION/COMMENTS

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference Report 1; p. 3 & Appendix 2, p. 7. Also, Tab E.7, page 3,, section II(4)).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	130°F (54.4°C) SVR	150°C	90°C
Time	40 Years	504Hrs	40 Years

JUSTIFICATION/COMMENTS See TAB C, Section A.2. The 150°C/504 hours aging is acceptable because this thermal aging is for unjacketed single conductor cable with 30 and/or 47 mils of insulation tested to 40 percent retention of elongation. Okonite has proven that cables aged for an equivalent of 40 years in jacketed form (as installed condition) retain better than 60 percent elongation. These jacketed 40 year equivalent aged cables were aged 180°C/360 hours, 165°C/960 hours and 150°C/2500 hours. Therefore, the 150°C/504 hours aging for the unjacketed samples is much more conservative and acceptable as an aging parameter.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference Report 1, Appendix 2, p. 7).

JUSTIFICATION/COMMENTS See TAB C, Section A.2

(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)? No (Reference).

JUSTIFICATION/COMMENTS See H(4)(g) and TAB C, Section A.2

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)? No (Reference Report 1, Appendix 2).

JUSTIFICATION/COMMENTS No actual data points are provided on chart No. 1, EP and XLPE, time to 40 percent elongation; however, the aging at 150°C/504 hours is located on the solid line portion constructed via the least squares method which passes through the experimental data points. Test data is maintained at Okonite. See Reference Section and Comments of H(4)d.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS The thermal aging simulates a 40-year life for the cable operated in a 54.4°C ambient plus energized heat rise. Therefore, the energized heat rise, when added to the environmental temperature, will not raise the total temperature above the 90°C rated cable temperature.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Report 1, p. 3).

JUSTIFICATION/COMMENTS

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference).

JUSTIFICATION/COMMENTS The insulation material is the only non-metallic material, and therefore, the only thing subject to radiation degradation. The jacket material is also subject to degradation, but it is considered sacrificial.

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report 1, Appendix 3).

JUSTIFICATION/COMMENTS The radiation level of 201.4 Mrads was used to provide for the maximum total cumulative radiation dose expected for the design life plus the expected accident radiation dose, including a 10 percent margin, as suggested by IEEE323 (1974). The .95 Mrad/hr dose rate is in accordance with IEEE383 (1974), para. 2.4.2 requiring the dose rate not to exceed 1 Mrad/hr.

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report 1, p. 3 & Appendix 3).

Plant normal ambient radiation dose (rd) 1.0E6 (see TAB B K(1)d)

Test exposure dose (rd) 2×10^8

Test exposure dose rate (rd/hr) 0.95×10^6

Test exposure source type (e.g., Co-60 gamma) Co-60 GAMMA

JUSTIFICATION/COMMENTS See H(5)c comments

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS See TAB C, Section B

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS See TAB C, Section B

(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)? No (Reference _____).

JUSTIFICATION/COMMENTS See TAB C, Section B

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference _____).

JUSTIFICATION/COMMENTS See TAB C, Section B

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes
(Reference Report 1, Appendix 2, page 1 and section 1.4.4).

Qualified life (Document in QMDS) 40 years (see TAB G)

JUSTIFICATION/COMMENTS See TAB C, Section A.3

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? No
(Reference _____).

Replacement Intervals (Document in QMDS) None (see TAB G)

JUSTIFICATION/COMMENTS No replacement intervals recommended since the cables are qualified for the design life of the plant.

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 13 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JOJ DATE 9-21-86 R ___ R ___

CHECKED RLW DATE 9/22/86

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 Threshold	Reference	Activation Energy	Reference
(a)	Okonite-FMR*	NA**	NA	NA	TAB C, Section A.2
(b)					
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS *Okonite composition of flame and moisture retardant Ethylene-Propylene-Rubber insulation.

**Samples successfully passed test (Report 1) after total radiation exposure of 2 x 10^8 rads which exceeds requirements of IEEE 383-1974 and exceeds actual plant environment levels.

***Thermal aging analysis is discussed in TAB C, Section A.2 and Report 1, Appendix 2. The evaluation is based on physical properties measured after thermal aging and is supported by actual service data.

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 14 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JOJ DATE 9-21-86 R ___ R ___

CHECKED RLW DATE 9/22/86

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

(1) 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 Report 1, Section 1.4.1.4).

Identify Acceptance Criteria: Post-LOCA withstand tests in accordance with IEEE 383, Section 2.4.4.

(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 Report 1, Sections 1.4.1.4, 1.4.1.5(b)(e)(g)(k)(n), 1.4.2.5, and 1.4.2.6).

Identify baseline and functional testing: Insulation resistance measured before, during, and after LOCA.

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report 1, Section 1.4.2.4).

JUSTIFICATION/COMMENTS

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? No (Reference).

JUSTIFICATION/COMMENTS See TAB C, Section E, the test load 600V/30A was more severe than actual service requirements.

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	480V	WBEP-EP-43.13 Sec.4.1.7(d) TAB E.12
Load	NA	NA
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS See TAB C, Section E

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 16 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JOJ DATE 9-21-86 CHECKED RKW DATE 9/22/86

R ___ R ___

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	600V	Rpt 1, p 5
Load	30 AMPS	Rpt 1, p 5
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS None

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-44, -76, -78, and QIR NEB86101. These drawings and the QIR represent the limiting environmental parameters.

(1) Normal Max

(a) Temperature (°F) 130°F (SVR)
(b) Pressure (psig) 14.4 psia (ATM)
(c) Humidity (%) 80%
(d) Radiation (rd) 1.0E06 *

(2) Abnormal Max

(a) Temperature (°F) 140°F (SVR)
(b) Pressure (psig) 14.4 psia (ATM)
(c) Humidity (%) 100% (SVR)
(d) Radiation (rd) NA

(3) Process Interfaces: None

(4) State anticipated occurrence frequency and duration of abnormal conditions: Could exist up to 8 hours duration per excursion and will occur less than 1% of plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (F)	535°F (SVR)*** 323°F (SVR)	Accident type	MSLB*** HELB
(b) Pressure	25.18 psia (SVR)	Accident type	HELB
(c) Humidity (%)	100% (ANN)	Accident type	LOCA
(d) Radiation (rd)	1.5E8 ** (EGTS)	Accident type	LOCA
(e) Spray Type	NA-Outside Containment	Accident type	N/A

*40-year normal dose in Annulus (Drawing 47E235-44).

**1.5E8 rads is the dose 1-1/2 feet from the front of EGTS HEPA filter (small face) according to QIR NEB86101 (RIMS B45 860723 261) located in TAB E.1. OE Calculation WBPEVAR8606004 (RIMS B26 860618 020) located in TAB E.6, provides verification that cable 1-PL-3540-A was the closest to the EGTS Filter at 1-1/2 feet from the small face of the EGTS filter.

***See TAB C, Section F, for an evaluation of superheated steam in SVR.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Cable location is outside containment; therefore, Beta radiation is not a concern.

(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)? No (Reference IEEE 383-1974 Section 2.3.1 & IPCEA S-68-516).

(7) Subject to submergence (yes/no/NA)? No (Reference See TAB C, Section C).

Identify initiation time and duration of submergence: NA

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

Type	RIMS No.
QIR NEB860101 (Radiation)	B45 860723 261
QIR WBNEEB86036 (Submergence)	B26 860310 004

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time	100 Day	130 Day	Report 1, pp. 3 & 5
Temperature (°F)	535*** 323	341	Report 1, pp. 3 & 5
Pressure (psia)	25.18	112	Report 1, pp. 3 & 5
Relative Humidity (%)	100	100	Report 1, pp. 3 & 5
Chemical Spray	NA-Outside Containment	**	Report 1, pp. 3 & 5
*Radiation (rd)	1.5E8 Rads GAMMA	2E+08 Rads GAMMA	Report 1, pp. 3 & 5
Submergence	NA		See TAB C, Section C

*Worst case 40-year integrated normal dose plus integrated accident dose

**In accordance with IEEE 323-1974

***Cables in the SVR are not qualified for 100 days but they will perform their safety function prior to the onset of superheated steam. See TAB C, Section F.

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	Report 1, p. 5 & Appendix 1
Pressure	Yes	Report 1, p. 5 & Appendix 1
Relative Humidity	Yes	Report 1, p. 5 & Appendix 1
Chemical Spray	NA	Report 1, p. 5 & Appendix 1 (Outside Containment)
Submergence	NA	See TAB C, Section C

JUSTIFICATION/COMMENTS The temperature test profile envelops all postulated event profiles for areas where the cables in this binder are routed except for the SVR MSLB temperature profile. The four cables in the SVR are qualified since they perform their safety function before the onset of superheated steam temperatures. Cables

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

1V-38-B and 1V-42-B perform their safety function 12.7 seconds after a worst case 1.4ft^2 MSLB. Cables 1V-2980-A and 1V-3010-B perform their safety function 9.2 seconds after a worst case 1.4 ft^2 MSLB. The SVR will not reach 323°F until at least 25 seconds after the MSLB, thus providing the time margin necessary to assume valve operation.

(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	Yes/No/NA
Temperature: +15 degrees F	+15°F***	No***
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)	+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	Yes	Yes
Vibration: +10% added to acceleration	NA	See TAB C, Section B

JUSTIFICATION/COMMENTS: *Tested at 600 volts AC whereas required operating voltage is 480 volts AC or less.

**Not applicable to low voltage power and control power cable.

***Cables meet the 15°F temperature margin except during an MSLB in the SVR with superheated steam; however, the cables in the SVR do perform their safety function prior to the onset of superheated steam. See TAB C, Sections F and L(2) comments.

NOTE: Margins noted are applied to plant conditions and difference shown is between plant requirements and test conditions.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment:
(Reference NA).

JUSTIFICATION/COMMENTS Maintain required voltage and current to the connected equipment

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes
(Reference Report 1, p. 5).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes
(Reference Report 1, p. 5).

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 Report 1, p. 5).

JUSTIFICATION/COMMENTS

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes
(Reference TAB C, Section D).

JUSTIFICATION/COMMENTS

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)? No (Enter all requirements in Section G of the Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS See TAB G, there were no surveillance or maintenance requirements identified from the vendor or test documentation; however, TVA does have a maintenance and surveillance program.

BINDER NO. WBNEQ-CABL-043 PLANT WBN 1 UNIT(S) 1 SHEET 23 OF 25

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JDJ DATE 9-24-86 R ___ R ___

CHECKED RLW DATE 9/24/86

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)?	Yes
(2) Any exceptions (i.e., sound reasons to the contrary) taken to the specified qualification level adequately justified?	NA None Taken
(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?	NA
(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 aging identified?	Yes

0. SUMMARY 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) Criteria regarding test sequence satisfied?	Yes
(10) Criteria regarding spray satisfied?	NA-Outside Containment
(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?	NA
(11) Criteria regarding submergence satisfied?	NA
(12) Criteria regarding radiation satisfied?	Yes
(a) Was dose rate considered?	Yes
(b) Was beta radiation considered?	NA-Outside Containment
(13) Criteria regarding operability status/mode satisfied?	Yes
(14) Criteria regarding test failures or anomalies satisfied?	Yes

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied?	NA
(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. DISCUSSION

BINDER NO. WBNEQ-CABL-043 PLANT WBN UNIT(S) 1 SHEET 1 OF 3

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JOJ DATE 8-21-86 CHECKED RKW DATE 9/22/86

R R

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No (See Comments)

Item	Plant	Report	Acceptable Yes/No/NA	Report Page
(a) Conductor				
Insulation material	Okonite FMR	Okonite FMR	Yes	2
Size	See Comments	12 AWG	Yes	2
Stranding	7	7	Yes	2
Coating	Tinned	Tinned	Yes	2
Insulation Thickness	See Comments	30 MIL	Yes	2
Number of conductors	See Comments	1	Yes	2
Arrangement of conductors	See Comments	NA-Single Conductor	Yes	2
(b) Shielding	NA	NA	NA	NA
(c) Insulation jacket				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
(d) Outer jacket				
Material	Okolon (Hypalon)	None	Yes	2, See Comment
Thickness	See Comments	None	Yes	2, See Comment

BINDER NO. WBNEQ-CABL-043 PLANT WBN UNIT(S) 1 SHEET 2 OF 3

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JOJ DATE 9-21-86 R ___ R ___

CHECKED RKW DATE 9/22/86

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Page
(e) Voltage	600 VAC	600 VAC	Yes	2
(f) Current	NA	30 AMPS	Yes	2
(g) Operating temperature				
Normal	54.4°C	90°C	Yes	2
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	NA	NA	NA	NA
(i) Splice				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: See Sheet 2A for a matrix of cables in this binder. Testing without the jacket provides for a more severe test and is acceptable per IEEE 383-1974.

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference Report 1, Appendix 6 & p.5).

Comments:

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference Report 1, p. 5).

Comments: 600 VAC/30 AMPS

BINDER NO. WBNEQ-CABL-043 PLANT WBN UNIT(S) 1 SHEET 2A OF 3

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JOJ DATE 9-21-86 R ___ R ___

CHECKED RKW DATE 9/22/86

CABLE IDENTIFICATION MATRIX

Sheet 2A of 3

Contract	Contract Item No.	Size	Insulation Thickness	No. of Conductors	Arrangement of Conductors	Jacket Thickness
824749	2	8 AWG	60 MIL	3	Twisted	60 MIL
824749	3	14 AWG	45 MIL	16	Twisted	80 MIL
827928	13	12 AWG	30 MIL	2	Parallel	45 MIL
824443-1	1	12 AWG	45 MIL	2	Parallel	45 MIL
824443-1	4	8 AWG	60 MIL	3	Twisted	60 MIL
824443-1	5	4 AWG	60 MIL	3	Twisted	80 MIL

BINDER NO. WBNEQ-CABL-043 PLANT WBN UNIT(S) 1 SHEET 3 OF 3

BINDER TITLE OKONITE/LOW VOLTAGE POWER & CONTROL/EPR INSULATION/ TVA TYPE PXMJ

COMPUTED JDJ DATE 9-2-86 R R

CHECKED RKW DATE 9/22/86

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report 1, p. 5).

Comments:

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference Report 1, pp. 3 & 5).

Comments:

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report 1, pp. 3 & 5).

Comments:

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Report 1, Appendix 7).

Identify flame test standard: IEEE 383-1974, paragraph 2.5

Comments:

BINDER NO. WBNEQ-CAEL-044
MANUFACTURER Rockbestos
PAGE 1 OF 1

TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEVICE ID NO.	DESCRIPTION	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ROOM	PURCHASE CONTRACT NO./RD	CAT	OPERATING TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-@M-300-INTJMF01-A	Not Applicable**	SIS	WJG-6		Various	I,0*	86PLD-838433	A	100D	LOCA/HELB	Carry voltage and current
0-@M-300-INTJMF02-B	Not Applicable**	SIS	WJG-6		Various	I,0*	86PLD-838433	A	100D	LOCA/HELB	Carry voltage and current
0-@M-300-INTJMF03-D	Not applicable**	SIS	WJG-6		Various	I,0*	86PLD-838433	A	100D	LOCA/HELB	Carry voltage and current
0-@M-300-INTJMF04-E	Not applicable**	SIS	WJG-6		Various	I,0*	86PLD-838433	A	100D	LOCA/HELB	Carry voltage and current
0-@M-300-INTJMF05-F	Not applicable**	SIS	WJG-6		Various	I,0*	86PLD-838433	A	100D	LOCA/HELB	Carry voltage and current
0-@M-300-INTJMF06-G	Not applicable**	SIS	WJG-6		Various	I,0*	86PLD-838433	A	100D	LOCA/HELB	Carry voltage and current
0-@M-300-INTJMF07-S	Not applicable**	SIS	WJG-6		Various	I,0*	86PLD-838433	A	100D	LOCA/HELB	Carry voltage and current

PAGE A-1

*I = Inside Containment
*O = Outside Containment

**This is jumper wire which has no unique Unit Device ID No.

		R	R	R
Preparer/Date	DL Scalthorpe 7/26/86			
Checked/Date	[illegible] 7/28/86			

NQF165.41

BINDER NO. WBNEQ-CABL-044 PLANT WBN UNIT(S) 1 SHEET 1 OF 1

BINDER TITLE ~~SWITCHBOARD WIRE - KXL760G-KXLPE~~ ROCKBESTOS/INSULATED INS./TVA TYPE SIS

COMPUTED DLS DATE 7/21/86 R ___ R ___

CHECKED [illegible] DATE 7/25/86

SUMMARY

The cable qualified by this binder is Rockbestos Insulated Switchboard Wire with their FW-III Irradiation Cross-linked Flame-Retardant Polyethylene Insulation (Rockbestos compound KXL760G). This cable was purchased primarily to replace jumper wires (for which qualification could not be established) in junction boxes and Limitorque valves located both inside and outside primary containment.

The cable in this binder has been demonstrated to be qualified for a 46-year life at 90°C including one DBA and 100 days post-accident operating time to environmental parameters (341.9°F, 117.8 psig and 2.0014×10^8 rads) which exceed WBN's operating environments both inside and outside containment with the following exceptions:

1. This cable is not qualified for submergence. None of this cable shall be installed where it would be subject to submergence.

2. Cable, if installed in the Emergency Gas Treatment Room, must not be installed any closer than 2 feet from the HEPA filter.

3. This cable is not qualified for use in the Spent Resin Storage Tank Room. No cable is presently installed in this room.

4. Qualification must be determined on a case by case basis before any of this cable can be installed in the following inside containment area:

   Cylindrical space of radius 8'6" in the reactor cavity directly beneath the reactor pressure vessel.

BINDER NO. WBNEQ-CABL-044 PLANT WBN UNIT(S) 1 SHEET 1 OF 36

BINDER TITLE ROCKBESTOS/INSULATED SWITCHBOARD WIRE - KXL760G-RXLPE INS./TVA TYPE SIS COMPUTED DLS DATE 7/21/86 R ___ R ___

CHECKED [illegible] DATE 7/25/86

A. DOCUMENTATION

Equipment Description 600V Switchboard Wire

Vendor/Manufacturer The Rockbestos Company

Equipment Model No.(s)* TVA Cable Type SIS (XLPE)(Irradiation Cross-linked) (Compound KXL 760G)

TVA Contract 86PLD-838433

QUALIFICATION REPORTS

(1) Title/Number/Revision Rockbestos Report No. QR-5805, "Report on Qualification Tests for Firewall III Irradiation Cross-linked Polyethylene Constructions for Class 1E Service in Nuclear Generating Stations." RIMS B70 851108 107 DATE Oct. 8, 1985

Additional Documents Included in Binder:

TAB C - System 1000 Qualified Life Calculations

TAB E - 1) Rockbestos' Nov. 6, 1985, letter (RIMS B43 851106 003) to TVA certifies that Report No. QR-5805 is applicable to Contract 86PLD-838433 and that cable furnished on this contract is irradiation cross-linked polyethylene.

2) SCR WBNEEB8564 (B43 851126 923).

3) Engineering Report for SCR WBNEEB8564R0 (B45 851206 273).

4) SCR WBNEEB8565 (B43 851126 921).

*TVA type designation 600V switchboard wire, single conductor, heat and moisture resistant with flame-retardant, cross-linked polyethylene insulation.

QUALIFICATION REPORTS (Continued)

5) Engineering Report for SCR WBNEEB8551 (B45 851121 255).

6) OE Calculation WBNNAL3-025 "Normal Operation Dose for Equipment Qualification Outside the Shield Building" (B45 860328 236).

7) OE Calculation GENNAL3-002 "Reduction of Beta Dose by Sheet Steel" (B45 851210 235).

8) OE Calculation WBNNAL3-031 "100-Day Loss of Coolant Accident Due to Electrical Equipment in the EGTS Filter Train Room" (B45 860529 237).

TAB J - NRC 1E Information Notice No. 84-44 "Environmental Qualification Testing of Rockbestos Cables" (NEB 840619 600).

BINDER NO. WBNEQ-CABL-044 PLANT WBN UNIT(S) 1 SHEET 2 OF 36

BINDER TITLE ROCKBESTOS/INSULATED SWITCHBOARD WIRE - KXL760G-RXLPE INS./TVA TYPE SIS COMPUTED DLS DATE 9/21/86 R ___ R ___

CHECKED B DATE 9/4/86

B. CONCLUSION OF REVIEW (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) Rewiring of Limitorque operators.

*(2) Rewiring of 10CFR50.49 junction boxes.

*See Open Item sheets in front of binder for additional discussion.

COMMENTS/RECOMMENDATIONS See Summary in TAB A.

BINDER NO. WBNEQ-CABL-044 PLANT WBN UNIT(S) 1 SHEET 3 OF 36

BINDER TITLE ~~SWITCHBOARD WIRE - KXL760G-RXLPE~~ ROCKBESTOS/INSULATED INS./TVA TYPE SIS

COMPUTED DLS DATE 7/21/86 R ___ R ___

CHECKED DJ Cox DATE 7/25/86

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 (IEEE 323-1974)

___ Components are Qualified to the Criteria o 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

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

BINDER NO. WBNEQ-CABL-044 PLANT WBN UNIT(S) 1 SHEET 4 OF 36

R ___ R ___

BINDER TITLE ROCKBESTOS/INSULATED ~~SWITCHBOARD WIRE - KXL760G-RXLPE~~ INS./TVA TYPE SIS

COMPUTED DLS DATE 7/21/86

CHECKED DJCox DATE 7/25/86

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 Representative samples were tested in accordance with Table 1 of IEEE 383-1974. See TAB B, Section E, of checklist for comparison of tested sample to purchased cable.

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Reference
(1) Equipment Type	Cable	Report No. 1	Rockbestos Report No. QR-5805, p 4
(2) Manufacturer	Rockbestos	Report No. 1	Rockbestos Report No. QR-5805, p 4
(3) Model Number(s)	TVA Type SIS	Report No. 1	Rockbestos Report No. QR 5805, p 4
		NA	
		NA	
		NA	
(4) Serial Number(s)		NA	
		NA	
		NA	
		NA	
(5) Identify Component-Unique checksheet attached:	Supplement 2 - Cables		

JUSTIFICATION/COMMENTS Tested sample: Test specimen B1 was a single conductor removed from a 600V, 7/c, 14 AWG 90°C control cable which was described as 7/c, 14 AWG 7-strand x .0242" tinned copper conductors with .025" irradiation cross-linked flame-retardant polyethylene (KXL-760G) with a .045" hypalon (chloro-sulfonated polyethylene) outer jacket.
Purchased Cable: 1/c, 14 AWG, 41-strand copper conductor with .030" flame-retardant irradiated cross-linked polyethylene insulation (TVA Mark No. WJG-6) [Purchased cable construction was obtained from routine test reports in contract file.]

BINDER NO. WBNEQ-CABL-044 PLANT WBN UNIT(S) 1 SHEET 6 OF 36

BINDER TITLE ~~SWITCHBOARD WIRE - KXL760G-RXLPE~~ ROCKBESTOS/INSULATED INS./TVA TYPE SIS

COMPUTED DLB DATE 2/21/86 R ___ R ___

CHECKED DJCox DATE 7/25/86

F. INSTALLATION INTERFACES

List all interfaces pertinent to EQ identified in the test report 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		NA	
Electrical Connections		NA	
Conduit Seals		NA	
Connector Seals		NA	
Orientation		NA	
Physical Configuration		NA	
Other		NA	

JUSTIFICATION/COMMENTS This does not apply for cable qualification.

TVA 19537 (OE-3-86) EQP133.51

BINDER NO. WBNEQ-CABL-044 PLANT WBN UNIT(S) 1 SHEET 7 OF 36

BINDER TITLE ~~SWITCHBOARD WIRE - XXL760C-RXLPE~~ ROCKBESTOS/INSULATED INS./TVA TYPE SIS

COMPUTED DLS DATE 7/21/86 R ___ R ___

CHECKED DJ Cop DATE 7/25/86

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)

	Yes/No/NA	Report No. 1 Reference
(a) Equipment inspected for damage	Yes	pp 36-40
(b) Baseline performance measurements taken	Yes	pp 36-40
(c) Equipment aged:		
Thermal	Yes	pp 8-9 and pp 42-46
Radiation	Yes	p 10 and pp 47-48
Wear	No	---
(d) Vibration/seismic testing conducted	No	---
(e) Design basis event (DBE) exposure	Yes	pp 11-12 and p 65
(f) Post-DBE exposure	Yes	p 65
(g) Final inspection and disassembly	Yes	pp 13-15

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes (Reference Report No. 1, p 85).

JUSTIFICATION/COMMENTS G(1)(c) Wear and G(1)(d) - See Comments, Sheet 8 of TAB B.

BINDER NO. WBNEQ-CABL-044 PLANT WBN UNIT(S) 1 SHEET 8 OF 36

BINDER TITLE ~~SWITCHBOARD WIRE - KXL760G-RXLPE~~ ROCKBESTOS/INSULATED INS./TVA TYPE SIS COMPUTED [illegible] DATE 7/21/86 R R

CHECKED [illegible] DATE 7/25/86

GENERIC COMMENT FOR G(1)(C) WEAR, G(1)(D) VIBRATION, H(2),H(6), AND H(7)

Normal Service Related Stresses - In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards...". Paragraph 2.3.1 of that same document further states, "Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more of the following industry standards or criteria". IPCEA S-66-524 "Cross-Linked-Polyethylene-Insulated Cable" applies to the cable purchased on the contract in this binder and it is one of the industry standards listed in para. 2.3.1.

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service.

GENERIC COMMENT FOR G(1)(D) SEISMIC:

Upon completion of the LOCA simulation, the cable samples were subjected to a mandrel rebend test and an in-water hipot test. IEEE 383-1974, paragraph 2.4.4, regards that the performance of this test demonstrates that the cables have retained considerable mechanical durability and would be more severe even than the application of two cycles of the environment. The retention of a high degree of flexibility at the end of life (plus an accident) demonstrates the cables' ability to withstand significant mechanical stresses.

H. AGING

(1) Was aging considered in the qualification program (Yes/no/NA)? Yes (Reference Report No. 1, pp 42-46 and pp 47-48).

JUSTIFICATION/COMMENTS Thermally aged at 909.5 hours at 150°C and radiation aged at 2 x 10^8 rads.

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	pp 8-9
Radiation exposure	No	p 10
Vibration (non-seismic) aging	No	---
Operational (electrical/mechanical/process) stress aging	No	---

JUSTIFICATION/COMMENTS Vibration and operational stress aging - See Comments, Sheet 8 of TAB B.

(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)? Yes (Reference Report No. 1, p 8).

JUSTIFICATION/COMMENTS See Sheet 10 of TAB B.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, pp 42-46).

JUSTIFICATION/COMMENTS See Section H(1).

TEST SEQUENCE AND SYNERGISTIC EFFECTS

The test sequence was in accordance with IEEE 323-1974 as follows:

Test Activity	Report No. 1 Page Number
Initial Functional Test (Baseline)	p 8
Aging Simulation	pp 8-9
Radiation Exposure	p 10
Post-Radiation Functional Test	p 11 and Data Sections
Accident Simulation (LOCA and MSLB)	p 13
Post-Accident Functional Test	pp 13-16

The sequential test performed and shown above is substantiated by Sandia Tests documented in NUREG/CR-3588 (SAND 83-2406 dated April 1984), which demonstrated that electrical performance during simultaneous tests was similar to that during sequential tests for cross-linked polyethylene materials.

Sandia's 81-2027/1 of 2 figure 3-1 indicates that there are dose rate effects (degradation of percent elongation and tensile force properties) for cross-linked polyethylene insulation for total aging exposures of approximately 20 to 75 megarads. However, the amount of degradation experienced at 200 megarads total exposure was greater than that for lower total exposures and it was essentially the same regardless of aging sequence and/or dose rate.

This cable was subjected to the simulated LOCA steam temperature (with chemical spray) profile after it had already received the degradation resulting from 200 megarads radiation exposure and it passed the qualification test.

The worst case radiation exposure for installed cables is 80 megarads (40-year normal dose) plus 87 megarads (accident dose) for a total integrated dose of 167 megarads.

The 200 megarad test exposure is significantly higher than the worst case installed conditions. Installed cables will experience considerably less degradation from a dose rate of 2 megarads/yr (80 megarads normal/40-year) than the amount of degradation experienced by the tested cable. Therefore, qualification of cable in this binder is not affected by dose rate or aging sequence synergisms.

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: Report No. 1, pp 42-43).

JUSTIFICATION/COMMENTS Use of IEEE-1974 test guidelines considers cable insulation/jacket materials susceptible to thermal degradation.

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, pp 9 and 42).

JUSTIFICATION/COMMENTS

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, pp 9 and 42).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	130°F(54°C)	150°C	90°C
Time	40 years	909.5 hours	46 years

JUSTIFICATION/COMMENTS

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? Yes (Reference Report No. 1, p 42).

JUSTIFICATION/COMMENTS For verification of vendor's Arrhenius calculations (activation energy, slope of curve, and qualified life), see TAB C, Sheet C-5. Minor differences are attributed to number of decimal places carried by the different computers for 1/test temperatures (°K).

(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)? NA (Reference NA).

JUSTIFICATION/COMMENTS Cable specific insulation regression curve was used for aging. See H(4)(g).

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)? Yes (Reference Report No. 1, pp 42, 43).

JUSTIFICATION/COMMENTS Vendor supplied Arrhenius plot for 60 percent retention of elongation.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference Report No. 1, pp 9 and 42).

JUSTIFICATION/COMMENTS Not required. The thermal aging simulates a 40-year life for cable operated in a 40°C ambient plus a 50°C rise (due to energized cable). This is a 90°C rated cable and it was aged for an equivalent life of 46 years at 90°C to include margin.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, p 10).

JUSTIFICATION/COMMENTS Aged at .40 megarads/hr for 503.5 hours to a total dose of 200.14 megarads.

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, p 10).

JUSTIFICATION/COMMENTS See H(5)(a).

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, p 10).

JUSTIFICATION/COMMENTS See H(5)(a).

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report No. 1, pp 10, 47 and 48).

Plant normal ambient radiation dose (rd) 1.8×10^3 (EGTS)
8×10^3 (Inside Containment)

Test exposure dose (rd) 2×10^8

Test exposure dose rate (rd/hr) 0.40 Mr/hr average dose rate

Test exposure source type (e.g., Co-60 gamma) Cobalt 60 gamma

JUSTIFICATION/COMMENTS See TAB B, Sheets 22 and 23, for discussion of radiation values.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? No (Reference G(1)(d)).

JUSTIFICATION/COMMENTS See Comments, Sheet 8 of TAB B.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? No (Reference G(1)(d) and H(2)).

JUSTIFICATION/COMMENTS See Comments, Sheet 8 of TAB B.

H. AGING (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)? No (Reference See Comments, Sheet 8 of TAB B).

JUSTIFICATION/COMMENTS

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Comments, Sheet 8 of TAB B.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, pp 9, 42-46).

Qualified life (Document in QMDS) 46 years at 90°C.

JUSTIFICATION/COMMENTS Cable will be used for control purposes. Therefore, there will be no appreciable conductor temperature rise due to cable current loading. Also, see Comments, Sheet 23. Conductor temperature will not exceed 90°C.

H. AGING (Continued)

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA (Reference NA).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS Not required because cable is qualified for the design life of the plant.

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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 Threshold	Reference	Activation Energy	Reference
(a)	Cross-linked polyethylene (Irradiation cross-linked)	---	---	1.3464	Report No. 1 pp 42-43
(b)	NA				
(c)	NA				
(d)	NA				
(e)	NA				

JUSTIFICATION/COMMENTS Thermal and radiation aging was performed as part of the test program in accordance with industry standards. Therefore, no materials analysis is required.

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

(1) 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 Report No. 1, p 16).

Identify Acceptance Criteria: Successful withstand of the continuous (except during IR measurements) application of rated voltage and current for 100-day LOCA and post-LOCA exposure and by successful withstand of 80V/mil AC stress after the 40-times OD mandrel bend test.

(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 See Below).

Identify baseline and functional testing: Before LOCA exposure (after aging) - Insulation resistance at 500VDC and dielectric (Report No. 1, p 11, and Data Section 5). During LOCA exposure - Cable energized at 600VAC and 20 amperes except when insulation resistance measurements were taken (Report No. 1, p 75). After LOCA exposure - 40-times cable OD mandrel bend (80V/mil for 5 minutes) withstand test (Report No. 1, pp 42 and 12).

JUSTIFICATION/COMMENTS IR measurements were taken during the LOCA test at 8 hours (temp 328.5 to 342.1°F), 11 hours (296.3 to 321.4°F), 15 hours (288 to 300.5°F), 23 hours (244.4 to 251.4°F), 99 hours (247.7 to 248.9°F), day 14 (223.1 to 232.3°F), day 46 (223.2 to 232.9°F), day 62 (219.6 to 233.3°F), day 85 (219.4 to 229.9°F), end day 111 (226.1 to 230.7°F), and the lowest of these readings was 0.144 megohm - 1000 feet at the 8-hour point with the test profile temperature between 328.5 to 342.1°F.

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

JUSTIFICATION/COMMENTS (Continued)

Since this cable is going to be used to replace jumper wires in 50.49 junction boxes and Limitorque valves, we will conservatively assume that the maximum installed length of any jumper will be 10 feet. The minimum IR of 0.144 megohm - 1000 feet - is equivalent to 14.4 megohms for a cable length of 10 feet. Shorter length jumpers would have higher IR values. Insulation resistance values of 14.4 megohms for maximum installed lengths of 10 feet are acceptable for any of the power and control circuits in which this cable will be installed.

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report No. 1, pp 61 and 75).

JUSTIFICATION/COMMENTS 600V AC at 20 amperes was applied during LOCA exposure and post-LOCA exposure.

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? Yes (Reference Report No. 1, pp 36-40).

JUSTIFICATION/COMMENTS No load applied during baseline testing. Insulation resistance measurements at 500VDC were taken before thermal and radiation aging. Qualification for normal operation is established because cable was manufactured and tested in accordance with IPCEA S-66-524 in accordance with IEEE 383, paragraph 2.3.1.

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

(a)

Parameter	Specific Accident Conditions	Reference
Voltage	480VAC	NA*
Load	NA	NA
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS *Cable is rated at 600 volts, but it is only required to operate at 480 volts AC. Load currents are not specified by TVA in the contract. Only voltage rating and wire size are specified. The demonstrated current is larger than installed current for this cable because loads for this type cable are typically small.

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

(5)(b)

Parameter	Demonstrated Conditions	Reference
Voltage	600VAC	Report No. 1, p 61
Load	20 amps	Report No. 1, p 61
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		

JUSTIFICATION/COMMENTS See comments for (5)(a) on Sheet 18.

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K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. See comments on Sheet 22.

(1) Normal Max

(a) Temperature (°F) *130

(b) Pressure (psia) 14.7

(c) Humidity (%) 80

(d) Radiation (rd) *8E07

(2) Abnormal Max

(a) Temperature (°F) *140

(b) Pressure (psia) 14.7

(c) Humidity (%) *90

(d) Radiation (rd) NA

(3) Process Interfaces: None required.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Eight hours per excursion and will occur less than 1 percent of plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F) *327 Accident type LOCA/HELB

(b) Pressure (psia) *26.4 Accident type LOCA/HELB

(c) Humidity (%) 100 Accident type LOCA/HELB

(d) Radiation (rd) *1.18×10^8 (EGTS) *8.7×10^7 (Inside Containment) Accident type LOCA/HELB

(e) Spray Type ***Chemical Accident type LOCA/HELB

*Limiting values, see comments on Sheets 22 and 23.

***0.1847 molar H_3BO_3 (2000 ppm Boron), .033 molar NaOH, resulting in a pH of 8.2 at 25°C, rate of 0.92 (gal/min)/ft^2, with duration $\leq$30 days.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

Worst-case radiation doses were obtained from GENNAL3-001, WBNNAL3-004, and TI-RPS-48. Worst-case temperatures are shown on TVA Dwgs 47E235-76R2 (normal and abnormal) and 47E235-42R1 (accident). Worst-case pressure is shown on TVA Dwgs 47E235-41R0 and -42R1. (See Sheet 23 for additional comments).

(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)? *No (Reference NA).

*See TAB B, Sheet 35, "Component-Unique Checklist Cables/Splices," p 2 of 3.

(7) Subject to submergence (yes/no/NA)? No (Reference NA).

Identify initiation time and duration of submergence: Cable qualification does not include qualification for submergence. This cable should not be installed in any submerged applications. Refer to TAB B, Section B.

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

Type	RIMS No.
OE Calc WBNNAL3-031 "100-Day Loss of Coolant Accident Dose to Electrical Equipment in the EGTS Filter Train Room	B45 860529 237
OE Calc GENNAL3-001 "Doses for Equipment Qualification for All Shield Bldg. Spaces"	B45 851117 235
OE Calc WBNNAL3-004 "Accident Doses Inside Reactor Bldg."	B45 860205 235
OE Calc TI-RPS-48R2 "Integrated Accident Dose Inside Primary Containment"	B45 851105 235
OE Calc WBNNAL3-025 "Normal Operation Dose for Equipment Qualification Outside the Shield Building"	B45 860401 235

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Cable in this binder is a distributed component located throughout inside and outside containment and is used primarily as jumper wires in Limitorque valves and in some junction boxes. The temperatures shown in K(1) and K(5) are for the Main Steam Valve Vault rooms. All other Rockbestos cable from this contract will be installed in areas where the maximum normal temperature is 104°F, with the exception of any cable located in the Annulus (110°F) or inside containment where the maximum normal temperature is 120°F (shown on TVA Dwg 47E235-42R1).

Cables installed in ambient temperatures higher than 104°F (40°C) are derated to lower current-carrying capacities to limit conductor temperature to 90°C during the design process to account for the higher ambient environment per TVA Electrical Design Standards DS-E12.1.1 through DS-E12.1.4 (all Revision 0).

Cable from this contract is qualified for installation in the ABGTS rooms (Rooms A5 and A9), where maximum possible radiation dose is 1.18×10^8 rads per OE Calc TI-RPS-194R0 (NEB 850118 235) (see TAB E).

The maximum radiation dose in the EGTS for equipment located 2 feet or greater from the large face of the HEPA filter is 1.18E08 (1.8×10^3 normal dose plus 1.18×10^8 accident) rads per OE Calculation WBNNAL3-031 (B45 860529 237) (see TAB E). Therefore (since cable is qualified for 2×10^8 rads), cable from this contract is qualified for use in the EGTS (Emergency Gas Treatment System) (Room A16), provided it is not installed at distances within 2 feet of the HEPA filter.

The accident dose of 8.7×10^7 rads shown in K(5) consists of 3.8×10^7 rads gamma and 5.2×10^7 rads beta. OE Calculation TI-RPS-48(R2) (B45 851105 235) and GENNAL3-001 (B45 851117 235) provide accident dose information. The free field beta dose inside containment is 4.7×10^8 rads. The cable addressed in this binder will be installed in junction boxes or Limitorque valves. It is conservatively assumed that 16-gauge sheet steel will be the worst case thickness of any enclosure in which this cable is installed. Per OE Calculation GENNAL3-002 (B45 851210 235) 16-gauge sheet steel results in an 89.6% reduction in the beta radiation. Therefore, the maximum beta dose this cable (jumper wire) will be exposed to is 4.9×10^7 rads (4.7×10^8 rads times (1.000 - 0.896)).

Per OE Calculation WBNOSG4-003 R2 (B45 851112 218), all devices (except PAM devices) perform their required function to mitigate a MSLB within 9.7 seconds, which is prior to any significant superheat. Per this calculation, subsequent failure of cables due to higher temperatures (535°F superheat) does not have any adverse affect on the mitigation of an MSLB. This cable is not installed in any PAM conduits.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Reference
Operating Time (days)	100	****100	p 65
Temperature (°F)	327	341.9	p 65
Pressure	26.4 psia	117.8 psig	p 65
Relative Humidity (%)	100	100	p 12
*Chemical Spray	See K(5) Comments	*** Assumed vendor used IEEE 323-1974 (Table A) Spray Composition per p 12.	p 10
**Radiation (rd)	1.18E08 TID (See Sheet 21) 1.67E08 TID (Inside Containment)	2.0014×10^8	p 10
Submergence	No	No	No

*Includes spray concentration, flowrate, density, duration, and pH.
**Enter 40-year integrated normal dose plus integrated accident dose and specify type.
***0.28 molar H_3BO_3 (3000 ppm Boron) 0.064 molar $Na_2S_2O_3$ and Na OH to make a pH of 10.5 at 77°F. Actual pH was 8.9 to 10.7 and GPM was a 1.1 to 2.5. Spray was applied for 24 hours.
****Profile shows 111 days, but there were 7.32 days of downtime due to miscellaneous shutdown times (per backup test data). Therefore, "demonstrated" is listed as 100 days above in L(1) operating time.

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Reference
Temperature	Yes	p 65
Pressure	Yes	p 65
Relative Humidity	Yes	p 65
Chemical Spray	Yes (see Comments)	pp 12, 67, 71
Submergence	NA	---

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

JUSTIFICATION/COMMENTS All cables in primary containment are routed in conduits or installed inside devices and are therefore, not subject to direct impingement of chemical spray solution. Because the spray rate and direct impingement are of no concern, the tested condition demonstrates that the cables are conservatively qualified for their installed environment.

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(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	Yes/No/NA
Temperature: +15 degrees F	+15	Yes
Pressure: +10% but no more than 10 psig	10 psig	Yes
Radiation: +10% of accident dose	+10%	Yes
Time: +10% (or 1 hour + operating time per NUREG-0588)	No	**No
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	2 transients	Yes
Vibration: +10% added to acceleration	No	***No

JUSTIFICATION/COMMENTS *Cable is rated at 600V, but it is only required to operate at 480V or less. Cable was tested at 600V. **The tested profile shows 111 days duration, but there were 7.32 days of downtime due to miscellaneous shutdown times (per backup test data). Therefore, this binder only claims 100 days as demonstrated (See TAB B, Section L(1)). Even though 10 percent time was not added to the test profile, sufficient margin exists because the test profile was at 225°F temperature

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

JUSTIFICATION/COMMENTS (Continued)

for the 4th through the 100th day, and the required plant profile conditions (worst-case inside containment) are 140°F for the 4th through the 30th day (temperature conservatively assumed from TVA Dwg 47E235-42) and 115°F from the 30th to the 100th day.

***Vibration - See Sheet 8 of TAB B.

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M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference TAB A).

JUSTIFICATION/COMMENTS Maintain electrical integrity and operability.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference Report No. 1, p 16).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference Report No. 1, p 16).

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 Report No. 1, pp 16, 74-79).

JUSTIFICATION/COMMENTS

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M. OPERABILITY TEST RESULTS (Continued)

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference Report No. 1, pp 18-20).

JUSTIFICATION/COMMENTS Anomalies to samples A2, E1, and E4 were explained but do not apply to sample qualified in this binder (Sample B1). Other power and steam/temperature interruptions were compensated for by extending the 100-day test to 111 days to ensure all samples were exposed to 100 days or greater of required environment and electrical load conditions.

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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 Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS No vendor required surveillance, maintenance, and inspection parameters are necessary to maintain qualification.

TVA Storage and Recommended Surveillance requirements have been included in TAB G QMDS. Purpose of surveillance requirements is to accumulate historical data and identify any potential cable degradation.

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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)?	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?	No
(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

0. SUMMARY 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) 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?	See Comments L(2) of TAB B
(11) Criteria regarding submergence satisfied?	NA
(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

O. SUMMARY OF REVIEW (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?	Yes
(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 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. DISCUSSION

O(2) - No exceptions taken.

O(4) - No analysis performed.

O(6)(a) - See Sheet 8 of TAB B.

O(6)(c) - Preaging was performed.

O(11) - Cable not qualified for submergence and should not be installed in submerged applications.

O(17)(b) - No exception was taken.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	EQ Checklist Sect. E	EQ Checklist Sect. E	Yes	Report No. 1, p 4
Size	EQ Checklist Sect. E	EQ Checklist Sect. E	Yes	Report No. 1, p 4
Stranding	EQ Checklist Sect. E	EQ Checklist Sect. E	Yes	Report No. 1, p 4
Coating	EQ Checklist Sect. E	EQ Checklist Sect. E	Yes	Report No. 1, p 4
Insulation Thickness	EQ Checklist Sect. E	EQ Checklist Sect. E	Yes	Report No. 1, p 4
Number of conductors	EQ Checklist Sect. E	EQ Checklist Sect. E	Yes	Report No. 1, p 4
Arrangement of conductors	EQ Checklist Sect. E	EQ Checklist Sect. E	Yes	Report No. 1, p 4
(b) Shielding	NA	NA	NA	NA
(c) Insulation jacket				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
(d) Outer jacket				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA

BINDER NO. WBNEQ-CABL-044 PLANT WBN UNIT(S) 1 SHEET 35 OF 36

BINDER TITLE ~~SWITCHBOARD WIRE - KXL760G-RXLPE~~ ROCKBESTOS/INSULATED INS./TVA TYPE SIS COMPUTED DLS DATE 2/21/86 R ___ R ___

CHECKED D.A. Cap DATE 2/25/86

EQUIPMENT IDENTIFICATION (Continued) Page 2 of 3

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	EQ Checklist Sect. E	EQ Checklist Sect. E	Yes	Report No. 1, p 61
(f) Rated current	NA	NA	NA	NA
(g) Operating temperature rating				
Normal	Contract	EQ Checklist Sect. E	Yes	Report No. 1, p 61
Emergency	NA	NA	NA	NA
Short circuit	NA	NA	NA	NA
(h) Insulation resistance	NA	NA	NA	NA
(i) Splice				
Material	NA	NA	NA	NA
Thickness	NA	NA	NA	NA
Identification	NA	NA	NA	NA

Comments: _____

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference Contract).

Comments: Cable is qualified for temperature and moisture resistance for normal operation because it has been manufactured and routine tested in accordance with IPCEA S-66-524 per the contract requirements.

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference Report No. 1, p 61).

Comments: Cable was energized at 600V 20 amperes.

EQUIPMENT IDENTIFICATION (Continued) Page 3 of 3

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report No. 1, p 58).

Comments: 80V/mil rms stress for 1 minute was applied after IR measurements at end of thermal and radiation aging.

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference Report No. 1, p 81).

Comments: Cable was subjected to IR test pre-LOCA, during and past exposure. Lowest IR reading for Specimen B1 was .144 megohms-1000-feet.

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report No. 1, p 81).

Comments: Cable was subjected to a 40 x diameter mandrel bend and an 80V/mil AC rms 60Hz stress test after 100-day profile exposure.

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Routine Test Report).

Identify flame test standard: IEEE 383-1974.

Comments:

PRINT DATE: 09/05/86

BINDER NO. : WBNEQ-CABL-047
MANUFACTURER : TELEDYNE

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	ELEV	*SM	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-XXM-090-0031-A	ORM 31-A	SPESIG	WWK	VARIOUS	VARIOUS	0	79K7-825280-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-XXM-090-0033-A	ORM 33-A	SPESIG	WWK	VARIOUS	VARIOUS	0	79K7-825280-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-XXM-090-0036-B	ORM 36-B	SPESIG	WWK	VARIOUS	VARIOUS	0	79K7-825280-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-XXM-090-0038-B	ORM 38-B	SPESIG	WWK	VARIOUS	VARIOUS	0	79K7-825280-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-XXM-090-0057-A	ORM 57-A	SPESIG	WWK	VARIOUS	VARIOUS	0	79K7-825280-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-XXM-090-0058-B	ORM 58-B	SPESIG	WWK	VARIOUS	VARIOUS	0	79K7-825280-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT

PAGE A-1

PREPARER/DATE R.A. Mindorff 9-10-86 R____ R____ R____

CHECKED/DATE R.T. Spurlin 9.10.86

PRINTED IN U.S.A.

BINDER NO. WBNEQ-CABL-047 PLANT WBN UNIT(S) 1 SHEET 1 OF 34

BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR TELEDYNE SIGNAL CABLE COMPUTED AMI DATE 9-10-86 R R

CHECKED ETD DATE 9.10.86

A. DOCUMENTATION

Equipment Description Special Signal Cable

Vendor/Manufacturer Teledyne

Equipment Model No.(s) Tefzel/Tefzel - TVA Type ETFE, Mark Letter WWK*

TVA Contract 79K7-825280

*TVA Mark WWK - See TAB B, Section E

QUALIFICATION REPORTS

(1) Title/Number/Revision Nuclear Environmental Qualification Test Program on Electrical Cables for Carolina Wire & Cable Company, Wyle Laboratories Report No. 46350-2, dated July 22, 1983, TAB D. RIMS B70 860114 100 DATE July 22,1983

OTHER (ANALYSIS, VENDOR DATA, ETC.)

(2) Title/Number/Revision DuPont letter to TVA, TAB E. RIMS B43 850311 014 DATE March 5, 1985

(3) Title/Number/Revision Qualification of Okozel Insulated Wire and Cable for Nuclear Plant Service, Okonite Report No. K-0-1, Sept. 1979, TAB E. RIMS B70 860114 102 DATE Sept. 1979

(4) Title/Number/Revision Nuclear Environmental Qualification Test Program on Electrical Cables for Carolina Wire & Cable Company, Wyle Laboratories Report No. 46350-1, dated April 10, 1983, TAB E. RIMS B70 851011 100 DATE Apr 10, 1983

(5) Continental letter to TVA dated October 29, 1985 (B70 851104 004), TAB E.

(6) Siecor (formerly Carolina Wire and Cable) letter to TVA dated October 30, 1985 (B70 851104 005). Siecor letter to TVA dated January 28, 1986 (B70 860203 001). TVA letter to Siecor dated January 23, 1986 (B70 860123 001). TVA letter to Siecor dated February 25, 1986 (B70 860225 004). Siecor letter to TVA dated February 28, 1986 (B70 860305 001), TAB E.

(7) Teledyne letters to TVA dated October 10, 1985 (B70 851015 002) and January 13, 1986 (B70 860116 002), TAB E.

(8) Okonite letter to TVA dated October 11, 1985 (B70 851015 003), with attached DuPont letter dated September 10, 1979, and Okonite report, Qualification of Okozel Insulation for Nuclear Plant Service, Okonite Report No. NQRN-4, Rev. 3, dated February 16, 1984, TAB E.

(9) DuPont paper "Tefzel[R] ETFE Fluoropolymer: Temperature Rating and Functional Characterization," by J. C. Reed and J. R. Perkins, dated December 6, 1972 (B70 860114 101), TAB E.

(10) Contract 79K7-825280, dated February 14, 1979 (QAS 790306 552), TAB E.

(11) Routine test report for 35,070 feet, Mark WWK, dated June 4, 1979, with memorandum dated July 10, 1979 (EEB 790711 912). TAB E.

(12) TVA letter to Okonite dated January 23, 1986, RIMS No. B70 860123 003, Okonite letter to TVA dated February 18, 1986, RIMS No. B71 860225 005, TAB E.

(13) QIR NEB86101 (B45 860723 261), Radiation Dose From EGTS Filters for Cable Qualification.

(14) WBPEVAR8606504 (B26 060618 020), Cables Routed Within Certain Specified Distances From the EGTS and ABGTS HEPA Filters.

(15) WBNOSG4-026 (B45 860326 220), Radiation Monitoring System (90) NUREG-0588 Category and Operating Times.

(16) WBNNAL3-025 (B45 860401 235), Normal Operation Dose for Equipment Qualification Outside the Shield Building.

(17) QIR WBNEEB86072 (B26 860804 005), Detailed Routing of Selected 1E Cables Through Harsh Environments.

BINDER NO. WBNEQ-CABL-047 PLANT WBN UNIT(S) 1 SHEET 3 OF 34

BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR TELEDYNE SIGNAL CABLE COMPUTED AMI DATE 9-10-86 R R

CHECKED ETD DATE 9.10.86

B. CONCLUSION OF REVIEW (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

COMMENTS/RECOMMENDATIONS The cable on this contract is only used outside containment. It is a special signal cable used to provide service to radiation monitors in the auxiliary building from a panel in the control building. It has been qualified for a 40-year life at 78°C, plus DBE and post-accident, to environmental parameters (profiles) which exceed the required WBN operating environmental parameters. We have verified the exact route of this cable and the worst conditions the cable sees are 104°F (normal), 110°F (abnormal), 110°F (LOCA), 90% humidity, atmospheric pressure, total radiation less than 6.838×10^7 rads, and 195°F (HELB). All references to Tefzel 280 and specimen 1.1.A are in parentheses behind Tefzel 200 and specimen 3.1.A and are included strictly as extra information to demonstrate the capabilities of Tefzel 280 in addition to Tefzel 200. The representative Tefzel 200 (and 280) Carolina cable was aged to an equivalent of 9052 years at 104°F and was irradiated to more than 2.02×10^8 rads (almost 3 times the expected service). They maintained 2.8×10^{12} for specimen 3.1.A (8.8×10^{11} for specimen 1.1.A) ohms insulation resistance after the thermal and radiation aging. They passed a two-transient LOCA for 30 days, with 356°F temperature, 70 psig, 100% humidity and chemical spray.

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BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR TELEDYNE SIGNAL CABLE COMPUTED [illegible] DATE 9-10-86 R R

CHECKED [illegible] DATE 9.10.86

C. 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 IE Bulletin No. 79-01B (IEEE323-1971) (DOR Guidelines Applicable to only BFN)

JUSTIFICATION/COMMENTS

INDICATE OTHER REGULATORY DOCUMENTS AND/OR INDUSTRY STANDARDS MET

Test program for Report 1, Carolina's Report No. 46350-2, was in accordance with IEEE 323-1974 and IEEE 383-1974 guidelines.

BINDER NO. WBNEQ-CABL-047 PLANT WBN UNIT(S) 1 SHEET 5 OF 34

BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR TELEDYNE SIGNAL CABLE COMPUTED AHE DATE 9-10-86 R ___ R ___

CHECKED ETD DATE 9.10.86

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 Samples were tested which are representative of the contracted item. See TAB B, Section E, and TAB C, Section A. Contract 79K7-825280 does not have a qualification test report. However, because it is constructed from Tefzel 200 insulation, we are using a Carolina Tefzel 200 (and 280) qualification report with support from two other Tefzel 200 qualification documents. This report with the supporting documents shows clearly that this Tefzel cable is qualified for the application of this binder. In TAB E are referenced documents and also letters from DuPont, Okonite, Continental Wire and Cable, Siecor (formerly Carolina Wire and Cable), and Teledyne Thermatics. These letters testify that Tefzel is the same chemical compound regardless of who manufactures the cable and that all manufacturers use the same guidelines for applying Tefzel. These guidelines are distributed by DuPont and are referenced in TAB E in some of the manufacturer's letters. Because we do not have a tested cable meeting Table 1 of IEEE 383-1974, we are using a 1/c, No. 20 AWG, Tefzel 200 (and 280) insulated conductor (Carolina Report No.

D. QUALIFICATION METHODOLOGY (Continued)

46350-2) to demonstrate the qualification of the 8-conductor combination, special signal cable (WWK) described in TAB B, Section E and installed in the plant.

Only four of the eight conductors of the WWK cable are used. The two coaxial cables are used as power cables for D.C. bias voltage and the twisted shielded pair serves for contact closure with D.C. power. This particular service, from a practical standpoint, makes them immune to leakage currents and when one examines the excellent insulation resistances maintained throughout the very severe LOCA testing and hi-pot testing, leakage currents are no concern. In essence each cable is acting as a single conductor within the WWK cable. All of the cables have the same insulation, so there can be no interaction between cables due to different insulations. There is no extremely high temperature to consider so there can be no problem of cables affecting each other due to swelling or one cable melting against another cable. The severity of the 1/c tested demonstrated the durability of the insulation and the capability of service. The report also included a 7/c, No. 14 AWG, Tefzel 200 (and 280) insulated cable and by the severity of the test demonstrated there was no interaction of conductors within the multiconductor cable. We, therefore, conclude there is no difference in the 1/c and 7/c cables tested and the 1/c cable demonstrates the qualification of the WWK cable.

E. EQUIPMENT DESCRIPTION

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

	Plant Device	Qualification Document	Report Reference
(1) Equipment Type	Cable	Cable	Report No.1 page iv
(2) Manufacturer	Teledyne Thermatics	Carolina	
(3) Model Number(s)	Special Signal Cable Tefzel 200	Tefzel 200 (and 280)	Specimen 3.1.A (and 1.1.A)
(4) Serial Number(s)		NA	
(5) Identify Component-Unique checksheet attached:	Supplement 2 - Cable/Splices		

JUSTIFICATION/COMMENTS Samples were tested which are representative of the contracted cable. This justification is applicable to TAB B Section D, TAB C Section A, and Item 1 of Supplement 2.

The purchased cable was procured under Contract 79K7-825280 and is described as: TVA Mark WWK:

Special Signal Cable, 8-conductor combination, constructed as follows:

2-single conductors No. 22 AWG (7 strands No. 30 AWG) with 10 ± 2 mils ETFE insulation.

ETFE as provided by Teledyne for the contract in this binder is Tefzel 200 insulation material.

E. EQUIPMENT DESCRIPTION (Continued)

One twisted pair, No. 20 AWG (7 strands No. 28 AWG) conductors, each with 10 ± 2 mils ETFE insulation.

One twisted shielded pair, No. 22 AWG (7 strands No. 30 AWG) conductors, each with 10 ± 2 mils ETFE insulation, aluminum/mylar shield with No. 22 AWG (7 strands No. 30 AWG) drain wire.

Two coaxial cables, ETFE insulation, ETFE jacket, center conductor No. 27 AWG (7 strands No. 35 AWG), with No. 34 AWG copper, braided, tinned shield.

Overall shield is No. 34 AWG copper, braided, tinned.

Overall jacket over the 8-conductor combination is ETFE, (Tefzel 280) 15 mils minimum thickness.

See TAB E for a copy of the contract and a description of the cable, WWK.

Per Qualification Report No. 1: The tested cable was described as follows: 1/c, No. 20 AWG, 600-volt 0.015 inch ETFE Tefzel 200, (and 280) insulation.

See TAB C, Section A, for justification discussion.

F. INSTALLATION INTERFACES

Does the qualification program address all relevant interfaces of the equipment so that the installed design and configuration is similar or identical to the test configuration (yes/no/NA)? (note below)

Interface	Identify Interface Requirement	Acceptable? (Yes/No/NA)	Reference Test Report
Mounting Bolts	NA	NA	
External Process Connections	NA	NA	
Electrical Connections	NA	NA	
Conduit Seals	NA	NA	
Connector Seals	NA	NA	
Orientation	NA	NA	
Physical Configuration	NA	NA	
Other	NA	NA	

JUSTIFICATION/COMMENTS Not required for cable qualification.

G. TEST SEQUENCE - REPORT NO. 1

(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/NA	Report No. 1 Reference
(a) Equipment inspected for damage	Yes	page I-2, -3
(b) Baseline performance measurements taken	Yes	page I-2, -3
(c) Equipment aged:		
Thermal	Yes	page II-1
Radiation	Yes	page III-1
Wear	No**	--
(d) Vibration/seismic testing conducted	No**	--
(e) Design basis event (DBE) exposure	Yes	page IV-3
(f) Post-DBE exposure	Yes	See TAB C, Section B
(g) Final inspection and disassembly and functional test	Yes	page V-2

(2) Was the same piece of equipment used throughout the test sequence described in item (1) above (yes/no/NA)? Yes

(3) Have the test equipment, test equipment accuracies and calibration data been appropriately documented (yes/no/NA)? Yes
(Reference Report No. 1, page v (pages I-18, I-19, II-18, II-19, III-14, IV-70 through 73, V-14).

JUSTIFICATION/COMMENTS

G. TEST SEQUENCE - REPORT NO. 1 (Continued)

**G(1)(c) Wear and G(1)(d) - See Comments Sheet 12 of TAB B. The test sequence for Report No. 1 is shown on Sheet 13A.

GENERIC COMMENT FOR G(1)(C) WEAR, G(1)(D) VIBRATION, H(2), H(6), AND H(7)

Normal Service Related Stresses- In accordance with paragraph 1.3.4.1 of IEEE 383-1974, "The cable, as installed, should be suitable for operation at maximum ambient temperature, radiation, and atmospheric conditions and normal electrical and physical stresses for its installed life as specified. Evidence of this suitability may be based on compliance with appropriate published industry standards...". Evidence of qualification for normal operation may be demonstrated by providing certified evidence that the cable has been manufactured and tested and passed in accordance with the provisions of one or more industry standards or criteria.

The following are applicable industry standards to which TVA purchases ETFE insulated cables:

1. MIL-W-22759/16A, March 10, 1981, Military Specification Sheet, superseding MIL-W-22759/16 (AS), January 12, 1973.

2. MIL-W-22759D, Amendment 1, December 7, 1979, and MIL-W-22759D, Supplement 1B, May 27, 1980.

3. MIL-W-22759D, June 29, 1973: Military Specification - Wire, Electric, Fluoropolymer-Insulated, Copper or Copper Alloy.

Based on the above, we conclude that the cables, having been tested in accordance with the appropriate standard, are qualified for normal duty, including vibration commensurate with such service.

GENERIC COMMENT FOR G(1)(D) SEISMIC:

Seismic testing is not required for USNRC NUREG-0588, Category II.

H. AGING

(1) Was aging considered in the qualification program (Yes/No/NA)? Yes (Reference Report No. 1, pages II-1, III-1, and III-4).

JUSTIFICATION/COMMENTS Thermally aged 100 hours at 159°C and radiation aged at 202.24 x 10^6 rads.

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

Aging Effect	Yes/No/NA	Reference
Thermal aging	Yes	Report No. 1, page II-1,
Radiation exposure	Yes	Report No. 1, pages III-1, III-4
Vibration (non-seismic) aging	No	--
Operational (electrical/mechanical/process) stress aging	No	--

JUSTIFICATION/COMMENTS Vibration and Operational Stress Aging - See Comment Sheet 12 of TAB B.

(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)? Yes (Reference See Comments on Sheets 13A, 13B).

JUSTIFICATION/COMMENTS See Sheets 13A and 13B of TAB B.

(4) Thermal Aging:

(a) Was thermal aging considered in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page II-1).

JUSTIFICATION/COMMENTS See H.(1).

TEST SEQUENCE AND SYNERGISTIC EFFECTS

The test sequence was in accordance with IEEE 323-1974 as follows:

TEST PROGRAM	REPORT NO 1, PAGE ii
(a) Baseline functional test.	REPORT NO 1, PAGE ii
(b) Thermal aging and functional.	REPORT NO 1, PAGE ii
(c) Irradiation and functional.	REPORT NO 1, PAGE ii
(d) DBE/LOCA and functional.	REPORT NO 1, PAGE ii
(e) Voltage withstand test.	REPORT NO 1, PAGE ii
(f) Flame test.	REPORT NO 1, PAGE ii

(Continued on Sheet 13B)

TEST SEQUENCE AND SYNERGISTIC EFFECTS (Continued)

Under TAB D, Report No. 46350-2 by Wyle Lab for Carolina has an addendum report No. 46350-3, Section VIII. This addendum documents the requirements, procedures, and results of a test performed to determine the extent of the synergistic effects of varying the sequence of thermal aging and radiation exposure on Tefzel 200 and 280 insulation cables. There were no anomalies during this test program, (No. 46350-3, Section VIII, synergistic effects). All the test specimens successfully withstood the effects of the thermal aging, irradiation, and voltage withstand tests without compromising their functional integrity. Based on the results, it was concluded that test sequence had no detectable effect on the degradation of the Tefzel insulation used on the test specimens.

Also see Section VII-11.

H. AGING (Continued)

(b) Were the materials susceptible to thermal aging degradation identified in the qualification program (yes/no/NA)? Yes (Reference: Report No. 1, page VII-5).

JUSTIFICATION/COMMENTS Use of IEEE 383-1974 aging guidelines implicitly considers cable insulation/jacket materials susceptible to thermal degradation.

(c) Was the basis for thermal aging identified in the qualification program (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS See TAB B, H(4)(g).

(d) Was the aging acceleration rate justified and the parameters of time and temperature identified in the qualification program (yes/no/NA)? NA (Reference _____).

Parameter	Plant Maximum Normal	Test	Equivalent
Temperature	104°F	159°C	78°C
Time	40 yrs	100 hrs	40 yrs

JUSTIFICATION/COMMENTS See TAB C, Section A, page 4.

(e) Was the Arrhenius methodology used for accelerated aging (yes/no/NA)? NA (Reference _____).

JUSTIFICATION/COMMENTS See TAB B, H(4)(g).

(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)? NA (Reference _____).

JUSTIFICATION/COMMENTS See TAB B, H(4)(g).

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)? Yes (Reference NA).

JUSTIFICATION/COMMENTS Insulation specific aging regression curves were used in the qualified life analysis. See TAB C, Section A.

(h) Was the equipment operated during the thermal aging (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS Not required. Thermal aging simulates 40-yr life for cable energized at 40°C ambient plus rise due to loading. WWK is a signal cable and the conductor temperature rise is negligible. Therefore, the equivalent aging temperature of 78°C is very conservative. See TAB B, H(4)(d). Also see TAB C, Sect. A, p. 4.

(5) Radiation Aging Exposure:

(a) Was radiaton aging exposure considered in the qualification program (yes/no/NA)? Yes (Ref Report No. 1, pages III-1, III-4).

(b) Were the materials susceptible to radiation degradation identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page VII-5).

JUSTIFICATION/COMMENTS Use of IEEE 383-1974 aging guidelines implicitly considers cable insulation/jacket materials susceptible to radiation degradation.

(c) Was the basis for radiation aging exposure identified in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page VII-10).

JUSTIFICATION/COMMENTS IEEE 383-1974 guidelines were used. The aging and accident doses were combined when irradiated during the test.

H. AGING (Continued)

(d) Is the radiation test exposure dose and dose rate acceptable (yes/no/NA)? Yes (Reference Report No. 1, pages III-1, III-4).

Plant normal ambient radiation dose (rd)* 3.6×10^6 (Room A8-EL. 737)

Test exposure dose (rd) 202.24×10^6

Test exposure dose rate (rd/hr) 0.50×10^6

Test exposure source type (e.g., Co-60 gamma) Co-60 gamma

JUSTIFICATION/COMMENTS *Test exposure envelops plant normal (3.6×10^6) plus accident ($<1.0 \times 10^4$) or $<3.61 \times 10^6$.

(6) Vibration (non-seismic) Aging:

(a) Were the effects of non-seismic vibration induced during normal and abnormal operation addressed in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Comments Sheet 12 of TAB B.

(b) Was the basis for vibration aging identified and justified in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Comments Sheet 12 of TAB B.

(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)? No (Reference NA).

JUSTIFICATION/COMMENTS See Comments Sheet 12 of TAB B.

*Room A5-EL.737 (ABGTS) normal dose is 8.8×10^5 plus accident, $<6.75 \times 10^7$, or $<6.838 \times 10^7$, which is worst-case total radiation environment.

H. AGING (Continued)

(b) Was the basis for stresses induced during operational aging identified and justified in the qualification program (yes/no/NA)? No (Reference NA).

JUSTIFICATION/COMMENTS See Sheet 12 of TAB B.

(8) Was the qualified life of the equipment and its basis defined in the qualification program (yes/no/NA)? Yes (Reference Report No. 1, page VII-15, -16).

Qualified life (Document in QMDS) 40 years at 78°C. See TAB C, Section A, page 4.

JUSTIFICATION/COMMENTS

(9) Were replacement intervals for the equipment or its components defined in the qualification program (yes/no/NA)? NA (Reference NA).

Replacement Intervals (Document in QMDS) NA

JUSTIFICATION/COMMENTS Not required because cable is qualified for the design life of the plant.

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BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR TELEDYNE SIGNAL CABLE COMPUTED AMLF DATE 9-10-86 R R

CHECKED ETD DATE 9.10.86

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)

	Material/Property/Function	Radiation Threshold	Reference	Activation Energy	Reference
(a)	Tefzel 200 (and 280)			1.33eV	See TAB C, Section A, page 4
(b)					
(c)					
(d)					
(e)					

JUSTIFICATION/COMMENTS The testing was done in accordance with industry standards and is done to test the insulation and jacket materials. Thermal and radiation age-conditioning was performed as part of the test program.

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

(1) 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 Report No. 1, page VII-8).

Identify Acceptance Criteria: IEEE 383-1974, the criteria included functioning continuously at test specified voltage and current during the LOCA test, passing mandrel bend and high voltage withstand test of 80V/mil for five minutes, and passing flame test.

(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 Report No. 1, page (see parenthesis below)).

Identify baseline and functional testing: Insulation resistance, voltage, and current (I-8).

Before, during, and after: Before and after each exposure period and during the LOCA they did an insulation resistance test (II-12, III-8, IV-26, IV-38, IV-45, IV-55, IV-59, IV-63).

During: Cables energized @ 660VAC and 5.5 amps (IV-2).

After: High-voltage withstand test with cable immersed in water at 80V/mil for five minutes (V-10).

JUSTIFICATION/COMMENTS

(3) Does the qualification report/analysis describe loads (or load combinations) applied during DBE test (yes/no/NA)? Yes (Reference Report No. 1, page IV-2).

JUSTIFICATION/COMMENTS 660VAC and 5.5 amps current applied during DBE test. This includes 10% margin. The 5.5 amps was applied to our specimen of interest, 3.1.A (and 1.1.A).

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

(4) Do the applied loads during baseline testing reflect normal operating conditions (yes/no/NA)? Yes (Reference Report No. 1, page I-2).

JUSTIFICATION/COMMENTS Baseline testing consisted of insulation resistance measurements prior to and after each environmental exposure. Qualification for normal operation is established because cable was manufactured and tested in accordance with MIL-W-22759/16(AS).*

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

(a) Parameter	Specific Accident Conditions	Reference
*Voltage	NA	NA
Load	NA	NA
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		
	NA	NA
	NA	NA

JUSTIFICATION/COMMENTS *Cable WWK does not have a specified voltage rating. This special signal cable, made up of 8 cables, is used to provide service to detectors 0-RE-90-133 and -140 and 0-RE-90-134 and -141 which are part of the Essential Raw Cooling Water liquid monitors 0-RE-90-133-A and 0-RE-90-134-B, respectively, and to provide service to detectors 0-RE-90-102 and -103 which are part of the fuel pool exhaust monitors 0-RE-90-102-A and 0-RE-90-103-B, respectively. The WWK cable runs from the monitor in the auxiliary building to a panel, 0-M-12, in the control building.

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

(5)(b) Parameter	Demonstrated Conditions	Report No. 1 Reference
*Voltage	660VAC	page IV-2
Load	5.5 amps	page IV-2
Frequency	NA	NA
Accuracy	NA	NA
Other(s)		
	NA	NA
	NA	NA

JUSTIFICATION/COMMENTS The cable terminates to the detector's preamplifier on the monitor and to a readout module at the 0-M-12 panel in the control building. The following are circuit requirements for the WWK cable relative to the monitor.

The only conductors of the subject cable which are being utilized for the detector circuit of the radiation monitor are the two coaxial cables and the No. 22 AWG twisted, shielded pair. The remaining four conductors are spare conductors only.

The black coaxial conductor is a bias voltage conductor to the detector and can carry 500-1200 VDC at up to 2mA.

The white coaxial cable can carry detector outputs of 0-4 VDC negative pulses at a repetition rate of 0-10⁷/minute, operating at essentially 0 VDC. These pulses are random in nature and are 1 micro-second in length.

The twisted, shielded pair provides a safety loop, maintaining 15 VDC $\pm$0.7 VDC at approximately 17mA (20 mA maximum). If contacts in the monitor piping circuit are opened, the loop maintains 15 VDC at 0 current.

The output impedance of the preamp at the detector is 75 ohms, as is the impedance of the readout module at the 0-M-12 panel in the control building. The signal is carried to an upper or lower level discriminator in the readout module where it becomes a logic function. The signal pulses are counted only and their form is not significant.

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

The following are cable requirements and characteristics of the furnished WWK cable. The coaxial cables are 75 ± 3 ohms with a nominal capacitance of 20.5 pf/ft, with a 1500 VAC operating voltage rating. Note from the Teledyne routine test report, the coax impedance was 76 ohms. The capacitance was 21.96 pf/ft. The insulation resistance, taken to show the lowest in the WWK cable group of eight cables, was greater than 100,000 megohms per mile. The eight cables passed a 2 kV spark test and 5 kV impulse test. The cables passed other electrical and physical tests as seen in the test report. The coax cables installed at WBN have 49 mils insulation and can carry 1200 VDC or 28 volts per mil. The twisted shielded pair can carry 15 VDC and has 10 mils insulation or 1.5 volts per mil.

The following cable characteristics are of the tested Carolina cable (46350-2). The cable was thermally aged to an equivalent of 9052 years at 104°F and was irradiated to more than 2.02×10^8 rads. After thermal aging, the IR was 1.7×10^{13} ohms and after radiation aging the IR was 2.8×10^{12} ohms for specimen 3.1.A.
It was tested continuously during the LOCA at 660 VAC with 15 mil insulation or 44 volts per mil. It was hi-potted at 80 volts per mil for 5 minutes after the LOCA. Note, the LOCA was very severe with

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

two transients, 30 days, 356°F temperature, 70 psig, 100 percent humidity, and chemical spray.

The worst conditions the installed cable can see are 104°F (normal), 110°F (abnormal), 110°F (LOCA) 90 percent humidity, atmospheric pressure, total radiation less than 0.6838×10^8 rads, and the LOCA only lasts 30 days at 110°F and then 70 days at 104°F, and a HELB with maximum temperature at 195°F decreasing to 104°F within 24 hours and continuing at 104°F for 99 days. There is no chemical spray. As can be seen, the tested conditions were much more severe than the required conditions. It is also pointed out that the signal cable coax only has approximately 0 VDC and the signal pulses' waveform is not significant.

Based on the evaluation of circuit requirements, the WWK cable characteristics, factory routine test results, and Carolina LOCA test results, it is demonstrated that the subject special signal cable is capable of maintaining the performance characteristics needed to support its end device. The cables' operation should not be affected by the conditions to which they will be exposed at Watts Bar.

K. REQUIRED OPERATING ENVIRONMENT

Reference Environmental Drawing No. 47E235-48 R3, -49 R1, and -82 R1 (if these drawings are revised again, the binder will have to be re-evaluated); these drawings are the most severe the cables route through, see comments, sheet 23.

(1) Normal Max

(a) Temperature (°F) 104°F
(b) Pressure (psig) ATM
(c) Humidity (%) 80
(d) Radiation (rd) *3.6×10^6

(2) Abnormal Max

(a) Temperature (°F) 110°F
(b) Pressure (psig) ATM
(c) Humidity (%) 90
(d) Radiation (rd) NA

(3) Process Interfaces: None.

(4) State anticipated occurrence frequency and duration of abnormal conditions: Could exist for up to 8 hours per excursion and will occur less than one percent of the plant life.

(5) Accident (worst case for any combination of specified accident parameter including peak, duration, and profile):

(a) Temperature (°F)	195°F	Accident type	HELB
(b) Pressure (psig)	ATM	Accident type	LOCA/HELB
(c) Humidity (%)	100	Accident type	HELB
(d) Radiation (rd)	$<$ *6.75×10^7	Accident type	LOCA
(e) Spray Type	NA	Accident type	NA

*See WBNNAL3-025, WBPEVAR8606004, and QIR NEB86101; worst-case radiation environment occurs in Room A5-El. 737 (ABGTS) and consists of normal dose of 8.8×10^5 rads plus accident dose of $< 6.75 \times 10^7$ or $< 6.838 \times 10^7$ rads.

K. REQUIRED OPERATING ENVIRONMENT (Continued)

Comments (duration/peak/profile/spray composition and pH, margin, etc.):

The cables, ORM31A, 33A, 36B, 38B, 57A, and 58B run from the control building to the auxiliary building, and terminate at rooms A1/EL 692 and A1/EL 757, respectively. See TAB F for QIR No. WBNEEB86072, dated August 4, 1986, RIMS No. B26 860804 005, for cable routing. The routing shows the environment in room A5, EL 737, (ABGTS) is the most severe. The cable conductor temperature is essentially at ambient (40 °C), as there is no added temperature rise due to loading on signal cable under normal environmental conditions. See TAB C, Section A.

(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)? No (Reference NA).

(7) Subject to submergence (yes/no/NA)? No - See QIR WBN EEB 86037 (B26 860310 004), dated March 10, 1986. (Reference NA).

Identify initiation time and duration of submergence: _____

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

Type	RIMS No.
WBNNAL3-025	B45 860401 235
WBNOSG4-026	B45 860326 220
QIR NEB86101	B45 860723 261
WBPEVAR8606 004	B26 860618 020
QIR WBNEEB86072	B26 860804 005

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS

(1) Comparison of worst-case maximum parameters:

Parameter	Specified	Demonstrated	Report No. 1 Reference
Operating Time	100 D	30D***	Fig. IV-2
Temperature (°F)	195°F	356°F	Fig. IV-2
Pressure (psig)	ATM	70 psig	Fig. IV-2
Relative Humidity (%)	100	100	page IV-3
*Chemical Spray	***NA	***NA	pages IV-3 and IV-9
**Radiation (rd)	*****< 6.838×10^7 gamma	2.0224×10^8 gamma	page III-1
Submergence	****No	NA	NA

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

**Enter 40-year integrated normal dose plus integrated accident dose and specify type. Note, that Beta is not a concern due to the location being outside containment.

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

Parameter	Test Profile Envelopes Specified (Yes/No/NA)	Report No. 1 Reference
Temperature	Yes	Fig. IV-2
Pressure	Yes	Fig. IV-2
Relative Humidity	Yes	page IV-3
Chemical Spray	***NA	pages IV-1 and IV-3
Submergence	****No	NA

***See next page.
****See TAB B, K (7).
*****See TAB B, K (1)(d).

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

JUSTIFICATION/COMMENTS ***Chemical spray not required, but it was used as follows: Per IEEE 323, Appendix A, Table A-1, 0.28 molar H_3BO_3, 0.064 molar $Na_2S_2O_3$, NaOH to make a pH of 10.5 at 77°F dissolved in tap water, 0.15 gal/min/ft^2 of surface area of vessel. See TAB C, Section B, evaluation of post-accident operability.

(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) Report No. 1:

Suggested Margins per IEEE-323(74)	Margin Applied	Yes/No/NA
Temperature: +15 degrees F	> 15°F	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)	> 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	Two transients	Yes
Vibration: +10% added to acceleration	No	No**

L. SUMMARY COMPARISON OF TEST CONDITIONS TO SPECIFIED CONDITIONS (Continued)

JUSTIFICATION/COMMENTS:

The LOCA is 110°F for 30 days and then 104°F for 70 days. The HELB maximum temperature is 195°F decreasing to 104°F within 24 hours and continuing at 104°F for 99 days. The cable was tested to 356°F and at more than 320°F for most of 6 hours, then tested at 244°F for 26 days. All of this considerable margin. See TAB C, Section B.

**See Sheet 12 of TAB B.

***See Sheet 20 of TAB B.

****See TAB C, Section B.

M. OPERABILITY TEST RESULTS

(1) Identify the safety function(s) of this equipment: (Reference See TAB A).

JUSTIFICATION/COMMENTS Cable to maintain rated voltage and current.

(2) Did the equipment perform its intended function during the simulated design basis accident exposure (yes/no/NA)? Yes (Reference Report No. 1, page IV-3).

JUSTIFICATION/COMMENTS

(3) Did the equipment perform its intended function during the simulated post-design basis accident exposure (yes/no/NA)? Yes (Reference Report No. 1, page IV-3).

JUSTIFICATION/COMMENTS See TAB C, Section B.

(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 Report No. 1, page IV-3).

JUSTIFICATION/COMMENTS See TAB C, Section B.

(5) Abnormal Conditions: Were abnormal conditions or anomalies properly addressed and resolved (yes/no/NA)? Yes (Reference Report No. 1, pages IV-3 and V-2).

JUSTIFICATION/COMMENTS See TAB C, Section C.

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 EQC Binder - Qualification Maintenance Data Sheets).

JUSTIFICATION/COMMENTS No vendor required surveillance, maintenance, and inspection are necessary to maintain qualification. TVA storage and recommended surveillance requirements have been included in TAB G, QMDS. Purpose of surveillance requirements is to accumulate historical data and identify any potential cable degradation.

BINDER NO. WBNEQ-CABL-047 PLANT WBN UNIT(S) 1 SHEET 29 OF 34

BINDER TITLE ENVIRONMENTAL QUALIFICATION DOCUMENTATION FOR TELEDYNE SIGNAL CABLE COMPUTED [illegible] DATE 9-10-86 R ___ R ___

CHECKED [illegible] DATE 9.10.86

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)?	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?	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

0. SUMMARY 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) 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?	*Yes
(11) Criteria regarding submergence satisfied?	NA
(12) Criteria regarding radiation satisfied?	Yes
(a) Was dose rate considered?	Yes
(b) Was beta radiation considered? Cables are outside containment.	NA
(13) Criteria regarding operability status/mode satisfied?	Yes
(14) Criteria regarding test failures or anomalies satisfied?	Yes

*Chemical spray was not required since cables are outside containment, but it would have satisfied the incontainment requirements.

O. SUMMARY OF REVIEW (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?	Yes
(16) Criteria regarding instrument accuracy satisfied? (Relates to transmitters, etc.)	NA
(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. DISCUSSION

O.(17)(b) - No exception was taken.

O.(2) - No exceptions were taken.

O.(4)(a-d) - See TAB C, Section B.

O.(6)(a) - See TAB B, G.(1)(c) Wear, G.(1)(d)

O.(6)(c) - There was preaging.

SUPPLEMENT 2
COMPONENT-UNIQUE CHECKLIST
CABLES/SPLICES

EQUIPMENT IDENTIFICATION

(1) Are the cables (splices) identified in the qualification program identical to the plant cables (splices) which require qualification (yes/no/NA)? No - See Section E

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(a) Conductor				
Insulation material	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Size	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Stranding	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Coating	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Insulation Thickness	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Number of conductors	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
Arrangement of conductors	See TAB B Section E	See TAB B Section E	Yes	Report 1 pages iv, v
(b) Shielding	See TAB B Section E	NA	NA	
(c) Insulation jacket				
Material	See TAB B Section E	NA	NA	
Thickness	See TAB B Section E	NA	NA	
(d) Outer jacket				
Material	See TAB B Section E	NA	NA	
Thickness	See TAB B Section E	NA	NA	

EQUIPMENT IDENTIFICATION (Continued)

Item	Plant	Report	Acceptable Yes/No/NA	Report Section
(e) Rated voltage	-	660V	Yes	Report 1 page IV-2
(f) Rated current	-	5.5	Yes	Report 1 page IV-2
(g) Operating temperature rating				
Normal	104°F (40°C)	78°C	Yes	TAB C Section A
Emergency	NA	NA	NA	
Short circuit	NA	NA	NA	
(h) Insulation resistance	NA	NA	NA	
(i) Splice				
Material	NA	NA	NA	
Thickness	NA	NA	NA	
Identification	NA	NA	NA	

Comments:

(2) Does the qualification program adequately address temperature and moisture resistance (yes/no/NA)? Yes (Reference Report No. 1, page IV-3).

Comments: Cable is qualified for temperature and moisture resistance for normal operation because it has been manufactured and routinely tested in accordance with MIL-W-22759/16(AS).

(3) Was the cable energized during test (yes/no/NA)? Yes (Reference Report No. 1, page IV-2).

Comments: 660 Volts at 5.5 amps.

EQUIPMENT IDENTIFICATION (Continued)

(4) Was the cable subjected to a voltage withstand test (yes/no/NA)? Yes (Reference Report No. 1, pages V-1 and V-10).

Comments: See TAB B, J(2).

(5) Was the cable subjected to an insulation resistance test (yes/no/NA)? Yes (Reference See TAB B, J(2)).

Comments: See TAB B, J(2).

(6) Was the cable subjected to a mandrel bend and voltage withstand test (yes/no/NA)? Yes (Reference Report No. 1, page V-1).

Comments: See TAB B, J(2).

(7) Was the cable subjected to a flame test to demonstrate flame retardant characteristics (yes/no/NA)? Yes (Reference Report No. 1, pages VI-1, -2).

Identify flame test standard: UL44, FR-1

Comments:

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *EM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
0-QL-228-0453-A	OL 453-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QL-228-0455-A	OL 455-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QL-228-0458-B	OL 458-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QL-228-0460-B	OL 460-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPL-067-2145B-A	OPL2145-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPL-067-2151-A	OPL2151-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPL-067-2158-A	OPL2158-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPL-067-2165B-A	OPL2165-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPL-067-2172-B	OPL2172-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPL-067-2173B-B	OPL2173-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPL-067-2185-B	OPL2185-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPL-067-2192-B	OPL2192-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPP-082-0328-A	OPP 328-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPP-082-0336-A	OPP 336-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPP-082-0448-A	OPP 448-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPP-082-0456-A	OPP 456-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPP-082-0568-B	OPP 568-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPP-082-0576-B	OPP 576-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPP-082-0688-B	OPP 688-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QPP-082-0696-B	OPP 696-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QV-077-0430-B	OV 430-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QV-031-1240-A	OV 1240-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
0-QV-031-1250-B	OV 1250-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-003-0812-A	1M 812-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-003-0814-B	1M 814-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-270-0980-A	1M 980-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-270-0982-B	1M 982-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-003-1431-A	1M 1431-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-003-1435-B	1M 1435-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-003-1451-A	1M 1451-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-031-2341-A	1M 2341-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-074-2441-A	1M 2441-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-074-2442-A	1M 2442-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-074-2443-A	1M 2443-A	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-074-2451-B	1M 2451-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-074-2452-B	1M 2452-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-QM-074-2453-B	1M 2453-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

PREPARER/DATE 9/21/86 R____ R____ R____

CHECKED/DATE 9-21-86 _____ _____ _____

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±BM	**CONTRACT	C A I*	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-APL-030-2992-B	1PL2992-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3012-B	1PL3012-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3042-B	1PL3042-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3062-B	1PL3062-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3072-A	1PL3072-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3082-B	1PL3082-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3092-A	1PL3092-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3102-B	1PL3102-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3112-A	1PL3112-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3122-B	1PL3122-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3132-A	1PL3132-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3142-B	1PL3142-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3152-A	1PL3152-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3162-B	1PL3162-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3192-A	1PL3192-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-3202-B	1PL3202-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-026-3614-B	1PL3814-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3881-A	1PL3881-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-067-3941-B	1PL3941-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4033-B	1PL4033-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-031-4468-B	1PL4468-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4732-A	1PL4732-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-070-4749-B	1PL4749-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4756-A	1PL4756-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4770-B	1PL4770-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4781-A	1PL4781-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-030-4795-B	1PL4795-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-078-4896-B	1PL4896-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-232-4956-B	1PL4956-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-212-4968-B	1PL4968-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-214-4971-B	1PL4971-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6148-A	1PL6148-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-062-6155-B	1PL6155-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-063-6167-B	1PL6167-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6247-A	1PL6247-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6252-A	1PL6252-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-APL-087-6257-B	1PL6257-B	PXMJ	WHH-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

R____ R____ R____

PREPARER/DATE 9/21/86 ____ ____ ____

CHECKED/DATE 9-21-86 ____ ____ ____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION ±BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PL-087-6262-B	1PL6262-B	PXMJ	WHH-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-072-0225-B	1PS 225-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@PS-072-0230-A	1PS 230-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0080-A	1SG 80-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0085-B	1SG 85-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0090-A	1SG 90-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0095-B	1SG 95-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0100-A	1SG 100-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0108-A	1SG 108-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0124-B	1SG 124-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0132-B	1SG 132-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0321-B	1SG 321-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0326-A	1SG 326-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0331-B	1SG 331-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-003-0336-A	1SG 336-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1026-A	1V 1026-A	PXMJ	WHB-1	VARIOUS	VARIOUS	C	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1036-B	1V 1036-B	PXMJ	WHB-1	VARIOUS	VARIOUS	O	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1046A-B	1V 1046-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1056-A	1V 1056-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1057-A	1V 1057-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1066-A	1V 1066-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1067-A	1V 1067-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1086-A	1V 1086-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1087-A	1V 1087-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1104-B	1V 1104-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1106-B	1V 1106-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1107-B	1V 1107-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1124-B	1V 1124-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1126-B	1V 1126-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-003-1127-B	1V 1127-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-1474-A	1V 1474-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-1476-A	1V 1476-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-1503-A	1V 1503-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-1512-A	1V 1512-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-1714-A	1V 1714-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-030-1717-A	1V 1717-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-001-1822-A	1V 1822-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
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		R____	R____	R____
PREPARER/DATE	9/21/86	-----	-----	-----
CHECKED/DATE	9-21-86	-----	-----	-----

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION *BM	**CONTRACT	C A I.	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-001-1832-A	1V 1832-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-1855-B	1V 1855-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-1875-A	1V 1875-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1904-B	1V 1904-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1907-B	1V 1907-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1908-B	1V 1908-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1909-B	1V 1909-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1910-B	1V 1910-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1912-B	1V 1912-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1927-A	1V 1927-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1928-A	1V 1928-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1930-A	1V 1930-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-1933-A	1V 1933-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2657-A	1V 2657-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2667-A	1V 2667-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-2677-B	1V 2677-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-2744-A	1V 2744-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-2753-B	1V 2753-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-072-2755-B	1V 2755-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-2767-A	1V 2767-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-062-2777-B	1V 2777-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2785-A	1V 2785-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-2849-B	1V 2849-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2943-B	1V 2943-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-2985-A	1V 2985-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-3005-B	1V 3005-B	PXMJ	WHH-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-003-3015-B	1V 3015-B	PXMJ	WHH-1	VARIOUS	VARIOUS	0	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-074-3117-B	1V 3117-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-087-3300-A	1V 3300-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-087-3301-A	1V 3301-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3352-B	1V 3352-B	PXMJ	WHH-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-030-3827-B	1V 3827-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3984-A	1V 3984-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-3992-B	1V 3992-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-4025-B	1V 4025-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-070-4026-B	1V 4026-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-068-5634-A	1V 5634-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

		R____	R____	R____
PREPARER/DATE	9/21/86	-----	-----	-----
CHECKED/DATE	9-26-86	-----	-----	-----

W A T T S B A R N U C L E A R P L A N T
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESC.	MODEL NO.	LOCATION COL/AZ.	LOCATION ELEV.	LOCATION ZSM	**CONTRACT	C A I*	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-av-068-5637-B	1V 5637-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6322-B	1V 6322-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6342-B	1V 6342-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6372-B	1V 6372-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-067-6392-B	1V 6392-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6560-A	1V 6560-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6570-A	1V 6570-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6600-A	1V 6600-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6628-A	1V 6628-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-065-6637-A	1V 6637-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7140-B	1V 7140-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7148-B	1V 7148-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7165-A	1V 7165-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7173-A	1V 7173-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7190-A	1V 7190-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-031-7198-A	1V 7198-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7964B-A	1V 7964-A	PXMJ	WHH-1	VARIOUS	VARIOUS	0	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-7971-B	1V 7971-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	N77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8400-A	1V 8400-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8407-A	1V 8407-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8561-A	1V 8561-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8571-B	1V 8571-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8581-A	1V 8581-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8591-B	1V 8591-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8601-A	1V 8601-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8615-B	1V 8615-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8621-A	1V 8621-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-001-8635-B	1V 8635-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-9148-A	1V 9148-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-9156-B	1V 9156-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-9166-A	1V 9166-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-9171-B	1V 9171-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-9176-A	1V 9176-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-026-9361-A	1V 9361-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-9596-A	1V 9596-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-9600-A	1V 9600-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-av-043-9605-A	1V 9605-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

PREPARER/DATE 9/21/86 R____ R____ R____
CHECKED/DATE 9-21-86 _____ _____ _____

WATTS BAR NUCLEAR PLANT
TAB A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COL/AZ	LOCATION ELEV	LOCATION ±RM	** CONTRACT	C A I *	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@V-043-9609-A	1V 9609-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9614-A	1V 9614-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9618-A	1V 9618-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9623-A	1V 9623-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9627-A	1V 9627-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9632-A	1V 9632-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9636-A	1V 9636-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9723-A	1V 9723-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9840-B	1V 9840-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9847-B	1V 9847-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9855-B	1V 9855-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@V-043-9863-B	1V 9863-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3072-A	2PL3072-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3082-B	2PL3082-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3092-A	2PL3092-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3102-B	2PL3102-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3112-A	2PL3112-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3122-B	2PL3122-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3132-A	2PL3132-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3142-B	2PL3142-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-030-3775-A	2PL3775-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3881-A	2PL3881-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-067-3941-B	2PL3941-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-3983-B	2PL3983-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-4003-A	2PL4003-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@PL-031-5131-A	2PL5131-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-3984-A	2V 3984-A	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-067-3992-B	2V 3992-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-065-6580-B	2V 6580-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-065-6590-B	2V 6590-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-065-6610-B	2V 6610-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR
2-@V-065-6620-B	2V 6620-B	PXMJ	WHB-1	VARIOUS	VARIOUS	0	77K5-822173-1	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, O=OUTSIDE PRIMARY CONTAINMENT
** CONTRACTS PREFIXED WITH "N" INDICATE UNVERIFIED CONTRACT AND CABLE DATA

PREPARER/DATE 9/21/86 R____ R____ R____
CHECKED/DATE 9-21-86 _____ _____ _____

PRINT DATE: 09/21/86

BINDER NO. : WBNEQ-CABL-049
MANUFACTURER : ROCKBESTOS
PAGE 1 OF 1

W A T T S B A R N U C L E A R P L A N T
TA3 A - EQUIPMENT IDENTIFICATION MATRIX

EQIS NO.	UNIT DEV ID NO.	DESCR.	MODEL NO.	LOCATION COLUMN	LOCATION ELEV	LOCATION *RM	CONTRACT	C A I	OPER TIME	MITIGATING ACCIDENT	SAFETY FUNCTION
1-@PS-099-0167-A	1PS 167-A	MS	WVA	VARIOUS	VARIOUS	0	77K5-823265-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR
1-@SG-046-0262-S	1SG 262-S	MS	WVA	VARIOUS	VARIOUS	0	77K5-823265-0	A	100 D	LOCA/HELB	CARRY VLTG/CURR

* I=INSIDE, C=OUTSIDE PRIMARY CONTAINMENT

		R____	R____	R____
PREPARER/DATE	9/21/86	____	____	____
CHECKED/DATE	9-31-86	____	____	____