

**PERRY NUCLEAR POWER PLANT
SYSTEM COMPONENT EVALUATION WORKSHEET
(FOR CLASS 1E EQUIPMENT IN HARSH ENVIRONMENT)**

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QUALIFICATION SUMMARY (FILE NO.) SP-594-00-13
 MANUFACTURER'S QUALIFICATION REPORT NO. ES-1000; 43706-2 REV. B
 QUALIFICATION METHOD Test
 EQUIPMENT DESCRIPTION Relay
 MANUFACTURER/MODEL NO. Agastat/E7012-PCM, ACM, PCLM, ACLM
 TESTED DEVICE MODEL NO. E7012

AGING SUMMARY:

| NORMAL/ABNORMAL ENVELOPE | LIMITING ENVIRON.ZONE (1) | VALUE | DURATION |
|--|---------------------------|-------------------------------|---------------|
| TEMPERATURE (°F): MAXIMUM | AB-9 | 107°F | 8,410 Hours |
| AVERAGE | AB-9 | 93°F | 338,486 Hours |
| MINIMUM | AB-9 | 86°F | 3,504 Hours |
| ABNORMAL TEMP. TRANSIENTS (°F): Loss of HVAC | AB-9 | 126/107°F | 49 Hours |
| | | | |
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| | | | |
| | | | |
| RADIATION DOSE (RADS, TID) | AE-9 | 8.8 x 10 ² Rads(2) | 40 Years |

ACCELERATED AGING TEMP./TIMES 212°F/42 Days
 QUALIFIED LIFE/MAINTENANCE INTERVAL 10 Years/None
 LIFE-LIMITING COMPONENT Knob Seal, Washer, Diaphragm (A.E. - 0.61 eV)
 TEST RADIATION DOSE (TID) 2 x 10⁵ Rads (2)

OPERABILITY SUMMARY:

| FUNCTION | REQUIREMENTS (3) | QUALIFICATION DEMONSTRATED |
|-------------------------|------------------|--|
| EQUIPMENT CATEGORY (EC) | A3 | The relay was functionally tested during the hostile environment test. |
| FUNCTION TIME (FT) | J (180 Days) | 30-Days Test extended to 180 Days Post-LOCA by Analysis |
| ACCURACY (ACC) (4) | + 10% (Note 4) | N/A |
| RESPONSE TIME (RT) | N/A (Note 4) | N/A |

ACCIDENT SUMMARY (Note 5)

| ENVIRONMENTAL PARAMETER | REQUIRED ENVELOPE | | QUALIFICATION DEMONSTRATED | |
|-------------------------|---------------------------|--------------------------|------------------------------|--------|
| | LIMITING ENVIRON.ZONE (1) | MAXIMUM VALUE | MAXIMUM VALUE | MARGIN |
| TEMPERATURE (°F) | AB-9 | 217°F | 40-212°F | Note 5 |
| PRESSURE (PSIG) | AB-9 | 1.6 PSIG | 1.6 PSIG | Note 5 |
| R.H. (%) | AB-9 | 100% | 10-95% | N/A |
| SPRAY | N/A | N/A | N/A | N/A |
| SUBMERGENCE | N/A | N/A | N/A | N/A |
| RADIATION (RADS) | AB-9 | 1 x 10 ³ Rads | 2 x 10 ⁵ Rads (2) | > 10% |

(FOR SUPPLEMENTAL NOTES SEE PAGE 2)

| REV. NO | DATE | INITIALS | | |
|---------|------|----------|---------|----------|
| | | REVIEW | CHECKED | APPROVED |
| / | / | / | / | / |
| / | / | / | / | / |

8403130118 840307
 PDR ADOCK 05000440
 A PDR

REVIEWED BY Claude Gosch (GAI) / 2/1/84
 CHECKED BY Eddie B. Thomas / 2-3-84
 APPROVED BY W.A. Anthony / 2/6/84

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QUALIFICATION SUMMARY (FILE NO.) SP-594-00-13

SUPPLEMENTAL NOTES:

1. See FSAR Tables 3.11-1 thru 8.

2. A portion of the "TEST RADIATION DOSE (RADS, TID)" is applied to qualify the device for the required Normal/Abnormal radiation dose (for the desired qualified life). The remainder of the "TEST RADIATION DOSE (RADS, TID)" is applied to qualify the device for the required Accident radiation dose (for the required function time) plus 10% margin.

$$\text{TEST RAD. DOSE} \geq \text{NORMAL/ABNORMAL RAD (Qual.Life)} + (\text{ACCIDENT RAD DOSE (FT)} + 10\% \text{ MARGIN})$$

3. "OPERABILITY SUMMARY : REQUIREMENTS" are as specified in the Environmental Qualification Review List (EQRL) report titled "SAFETY RELATED EQUIPMENT IDENTIFICATION AND ENVIRONMENTAL QUALIFICATION SUMMARY."

4. Source of accuracy requirements:

The only function of these relays is to prevent spurious alarms. The relay has a maximum time delay of 15 seconds and a normal setting of 10 seconds. If the relay takes 15 seconds to change state, its function will have been performed. If the relay takes 0 seconds to change state, there will be a momentary alarm which will clear when the fan comes up to speed. Therefore, the accuracy of this relay is not critical.

5. The Agastat relays which are located in Harsh Environment (Zone AB-9) are normally de-energized and are not required to operate to mitigate the RWCU break in AB-9. The equipment in which they are located will not receive an auto start signal and will not be manually activated. Further, their failure is deemed not detrimental to plant safety or accident mitigation. It should be noted that the relays are qualified to 212°F maximum in their de-energized mode and that the short (15 second) temperature rise to 217°F outside the panel will not result in a temperature rise inside the panel above 212°F. This is because the panel is a NEMA-12 enclosure (sealed from moisture) which prevents the warm air outside the enclosure from quickly entering the enclosure and raising its internal temperature. Heat will be transferred by conduction, however, this will not occur quickly enough to raise the temperature inside the enclosure from 115°F to 217°F in 15 seconds. Further, the gaskets around all doors, conduit entries, and removable panels will prevent the 15-second 100% humidity and 1.6 psig pressure condition external to the panel from affecting its internal conditions. This analysis, however, is not required to prove qualification, since the relays are not required to operate to mitigate the RWCU break and their failure is deemed not detrimental to plant safety or accident mitigation.

TABLE 1

MISCELLANEOUS PARTS AND MATERIALS LIST
FOR SPECIFICATION SP-594-4549-00
(MATERIALS OF CONSTRUCTION)

The items listed under Part A of this table are used in the equipment assemblies listed under Part B.

A. Items List

| <u>Item No.</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Type No.</u> |
|-----------------|-----------------------------------|---------------------|--------------------------|
| 1. | Indicating Lamps | General Electric | ET-16 |
| 2. | Terminal Boards | General Electric | CR151B2 |
| 3. | Cable | General Electric | Vulkene Supreme SP-57279 |
| 4. | Terminal Lugs | Thomas & Betts | Sta-Kon RBT853 |
| 5. | Fuse Blocks | Buchanan | NQ0361 |
| 6. | Section Blocks | Buchanan | NQ0211 |
| 7. | BIW Wire | Boston | BOSTRAD XL |
| 8. | Auxiliary Logic Relays | Agastat | 7012 |

TABLE 1, Part A (continued)

page two

| <u>Item No.</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Type No.</u> |
|-----------------|--|---------------------|-----------------|
| 9. | Auxiliary Logic Relays | General Electric | HMA111B |
| 10. | Auxiliary Logic Relays | ITE-Gould | J10 |
| 11. | Control Switches | General Electric | CR2940Y |
| 12. | Indicating Differential Pressure Switches | ITT Barton | 580A-1 |
| 13. | Temperature Transmitters | Weed | 4000 |
| 14. | Pressure Transmitters | Rosemount | 1153 |

Table 1 (continued)

-3-

B. Equipment Assemblies List (Panels and Racks)

| <u>Panel/Rack MPL No.</u> | <u>Panel/Rack Description</u> | <u>Service Description System/Function</u> | <u>Location: Building - Elevation</u> | <u>Environmental Zone</u> | <u>Manufacturer & Mfr. Dwg. No./CAI Dwg.</u> | <u>Items Used Per Part A</u> |
|-------------------------------|--|---|---|-------------------------------|--|----------------------------------|
| OH51 P 0036A | Control Panel, Wall Mounted Box | ECC Pump Area HVAC Control Station | Control 574 ft. | CB-5 Mild | Cowsip - Customline 44-056/B-201-142 | 1, 2, 3, 4, 11 |
| OH51 P 0036B | Control Panel, Wall Mounted Box | ECC Pump Area HVAC Control Station | Control 574 ft. | CB-5 Mild | Cowsip - Customline 44-155/B-201-142 | 1, 2, 3, 4, 11 |
| OH51 P 0039 | Open Rack, Free Standing | Emergency Closed Cooling System Instr. Rack | Control 574 ft. | CB-5 Mild | Cowsip - Customline 44-057/B-809-247 | 2, 3, 4, 14 |
| OH51 P 0177A | Control Panel, Free Standing, Enclosed | MCC, Swgr. & Batt. Rooms HVAC Control Panel (Divn.1) | Control 679 ft. | CB-5 Mild | Cowsip - Customline 44-055/B-809-076 | 1 thru 6, 8 thru 11 |
| OH51 P 0177B | Control Panel, Free Standing, Enclosed | MCC, Swgr. & Batt. Rooms HVAC Control Panel (Divn.2) | Control 679 ft. | CB-5 Mild | Cowsip - Customline 44-188/B-809-081 | 1 thru 11 |
| OH51 P 0178 | Open Rack, Free Standing | Emergency Closed Cooling System Instr. Rack | Control 574 ft. | CB-5 Mild | Cowsip - Customline 44-144/B-809-243 | 2, 3, 4, 14 |
| OH51 P 0193 | Open Rack, Free Standing | ECCW Pumps & CC Chilled Water Instr. Rack "A" | Control 574 ft. | CB-5 Mild | Cowsip - Customline 44-147/B-809-237 | 2, 3, 4, 12, 13 |
| OH51 P 0194 | Open Rack, Free Standing | ECCW Pumps & CC Chilled Water Instr. Rack "C" | Control 574 ft. | CB-5 Mild | Cowsip - Customline 44-146/B-809-238 | 2, 3, 4, 12, 13 |
| OH51 P 0195 | Open Rack, Free Standing | ECCW Pumps & CC Chilled Water Instr. Rack "B" | Control 574 ft. | CB-5 Mild | Cowsip - Customline 44-145/B-809-239 | 2, 3, 4, 12, 13 |
| OH51 P 0037 | Control Panel, Floor Mounted, Enclosed | Pump Room Cooling HVAC Control Panel | Auxiliary 599 ft. | AB-5 Mild | Cowsip - Customline 44-151/B-809-073 | 1 thru 6, 8, 10, 11 |
| IH51 P 0134A | Open Rack, Free Standing | Containment Atmospheric Monitoring Instr. Rack "A" | Auxiliary 620 ft. | AB-1 Mild | Cowsip - Customline 44-148/B-809-230 | 2, 3, 4, 14 |
| IH51 P 0134B | Open Rack, Free Standing | Containment Atmospheric Monitoring Instr. Rack "B" | Intermediate 654 ft. | FB-4 Mild | Cowsip - Customline 44-058/B-209-248 | 2, 3, 4, 14 |
| IH51 P 014 | Wall Mounted Box | Containment System Temp. Trans. Enclosure (Divn.1) | Intermediate 620 ft. | FB-5 Mild | Cowsip - Customline 44-149/B-201-142 | 13 |
| IH51 P 0143 | Wall Mounted Box | Containment System Temp. Trans. Enclosure (Divn.2) | Intermediate 620 ft. | FB-5 Mild | Cowsip - Customline 44-154/B-201-142 | 13 |

ATTACHMENT A

Documentation required to prepare the NUREG-0588 check list will be maintained in an auditable form for the entire period during which the covered items is installed at Perry.

ALTERNATE PLAN

If the documentation required to prepare the NUREG-0588 check list is not available in our auditable file, we will:

1. Attempt to obtain the documentation from the Vendor.
2. If the Vendor will not release the documentation, we will attempt to obtain a letter from the Vendor stating that he will maintain the required documentation for the 40 year life of the item and if he goes out of business, he will provide us with the required documentation.
3. If the Vendor fails to provide the documentation or letter, we will obtain the necessary documentation to support qualification. This will be in the form of either documentation obtained from other utilities or further material analysis to support qualification of the item.

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|--------|--|--|
| SP 506 | Siemens/Allis | Will go to Norwood Summary acceptable + alternate plan |
| SP 632 | Reliance Motors | Summary acceptable |
| SP 645 | Reliance Motors | " " |
| SP 646 | Reliance Motors | " " |
| SP 594 | G.E. ET16 Lights and Gould J10 Relays | Alternate Plan |

J. B. Anthony
1/18/84