PLANT SYSTEMS

3/4.7.5 SEALED SOURCE CONTAMINATION

LIMITING CONDITION FOR OPERATION

3.7.5 Each sealed source containing radioactive material either in excess of 100 microcuries of beta and/or gamma emitting material or microcuries of alpha emitting material shall be free of greater than or equal to 0.005 microcuries of removable contamination.

APPLICABILITY: At all times.

ACTION:

a. With a sealed source having removable contamination in excess of the above limit, withdraw the sealed source from use and either:

1.

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- 1. Decontaminate and repair the sealed source, or
- Dispose of the sealed source in accordance with Commission Regulations.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.5.1 Test Requirements - Each sealed source shall be tested for leakage and/or contamination by:

- a. The licensee, or
- b. Other persons specifically authorized by the Commission or an Agreement State.

The test method shall have a detection sensitivity of at least 0.005 microcuries per test sample.

4.7.5.2 Test Frequencies - Each category of sealed sources, excluding startup sources and fission detectors previously subjected to core flux, shall be tested at the frequency described below.

- a. Sources in use At least once per six months for all sealed sources containing radioactive material:
 - 1. With a half-life greater than 30 days, excluding Hydrogen 3, and

2. In any form other than gas.

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GRAND GULF-UNIT 1

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

b. Stored sources not in use - Each sealed source and fission detector shall be tested prior to use or transfer to another licensee unless tested within the previous six months. Sealed sources and fission detectors transferred without a certificate indicating the last test date shall be tested prior to being placed into use.

2.

c. Startup sources and fission detectors - Each sealed startup source and fission detector shall be tested within 31 days prior to being subjected to core flux or installed in the core and following repair or maintenance to the source.

4.7.5.3 <u>Reports</u> - A report shall be prepared and submitted to the Commission on an annual basis if sealed source or fission detector leakage tests reveal The presence of greater than or equal to 0.005 microcuries of removable contamination.

within 30 days)

3. (GGNS- 682)

PLANT SYSTEMS

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SURVEILLANCE REQUIREMENTS

- 4.7.5.1.1 The fire suppression water system shall be demonstrated OPERABLE:
 - At least once per 7 days by verifying the minimum contained water supply volume.
 - b. At least once per 31 days by starting the electric motor driven fire suppression pump and operating it for at least 15 minutes.
 - c. At least once per 31 days by verifying that each valve, manual, power operated or automatic, in the flow path is in its correct position.
 - d. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of full travel.
 - e. At least once per 18 months by performing a system functional test which includes simulated automatic actuation of the system throughout its operating sequence, and:

2. Verifying that each automatic valve in the flow path actuates

- Verifying that each fire suppression pump develops at least 1500 gpm at a system head of 275 feet,
- Cycling each valve in the flow path that is not testable during plant operation through at least one complete cycle of full travel, and
- 3. A. Verifying that each fire suppression pump starts sequentially to maintain the fire suppression water system pressure greater than or equal to 120 psig.
- f. At least once per 3 years by performing a flow test of the system in accordance with Chapter 5, Section 11 of the Fire Protection Handbook, 14th Edition, published by the National Fire Protection Association.
- 4.7.6.1.2 The diesel driven fire suppression pump shall be demonstrated OPERABLE:
 - a. At least once per 31 days by:
 - Verifying the fuel storage tank contains at least 300 gallons of fuel.
 - Starting the diesel driven pump from ambient conditions and operating for greater than or equal to 30 minutes.

4. (GGNS-209)

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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- At least once per 92 days by verifying that a sample of diesel fuel from the fuel storage tank, obtained in accordance with ASTM-D270-75, b. is within the acceptable limits specified in Table 1 of ASTM D975-77 when checked for viscosity, water and sediment.
- At least once per 18 months, during shutdown, by subjecting the diesel to an inspection in accordance with procedures prepared in conjunction с. with its manufacturer's recommendations for the class of service.

4.7.6.1.3 The diesel driven fire pump starting 24-voit battery bank and charger shall be demonstrated OPERABLE:

At least once per 7 days by verifying that: a.

Pilot

- The electrolyte level of each cell in each battery is above 1.
- the plates. **Pilot** The battery cell specific gravity, corrected to 77°F and full 2. electrolyte level, is greater than or equal to 1.20,
- Each battery voltage is greater than or equal to 12 volts. 3. and
- The overall battery set voltage is greater than or equal to 4. 24 volts. / FOR EACH CELL

At least once per 92 days by verifying that the specific gravity is b. appropriate for continued service of the battery.

At least once per 18 months by verifying that: C.

- The battery case and battery racks show no visual indication 1. of physical damage or abnormal deterioration, and
- Battery terminal connections are clean, tight, free of corrosion 2. and coated with anti-corrosion material.

5. (GGNS-152,223,241) PI

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS

(EXCEPT DIFFERENTIAL PRESSURE VALVES, C. THOSE HAVING NO EXTERNAL POSITION INDICATION)

4.7.6.3.1 Each of the above required CO_2 systems shall be demonstrated OPERABLE at least once per 31 days by verifying that each valves manual, power operated or automatic, in the flow path is in its correct position.

4.7.6.3.2 Each of the above required low pressure CO2 systems shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying the CO_2 storage tank level to be greater than 50% and pressure to be greater than 275 psig, and
- b. At least once per 18 months by: actuations signals functions
 - Verifying that the system valves, associated ventilation dampers and electro-thermal links actuate automatically upon receipt of a cimulated actuation signal, and detector frip
 - 2. Flow from each nozzle by performance of a "Puff Test".
 - 3. Performing a Visuel inspection of each fire damper and associated natiware.

5. (GGNS-211, 211a) P.2

PLANT SYSTEMS

HALON SYSTEMS

LIMITING CONDITION FOR OPERATION

3.7.6.4 The following Halon systems shall be OPERABLE with the storage tanks having at least 95% of full charge weight and 90% of full charge pressure:

- a. Control Building, elev. 148'0", Computer and Control Panel Room
- b. Control Building, elev. 166'0", PGCC Room under floor area
- c. Control Cabinet Room, elev. 189'0", PGCC Room under floor area

APPLICABILITY: Whenever equipment protected by the Halon systems is required to be OPERABLE.

ACTION:

- a. With one or more of the above required Halon systems inoperable, within one hour establish a continuous fire watch with backup fire suppression equipment for those areas in which redundant systems or components could be damaged; for other areas, establish an hourly fire watch patrol. Restore the system to OPERABLE status within 14 days or, in lieu of any other report required by Specification 6.9.1, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.6.4 Each of the above required Halon systems shall be demonstrated OPERABLE:

- At least once per 31 days by verifying that each valve, manual, power operated or automatic, in the flow path is in its correct position.
- At least once per 6 months by verifying Halon storage tank weight and pressure.
- b f. At least once per 18 months by:

 - Performance of a flow test through headers and nozzles to assure no blockage.
 - 3. Performing a visual inspection of each fire damper and associated hardware. 3/4 7-34

GRAND GULF-UNIT 1

6. (GGNS- 681)P.1

HOSE RACK

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TABLE 3.7.6.5-1

FIRE HOSE STATIONS

| AUXILIARY BUILDING | LÓCATION | ELEVATION | INDENTIFICATION |
|---|--------------------|--------------------|-----------------|
| q-3.5 Q.1-6.0 $103'-0"$ 138 $q-3.5 Q.1-6.1$ $139'-0"$ 130 $q-3.5 Q.1-6.1$ $139'-0"$ 130 $q-3.5 Q.1-6.1$ $139'-0"$ 130 $q-3.5 Q5.9$ $185'-0"$ 130 $q-3.5 Q5.9$ $185'-0"$ 136 $q-3.5 Q5.9$ $185'-0"$ 137 $q-3.5 Q5.9$ $185'-0"$ 144 $p-4.9.0, q-11.3$ $93'-0"$ 144 $p.4-9.0, q+1.5$ $185'-0"$ 140 $p.4-9.0, q+1.5$ $185'-0"$ 140 $p.4-9.0, q+1.5$ $185'-0"$ 144 $p.4-9.0, q+1.5$ $185'-0"$ 146 $p.4-9.0, q+1.5$ $165'-0"$ 146 $p.4-12.5$ $139'-0"$ 150 $q-13.6$ $R-13.7$ $208'-10"$ 150 $q-13.6$ $R-13.7$ $208'-10"$ 166 $q-13.6$ $R-13.7$ $208'-10"$ 166 $q-13.6$ $R-13.7$ $208'-10"$ 166 $q-13.6$ $R-13.7$ $208'-10"$ 166 $q-13.7$ | AUXILIARY BUILDING | | |
| $q - 3 - 5 - q$ $119 - 0^{\circ}$ 138 $q - 3 - 5 - q$ $139 - 0^{\circ}$ 130 $q - 3 - 5 - q$ $165 - 0^{\circ}$ 130 $q - 3 - 5 - q$ $165 - 0^{\circ}$ 130 $q - 3 - 5 - q$ $165 - 0^{\circ}$ 130 $q - 3 - 5 - q$ $185 - 0^{\circ}$ 136 $q - 3 - 5 - q$ $185 - 0^{\circ}$ 136 $q - 3 - 5 - q$ $195 - 0^{\circ}$ 144 $p - 4 - 9 - 0$ $q - 11 - 3$ $93 - 0^{\circ}$ 144 $p - 4 - 9 - 0$ $q - 4 - 7 - 0^{\circ}$ 140 $p - 4 - 9 - 0^{\circ}$ 140 $p - 4 - 9 - 0$ $q - 4 - 7 - 5$ $185 - 0^{\circ}$ $2 - 9 - 10^{\circ}$ 146 $p - 4 - 12 - 5$ $139 - 0^{\circ}$ 145 142 142 $p - 4 - 12 - 5$ $139 - 0^{\circ}$ 150 144 $145 - 10^{\circ}$ $p - 4 - 12 - 5$ $139 - 0^{\circ}$ 150 144 $145 - 10^{\circ}$ $p - 4 - 12 - 5$ $p - 10^{\circ}$ 150 150 150 $p - 4 - 12 - 5$ $p - 10^{\circ}$ 150 150 150 $p - 15 - 15 - 15 - 15 - 10^{\circ}$ | 0-3-5 0.1-6.0 | 103'-0" | 13A |
| $q -3 - 5 q - 6 - 0$ $136 \cdot -0^n$ 130 $q -3 - 5 q - 6 - 0$ $165 \cdot -0^n$ 130 $q -3 - 5 q - 6 - 0$ $165 \cdot -0^n$ 136 $q -3 - 5 q - 6 - 0$ $208 \cdot -0^n$ $13F$ $q -3 - 5 q - 6 - 0$ $208 \cdot -0^n$ $13F$ $q -3 - 5 q - 6 - 6 - 0$ $208 \cdot -0^n$ $14A$ $p -4 - 9 - 0 + 1 - 1$ $139 \cdot -0^n$ $14A$ $p -4 - 9 - 0 + 7 - 5 - 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1$ | 8-250-5.7 | 119'-0" | 138 |
| $Q_{-3.5} = Q_{-5.9} = Q_{-5.9}$ $185' - 0^{n}$ 136 $Q_{-3.5} = Q_{-5.9} = Q_{-5.9}$ $185' - 0^{n}$ 137 $Q_{-3.5} = Q_{-5.9} = Q_{-5.9}$ $148' - 0^{n}$ 137 $Q_{-11.1} = Q_{-11.3}$ $93' - 0^{n}$ 144 $P_{-4.9,0} = Q_{-4.5} = Q_{-5.9}$ $146' - 0^{n}$ $146' - 0^{n} - 0^{n}$ $P_{-4.9,0} = Q_{-4.5} = Q_{-5.0}$ $146' - 0^{n} - 0^{n}$ $146' - 0^{n} - 0^{n}$ $P_{-4.9,0} = Q_{-4.5} = Q_{-5.0}$ $185' - 0^{n} - 0^{n}$ $146' - 0^{n} - 0^{n}$ $P_{-4.9,0} = P_{-10} = 2^{n} - 0^{n} = 2^{n} - 0^{n} - 0^{n}$ $146' - 0^{n} - 0^{n} - 0^{n}$ $156' - 0^{n} - 0^{n} - 0^{n}$ $P_{-4.12,5} = P_{-4.13,1} = 103' - 0^{n} - 0^{n} - 0^{n} - 0^{n}$ $150' - 0^{n} - 0^{n} - 0^{n} - 0^{n}$ $166' - 0^{n} - 0^{n} - 0^{n} - 0^{n}$ $P_{-15,1} = M_{-7.15,1} = 103' - 0^{n} - 0^{n}$ | A-3-501-61 | 139'-0" | 130 |
| Q-2.5 \in Q-5.9 185'-0" 137 Q-11.1 Q-11.3 93'-0" 144 P.4-9.0, Q-11.1 119'-0" 148 P.4-9.0, Q-11.1 139'-0" 140 P.4-9.0, Q-11.1 139'-0" 140 P.4-9.0, Q-11.1 139'-0" 140 P.4-9.0, Q-11.1 139'-0" 140 P.4-9.0, Q-11.1 139'-0" 141 P.4-9.0, Q-11.1 139'-0" 142 P.4-9.0, Q-11.1 139'-0" 144 P.4-9.0, Q-11.1 155'-0" 145 P.4-12.5 139'-0" 158 P.4-12.5 166'-0" 158 P.4-12.5 166'-0" 150 P.4-12.5 103'-0" 160 #-15.1 1.7 -15.1 139'-0" 168 #-15.1 1.7 -15.1 139'-0" 166 #-15.1 1.7 -15.1 139'-0" 166 #-15.1 1.7 -15.1 139'-0" 166 #-15.1 1.7 -15.1 139'-0" 166 #-15.1 1.7 -15.1 103'-0" 166 #-15.4 | 0350-60 | 166'-0" | 130 |
| $Q_{-3,5} \in Q_{-6,0}$ $208'-0"$ 13F $Q_{-11,1} = Q_{-11,3}$ $93'-0"$ 14A $P, 4-9,0, Q_{-11,-1}$ $119'-0"$ 14B $P, 4-9,0, Q_{-11,-1}$ $119'-0"$ 14C $P, 4-9,0, Q_{-11,-1}$ $119'-0"$ 14C $P, 4-9,0, Q_{-11,-1}$ $119'-0"$ 14C $P, 4-9,0, Q_{-11,-1}$ $129'-0"$ 14C $P, 4-9,0, Q_{-11,-1}$ $125'-0"$ 14F $P, 4-9,0, Q_{-11,-1}$ $125'-0"$ 14F $P, 4-12,5$ $139'-0"$ 15B $P, 4-12,5$ $126'-0"$ 15B $P, 4-12,5$ $P, 4-13,1$ $185'-0"$ 15C $R-13, Q_{-13,1}$ $103'-0"$ 16B 15D $R-13, Q_{-13,1}$ $139'-0"$ 16B 16C $M-15-1$ $1,7-15,1$ $139'-0"$ 16E $M-15-1$ $1,7-15,1$ $208'-10"$ 16E $M-15-1$ $1,7-15,1$ $208'-10"$ 16E $M-15-1$ $1,7-15,1$ $208'-10"$ 16E $M-15-1$ $1,7-15,1$ $208'-10"$ 17C $M-13.8$ </td <td>0-250-59</td> <td>185'-0"</td> <td>13E</td> | 0-250-59 | 185'-0" | 13E |
| $Q \cdot 11 \cdot 1 = Q - 11 \cdot 3$ $93' \cdot 0"$ 144 $P \cdot 4 \cdot 9 \cdot 0, Q \cdot 11 \cdot 1$ $139' \cdot 0"$ 148 $P \cdot 4 \cdot 9 \cdot 0, Q \cdot 11 \cdot 1$ $139' \cdot 0"$ 140 $P \cdot 4 \cdot 9 \cdot 0, Q \cdot 11 \cdot 1$ $139' \cdot 0"$ 140 $P \cdot 4 \cdot 9 \cdot 0, Q \cdot 11 \cdot 1$ $139' \cdot 0"$ 140 $P \cdot 4 \cdot 9 \cdot 0, Q \cdot 11 \cdot 1$ $139' \cdot 0"$ 140 $P \cdot 4 \cdot 9 \cdot 0, Q \cdot 11 \cdot 1$ $139' \cdot 0"$ 140 $P \cdot 4 \cdot 9 \cdot 0, Q \cdot 11 \cdot 1$ $155' \cdot 0"$ 140 $P \cdot 4 \cdot 12 \cdot 5$ $139' \cdot 0"$ 147 $P \cdot 4 \cdot 12 \cdot 5$ $166' \cdot 0"$ 158 $P \cdot 4 \cdot 12 \cdot 5$ $166' \cdot 0"$ 158 $P \cdot 4 \cdot 12 \cdot 5$ $166' \cdot 0"$ 150 $R \cdot 13 \cdot 6 \cdot 0 \cdot 13 \cdot 13 \cdot 10'$ $103' \cdot 0"$ 168 $R \cdot 15 \cdot 1 \cdot 1 \cdot 7 \cdot 15 \cdot 1$ $119' \cdot 0"$ 166 $R \cdot 15 \cdot 1 \cdot 1 \cdot 7 \cdot 15 \cdot 1$ $103' \cdot 0"$ 166 $R \cdot 15 \cdot 1 \cdot 1 \cdot 7 \cdot 15 \cdot 1$ $103' \cdot 0"$ 166 $R \cdot 15 \cdot 1 \cdot 1 \cdot 7 \cdot 15 \cdot 1$ $103' \cdot 0"$ 166 $R \cdot 15 \cdot 1 \cdot 1 \cdot 7 \cdot 15 \cdot 1$ $103' \cdot 0"$ 176 $R \cdot 15 \cdot 1 \cdot 1 \cdot 1 \cdot 15 \cdot 1 \cdot 10 \cdot 0' \cdot 0'$ 176 178 | 0-358-60 | 208'-0" | 13F |
| P.4-9.0, Q-11-1 $119'-0"$ 148 $P.4-9.0, Q-11-1$ $139'-0"$ $14C$ $P.4-9.0, Q+1-1$ $139'-0"$ $14C$ $P.4-9.0, Q+1-1$ $139'-0"$ 140 $P.4-9.0, Q+1-1$ $139'-0"$ 140 $P.4-9.0, Q+1-15.1$ $166'-0"$ 146 $P.4-9.0, Q+1-15.1$ $139'-0"$ 154 $P.4-12.5$ $139'-0"$ 155 $P.4-12.5$ $166'-0"$ 155 $P.4-12.5$ $166'-0"$ 155 $P.4-12.5$ $166'-0"$ 156 $P.4-12.5$ $166'-0"$ 156 $P.4-12.5$ $P.4-13.1$ $105'-0"$ 156 $P.4-12.5$ $P.4-13.1$ $103'-0"$ 166 $P.4-12.5$ $P.4-13.1$ $103'-0"$ 166 $P.4-12.5$ $103'-0"$ 166 170 $P.4-13.8$ $139'-0"$ 166 $P.15.1$ $105'-0"$ 176 $P.15.4$ $103'-0"$ 176 $P.13.8$ $166'-0"$ 170 $P.13.8$ $166'-0"$ 1 | 0-11 10-113 | 93'-0" | 14A |
| P.4-9.0, $\frac{111.1}{4.9.0}$ 139'-0" 140 P.4-9.0, P.4-8.6 166'-0" 140 P.40, P.4-8.6 185'-0" 141 P.10 266'-10" 145 P.40, P.10 266'-10" 145 P.412.5 139'-0" 154 P.4-12.5 139'-0" 155 P.4-12.5 166'-0" 158 P.4-12.5 P.4-13.1 185'-0" R-13.7 208'-10" 150 #15.1 M.7-15.1 103'-0" #15.1 M.7-15.1 139'-0" #15.1 L.7-15.1 139'-0" #15.1 L.7-15.1 166'-0" #15.1 L.7-15.1 166'-0" #15.1 L.7-15.1 103'-0" #15.1 L.7-15.1 105'-0" #15.3 M.7-15.1 103'-0" #15.4 M.7-15.1 103'-0" #13.8 139'-0" 176 #13.8 139'-0" 176 #13.8 139'-0" 188 G.4-7.5 103'-0" 180 G.4-7.5 | P 4-9 0 A-11_1 | 119'-0" | 148 |
| P.4-9.0 $P.4-9.0$ $P.4-9.0$ $P.4-9.5$ $185'-0"$ 140 $P.4-9.0$ $P-10$ $266'-10"$ 145 $P.4-12.5$ $139'-0"$ $15A$ $P.4-12.5$ $139'-0"$ $15A$ $P.4-12.5$ $166'-0"$ $15B$ $P.4-12.5$ $P.4-13.1$ $185'-0"$ $15C$ $P.4-12.5$ $P.4-13.1$ $185'-0"$ $15C$ $P.4-12.5$ $P.4-13.1$ $185'-0"$ $15C$ $P.4-12.5$ $P.4-13.1$ $185'-0"$ $15C$ $P.4-12.5$ $P.4-13.1$ $105'-0"$ $15C$ $P.4-12.5$ $P.4-13.1$ $103'-0"$ $16E$ $P.4-12.5$ $P.4-13.1$ $109'-0"$ $16E$ $P.4-12.5$ $P.4-13.1$ $103'-0"$ $16E$ $P.15-1$ $P.7-15.1$ $208'-10"$ $16F$ $P.15-1$ $P.7-15.1$ $208'-10"$ $16E$ $P.13.8$ $P.7-15.1$ $208'-10"$ $17A$ $P.13.8$ $139'-0"$ 176 176 $P.13.8$ $139'-0"$ 176 <td< td=""><td>P 4-9 0 0-11-1</td><td>139'-0"</td><td>140</td></td<> | P 4-9 0 0-11-1 | 139'-0" | 140 |
| P.4-9.6 $P.4-9.5$ $185'-0"$ $14E$ $P.40$ $P-10$ $268'-10"$ $14f$ $P.4-12.5$ $139'-0"$ $15A$ $P.4-12.5$ $166'-0"$ $15B$ $P.4-12.5$ $P.4-13.1$ $185'-0"$ $15C$ $P.4-12.5$ $P.4-13.1$ $185'-0"$ $15C$ $P.4-12.5$ $P.4-13.1$ $185'-0"$ $15C$ $P.4-12.5$ $P.4-13.1$ $185'-0"$ $15C$ $P.4-12.5$ $P.4-13.1$ $103'-0"$ $16A$ $P.4-12.5$ $P.4-13.1$ $103'-0"$ $16B$ $P.4-12.5$ $P.4-13.1$ $103'-0"$ $16C$ $P.4-12.5$ $1.6'-0"$ $16C$ $1.77-15.1$ $105'-0"$ $P.4-15.1$ $1.77-15.1$ $105'-0"$ $16C$ $1.77-15.1$ $105'-0"$ $16C$ $P.4-13.8$ $P.4-13.8$ $139'-0"$ $17C$ $17B$ 1.76 $P.13.8$ $103'-0"$ $17C$ $17D$ $165'-0"$ $18D$ $P.4-13.8$ $139'-0"$ $18C$ $1.4-13.2$ $139'-0"$ $18C$ | D 4-0 0 DA 8.6 | 166'-0" | 14D |
| P_{-10} $268 \cdot 10^{\circ}$ $208 \cdot 10^{\circ}$ $14f$ $P.4-12.5$ $139'-0^{\circ}$ $15A$ $P.4-12.5$ $P.4-13.1$ $185'-0^{\circ}$ $15B$ $P.4-12.5$ $P.4-13.1$ $185'-0^{\circ}$ $15C$ $P.4-12.5$ $P.4-13.1$ $185'-0^{\circ}$ $15C$ $P.4-12.5$ $P.4-13.1$ $185'-0^{\circ}$ $15C$ $P.4-12.5$ $P.4-13.1$ $185'-0^{\circ}$ $15D$ $P.4-12.5$ $P.4-13.1$ $103'-0^{\circ}$ $16A$ $P.4-12.5$ $P.4-13.1$ $103'-0^{\circ}$ $16A$ $P.4-12.5$ $P.4-15.1$ $103'-0^{\circ}$ $16E$ $P.4-15.1$ $P.7-15.1$ $106'-0^{\circ}$ $16D$ $P.4-15.1$ $P.7-15.1$ $103'-0^{\circ}$ $17A$ $P.13.8$ $P.4-13.8$ $119'-0^{\circ}$ $17B$ $P.13.8$ $P.4-13.8$ $1103'-0^{\circ}$ $18A$ $P.4-13.8$ $166'-0^{\circ}$ $17D$ $18B$ $P.4-13.8$ $166'-0^{\circ}$ $17D$ $18A$ $P.4-13.8$ $166'-0^{\circ}$ 180 $0.4-7.5$ $139'-0^{\circ}$ | P 4-9-9 P4-9.5 | 185'-0" | 14E |
| P. 4-12.5 139'-0" 15A P. 4-12.5 F. 4-13.1 185'-0" 15C R-12.6 R-13.7 208'-10" 15D M-15.1 M.2-15.1 103'-0" 16A M-15.1 M.2-15.1 103'-0" 16B M-15.1 M.7-15.1 119'-0" 16B M-15.1 M.7-15.1 119'-0" 16C M-15.1 L.7-15.1 166'-0" 16C M-15.1 L.7-15.1 166'-0" 16C M-15.1 L.7-15.1 166'-0" 16C M-15.1 L.7-15.1 185'-0" 16E M-15.1 M.7-16.1 208'-10" 16F H-15.1 M.7-16.1 208'-10" 17A H-13.8 119'-0" 17B H-13.8 139'-0" 17C H-13.8 166'-0" 17D G.4-11 G.3'-0" 18B G.4-11 G.3'-0" 18D G.4-7.5 103'-0" 18D G.4-7.5 139'-0" 20B G.4-7.5 139'-0" 20B | P-10 P-10 | 268'-10" 2 08 - 10 | 14F |
| P. 4-12.5 166'-0" 158 P. 4-12.5 P. 4-13.1 185'-0" 150 A-13.6 R-13.7 208'-10" 150 A-13.6 R-13.7 208'-10" 160 M-15.1 M.2-18.1 103'-0" 168 M-15.1 M.7-15.1 119'-0" 168 M-15.1 L.7-15.1 139'-0" 166 M-15.1 L.7-15.1 166'-0" 160 M-15.1 L.7-15.1 166'-0" 166 M-15.1 L.7-15.1 166'-0" 166 M-15.1 M.7-15.1 208'-10" 166 H-15.3 M.7-15.1 208'-10" 17A J-13.6 J.3'-0" 17A 17C H-13.8 139'-0" 17C 17C H-13.8 139'-0" 18A 164'-11 103'-0" G.4-11 G.4-11.7 119'-0" 18B 18C G.4-7.5 103'-0" 18A 164'-7.5 190 G.4-7.5 103'-0" 18A 164'-7.5 190 G.4-7.5 103'-0" <td>P 4-12 5</td> <td>139'-0"</td> <td>154</td> | P 4-12 5 | 139'-0" | 154 |
| P.4-12.5 $P.4-13.1$ $185'-0"$ $15C$ $P-13.8$ $R-13.7$ $208'-10"$ $15D$ $P-13.8$ $R-13.7$ $208'-10"$ $16A$ $P-13.8$ $M-2-15.1$ $103'-0"$ $16A$ $P-15.1$ $M-7-15.1$ $119'-0"$ $16B$ $P-15.1$ $L.7-15.1$ $139'-0"$ $16C$ $P-15.1$ $L.7-15.1$ $106'-0"$ $16D$ $P-15.1$ $L.7-15.1$ $208'-10"$ $16E$ $P-15.3$ $M.7-15.1$ $208'-10"$ $16E$ $P-15.3$ $M.7-15.1$ $208'-10"$ $16E$ $P-15.3$ $M.7-15.1$ $208'-10"$ $16E$ $P-15.3$ $M.7-15.1$ $208'-10"$ $17A$ $P-13.8$ $103'-0"$ $17D$ $17A$ $P-13.8$ $103'-0"$ $17D$ $18A$ $G-4-11$ $G.4-11.7$ $119'-0"$ $18B$ $G-4-11$ $G.4-7.5$ $133'-0"$ $19C$ $G-4-7.5$ $G.4-8.3$ $119'-0"$ $19B$ $G.4-7.5$ $G.4-8.4$ $166'-0"$ | P 4-12 5 | 166'-0" | 15B |
| $R - 13.6$ $R - 13.7$ $208' - 10''$ 150 $H - 15.1$ $H \cdot 2 - 15.1$ $103' - 0''$ 168 $H - 15.1$ $H \cdot 7 - 15.1$ $119' - 0''$ 168 $H - 15.1$ $L \cdot 7 - 15.1$ $119' - 0''$ 166 $H - 15.1$ $L \cdot 7 - 15.1$ $166' - 0''$ 160 $H - 15.1$ $L \cdot 7 - 15.1$ $186' - 0''$ 166 $H - 15.1$ $L \cdot 7 - 15.1$ $186' - 0''$ 166 $H - 15.1$ $H \cdot 7 - 15.1$ $208' - 10''$ 166 $H - 15.1$ $H - 15.1$ $185' - 0''$ 166 $H - 13.8$ $H \cdot 3 - 15.6$ $103' - 0''$ 170 $H - 13.8$ $119' - 0''$ 176 $H - 13.8$ $139' - 0''$ 188 $G - 4 - 11 - 7$ $119' - 0''$ 188 $G - 4 - 11 - 7$ $119' - 0''$ 180 $G - 4 - 11 - 7$ $119' - 0''$ 180 $G - 4 - 7.5$ $103' - 0''$ 190 $G - 4 - 7.5$ $103' - 0''$ 190 $G - 4 - 7.5$ $103' - 0''$ 208 | PA-12 5 F 4-13.1 | 185'-0" | 150 |
| H 15.1 H .2-15.1 103'-0" 16A H 15.1 H.7-15.1 119'-0" 16B H 15.1 L.7-15.1 139'-0" 16C H 15.1 L.7-15.1 139'-0" 16C H 15.1 L.7-15.1 166'-0" 16C H 15.1 L.7-15.1 186'-0" 16E H 15.1 L.7-15.1 185'-0" 16E H 15.1 L.7-15.1 208'-10" 16F H 15.1 L.7-15.1 208'-10" 17A J 13.6 J.4-13.5 119'-0" 17B H-13.8 139'-0" 17C 17D H-13.8 139'-0" 18A G.4-11 G.4-11.7 119'-0" 18B G.4-11 G.4-11.3 166'-0" 18D G.4-7.5 103'-0" 19C 6.4-7.5 103'-0" G.4-7.5 103'-0" 19B 19C 6.4-7.5 103'-0" 20A G.4-7.5 139'-0" 19C 19C 6.4-6.2 G.6-6.4 103'-0" 20B G.4-6.2 G.6-6.4 119'-0" 20B | P-12 8 R-13.7 | 208'-10" | 150 |
| $H = 15 - 1$ $H = 7 - 15 \cdot 1$ $119' - 0''$ 168 $H = 15 - 1$ $L \cdot 7 - 15 \cdot 1$ $139' - 0''$ $16C$ $H = 15 - 1$ $L \cdot 7 - 15 \cdot 1$ $166' - 0''$ 160 $H = 15 \cdot 1$ $L \cdot 7 - 15 \cdot 1$ $185' - 0''$ $16F$ $H = 15 \cdot 1$ $L \cdot 7 - 15 \cdot 1$ $208' - 10''$ $16F$ $H = 15 \cdot 1$ $H \cdot 7 - 15 \cdot 1$ $208' - 10''$ $17A$ $J = 13 \cdot 8$ $103' - 0''$ $17B$ $H = 13 \cdot 8$ $139' - 0''$ $17B$ $H = 13 \cdot 8$ $139' - 0''$ $17D$ $H = 13 \cdot 8$ $166' - 0''$ $17D$ $H = 13 \cdot 8$ $166' - 0''$ $18A$ $G \cdot 4 - 11 \cdot 7$ $119' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 3$ $166' - 0''$ $18D$ $G \cdot 4 - 7 \cdot 5 = 0 \cdot 4 - 8 \cdot 3$ $119' - 0''$ $19A$ $G \cdot 4 - 7 \cdot 5 = 0 \cdot 4 - 8 \cdot 3$ $119' - 0''$ $19B$ $G \cdot 4 - 5 \cdot 2 = 6 \cdot 6 \cdot 4$ $103' - 0''$ $20A$ $G \cdot 4 - 5 \cdot 2 = 6 \cdot 6 \cdot 4$ $103' - 0''$ $20B$ $H - 6 \cdot 2 = 139' - 0''$ $20D$ $L - 6 \cdot 2$ $103' - 0'''$ | H-15 1 M.2-151 | 103'-0" | 16A |
| $H = 15 + 1 L \cdot 7 - 15 \cdot 1$ $139' - 0''$ $16C$ $H = 15 + 1 L \cdot 7 - 15 \cdot 1$ $166' - 0''$ $16D$ $H = 15 + 1 L \cdot 7 - 15 \cdot 1$ $185' - 0''$ $16E$ $H = 15 + 1 L \cdot 7 - 15 \cdot 1$ $185' - 0''$ $16E$ $H = 15 + 1 L \cdot 7 - 15 \cdot 1$ $185' - 0''$ $16E$ $H = 15 + 1 L \cdot 7 - 15 \cdot 1$ $208' - 10''$ $16F$ $H = 15 + 1 L \cdot 7 - 15 \cdot 1$ $208' - 10''$ $16F$ $H = 13 \cdot 8$ $103' - 0''$ $17B$ $H = 13 \cdot 8$ $139' - 0''$ $17D$ $H = 13 \cdot 8$ $139' - 0''$ $18A$ $G \cdot 4 - 11 \cdot 7$ $119' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 11 \cdot 7$ $119' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 11 \cdot 3$ $166' - 0''$ $18D$ $G \cdot 4 - 7 \cdot 5 - 5$ $103' - 0''$ $19A$ $G \cdot 4 - 7 \cdot 5 - 5$ $103' - 0''$ $19B$ $G \cdot 4 - 7 \cdot 5 - 6 \cdot 4 - 8 \cdot 3$ $119' - 0''$ $20A$ $G \cdot 4 - 5 \cdot 4 - 8 \cdot 4$ $166' - 0''$ $20A$ $G \cdot 4 - 6 \cdot 2 - 6 \cdot 6 \cdot 4$ $103' - 0''$ $20B$ $H - 6 \cdot 2$ $166' - 0'''$ $20D$ < | M-35-1 M.7-151 | 119'-0" | 168 |
| $H = 15 - 1$ $L = 7 - 15 \cdot 1$ $166^{\circ} - 0^{\circ}$ 260 $H = 15 \cdot 1$ $L = 7 - 15 \cdot 1$ $185^{\circ} - 0^{\circ}$ $16E$ $H = 15 \cdot 1$ $L = 7 - 15 \cdot 1$ $208^{\circ} - 10^{\circ}$ $16E$ $H = 15 \cdot 1$ $H = 7 - 15 \cdot 1$ $208^{\circ} - 10^{\circ}$ $17A$ $H = 13 \cdot 8$ $H = 3 \cdot 6$ $103^{\circ} - 0^{\circ}$ $17A$ $H = 13 \cdot 8$ $119^{\circ} - 0^{\circ}$ $17C$ $H = 13 \cdot 8$ $119^{\circ} - 0^{\circ}$ $17C$ $H = 13 \cdot 8$ $166^{\circ} - 0^{\circ}$ $17D$ $6 \cdot 4 - 11$ $103^{\circ} - 0^{\circ}$ $18A$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 11 \cdot 7$ $119^{\circ} - 0^{\circ}$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 11 \cdot 3$ $166^{\circ} - 0^{\circ}$ $18D$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 11 \cdot 3$ $103^{\circ} - 0^{\circ}$ $18D$ $G \cdot 4 - 7 \cdot 5 \cdot 6 \cdot 4 - 8 \cdot 3$ $119^{\circ} - 0^{\circ}$ $19A$ $G \cdot 4 - 7 \cdot 5 \cdot 6 \cdot 4 - 8 \cdot 3$ $119^{\circ} - 0^{\circ}$ $19C$ $G \cdot 4 - 5 \cdot 2 \cdot 6 \cdot 6 \cdot 4$ $103^{\circ} - 0^{\circ}$ $20A$ $G \cdot 4 - 6 \cdot 2 \cdot 6 \cdot 6 \cdot 4$ $103^{\circ} - 0^{\circ}$ $20B$ $H - 6 \cdot 2$ $103^{\circ} - 0^{\circ}$ $20D$ $H - 6 \cdot 2$ | M-16-1 1 7-151 | 139'-0" | 160 |
| H = 15.1 $L.7 - L5.1$ $185' - 0"$ $16E$ $H = 15.1$ $A.7 - L5.1$ $208' - 10"$ $16F$ $H = 13.8$ $H.3 - 13.6$ $103' - 0"$ $17A$ $J = 13.8$ $J.4 - 13.8$ $119' - 0"$ $17B$ $H = 13.8$ $J.9' - 0"$ $17C$ $H = 13.8$ $139' - 0"$ $17C$ $H = 13.8$ $166' - 0"$ $17D$ $6.4 = 11$ $103' - 0"$ $18A$ $G = 4 - 11.4$ $103' - 0"$ $18B$ $G = 4 - 11.6$ $4 - 12.2$ $139' - 0"$ $18B$ $G = 4 - 11.6$ $103' - 0"$ $18D$ $6 - 4 - 11.3$ $G = 4 - 7.5$ $103' - 0"$ $19A$ $6 - 4 - 7.5$ $G = 4 - 7.5$ $139' - 0"$ $19B$ $6 - 4 - 7.5$ $G = 4 - 7.5$ $139' - 0"$ $19D$ $6 - 4 - 2.6$ $6 - 6.4$ $103' - 0"$ $20A$ $G = 4 - 2.6$ $G - 6.4$ $119' - 0"$ $20B$ $H - 6.2$ $103' - 0"$ $20D$ $H - 6.2$ $166' - 0"$ $20D$ $L - 6.2$ $103' - 0"$ $21D$ $21D$ | M-16-1 1.7 - 151 | 166'-0" | 160 |
| $H = 15 \cdot 1$ $M \cdot 7 - 16 \cdot 1$ $208' - 10''$ $16F$ $H = 13 \cdot 8$ $-13 \cdot 6$ $103' - 0''$ $17A$ $J = 13 \cdot 6$ $J = 13 \cdot 6$ $103' - 0''$ $17B$ $H = 13 \cdot 8$ $119' - 0''$ $17B$ $H = 13 \cdot 8$ $139' - 0''$ $17C$ $H = 13 \cdot 8$ $139' - 0''$ $17D$ $6 \cdot 4 \cdot 11$ $103' - 0''$ $18A$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 12 \cdot 2$ $139' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 12 \cdot 2$ $139' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 12 \cdot 2$ $139' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 12 \cdot 2$ $139' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 11 \cdot 3$ $166' - 0''$ $18D$ $G \cdot 4 - 7 \cdot 5 = 103' - 0''$ $19A$ $6 \cdot 4 - 7 \cdot 5 = 103' - 0''$ $G \cdot 4 - 7 \cdot 5 = 4 - 8 - 3$ $119' - 0''$ $19B$ $G \cdot 4 - 6 \cdot 2 \cdot 6 - 6 - 4$ $103' - 0''$ $20A$ $G \cdot 4 - 6 \cdot 2 \cdot 6 - 6 - 4$ $103' - 0''$ $20B$ $H - 6 \cdot 2$ $166' - 0''$ $20D$ $H - 6 \cdot 2$ $103' - 0''$ $21A$ $L - 6 \cdot 2$ $103' - 0''$ < | H 1 1 1.7-15.1 | 185'-0" | 16E |
| $H = 13 \cdot 6$ $103' - 0''$ $17A$ $H = 13 \cdot 6$ $J \cdot 4 - 13 \cdot 8$ $119' - 0''$ $17B$ $H = 13 \cdot 6$ $J \cdot 4 - 13 \cdot 8$ $119' - 0''$ $17C$ $H = 13 \cdot 8$ $139' - 0''$ $17C$ $H = 13 \cdot 8$ $166' - 0''$ $17D$ $6 \cdot 4 \cdot 11$ $103' - 0''$ $18A$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 12 \cdot 2$ $139' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 12 \cdot 2$ $139' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 12 \cdot 2$ $139' - 0''$ $18B$ $G \cdot 4 - 11 \cdot 6 \cdot 4 - 11 \cdot 3$ $166' - 0''$ $19A$ $G \cdot 4 - 7 \cdot 5 \cdot 6 \cdot 4 - 8 - 3$ $119' - 0''$ 198 $G \cdot 4 - 7 \cdot 5 \cdot 6 \cdot 4 - 8 - 3$ $119' - 0''$ 190 $G \cdot 4 - 6 \cdot 2 \cdot 6 \cdot 6 - 6 \cdot 4$ $103' - 0''$ $20A$ $G \cdot 4 - 6 \cdot 2 \cdot 6 \cdot 6 - 6 \cdot 4$ $103' - 0''$ $20B$ $H - 6 \cdot 2$ $166' - 0''$ 200 $H - 6 \cdot 2$ $103' - 0''$ $21A$ $L - 6 \cdot 2$ $103' - 0''$ $21A$ $L - 6 \cdot 2$ $103' - 0''$ $21A$ $L - 6 \cdot 2$ $103' - 0'''$ $21B$ < | H-16-3 M.7-15.2 | 208'-10" | 16F |
| $J-13.6$ $J.4 - 13.8$ $119' - 0"$ 176 $H-13.8$ $139' - 0"$ 170 $H-13.8$ $166' - 0"$ 170 $H-13.8$ $166' - 0"$ 170 6.4 11 $103' - 0"$ $18A$ $6.4 \cdot 11$ $103' - 0"$ $18B$ $6.4 \cdot 11$ $103' - 0"$ $18B$ $6.4 \cdot 11$ $6.4 - 12.2$ $139' - 0"$ $18B$ $6.4 - 11.6$ $4 - 11.3$ $166' - 0"$ $18D$ $6.4 - 7.5$ $6.4 - 8.3$ $119' - 0"$ $19A$ $6.4 - 7.5$ $6.4 - 8.3$ $119' - 0"$ $19B$ $6.4 - 7.5$ $6.4 - 8.4$ $103' - 0"$ $19D$ $6.4 - 7.5$ $6.4 - 8.4$ $103' - 0"$ $20A$ $6.4 - 6.2$ $6.6 - 6.4$ $103' - 0"$ $20B$ $H - 6.2$ $103' - 0"$ $20D$ $1-6.2$ $103' - 0"$ $21A$ $L - 6.2$ $103' - 0"$ $21A$ $1-6.2$ $120' - 0"$ $21D$ | H 13-8 H.3 -13.8 | 103'-0" | 17A |
| H-13.8 $139'-0"$ $17C$ H-13.8 $166'-0"$ $17D$ 6.4 11 $103'-0"$ $18A$ G.4-11 G.4 - 11.7 $119'-0"$ $18B$ G.4-11 G.4 - 12.2 $139'-0"$ $18B$ G.4-11 G.4 - 11.3 $166'-0"$ $18D$ G.4-7.5 $103'-0"$ $18D$ G.4-7.5 $103'-0"$ $19A$ G.4-7.5 $103'-0"$ $19B$ G.4-7.5 $139'-0"$ $19D$ G.4-7.5 $139'-0"$ $19D$ G.4-7.5 $139'-0"$ $20A$ G.4-7.5 $139'-0"$ $20D$ G.4-7.5 $139'-0"$ $20D$ G.4-7.5 $139'-0"$ $20A$ G.4-7.5 $139'-0"$ $20A$ G.4-6.2 $G.6-6.4$ $103'-0"$ $20B$ H-6.2 $139'-0"$ $20D$ $1-6.2$ $103'-0"$ $21A$ L-6.2 $103'-0"$ $21B$ $1-6.2$ $21D$ L-6.2 $139''-0"$ $21D$ $21D$ | 1-12-0 7.4 -13.8 | 119'-0" | 178 |
| H-13.8 $166'-0"$ 170 6.4 11 $103'-0"$ $18A$ c.4-11 c.4-11.7 $119'-0"$ $18B$ c.4-11 c.4-12.2 $139'-0"$ $18D$ c.4-11 c.4-13.3 $166'-0"$ $18D$ c.4-11 c.4-12.2 $139'-0"$ $18D$ c.4-11 c.4-13.3 $166'-0"$ $18D$ c.4-7.5 $6.4-8.3$ $119'-0"$ $19B$ c.4-7.5 $6.4-8.3$ $119'-0"$ $19B$ c.4-7.5 $6.4-8.4$ $166'-0"$ $19D$ c.4-7.5 $6.4-8.4$ $103'-0"$ $20A$ c.4-6.2 $6.6-6.4$ $103'-0"$ $20B$ d.4-6.2 $6.6-6.4$ $103'-0"$ $20B$ H-6.2 $166'-0"$ $20D$ H-6.2 $103'-0"$ $21A$ L-6.2 $103'-0"$ $21B$ L-6.2 $139"-0"$ $21D$ | H-13 8 | 139'-0" | 170 |
| $6.4 \cdot 11$ $103' - 0"$ $18A$ $6.4 \cdot 11 \cdot 6.4 - 11.7$ $119' - 0"$ $18B$ $6.4 \cdot 11 \cdot 6.4 - 12.2$ $139' - 0"$ $18C$ $6.4 \cdot 11 \cdot 6.4 - 11.3$ $166' - 0"$ 180 $6.4 \cdot 11 \cdot 6.4 - 11.3$ $166' - 0"$ 180 $6.4 \cdot 7.5$ $103' - 0"$ $19A$ $6.4 \cdot 7.5$ $103' - 0"$ $19B$ $6.4 - 7.5$ $6.4 - 8.3$ $119' - 0"$ $6.4 - 7.5$ $6.4 - 8.3$ $119' - 0"$ $6.4 - 7.5$ $6.4 - 8.4$ $166' - 0"$ $6.4 - 6.2$ $6.4 - 8.4$ $103' - 0"$ $6.4 - 6.2$ $6.6 - 6.4$ $119' - 0"$ $6.4 - 6.2$ $6.6 - 6.4$ $119' - 0"$ $6.4 - 6.2$ $6.6 - 6.4$ $119' - 0"$ $6.4 - 6.2$ $6.6' - 0"$ 200 $H - 6.2$ $103' - 0"$ $21A$ $L - 6.2$ $119' - 0"$ 218 $L - 6.2$ $139'' - 0"$ 210 | N-13.8 | 166'-0" | 17D |
| G.4-11 $G.4-11.7$ $119'-0"$ 188 $G.4-11$ $G.4-12.2$ $139'-0"$ 180 $G.4-11$ $G.4-11.3$ $166'-0"$ 180 $G.4-7.5$ $103'-0"$ 19A $G.4-7.5$ $103'-0"$ 19B $G.4-7.5$ $G.4-8.3$ $119'-0"$ 19B $G.4-7.5$ $G.4-8.4$ $166'-0"$ 19D $G.4-7.5$ $G.4-8.4$ $166'-0"$ 20A $G.4-6.2$ $G.6-6.4$ $103'-0"$ 20B $G.4-6.2$ $G.6-6.4$ $103'-0"$ 20D $H-6.2$ $139"-0"$ 20D $H-6.2$ $103'-0"$ 20D $H-6.2$ $103'-0"$ 21A $L-6.2$ $103'-0"$ 21B $L-6.2$ $139"-0"$ 21B $L-6.2$ $139"-0"$ 21B $L-6.2$ $139"-0"$ 21D | 6 4.11 | 103'-0" | 18A |
| G.4-11 $G.4-12.2$ $139'-0"$ $18C$ $G.4-11$ $G.4-11.3$ $166'-0"$ $18D$ $G.4-7.5$ $103'-0"$ $19A$ $G.4-7.5$ $103'-0"$ $19B$ $G.4-7.5$ $G.4-8.3$ $119'-0"$ $19B$ $G.4-7.5$ $G.4-8.4$ $106'-0"$ $19D$ $G.4-7.5$ $G.4-8.4$ $166'-0"$ $19D$ $G.4-7.5$ $G.4-8.4$ $166'-0"$ $20A$ $G.4-6.2$ $G.6-6.4$ $103'-0"$ $20B$ $G.4-6.2$ $G.6-6.4$ $119'-0"$ $20B$ $H-6.2$ $139"-0"$ $20D$ $20D$ $H-6.2$ $103'-0"$ $21A$ $L-6.2$ $119'-0"$ $21B$ $L-6.2$ $139"-0"$ $21D$ | 6.4-11 6.4-11.7 | 119'-0" | 188 |
| G.4-11 G.4-11.3 $166'-0"$ 180 $G.4-7.5$ $103'-0"$ $19A$ $G.4-7.5 G.4-8.3$ $119'-0"$ $19B$ $G.4-7.5 G.4-8.3$ $119'-0"$ $19B$ $G.4-7.5 G.4-8.3$ $119'-0"$ $19D$ $G.4-7.5 G.4-8.4$ $166'-0"$ $19D$ $G.4-9 G.4-8.4$ $166'-0"$ $20A$ $G.4-6.2 G.6-6.4$ $103'-0"$ $20B$ $G.4-6.2 G.6-6.4$ $119'-0"$ $20B$ $H-6.2$ $139"-0"$ $20D$ $H-6.2$ $166'-0"$ $20D$ $H-6.2$ $103'-0"$ $21A$ $L-6.2$ $119'-0"$ $21B$ $L-6.2$ $139"-0"$ $21D$ | CA-12 6.4 - 12.2 | 139'-0" | 180 |
| G. 4-7.5 $103'-0"$ $19A$ G. 4-7.5G. 4-8-3 $119'-0"$ $19B$ G. 4-7.5 $139'-0"$ $19C$ G. 4-9G. 4-8.4 $166'-0"$ $19D$ G. 4-6.2G 6-6.4 $103'-0"$ $20A$ G. 4-6.2G 6-6.4 $119'-0"$ $20B$ H-6.2 $139''-0"$ $20C$ H-6.2 $166'-0"$ $20D$ L-6.2 $103'-0"$ $21A$ L-6.2 $119'-0"$ $21B$ L-6.2 $139''-0"$ $21C$ L-6.2 $139''-0"$ $21D$ | CA-11 C. 4-11.3 | 166'-0" | 18D |
| 6.4-7.5 $6.4-8.3$ $119'-0"$ $19B$ $6.4-7.5$ $139'-0"$ $19C$ $6.4-7.5$ $139'-0"$ $19D$ $6.4-9$ $6.4-8.4$ $166'-0"$ $19D$ $6.4-9$ $6.4-8.4$ $103'-0"$ $20A$ $6.4-6.2$ $6.6-6.4$ $103'-0"$ $20B$ $8-4-6.2$ $6-6.4$ $119'-0"$ $20B$ $H-6.2$ $139"-0"$ $20D$ $H-6.2$ $166'-0"$ $20D$ $L-6.2$ $103'-0"$ $21A$ $L-6.2$ $119'-0"$ $21B$ $L-6.2$ $139"-0"$ $21D$ | C 4-7 5 | 103'-0" | 19A |
| G. 4-7.5 $139'-0"$ 19CG. 4-9G. 4-8.4 $166'-0"$ 19DG. 4-6.2G. 6-6.4 $103'-0"$ 20AG. 4-6.2G. 6-6.4 $119'-0"$ 20BH-6.2 $139"-0"$ 20CH-6.2 $166'-0"$ 20DL-6.2 $103'-0"$ 21AL-6.2 $119'-0"$ 21BL-6.2 $139"-0"$ 21BL-6.2 $139"-0"$ 21D | 64-7-56.4-8-3 | 119'-0" | 19B |
| G:4-9 G:4-8.4 166'-0" 190 G:4-6.2 G:6-6.4 103'-0" 20A G:4-6.2 G:6-6.4 119'-0" 20B H-6.2 139"-0" 20C H-6.2 166'-0" 20D L-6.2 103'-0" 21A L-6.2 119'-0" 21B L-6.2 139"-0" 21C L-6.2 139"-0" 21D | G A-7 5 | 139'-0" | 190 |
| 6:4-6.2 6-6.4 103'-0" 208 6:4-6.2 6.6-6.4 119'-0" 208 H-6.2 139"-0" 200 H-6.2 166'-0" 200 L-6.2 103'-0" 21A L-6.2 119'-0" 21B L-6.2 139"-0" 21C L-6.2 139"-0" 21D | CA-9 G.4-8.4 | 166'-0" | 190 |
| G:4-6.2 G.6-6.4 119'-0" 20B H-6.2 139"-0" 20C H-6.2 166'-0" 20D L-6.2 103'-0" 21A L-6.2 119'-0" 21B L-6.2 139"-0" 21C L-6.2 139"-0" 21D | 646266-64 | 103'-0" | 20A |
| H-6.2 139"-0" 20C H-6.2 166'-0" 20D L-6.2 103'-0" 21A L-6.2 119'-0" 21B L-6.2 139"-0" 21C L-6.2 139"-0" 21D | 5-4-5 25 L-6.4 | 119'-0" | 20B |
| H-6.2 166'-0" 200 L-6.2 103'-0" 21A L-6.2 119'-0" 21B L-6.2 139"-0" 21C L-6.2 166'-0" 21D | H-6 2 | 139"-0" | 200 |
| L-6.2 103'-0" 21A L-6.2 119'-0" 21B L-6.2 139"-0" 21C L-6.2 166'-0" 21D | H-6 2 | 166'-0" | 200 |
| L-6.2 119'-0" 21B L-6.2. 139"-0" .21C L-6.2 166'-0" 21D | 1-5.2 | 103'-0" | 21A |
| L-6.2, 139"-0" ,21C L-6.2 166'-0" 21D | 1-5.2 | 119'-0" | 218 |
| 1-6.2 166'-0" 210 | 1-6.2 | 139"-0" | , 210 |
| | 1-5.2 | 166'-0" | 210 |

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TABLE 3.7.6.5-1 (Continued)

FIRE HOSE STATIONS

| LOCATION | ELEVATION | HOSE RACK |
|--------------------------|-----------|-------------|
| CONTAINMENT | | |
| +7 5 M.7-7.8 | 120'-10" | 22A |
| 100 H. 8-8.1 | 135'-4" | 23A |
| 17.5 J.1-8.1 | 161'-10" | 238 |
| ¥75 7.8-7.2 | 184'-6" | 230 |
| +7-5 7.4-7.5 | 208'-10" | 23D |
| #75 M.2 -7.2 | 135'-4" | 24A |
| #75 M.8-7.9 | 161'~10" | 248 |
| #-7-5 M.2 -7.2 | 184'-6" | 240 |
| N75 N-8.2 | 208'-10" | 24D |
| 4 12 P M. 6-12.4 | 135'-4" | 25A |
| 4-11-6 N.2-115 | 161'-10" | 25B |
| W-11-0 N. 3-163 | 208'-10" | 250 |
| 1 12 0 T.1 - 12.0 | 135'-4" | 26A |
| +11-0 7-11.6 | 161'-10" | 268 |
| K-10-5 K.2 -13.1 | 184'-6" | 260 |
| J-11.8 | 208'-10" | 260 |
| CONTROL BUILDING | | |
| T. 10 T. 4-18.8 | 133'-0" | 53A |
| K-10 K 2-18.8 | 111'-0" | 53B |
| * 19 N.L | | |
| 6-19 6.1 -19.4 | 111'-0" | 545 |
| 6-19 6.2-18.4 | 133'-0" | 540 |
| 6-19 61-18.7 | 148'-0" | 540 |
| 5-19 6.2-28-B | 166'-0" | 541 |
| 5-19 6.1 - 18.7 | 189'-0" | 241 |
| X-19 K.2 -18.8 | 148'-0" | 504 |
| 1-19 K.2-18.8 | 156'-0" | 330 |
| #-19 K. 2 - 18.8 | 189'-0" | 500 |
| DIESEL GENERATOR BUILDIN | <u>s</u> | |
| P-33 P-10.6 | 133'-0" | 66A |
| -R-9 R -8.4 | 133'-0" | 6 6B |
| | | |

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TABLE 3.7.6.6-1 7. (GGNS-153, 232, 239)

YARD FIRE HYDRANTS AND ASSOCIATED HYDRANT HOSE HOUSES

| LOCATION | | HYDRANT WUMBER/FIRE WATER WYDRANT HOSE | | | |
|---|--|--|--|--|--|
| North Coord. | East Coord. | Elevation | | | |
| 9,616.00 9,570.00 9,795.00 10,112.50 9,886.00 | 10,500.00 19,260.33 10,012.50 9,979.00 9,753.92 9,758.25 | 126'0" 47/D021 126'0" 48/D023 126'0" 51/D024 133 126'0" 60/D025/HH D029E 133 126'0" 107/D010/HH D029E 133 126'0" 116/D009/HH D029E | | | |
| 9,641.00 10,097.12 9,671.87 | 9,766.25 10,500.00 10,543.33 | 126'0" 125/0008 126'0" 35/0019 126'0" 39/0020 | | | |

8. P.1.

TABLE 3.3.7.9-1

FIRE DETECTION INSTRUMENTATION

| | | | | | MINIMUM INSTRUMENTS OPERABLE* | | | RABLE* |
|-----|-----------|----------------------------------|-------------------------|--------------------------------------|-------------------------------|----------|-------|-----------|
| INS | TRUM | ENT LOCAT | ION | | ZONE(1) | HEAT (2) | FLAME | SMOKE (3) |
| | Con 1. | tainment Return I Detector | Building Duct Mounts | nted | NA | NA | NA | 3 |
| | - | M NO. | ELEV. | ROOM NAME | | | | |
| b. | Con | trol Bui | lding | | | 12.197 | • | S |
| | 1. | 00202 | 111' | DIV I SWGR RM | 1-4 | 6 | NA | 1 |
| | 2. | 00207 | 111' | DIV I BATTERY RM | 1-4 | NA | NA | 1 |
| | 3. | 0C208 | 111' | DIV II REMOTE SHUTDOWN PANEL ROOM | 1-27 | 1 | NA | 1 |
| | 4. | 0C208A | 111' | DIV I REMOTE SHUTDOWN PANEL ROOM | 1-27 | 1 | NA | 1 |
| | 5. | 00209 | 111' | DIV III BATTERY RM | 1-5 | NA | NA | 1 |
| | 6. | 00210 | 211' | DIV III SWGR RM | 1-5 | 4 | NA | 2 |
| | 7. | 00211 | 111' | DIV II BATTERY RM | 1-6 | NA | NA | 1 |
| | 8. | 00215 | 111' | DIV II SWGR RM | 1-6 | 7 | NA | 4 |
| | 9. | 00307 | 133' | ELECTRICAL CHASE | 1-10 | NA | NA | 1 |
| | 10. | 00308 | 133' | ELECTRICAL CHASE | 1-10 | NA | NA | 1 |
| | 11. | 00302 | 133' | HVAL EQUIP. ROOM | 1-11 | NA | NA | 13 |
| | 12. | 0C402 | 148' | CABLE SPREADING RM | 1-15 | 7 | NA | 10 |
| | 13. | 00403 | 148' | COMPUTER ROOM | 1-14 | 23 | NA | 7 |
| | 14. | 00407 | 148' | INSTR. MOTOR GEN ROOM | 1-15 | 2 | NA | 1 |
| | 15. | 0C503 0C504 | 166' | CONTROL ROOM | 1-18 | NA | NA | 17 |
| | 16. | 00702 | 189' | CABLE SPREADING RM | 1-23 | 12 | NA | 14 |
| | 17. | 00703 | 189' | CONTROL CAB. ROOM | 1-24 | 4 | NA | |
| | 18. | 00707 | 189' | INSTR MOTOR GEN. RM | 1-23 | NA | NA | 1 |

* The fire detection instruments located within the primary containment are not required to be OPERABLE during the performance of Type A Containment Leakage Rate Tests.

(1) Iones apply only to smoke detectors.

(2) Heat detectors provide warning and activation of automatic extinguishing systems.

- (3) Smoke detectors provide early warning capability.
- (4) Four thermocouples which monitor ambient air temperatur will provide early norning capability.

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TABLE 3.3.7.9-1 (Continued)

FIRE DETECTION INSTRUMENTATION

| ANTENNENT LOCATION | | | | MINIMUM INSTRUMENTS OPERABLE* | | | |
|--------------------|----------------|----------|-----------------------|-------------------------------|---------|-------|-----------|
| INSTRUM | M NO. | ELEV. | ROOM NAME | ZONE(2) | HEAT(2) | FLAME | SMOKE (3) |
| e Auri | Hary But | Iding (C | Continued) | | | | |
| 81 | 14220 | 119' | PIPING PENETRATION RM | 2-3 | NA | NA | 1 |
| 32 | 14221 | 119' | ELECT. SWGR RM | 2-3 | 2 | NA | 2 |
| 33 | 14222 | 119' | WEST CORRIDOR | 2-2 | NA | NA | 18 |
| 33. | 14301 | 139' | NORTHEAST CORRIDOR | 2-6 | NA | NA | 2 |
| | 14302 | 139' | SOUTHEAST CORRIDOR | 2-6 | NA | NA | 1 |
| 95. | 14303 | 139' | RHR 'A' HX RM | 2-6 | NA | NA | 1 |
| 30. | 14304 | 139' | PIPING PENETRATION RM | 2-6 | NA | NA | 1 |
| 37. | 14305 | 139' | STEAM TUNNEL | 2-20 | NA (4) | NA | 2 NA |
| 30. | 14305 | 139' | PIPING PENETRATION RM | 2-6 | NA . | NA | 1 |
| 39. | 34307 | 139' | RHR 'B' HX RM | 2-6 | NA | NA | 1 |
| eu. | 14300 | 139' | FLECT. PENETRATION RM | 2-6 | 3 | NA | 2 |
| 42. | 1A309 | 139' | ELECT. PENETRATION RM | 2-6 2-6 | 3 | NA | 23 |
| | 14714 | 130' | SOUTH CORRIDOR | 2-19 | NA | NA | 3 |
| 43. | 14314 | 130' | NORTH CORRIDOR | 2-6 | NA | NA | 13 |
| 44. | 14310 | 135 | FIELT PENETRATION RM | 2-5 | 2 | NA | 2 |
| 45. | TASTO | 133 | PLV INSTR. TEST RM | 2-5 | NA | NA | 1 |
| 46. | 14319 | 135 | ELECT PENETRATION RM | 2-5 | 2 | NA | 2 |
| 47. | 14320 | 133 | MCC APFA | 2-19 | NA | NA | 3 |
| 48 | 1A321 1A322 | 139' | CENTRIFUGAL CHILLER | 2-19 | MA | NA | 4 |
| | 34323 | 139' | SGTS AREA | 2-19 | NA | KA | 1 |
| 50 | 34324 | 139' | HVAC EQUIP AREA | 2-19 | NA | NA | 1 |
| 21 | 34325 | 130' | SGTS AREA | 2-19 | NA | NA | 1 |
| 52 | . 14320 | 166' | NORTHEAST CORRIDOR | 2-8 | NA | NA | 2 |
| 53 | . 14401 | 100 | STEAM TUNNEL ROOF | 2-8 | NA | NA | 1 |
| 54 | . 14402 | 100 | SOUTHFAST CORRIDOR | 2-8 | NA | NA | 2 |
| 55 | . 1A403 | 100 | UNASSIGNED AREA | 2-8 | NA | NA | 1 |
| 56 | . 14404 | 100 | CHINT VENT. EQUIP RM | 2-8 | NA | . NA | 1 |
| 57 | B. 1A405 | 166' | CNTMT EXHAUST FILTER | 2-8 | NA | NA | 1 |

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2.2 LIMITING SAFETY SYSTEM SETTINGS

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BASES

2.2.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

The Reactor Protection System instrumentation setpoints specified in Table 2.2.1-1 are the values at which the reactor trips are set for each parameter. The Trip Setpoints have been selected to ensure that the reactor core and reactor coolant system are prevented from exceeding their Safety Limits during normal operation and design basis anticipated operational occurrences and to assist in mitigating the consequences of accidents. Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

Lareater

1. Intermediate Range Monitor, Neutron Flux - High

The IRM system consists of 8 chambers, 4 in each of the reactor trip systems. The IRM is a 5 decade 10 range instrument. The trip setpoint of 120 divisions of scale is active in each of the 10 ranges. Thus as the IRM is ranged up to accommodate the increase in power level, the trip setpoint is also ranged up. The IRM instruments provide for overlap with both the APRM and SRM systems.

The most significant source of reactivity changes during the power increase is due to control rod withdrawal. In order to ensure that the IRM provides the required protection, a range of rod withdrawal accidents have been analyzed. The results of these analyses are in Section 15.4 of the FSAR. The most severe case involve: an initial condition in which THERMAL POWER is at approximately 1% of RATED TH RMAL POWER. Additional conservatism was taken in this analysis by assuming the IRM channel closest to the control rod being withdrawn is bypassed. The results of this analysis show that the reactor is shutdown and peak power is limited to 21% of RATED THERMAL POWER with the peak fuel enthalpy well below the fuel failure threshold criterion of 170 cal/gm. Based on this analysis, the IRM provides protection against local control rod errors and continuous withdrawal of control rods in sequence and provides backup protection for the APRM.

2. Average Power Range Monitor

For operation at low pressure and low flow during STARTUP, the APRM scram setting of 15% of RATED THERMAL POWER provides adequate thermal margin between the setpoint and the Safety Limits. The margin accommodates the anticipated maneuvers associated with power plant startup. Effects of increasing pressure at zero or low void content are minor and cold water from sources available during startup is not much colder than that already in the system. Temperature coefficients are small and control rod patterns are constrained by the RPCS. Of all the possible sources of reactivity input, uniform control rod withdrawal is the most probable cause of significant power increase. Because the flux distribution associated with uniform rod withdrawals does not involve high local peaks and because several rods must be moved to change power by a significant

INSTRUMENTATION

9. (GGNS-450) P.2

BASES

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ISOLATION ACTUATION INSTRUMENTATION (continued)

the A.C. power supply is lost and is restored by startup of the emergency diesel generators. In this event, a time of 13 seconds is assumed before the valve starts to move. In addition to the pipe break, the failure of the D.C. operated valve is assumed; thus the signal delay (sensor response) is concurrent with the 13 second diesel startup. The safety analysis considers an allowable inventory loss in each case which in turn determines the valve speed in conjunction with the 13 second delay. It follows that checking the valve speeds and the 13 second time for emergency power establishment will establish the response time for the isolation functions. However, to enhance overall system reliability and to monitor instrument channel response time trends, the isolation actuation instrumentation response time shall be measured and recorded as a part of the ISOLATION SYSTEM RESPONSE TIME.

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or greater than the drift allowance assumed for each trip in the safety analyses.

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

The emergency core cooling system actuation instrumentation is provided to initiate actions to mitigate the consequences of accidents that are beyond the ability of the operator to control. This specification provides the OPERABILITY requirements, trip setpoints and response times that will ensure effectiveness of the systems to provide the design protection. Although the instruments are listed by system, in some cases the same instrument may be used to send the actuation signal to more than one system at the same time.

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

3/4.3.4 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

The anticipated transient without scram (ATWS) recirculation pump trip system provides a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. The response of the plant to this postulated event falls within the envelope of study events in General Electric Company Topical Report NEDO-10349, dated March 1971 and NEDO-24222, dated December 1979, and Section 15.8 Appendix 15A of the FSAR.

The end-of-cycle recirculation pump trip (EOC-RPT) system is a part of the Reactor Protection System and is an essential safety supplement to the reactor trip. The purpose of the EOC-RPT is to recover the loss of thermal margin which occurs at the end-of-cycle. The physical phenomenon involved is that the void reactivity feedback due to a pressurization transient can add positive reactivity to the reactor system at a faster rate than the control rods add negative scram reactivity. Each EOC-RPT system trips both recirculation pumps, reducing coolant flow in order to reduce the void collapse in the core during two of the most limiting pressurization events. The two events for which the EOC-RPT protective

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INSTRUMENTATION

BASES

RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION (Continued) .

feature will function are closure of the turbine stop valves and fast closure of the turbine control valves.

A fast closure sensor from each of two turbine control valves provides input to the EOC-RPT system; a fast closure sensor from each of the other two turbine control valves provides input to the second EOC-RPT system. Similarly, a closure sensor for each of two turbine stop valves provides input to one EDC-RPT system; a closure sensor from each of the other two stop valves provides input to the other EOC-RPT system. For each EOC-RPT system, the sensor relay contacts are arranged to form a 2-out-of-2 logic for the fast closure of turbine control valves and a 2-out-of-2 logic for the turbine stop valves. The operation of either logic will actuate the EOC-RPT system and trip both recirculation pumps.

Each EOC-RPT system may be manually bypassed by use of a keyswitch which is administratively controlled. The manual bypasses and the automatic Operating Bypass at less than 40% of RATED THERMAL POWER are annunciated in the control room.

The EOC-RPT system response time is the time assumed in the analysis between initiation of valve motion and complete suppression of the electric arc, i.e., 190 ms, less the time allotted from start of motion of the stop valve or turbine control valve until the sensor relay contact supplying the input to the reactor protection system opens, i.e., 70 ms, and less the time allotted for breaker arc suppression determined by test, as correlated to manufacturer's test results, i.e., 50 ms, and plant pre-operational test results.

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

3/4.3.5 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

The reactor core isolation cooling system actuation instrumentation is provided to initiate actions to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without providing actuation of any of the emergency core cooling equipment.

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or greater less than the drift allowance assumed for each trip in the safety analyses.

3/4.3.6 CONTROL ROD BLOCK INSTRUMENTATION

The control rod block functions are provided consistent with the requirements of the specifications in Section 3/4.1.4, Control Rod Program Controls and Section 3/4.2 Power Distribution Limits. The trip logic is arranged so that a trip in any one of the inputs will result in a control rod block.

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

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