

### 3/4.3 INSTRUMENTATION

#### 3/4.3/1 REACTOR PROTECTIVE INSTRUMENTATION

##### LIMITING CONDITION FOR OPERATION

3.3.1.1 As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE with RESPONSE TIMES as shown in Table 3.3-2.

APPLICABILITY: As shown in Table 3.3-1.

##### ACTION:

As shown in Table 3.3-1.

##### SURVEILLANCE REQUIREMENTS

4.3.1.1.1 Each reactor protective instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-1.

4.3.1.1.2 The logic for the bypasses shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total bypass function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.1.1.3a The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1.

4.3.1.1.3b The RESPONSE TIME of each RTD listed as Functional Units 10.c and 10.d in Table 3.3-2 shall be demonstrated to be within its limit at least once per 18 months. Any newly installed RTD, listed as a functional unit in 10.c or 10.d shall be demonstrated to be within its limit within one month of operation and at least once every 18 months thereafter.

4.3.1.1.4 The isolation characteristics of each CEA isolation amplifier and each optical isolator for CEA Calculator to Core Protection Calculator data transfer shall be verified at least once per 18 months during the shutdown per the following tests:

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PDR ADOCK 05000368  
P PDR

- a. For the CEA position amplifiers:
  - 1. With 120 volts AC (60 Hz) applied for at least 30 seconds across the output, the reading on the input does not exceed 0.015 volts DC.
  - 2. With 120 volts AC (60 Hz) applied for at least 30 seconds across the input, the reading on the output does not exceed 8 volts DC.
- b. For the optical isolators: Verify that the input to output insulation resistance is greater than 10 megohms when tested using a megohmmeter on the 500 volt DC range.

4.3.1.1.5 The Core Protection Calculator System shall be determined OPERABLE at least once per 12 hours by verifying the less than three auto restarts have occurred on each calculator during the past 12 hours.

4.3.1.1.6 The Core Protection Calculator System shall be subjected to a CHANNEL FUNCTIONAL TEST to verify OPERABILITY within 12 hours of receipt of a valid High CPC Room Temperature alarm.

TABLE 3.3-2 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
10. DNBR - Low	
a. Neutron Flux Power from Excore Neutron Detectors	< 0.39 seconds*
b. CEA Positions	< 1.09 seconds**
c. Cold Leg Temperature	< 3.79 seconds##
d. Hot Leg Temperature	< 1.54 seconds##
e. Primary Coolant Pump Shaft Speed	< 0.80 seconds#
f. Reactor Coolant Pressure from Pressurizer	< 3.19 seconds
11. Steam Generator Level - High	Not Applicable

\*Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

\*\*Response time shall be measured from the onset of a single CEA drop.

#Response time shall be measured from the onset of a 2 out of 4 reactor coolant pump coastdown.

##Based on a resistance temperature detector (RTD) response time of < 6.0 seconds where the RTD response time is equivalent to the time interval required for the RTD output to achieve 63.2% of its total change when subjected to a step change in RTD temperature.

If the effective RTD time constant for a CPC channel exceeds 6.0 seconds, the DNBR and LPD penalties for the affected channel(s) shall be increased by the amount indicated on Figure 3.3-1, and the Power Operating Limit on DNB will be decreased by the amount shown in Table 3.3-3.