

Docket No. 50-336  
B15476

Attachment 3

Millstone Nuclear Power Station, Unit No. 2

Proposed Revision to Technical Specifications  
Reactor Protective and Engineered Safety Feature  
Actuation System Instrumentation

Marked-up Pages

January 1996

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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 <sup>^</sup>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 during 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 during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. 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.

4.3.1.1.3 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.

~~4.3.1.1.4 The response time of all REACTOR TRIP SYSTEM resistance temperature detectors (RTD) shall be verified to be less than or equal to the value specified in Table 3.3-2 within one month of operation for newly installed RTD's and once every 18 months thereafter.~~

*Neutron detectors are exempt from response time testing.*

TABLE 3.3-2

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
1. Manual Reactor Trip	$\leq 2.0$ seconds
2. Power Level - High	$\leq 0.40$ seconds*# and $\leq 8.0$ seconds##
3. Reactor Coolant Flow - Low	$\leq 0.65$ seconds
4. Pressurizer Pressure - High	$\leq 0.90$ seconds
5. Containment Pressure - High	Not Applicable
6. Steam Generator Pressure - Low	$\leq 0.90$ seconds
7. Steam Generator Water Level - Low	$\leq 0.90$ seconds
8. Local Power Density - High	$\leq 0.40$ seconds*# and $\leq 8.0$ seconds##
9. Thermal Margin/Low Pressure	$\leq 0.90$ seconds*# and $\leq 8.0$ seconds##
10. Loss of Turbine--Hydraulic Fluid Pressure - Low	Not Applicable
11. Underspeed - Reactor Coolant Pumps	$\leq 0.45$ seconds

\*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 does not include contribution of RTDs.

#RTD response time only. This value is equivalent to the time interval required for the RTD's output to achieve 63.2% of its total change when subjected to a step change in RTD temperature.

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INSTRUMENTATION3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATIONLIMITING CONDITION FOR OPERATION

3.3.2.1 The engineered safety feature actuation system instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4 and with RESPONSE TIMES as shown in Table 3.3-5.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

- a. With an engineered safety feature actuation system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, either adjust the trip setpoint to be consistent with the value specified in the Trip Setpoint column of Table 3.3-4 within 2 hours or declare the channel inoperable and take the ACTION shown in Table 3.3-3.
- b. With an engineered safety feature actuation system instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each engineered safety feature actuation system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the modes and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. 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.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
9. AUXILIARY FEEDWATER					
a. Manual	1/pump	1/pump	1/pump	1, 2, 3	1
b. Steam Generator Level - Low	4	2	3	1, 2, 3	2 <sup>(1)</sup>

(1) For Cycle 12 only, OPERABILITY of the auxiliary feedwater (AFW) automatic initiation logic will rely on operator action to ensure successful initiation of AFW. Prior to startup for Cycle 13, modifications to the automatic initiation logic for AFW will be implemented to eliminate the reliance on operator action.

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Amendment No. 77, 83, 176

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TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES:

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
8. LOSS OF POWER		
a. 4.16 kv Emergency Bus Undervoltage (Undervoltage relays) - level one	≥ 2912 volts	≥ 2877 volts
b. 4.16 kv Emergency Bus Undervoltage (Undervoltage relays) - level two	≥ 3700 volts with an 8.0 ± 2.0 second time delay	≥ 3663 volts with an 8.0 ± 2.0 second time delay
9. AUXILIARY FEEDWATER		
a. Manual	Not Applicable	Not Applicable
b. Steam Generator Level - Low <sup>(1)</sup>	≥ 12%	≥ 10%

(1) For Cycle 12 only, OPERABILITY of the auxiliary feedwater (AFW) automatic initiation logic will rely on operator action to ensure successful initiation of AFW. Prior to startup for Cycle 13, modifications to the automatic initiation logic for AFW will be implemented to eliminate the reliance on operator action.

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Amendment No. 17, 16, 17, 17, 17, 12.

6/7/94

TABLE 3.3-5  
ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATING SIGNAL AND FUNCTION</u>	<u>RESPONSE TIME IN SECONDS</u>
<b>1. <u>Manual</u></b>	
a. SIAS	
Safety Injection (ECCS)	Not Applicable
Containment Isolation	Not Applicable
Enclosure Building Filtration System	Not Applicable
b. CSAS	
Containment Spray	Not Applicable
c. CIAS	
Containment Isolation	Not Applicable
d. SRAS	
Containment Sump Recirculation	Not Applicable
e. EBFAS	
Enclosure Building Filtration System	Not Applicable
f. Auxiliary Feedwater Initiation	Not Applicable
g. Main Steam Isolation	Not Applicable
<b>2. <u>Pressurizer Pressure-Low</u></b>	
a. Safety Injection (ECCS)	
1) High Pressure Safety Injection	≤ 25.0*/5.0**
2) Low Pressure Safety Injection	≤ 45.0*/5.0**
3) Charging Pumps	≤ 35.0*/35.0**
4) Containment Air Recirculation System	≤ 26.0*/15.0**
b. Containment Isolation	≤ 7.5
c. Enclosure Building Filtration System	≤ 45.0*/45.0**

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATING SIGNAL AND FUNCTION</u>	<u>RESPONSE TIME IN SECONDS</u>
<u>3. Containment Pressure - High</u>	
a. Safety Injection (ECCS)	
1) High Pressure Safety Injection	≤ 25.0*/5.0**
2) Low Pressure Safety Injection	≤ 45.0*/5.0**
3) Charging Pumps	≤ 35.0*/35.0**
4) Containment Air Recirculation System	≤ 26.0*/15.0**
b. Containment Isolation	≤ 7.5
c. Enclosure Building Filtration System	≤ 45.0*/45.0**
d. Main Steam Isolation	≤ 6.9
e. Feedwater Isolation	≤ 14
<u>4. Containment Pressure--High-High</u>	
a. Containment Spray	≤ 35.6* <sup>(1)</sup> /16.0** <sup>(1)</sup>
<u>5. Containment Radiation-High</u>	
a. Containment Purge Valves Isolation	≤ Counting period plus 7.5
<u>6. Steam Generator Pressure-Low</u>	
a. Main Steam Isolation	≤ 6.9
b. Feedwater Isolation	≤ 14
<u>7. Refueling Water Storage Tank-Low</u>	
a. Containment Sump Recirculation	≤ 120
<u>8. Steam Generator Level-Low</u>	
a. Auxiliary Feedwater System <sup>(3)</sup>	< 240*/240** <sup>(2)</sup>



TABLE 3.3-5 (Continued)ENGINEERED SAFETY FEATURES RESPONSE TIMESTABLE NOTATION

- \* Diesel generator starting and sequence loading delays included.
- \*\* Diesel generator starting and sequence loading delays not included. Offsite power available.
- (1) Header fill time not included.
- (2) Includes 3-minute time delay.
- (3) For Cycle 12 only, OPERABILITY of the auxiliary feedwater (AFW) automatic initiation logic will rely on operator action to ensure successful initiation of AFW. Prior to startup for Cycle 13, modifications to the automatic initiation logic for AFW will be implemented to eliminate the reliance on operator action.

PLANT SYSTEMSMAIN FEEDWATER ISOLATION COMPONENTS (MFICs)LIMITING CONDITION FOR OPERATION

3.7.1.6 Each feedwater isolation component listed in Table 3.7-3 shall be OPERABLE, with response times as given in Table 3.3-5.

FW Isolation Components	Description
FW-38A	A FP Discharge MOV
FW-38B	B FP Discharge MOV
FW-42A	A FW Block MOV
FW-42B	B FW Block MOV
FW-41A	A FW Regulating Bypass Valve
FW-41B	B FW Regulating Bypass Valve
FW-51A	A FW Regulating Valve
FW-51B	B FW Regulating Valve
H5A	A SG Feedwater Pump Trip Circuitry
H5B	B SG Feedwater Pump Trip Circuitry

Table 3.7-3

APPLICABILITY: MODES 1, 2 & 3

ACTION:

- a. With one feedwater isolation component inoperable in either or both feedwater flow paths, either:
  1. Restore the inoperable component(s) to OPERABLE status within 72 hours, or
  2. Close or isolate the inoperable feedwater isolation valve(s) within 72 hours, and verify that the inoperable feedwater isolation valve(s) is closed or isolated once per 7 days, or
  3. Secure or isolate the feedwater pump(s) with inoperable feedwater pump trip circuitry within 72 hours and verify that the inoperable feedwater pump(s) is secured or isolated once per 7 days, or
  4. Be in HOT SHUTDOWN within the next 12 hours.

3/4.3 INSTRUMENTATION

BASES

3/4.3.1 AND 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION

The OPERABILITY of the protective and ESF instrumentation systems and bypasses ensure that 1) the associated ESF action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof exceeds its setpoint, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available for protective and ESF purposes from diverse parameters.

The OPERABILITY of these systems is required to provide the overall reliability, redundancy and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the accident analyses.

The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability.

The measurement of response time at the specified frequencies provides assurance that the protective and ESF action function associated with each channel is completed within the time limit assumed in the accident analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. *THE REACTOR PROTECTIVE AND ENGINEERED SAFETY FEATURES RESPONSE TIMES ARE CONTAINED IN THE MILLSTONE UNIT NO 2 TECHNICAL REQUIREMENTS MANUAL.*

Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) in place, onsite or offsite test measurements or 2) utilizing replacement sensors with certified response times.

The containment spray response time with a loss of normal power assumes that the LNP occurs simultaneously with the CSAS. Therefore, the valve stroke time is bounded by the time required for signal generation, diesel start, sequencer, and time for the spray pumps to reach operating speed.

The containment spray response time without a loss of power is composed of signal generation and valve stroke time.

CAR fan response time is determined for the idle fan and conservatively applied to all four. For the case with a loss of power, signal generation, diesel start, sequencer and the time for the fans to reach operating speed bounds valve stroke time.

*CHANGES TO THE TECHNICAL REQUIREMENTS MANUAL REQUIRE A 100% REVIEW AS WELL AS A REVIEW BY THE PLANT OPERATIONS REVIEW COMMITTEE.*

May 17, 1995

3/4.3.1 AND 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF)  
INSTRUMENTATION (Continued)

CAR fan response time for the case without a loss of power is composed of signal generation and valves stroke time.

Feedwater isolation response time ensures a rapid isolation of feed flow to the steam generators via the feedwater regulating valves, feedwater bypass valves and, as backup, feed pump discharge valves. The response time includes signal generation time and valve stroke. Feed line block valves also receive a feedwater isolation signal since the steam line break accident analysis credits them in prevention of feed line volume flashing in some cases. Since the block valves are not credited with isolation, they are not required to operate as fast as the isolation valves although equal response times for all valves are specified. Feedwater pumps are assumed to trip immediately with an MSI signal.

The containment airborne radioactivity monitors (gaseous and particulate) are provided to initiate closure of the containment purge valves upon detection of high radioactivity levels in the containment. Closure of these valves prevents excessive amounts of radioactivity from being released to the environs in the event of an accident.

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Attachment 4

Millstone Nuclear Power Station, Unit No. 2

Proposed Revision to Technical Specifications  
Reactor Protective and Engineered Safety Feature  
Actuation System Instrumentation

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### 3/4.3 INSTRUMENTATION

#### 3/4.3.1 REACTOR PROTECTIVE INSTRUMENTATION

##### LIMITING CONDITION FOR OPERATION

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3.3.1.1 As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

##### SURVEILLANCE REQUIREMENTS

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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 during 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 during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. 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.

4.3.1.1.3 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. Neutron detectors are exempt from response time testing. 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.

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## INSTRUMENTATION

### 3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

#### LIMITING CONDITION FOR OPERATION

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3.3.2.1 The engineered safety feature actuation system instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

- a. With an engineered safety feature actuation system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, either adjust the trip setpoint to be consistent with the value specified in the Trip Setpoint column of Table 3.3-4 within 2 hours or declare the channel inoperable and take the ACTION shown in Table 3.3-3.
- b. With an engineered safety feature actuation system instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

#### SURVEILLANCE REQUIREMENTS

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4.3.2.1.1 Each engineered safety feature acutation system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the modes and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affects by bypass operation. 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.



TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
9. AUXILIARY FEEDWATER					
a. Manual	1/pump	1/pump	1/pump	1, 2, 3	1
b. Steam Generator Level - Low	4	2	3	1, 2, 3	2

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TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
8. LOSS OF POWER		
a. 4.16 kv Emergency Bus Undervoltage (Undervoltage relays) - level one	≥ 2912 volts	≥ 2877 volts
b. 4.16 kv Emergency Bus Undervoltage (Undervoltage relays) - level two	≥ 3700 volts with an 8.0 ± 2.0 second time delay	≥ 3663 volts with an 8.0 ± 2.0 second time delay
9. AUXILIARY FEEDWATER		
a. Manual	Not Applicable	Not Applicable
b. Steam Generator Level - Low	≥ 12%	≥ 10%

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PLANT SYSTEMS

MAIN FEEDWATER ISOLATION COMPONENTS (MFICs)

LIMITING CONDITION FOR OPERATION

3.7.1.6 Each feedwater isolation component listed in Table 3.7-3 shall be OPERABLE.

FW Isolation Components	Description
FW-38A	A FP Discharge MOV
FW-38B	B FP Discharge MOV
FW-42A	A FW Block MOV
FW-42B	B FW Block MOV
FW-41A	A FW Regulating Bypass Valve
FW-41B	B FW Regulating Bypass Valve
FW-51A	A FW Regulating Valve
FW-51B	B FW Regulating Valve
H5A	A SG Feedwater Pump Trip Circuitry
H5B	B SG Feedwater Pump Trip Circuitry

Table 3.7-3

APPLICABILITY: MODES 1, 2 & 3

ACTION:

- a. With one feedwater isolation component inoperable in either or both feedwater flow paths, either:
  1. Restore the inoperable component(s) to OPERABLE status within 72 hours, or
  2. Close or isolate the inoperable feedwater isolation valve(s) within 72 hours, and verify that the inoperable feedwater isolation valve(s) is closed or isolated once per 7 days, or
  3. Secure or isolate the feedwater pump(s) with inoperable feedwater pump trip circuitry within 72 hours and verify that the inoperable feedwater pump(s) is secured or isolated once per 7 days, or
  4. Be in HOT SHUTDOWN within the next 12 hours.

### 3/4.3 INSTRUMENTATION

#### BASES

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#### 3/4.3.1 AND 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION

The OPERABILITY of the protective and ESF instrumentation systems and bypasses ensure that 1) the associated ESF action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof exceeds its setpoint, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available for protective and ESF purposes from diverse parameters.

The OPERABILITY of these systems is required to provide the overall reliability, redundance and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the accident analyses.

The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability.

The measurement of response time at the specified frequencies provides assurance that the protective and ESF action function associated with each channel is completed within the time limit assumed in the accident analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. The Reactor Protective and Engineered Safety Feature response times are contained in the Millstone Unit No. 2 Technical Requirements Manual. Changes to the Technical Requirements Manual require a 10CFR50.59 review as well as a review by the Plant Operations Review Committee.

The containment airborne radioactivity monitors (gaseous and particulate) are provided to initiate closure of the containment purge valves upon detection of high radioactivity levels in the containment. Closure of these valves prevents excessive amounts of radioactivity from being released to the environs in the event of an accident.