Docket No. 50-245
B16136

Attachment 3

Millstone Nuclear Power Station, Unit No. 1

Proposed Technical Specifications Revision
Response Time Testing
Marked-up Version of Current Technical Specifications

February 1997

1.0 DEFINITIONS

The succeeding frequently used terms are explicitly defined so that a uniform interpretation of the Specifications may be achieved.

A. Deleted

B. Core Alterations

CORE ALTERATIONS shall be the movement of any fuel, sources, reactivity control components, or other components affecting reactivity within the reactor vessel with the vessel head removed and fuel in the vessel. Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special movable detectors (including undervessel replacement) is not considered a CORE ALTERATION.

Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

C. Hot Standby

HOT STANDBY means operation with the reactor critical, system pressure less than 600 psig, and the main steam isolation valves closed.

D. Immediate

IMMEDIATE means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action.

Replace with Insert ①

E. Instrument Calibration

An INSTRUMENT CALIBRATION means the adjustment of an instrument signal output so that it corresponds, within acceptable range, accuracy and response time, to a known value(s) of the parameter which the instrument monitors. Calibration shall encompass the entire instrument including actuation, alarm or trip.

F. Instrument Functional Test

An INSTRUMENT FUNCTIONAL TEST means the injection of a simulated signal into the instrument primary sensor to verify the proper instrument channel response, alarm, and/or initiating action.

G. Instrument Check

An INSTRUMENT CHECK is qualitative determination of operability by observation of behavior during operation. This determination shall include, where possible, comparison of the instrument with other independent instruments measuring the same variable.

INSERT (1)

14/6/96

E. Instrument or Channel Calibration

An INSTRUMENT or CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. The INSTRUMENT or CHANNEL CALIBRATION shall encompass those components, such as sensors, alarms, displays, and trip functions, required to perform the specified safety function(s). The INSTRUMENT or CHANNEL CALIBRATION shall include the INSTRUMENT or CHANNEL FUNCTIONAL TEST. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. The INSTRUMENT or CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps so that the entire channel is calibrated.

F. Instrument or Channel Functional Test

An INSTRUMENT or CHANNEL FUNCTIONAL TEST shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY, including all components in the channel, such as alarms, interlocks, displays, and trip functions, required to perform the specified safety function(s). The INSTRUMENT or CHANNEL FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total channel steps so that the entire channel is tested.

OO. Supplemental Reload Licensing Submittal

The SUPPLEMENTAL RELOAD LICENSING SUBMITTAL (SRLS), its supplements and revisions, are unit and cycle specific document(s) containing the power distribution limits (MCPR, LHGR, and APLHGR) for the current operating cycle. The limits in the SRLS, including supplements and revisions, are only applicable during the reload/cycle number(s) given in the title. These cycle specific limits shall be determined for each reload cycle in accordance with Specification 6.9.1.9.

PP. Average Planar Linear Heat Generation Rate (APLHGR)

The AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) shall be applicable to a specific planar height and is equal to the sum of the heat generation rate per unit length of fuel rod for all the fuel rods in the specified bundle at the specified height, divided by the number of fuel rods in the fuel bundle at that height.

QQ. Linear Heat Generation Rate (LHGR)

The LINEAR HEAT GENERATION RATE (LHGR) shall be applicable to a specific rod at a specific height and is equal to the heat generation rate per unit length for the specific rod at that specific height.

RR. Limiting Control Rod Pattern

A LIMITING CONTROL ROD PATTERN is a control rod configuration which results in the core being on a thermal hydraulic limit, i.e., operating on a limiting value for APLHGR, LHGR, or MCPR.

NEW

SS. Reactor Protection System (RPS) Logic Response Time

The RPS LOGIC RESPONSE TIME shall be that time interval from the opening of the sensor contact up to and including the de-energization of the scram pilot valve solenoids.

1/6/96 4:30

OCT 31 1986

LIMITING CONDITION FOR OPERATION

3.1 REACTOR PROTECTION SYSTEM

Applicability:

Applies to the instrumentation and associated devices which initiate a reactor scram and provide automatic isolation of the Reactor Protection System buses from their power supplies.

Objective:

To assure the operability of the Reactor Protection System.

Specification:

A. The setpoints, minimum number of trip systems, and minimum number of instrument channels that must be operable for each position of the reactor mode switch shall be as given in Table 3.1.1.

B. ~~Response Time~~ NOT USED.

~~The time from initiation of any channel trip to the de-energization of the scram solenoid relay shall not exceed 50 milliseconds.~~

C. Reactor Protection System Power Monitoring

Two RPS electric power monitoring channels for each inservice RPS MG set, or alternate power supply, shall be operable at all times except as follows:

1. With one RPS electric power monitoring channel for an inservice RPS MG set or alternate power supply inoperable, restore the inoperable channel to OPERABLE status within 72 hours or remove the associated RPS MG set or alternate power supply from service.

2. With both RPS electric power monitoring channels for an inservice RPS MG set or alternate power supply inoperable, restore at least one to OPERABLE status within 30 minutes or remove the associated RPS MG set or alternate power supply from service.

SURVEILLANCE REQUIREMENT

4.1 REACTOR PROTECTION SYSTEM

Applicability:

Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram and provide automatic isolation of reactor protection system buses from their power supplies.

11/6/96 amend +9/30

OCT 31 1986

SURVEILLANCE REQUIREMENT (Continued)

4.1 REACTOR PROTECTION SYSTEM

Objective:

To specify the type and frequency of surveillance to be applied to the reactor protection instrumentation.

Specification:

A. Instrumentation systems shall be functionally tested and calibrated as indicated in Tables 4.1.1 and 4.1.2, respectively. INSERT A

B. Daily during reactor power operation, the maximum fraction of limiting power density shall be checked and the APRM scram and rod block settings given by the equations in Specifications 2.1.2A and 2.1.2B shall be determined to be valid.

C. The RPS electrical protection assemblies shall be determined operable as follows:

1. At least once per 6 months by performance of a CHANNEL FUNCTIONAL TEST, and

2. At least once per 18 months by demonstrating the OPERABILITY of over-voltage, under-voltage and under-frequency protective instrumentation by performance of a CHANNEL CALIBRATION including simulated automatic actuation of the protective relays, tripping logic and output circuit breakers, and verifying the following setpoints:

a. Over-voltage ≤ (132)VAC,
b. Under-voltage ≥ (108)VAC,
c. Under-frequency ≥ (57)Hz, and
d. Time-delay ≤ (4.0) seconds.

D. When the reactor mode switch is in REFUEL or SHUTDOWN and fuel is in the reactor vessel, no trip functions are required to be operable provided that all control rods are fully inserted, and either electrically or hydraulically disarmed. Thereafter, daily surveillance shall be performed to verify that all control rods remain valved out or electrically disarmed.

INSERT A

Verify the RPS LOGIC RESPONSE TIME for each trip function listed below is within limits at least once every OPERATING CYCLE.

1. APRM: Flow Biased High Flux
2. High Reactor Pressure
3. High Drywell Pressure
4. Reactor Low Water Level
5. Main Steam Line Isolation Valve Closure
6. Turbine Control Valve Fast Closure
7. Turbine Stop Valve

Group (C) devices are active only during a given portion of the operational cycle. For example, the IRM is active during startup and inactive during full-power operation. Thus, the only test that is meaningful is the one performed just prior to shutdown or startup; i.e., the tests that are performed just prior to use of the instrument. While included in Group (C), the Condenser Low Vacuum trip is treated differently. This is because the condenser low vacuum trip sensor can only be tested during shutdown. The primary function of this trip is to protect the turbine and condenser, although it is connected into the reactor protection system; thus testing the sensor at each refueling outage is adequate.

Calibration frequency of the instrument channels is divided into two groups. These are as follows:

a. Passive type indicating devices that can be compared with like units on a continuous basis.

b. Vacuum tube or semiconductor devices and detectors that drift or lose sensitivity.

Experience with passive type instruments in generating stations and substations indicates that the specified calibrations are adequate. For those devices which employ amplifiers, etc., drift specifications call for drift to be less than 0.4%/month; i.e., in the period of a month a drift of 0.4% would occur thus providing for adequate margin. For the APRM system, drift of electronic apparatus is not the only consideration in determining a calibration frequency. Change in power distribution and loss of chamber sensitivity dictate a calibration every seven days. Calibration on this frequency assures plant operation at or below thermal limits.

9/11 → INSERT

B. The peak heat flux shall be checked once per day to determine if the APRM scram requires adjustment. This will normally be done by checking the LPRM readings. Only a small number of control rods are moved daily, thus the peaking factors are not expected to change significantly and a daily check of the peak heat flux is adequate.

New

The RPS LOGIC RESPONSE TIME surveillance ensures that the logic response time is less than or equal to the value assumed in the safety analyses. The logic response time is measured from the opening of the sensor contact up to and including the opening of the trip actuator contacts (de-energization of the SCRAM pilot valve solenoids). The RPS LOGIC RESPONSE TIME acceptance criterion is 50 milliseconds. RPS LOGIC RESPONSE TIME tests are conducted at least every OPERATING CYCLE. This frequency is consistent with the Millstone refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are extremely unlikely.

Docket No. 50-245
B16136

Attachment 4

Millstone Nuclear Power Station, Unit No. 1

Proposed Technical Specifications Revision
Response Time Testing
Retyped Technical Specifications

February 1997

1.0 DEFINITIONS

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A. Deleted

B. Core Alterations

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Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

C. Hot Standby

HOT STANDBY means operation with the reactor critical, system pressure less than 600 psig, and the main steam isolation valves closed.

D. Immediate

IMMEDIATE means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action.

E. Instrument or Channel Calibration

An INSTRUMENT or CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. The INSTRUMENT or CHANNEL CALIBRATION shall encompass those components, such as sensors, alarms, displays, and trip functions, required to perform the specified safety function(s). The INSTRUMENT or CHANNEL CALIBRATION shall include the INSTRUMENT or CHANNEL FUNCTIONAL TEST. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. The INSTRUMENT or CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps so that the entire channel is calibrated.

F. Instrument or Channel Functional Test

An INSTRUMENT or CHANNEL FUNCTIONAL TEST shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY, including all components in the channel, such as alarms, interlocks, displays, and trip

F. Instrument or Channel Functional Test (cont'd)

functions, required to perform the specified safety function(s). The INSTRUMENT or CHANNEL FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total channel steps so that the entire channel is tested.

G. Instrument Check

An INSTRUMENT CHECK is qualitative determination of operability by observation of behavior during operation. This determination shall include, where possible, comparison of the instrument with other independent instruments measuring the same variable.

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SS. Reactor Protection System (RPS) Logic Response Time

The RPS LOGIC RESPONSE TIME shall be that time interval from the opening of the sensor contact up to and including the de-energization of the scram pilot valve solenoids.

LIMITING CONDITION FOR OPERATION

3.1 REACTOR PROTECTION SYSTEM

Applicability

Applies to the instrumentation and associated devices which initiate a reactor scram and provide automatic isolation of the Reactor Protection System buses from their power supplies.

Objective:

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Specification:

A. The setpoints, minimum number of trip systems, and minimum number of instrument channels that must be operable for each position of the reactor mode switch shall be as given in Table 3.1.1.

B. NOT USED.

C. Reactor Protection System Power Monitoring

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SURVEILLANCE REQUIREMENT

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Applicability:

Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram and provide automatic isolation of reactor protection system buses from their power supplies.

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