UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON D.C. 20555

POWER AUTHORITY OF THE STATE OF NEW YORK

DOCKET NO. 50-333

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 183
License No. DPR-59

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Power Authority of the State of New York (the licensee) dated June 22, 1992, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-59 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 103 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Capra

Robert A. Capra, Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 9, 1992

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 183 , are hereby incorporated in the licen . The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Capra

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Attachment:
Changes to the Technical Specifications

Date of Issuance: September 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 183

FACILITY OPERATING LICENSE NO. DPR-59

DOCKET NO. 50-333

Revise Appendix A as follows.

Remove Pages	Insert Pages
i	i
v	v
2	2
3	3
30f	30f
38	38
39	39
40	40
-	43a
46	46
47	47
49	49
50	50
61	61
-	77e

JAFNPP

TECHNICAL SPECIFICATIONS

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1.0 (cont'd)

C. Cold Condition - Reactor coolant temperature $\leq$212°F.

D. Hot Standby Condition - Hot Standby condition means operation with coolant temperature >212°F, the Mode Switch in Startup/Hot Standby and reactor pressure < 1,005 psig.

E. 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.

F. Instrumentation

1. Functional Test - A functional test is the manual operation or initiation of a system, subsystem, or component to verify that it functions within design tolerances (e.g., the manual start of a core spray pump to verify that it runs and that it pumps the required volume of water).

2. Instrument Channel Calibration - An instrument channel calibration means the adjustment of an instrument signal output so that it corresponds, within acceptable range, and accuracy, to a known value(s) of the parameter which the instrument monitors. Calibration shall encompass the entire instrument channel including actuation, alarm or trip.

3. Instrument Channel - An instrument channel means an arrangement of a sensor and auxiliary equipment required to generate and transmit to a trip system a single trip signal related to the plant parameter monitored by that instrument channel.

4. Instrument Check - An instrument check is a qualitative determination of acceptable operability by observation of instrument behavior during operation. This determination shall include, where possible, comparison of the instrument with other independent instruments measuring the same variable.

5. Instrument Channel Functional Test - An instrument channel functional test means the injection of a simulated signal into the instrument primary sensor where possible to verify the proper instrument channel response, alarm and/or initiating action.

6. Primary Containment Isolation Actuation Instrumentation Response Time for Main Steam Line isolation is the time interval which begins when the monitored parameter exceeds the isolation actuation set point at the channel sensor and ends when the Main Steam Isolation Valve solenoids are de-energized (16A-K14, K16, K51, & K52 pilot solenoid relay contacts open). The response time may be measured in one continuous step or in overlapping segments, with verification that all components are tested.

7. Logic System Function Test - A logic system functional test means a test of relays and contacts of a logic circuit from sensor to activated device to ensure components are operable per design intent. Where practicable, action will go to completion: i.e., pumps will be started and valves operated.

8. Protective Action - An action initiated by the Protection System when limiting safety system setting is reached. A protective action can be at a channel or system level.

1.0 (cont'd)

9. Protective Function - A system protective action which results from the protective action of the channels monitoring a particular plant condition.

10. Reactor Protection System Response Time is the time interval which begins when the monitored parameter exceeds the reactor protection trip set point at the channel sensor and ends when the scram pilot valve solenoids are de-energized (05A-K14 scram contactors open). The response time may be measured in one continuous step or in overlapping segments, with verification that all components are tested.

11. Simulated Automatic Actuation - Simulated automatic actuation means applying a simulated signal to the sensor to actuate the circuit in question.

12. Trip System - A trip system means an arrangement of instrument channel trip signals and auxiliary equipment required to initiate action to accomplish a protective function. A trip system may require one or more instrument channel trip signals related to one or more plant parameters in order to initiate trip system action. Initiation of protective action may require the tripping of a single trip system or the coincident of two trip systems.

13. Sensor - A sensor is that part of a channel used to detect variations in a monitored variable and to provide a suitable signal to logic.

G. Limiting Conditions for Operation (LCO)

The limiting conditions for operation specify the minimum acceptable levels of system performance necessary to assure safe startup and operation of the facility. When these conditions are met, the plant can be operated safely and abnormal situations can be safely controlled.

H. Limiting Safety System Setting (LSSS)

The limiting safety system settings are settings on instrumentation which initiate the automatic protective action at a level such that the safety limits will not be exceeded. The region between the safety limit and these settings represent margin with normal operation lying below these settings. The margin has been established so that with proper operation of the instrumentation safety limits will never be exceeded.

I. Modes of Operation (Operational Mode)

Mode - The reactor mode is established by the Mode Selector Switch. The modes include shutdown, refuel, startup/hot standby, and run which are defined as follows:

3.1 LIMITING CONDITIONS FOR OPERATION

3.1 REACTOR PROTECTION SYSTEM

Applicability:

Applies to the instrumentation and associated devices which initiate the reactor scram.

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 shown in Table 3.1-1. The reactor protection system instrumentation response time shall be within the limits in Table 3.1-2.

B. Minimum Critical Power Ratio (MCPR)

During reactor power operation, the MCPR operating limit shall not be less than that shown in the Core Operating Limits Report.

1. During Reactor power operation with core flow less than 100% of rated, the MCPR operating limit shall be multiplied by the appropriate K_f as specified in the Core Operating Limits Report.

4.1 SURVEILLANCE REQUIREMENTS

4.1 REACTOR PROTECTION SYSTEM

Applicability:

Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram.

Objective:

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

Specification:

A. Instrumentation systems shall be functionally tested and calibrated as indicated in Tables 4.1-1 and 4.1-2 respectively.

The response time for each reactor protection system trip function listed in Table 3.1-2 shall be demonstrated to be within the limits in the table during each 18 month test interval. Each test shall include at least one channel in each trip system. All channels in both trip systems shall be tested within two test intervals.

B. Maximum Fraction of Limiting Power Density (MFLPD)

The MFLPD shall be determined daily during reactor power operation at $\geq$25% rated thermal power and the APRM high flux scram and Rod Block trip settings adjusted if necessary as specified in the Core Operating Limits Report.

4.1 BASES (cont'd)

The bi-stable trip circuit which is a part of the Group (B) devices can sustain unsafe failures which are revealed only on test. Therefore, it is necessary to test them periodically.

A study was conducted of the instrumentation channels included in the Group (B) devices to calculate their unsafe failure rates. The non-ATTS (Analog Transmitter Trip System) analog devices (sensors and amplifiers) are predicted to have an unsafe failure rate of less than $20x10^{-6}$ failures/hr. The non-ATTS bi-stable trip circuits are predicted to have unsafe failure rate of less than $2x10^{-6}$ failures/hr. The ATTS analog devices (sensors), bi-stable devices (master and slave trip units) and power supplies have been evaluated for reliability by Mean Time Between Failure analysis or state-of-the-art qualification type testing meeting the requirements of IEEE 323-1974. Considering the 2 hour monitoring interval for analog devices as assumed above, the instrument checks and functional tests as well as the analyses and/or qualification type testing of the devices, the design reliability goal for system reliability of 0.9999 will be attained with ample margin.

The bi-stable devices are monitored during plant operation to record their failure history and establish a test interval using the curve of Figure 4.1-1. There are numerous identical bi-stable devices used throughout the Plant's instrumentation system. Therefore, significant data on the failure rates for the bi-stable devices should be accumulated rapidly.

The frequency of calibration of the APRM flow biasing network has been established as each refueling outage. The flow biasing network is functionally tested at least once/month and, in addition, cross calibration checks of the flow input to the flow biasing network can be made during the functional test by direct meter reading. There are several instruments which must be calibrated and it will take several days to perform the calibration of the entire network. While the calibration is being performed, a zero flow signal will be sent to half of the APRM's resulting in a half scram and rod block condition. Thus, if the calibration were performed during operation, flux shaping would not be possible. Based on experience at other generating stations, drift of instruments, such as those in the flow biasing network, is not significant and therefore, to avoid spurious scrams, a calibration frequency of each refueling outage is established.

The measurement of response time within the specified intervals provides assurance that the Reactor Protection System trip functions are completed within the time limits assumed in the transient and accident analyses.

The Reactor Protection System trip functions in Table 3.1-2 are those fuctions for which the transient and accident analyses described in Chapter 14 of the FSAR take credit for the response time of instrument channels.

4.1 BASES (cont'd)

In terms of the transient analysis, the Standard Technical Specifications define individual trip function response time as "the time interval from when the monitored parameter exceeds its trip setpoint at the channel sensor until de-energization of the scram pilot valve solenoids." The individual sensor response time defined as "operating time" in General Electric (GE) design specification data sheet 22A3083AJ, note (8), is "the maximum allowable time from when the variable being measured just exceeds the trip setpoint to opening of the trip channel sensor contact during a transient." A transient is defined in note (4) of the same data sheet as "the maximum expected rate of change of the variable for the accident or the abnormal operating condition which is postulated in the safety analysis report.

The individual sensor response time may be measured by simulating a step change of the particular parameter. This method provides a conservative value for the sensor response time, and confirms that the instrument has retained its specified electromechanical characteristics. When sensor response time is measured independently, it is necessary to also measure the remaining portion of the response time in the logic train up to the time at which the scram pilot valve solenoids de-energize. The channel response time must include all component delays in the response chain to the ATTS output relay plus the 50 ms design allowance for RPS logic system response time. A response time for the RPS logic relays in excess of 50 ms is acceptable provided the overall response time does not exceed the response time limits of Table 3.1-2 which includes allowances for sensors, relays, and switches as follows:

High Reactor Pressure sensor	500 ms
High Drywell Pressure sensor	550 ms
Low Reactor Water Level sensor	1000 ms
Main Steam Isolation Valve Closure and Turbine Stop Valve Closure switches	10 ms
Turbine Control Valve Fast Closure from the first movement of the main turbine control valves until actuation of pressure switches which detect the loss of hydraulic control oil pressure.	30 ms

The 10 ms limit for the MSIV and TSV position switch response time is defined by GE design specification data sheet 22A3083AJ. It requires that after MSIV or TSV moves to the set point corresponding to 10% closure from full open, the position switch contacts should open in less than or equal to 10 ms. When the correct set point is verified by surveillance testing for the position switch, the response time requirement is considered to be satisfied. The maximum permissible TCV fast closure channel, logic, and scram contactor response time is 70 ms rather than the sum of TCV fast closure logic (30 ms) and the trip logic and scram contactor response time (50 ms). This provides a 10 ms margin to allow for uncertainty in the test method.

"The maximum permissible APRM channel, logic, and scram contactor response time is 90 ms rather than the sum of the APRM channel response time (60 ms) and the trip logic and scram contactor response time (50 ms)..." (GE design specification data sheet 22A3083AJ), note (12). This measurement is applicable to both the APRM fixed high neutron flux and the flow referenced simulated thermal power channels and requires measuring the time delay through the LPRM cards. The latter case does not include the time constant of approximately six seconds which is calibrated separately. The basis for excluding the neutron detectors from response time testing is provided by NRC Regulatory Guide 1.118, Revision 2, section C.5.

4.1 BASES (cont'd)

The 18 month response time testing interval is based on NRC NUREG-0123, Revision 3, "Standard Technical Specifications," surveillance requirement 4.3.1.3.

Group (C) devices are active only during a given portion of the operational cycle. For example, the IRM is active during start-up and inactive during full power operation. Thus the only test that is meaningful is the one performed just prior to shutdown or start-up; i.e., the tests that are performed just prior to use of the instrument.

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

1. Passive type indicating devices that can be compared with like units on a continuous basis.
2. 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 percent/month; i.e., in the period of a month a maximum drift of 0.4 percent could 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 7 days.

Calibration on this frequency assures plant operation at or below thermal limits.

A comparison of Tables 4.1-1 and 4.1-2 indicates that two instrument channels have not been included in the latter table. These are: mode switch in shutdown and manual scram. All of the devices or sensors associated with these scram functions are simple on-off switches and, hence, calibration during operation is not applicable.

B. The MFLPD is checked once per day to determine if the APRM scram requires adjustment. Only a small number of control rods are moved daily and thus the MFLPD is not expected to change significantly and thus a daily check of the MFLPD is adequate.

The sensitivity of LPRM detectors decreases with exposure to neutron flux at a slow and approximately constant rate. This is compensated for in the APRM system by calibrating twice a week using heat balance data and by calibrating individual LPRM's every 1000 effective full power hours, using TIP traverse data.

TABLE 3.1-2

REACTOR PROTECTION SYSTEM INSTRUMENTATION RESPONSE TIMES

	TRIP FUNCTION	REACTOR TRIP SYSTEM RESPONSE TIME (Seconds)	
1)	Reactor Vessel Pressure - High (02-3PT-55A, B, C, D)	$\leq$ 0.550	
2)	Drywell Pressure - High (05PT-12A, B, C, D)	$\leq$ 0.600	
3)	Reactor Water Level - Low (L3) (02-3LT-101A, B, C, D)	$\leq$ 1.050	
4)	Main Steam Isolation Valve Closure (29PNS-80A2, B2, C2, D2) (29PNS-86A2, B2, C2, D2)	$\leq$ 0.060	
5)	Turbine Stop Valve Closure (94PNS-101, 102, 103, 104)	$\leq$ 0.060	
6)	Turbine Control Valve Fast Closure (94PS-200A, B, C, D)	$\leq$ 0.070	
7)	APRM Fixed (120%) High Neutron Flux	$\leq$ 0.090	(2)
8)	APRM Flow Referenced Simulated Thermal Power	$\leq$ 0.090	(1) (2)

Notes for Table 3.1-2:

1. Trip system response time does not include the simulated thermal power time constant of approximately six seconds which is calibrated separately.
2. Trip system response time is the measured time interval from trip signal input to the first electronic component in the channel after the LPRM detector until the scram pilot valve solenoids de-energize (05A-K14 scram contactors open).

TABLE 4.1-2

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT CALIBRATION
MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

Instrument Channel	Group (1)	Calibration	Minimum Frequency (2)
IRM High Flux	C	Comparison to APRM on Controlled Shutdowns	Maximum frequency once/week
APRM High Flux Output Signal	B	Heat Balance	Daily
Flow Bias Signal	B	Internal Power and Flow Test with Standard Pressure Source	Every refueling outage
LPRM Signal	B	TIP System Traverse	Every 1000 effective full power hours
High Reactor Pressure	B	Standard Pressure Source	Note (6)
High Drywell Pressure	B	Standard Pressure Source	Note (6)
Reactor Low Water Level	B	Standard Pressure Source	Note (6)
High Water Level in Scram Discharge Instrument Volume	A	Water Column, Note (5)	Once/operating cycle, Note (5)
High Water Level in Scram Discharge Instrument Volume	B	Standard Pressure Source	Every 3 months
Main Steam Line Isolation Valve Closure	A	Note (4)	Note (4)
Main Steam Line High Radiation	B	Standard Current Source (3)	Every 3 months
Turbine First Stage Pressure Permissive	B	Standard Pressure Source	Note (6)

TABLE 4.1-2 (Cont'd)

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT CALIBRATION
MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

Instrument Channel	Group (1)	Calibration	Minimum Frequency (2)
Turbine Control Valve Fast Closure Oil Pressure Trip	A	Standard Pressure Source	Once/operating cycle
Turbine Stop Valve Closure	A	Note (4)	Note (4)

NOTES FOR TABLE 4.1-2

1. A description of three groups is included in the Bases of this Specification.
2. Calibration test is not required on the part of the system that is not required to be operable, or is tripped, but is required prior to return to service.
3. The current source provides an instrument channel alignment. Calibration using a radiation source shall be performed each refueling outage.
4. Actuation of these switches by normal means will be performed during the refueling outages.
5. Calibration shall be performed utilizing a water column or similar device to provide assurance that damage to a float or other portions of the float assembly will be detected.
6. Sensor calibration once per operating cycle. Master/slave trip unit calibration once per 6 months.

Amendment No. ~~46~~, ~~62~~, ~~86~~, ~~136~~, 183

3.2 LIMITING CONDITIONS FOR OPERATION

3.2 INSTRUMENTATION

Applicability:

Applies to the plant instrumentation which either (1) initiates and controls a protective function, or (2) provides information to aid the operator in monitoring and assessing plant status during normal and accident conditions.

Objective:

To assure the operability of the aforementioned instrumentation.

Specifications:

A. Primary Containment Isolation Functions

When primary containment integrity is required, the limiting conditions of operation for the instrumentation that initiates primary containment isolation are given in Table 3.2-1.

When primary containment integrity is required, the primary containment isolation actuation instrumentation response time for MSIV closure shall be within the limits in Table 3.2-9.

4.2 SURVEILLANCE REQUIREMENTS

4.2 INSTRUMENTATION

Applicability:

Applies to the surveillance requirement of the instrumentation which either (1) initiates and controls protective function, or (2) provides information to aid the operator in monitoring and assessing plant status during normal and accident conditions.

Objective:

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

Specifications:

A. Primary Containment Isolation Functions

Instrumentation shall be functionally tested and calibrated as indicated in Table 4.2-1.

System logic shall be functionally tested as indicated in Table 4.2-1.

The response time of each primary containment isolation actuation instrumentation isolation trip function listed in Table 3.2-9 shall be demonstrated to be within the limits in the table during each 18 month test interval. Each test shall include at least one channel in each trip system. All channels in both trip systems shall be tested within two test intervals.

3.2 (cont'd)

B. Core and Containment Cooling Systems - Initiation and Control

The limiting conditions for operation for the instrumentation that initiates or controls the Core and Containment Cooling Systems are given in Table 3.2-2. This instrumentation must be operable when the system(s) it initiates or controls are required to be operable as specified in Specification 3.5.

C. Control Rod Block Actuation

1. The limiting conditions of operation for the instrumentation that initiates control rod block are given in Table 3.2-3.
2. The minimum number of operable instrument channels specified in Table 3.2-3 for the rod block monitor may be reduced by one in one of the trip systems for maintenance and/or testing, provided that this condition does not last longer than 24 hours in any 30 day period.

D. Radiation Monitoring Systems - Isolation and Initiation Functions

Refer to the Radiological Effluent Technical Specifications (Appendix B).

4.2 (cont'd)

B. Core and Containment Cooling Systems - Initiation and Control

Instrumentation shall be functionally tested, calibrated, and checked as indicated in Table 4.2-2.

System logic shall be functionally tested as indicated in Table 4.2-2.

C. Control Rod Block Actuation

Instrumentation shall be functionally tested, calibrated, and checked as indicated in Table 4.2-3.

System logic shall be functionally tested as indicated in Table 4.2-3.

D. Radiation Monitoring Systems - Isolation and Initiation Functions

Refer to the Radiological Effluent Technical Specifications (Appendix B).

4.2 BASES

The instrumentation listed in Tables 4.2-1 through 4.2-8 will be functionally tested and calibrated at regularly scheduled intervals. The same design reliability goal as the Reactor Protection System is generally applied. Sensors, trip devices and power supplies are tested, calibrated and checked at the same frequency as comparable devices in the Reactor Protection System.

The response times for MSIV isolation in Table 3.2-9 include the primary sensor and all components of the logic which must function to de-energize the MSIV pilot valve solenoids. Electrolytic filter capacitors are installed on the input to the main steam line flow ATTS trip units. General Electric analysis (MDE-278-1285 December 1985) accounts for the delay caused by the capacitors and justifies the increase in response time to 2.5 seconds for the main steam line high flow actuation signal. With the exception of the MSIVs, response time testing is not required for any other primary containment isolation actuation instrumentation. The safety analyses results are not sensitive to individual sensor response times of the logic systems to which the sensors are connected for isolation actuation instrumentation.

Those instruments which, when tripped, result in a rod block have their contacts arranged in a 1 out of n logic, and all are capable of being bypassed. For such a tripping arrangement with bypass capability provided, there is an optimum test interval that should be maintained in order to maximize the reliability of a given channel (7). This takes account of the fact that testing degrades reliability and the optimum interval between tests is approximately given by:

$$i = \sqrt{\frac{2t}{r}}$$

Where:

i = the optimum interval between tests.

t = the time the trip contacts are disabled from performing their function while the test is in progress.

r = the expected failure rate of the relays.

To test the trip relays requires that the channel be bypassed, the test made, and the system returned to its initial state. It is assumed this task requires an estimated 30 minutes to complete in a thorough and workmanlike manner and that the relays have a failure rate of 10^{-6} failures per hour. Using this data and the above operation, the optimum test interval is:

$$i = \sqrt{\frac{2(0.5)}{10^{-6}}} = 1x\,10^{3}\ hr.$$

$$= 40 \text{ days}$$

For additional margin a test interval of once/month will be used initially.

The sensors and electronic apparatus have not been included here as these are analog devices with readouts in the control room and the sensors and electronic apparatus can be checked by comparison with other like instruments. The checks which are made on a daily basis are adequate to assure operability of the sensors and electronic apparatus, and the test interval given above provides for optimum testing of the relay circuits.

TABLE 3.2-9

PRIMARY CONTAINMENT ISOLATION SYSTEM ACTUATION INSTRUMENTATION RESPONSE TIMES

	TRIP FUNCTION	RESPONSE TIME (Seconds)
1)	MSIV Closure - Reactor Low Water Level (L1) (02-3LT-57A, B and 02-3LT-58A, B)	≤ 1.0
2)	MSIV Closure - Low Steam Line Pressure (02PT-134A, B, C, D)	≤ 1.0
3)	MSIV Closure - High Steam Line Flow (02DPT-116A-D, 117A-D, 118A-D, 119A-D)	≤ 2.5

Note for Table 3.2-9:

The measurement of the response time interval begins when the monitored parameter exceeds the isolation actuation set point at the channel sensor and ends when the Main Steam Isolation Valve pilot solenoid relay contacts open. The pilot solenoid relay contacts to be used for determination of the end point of the response time measurement are:

For the Inboard MSIV pilot solenoid relays:	16A-K14	(ac solenoids)
	16A-K51	(dc solenoids)
For the Outboard MSIV pilot solenoid relays:	16A-K16	(ac solenoids)
	16A-K52	(dc solenoids)