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	BWR PSB	1	1	BWR RSB	1	1
INTERNAL:	ACRS	6	6	ADM/LFMB	1	0
	NRR/PMAS/ILRB	1	1	NRR/ORAS	1	0
	OGC/HDS1	1	0	REG FILE 01	1	1
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N M NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/301 PLAINFIELD ROAD, SYRACUSE, N.Y. 13212/TELEPHONE (315) 474-1511

April 2, 1987
(NMP2L-1015)

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Re: Nine Mile Point Unit 2
Docket No. 50-410

Gentlemen:

This letter provides additional information in support of Niagara Mohawk's March 11, 1987 Application for Amendment to the Operating License. Specifically, Attachment A to this letter provides responses to the questions attached to Ms. Adensam's March 23, 1987 letter.

Also enclosed are changed FSAR pages, which are provided to make the documents consistent with information submitted to the Nuclear Regulatory Commission on March 11, 1987. These FSAR changes, as well as those submitted on March 11, 1987, will be included in an future FSAR amendment.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

CVMangan

C. V. Mangan
Senior Vice President

CVM/NLR/lmn
(0326C)
Enclosure

xc: Regional Administrator, Region I
Ms. E. G. Adensam, Project Director
Mr. W. A. Cook, Resident Inspector
SSC File (2)

A001
1/1

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of Niagara Mohawk Power Corporation (Nine Mile Point Unit 2)	]]]]]	Docket No. 50-410

AFFIDAVIT

C. V. Mangan, being duly sworn, states that he is Senior Vice President of Niagara Mohawk Power Corporation; that he is authorized on the part of said Corporation to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.

C Mangan

Subscribed and sworn to before me, a Notary Public in and for the State of New York and County of Onondaga, this 2nd day of April, 1987.

Mary Frateschi
Notary Public in and for
Onondaga County, New York

My Commission expires:

MARY FRATESCHI
Notary Public in the State of New York
Qualified in Onondaga County No. 4797550
My Commission Expires March 30, 19 89

ATTACHMENT A

QUESTION 1: Is pneumatic assist required to close the new MSIVs in accordance with Technical Specification requirements? If so, provide details of the system (e.g. design, qualifications) and explain why a loss of air or nitrogen would not create the possibility of a new or different kind of an accident, increase the probability or consequences of an accident previously evaluated or involve a significant reduction in a margin of safety.

RESPONSE 1: The pneumatic assist is required to close the wye pattern globe valve MSIVs to meet Technical Specification closing time requirements.

System Description

The safety related pneumatic assist function includes the check valves, accumulators and interconnecting piping up to the actuator. An accumulator is dedicated to each valve. See Figure 1 for a diagram of the actuator system for each valve. This equipment is ASME Section III, Safety Related, Seismic Class 1 and will be environmentally qualified for Unit 2. The valves will be environmentally qualified prior to being declared operable. This Safety Related portion pneumatic assist is separated from the instrument air or nitrogen system by a safety related check valve.

For the four outboard valves, the non-safety related instrument air system provides the initial charge for the accumulators and maintains the required air pressure in the accumulators during normal operation. If the instrument air or nitrogen system makeup is unavailable, the accumulator provides enough air for one closure of the MSIV. The inboard valves operate in the same manner except the nitrogen system is used to maintain accumulator pressure.

Loss of Air Transients

Loss of air or nitrogen pressure upstream of the check valve causes wye pattern globe valve closure within 3 to 5 seconds. A loss of instrument air transient is discussed in FSAR Section 15.0.4. Previously (with the ball valves), the MSIVs would also close on loss of condenser vacuum or low main steam line pressure with the mode switch in the run position, upon loss of the instrument air.

Loss of air or nitrogen between the check valve and actuator causes the affected valve to close by spring force.[1] The valve would close but possibly longer than the 3 to 5 seconds requirement of the Technical Specification. This latter case would not affect the ability of the other valve in the line to

---

NOTE 1: If the air or nitrogen pressure bleeds down due to this leak, either the outboard (instrument air line break) or inboard (nitrogen line break) causes a MSIV closure.

close within 3 to 5 seconds if required. Thus, the single failure criteria is met in either case. There is no single failure which would prevent at least one valve in each line from closing in the time prescribed by the Technical Specifications. These conditions are analogous to the design of the ball valve actuator which has been removed. For the ball valve, depending on the size of the break, the valve would close, but not necessarily within 3 to 5 seconds, upon loss of hydraulic fluid.

Previously, the ball valve would not close upon failure of the dual springs. Similarly, a failure of the springs and the pneumatic assist is required to prevent the wye pattern globe valve from closing. The pneumatic assist provides a diverse means of closing the valves reliably.

For the wye pattern globe valves, the ASME Section III accumulators are maintained at a pressure lower than that which causes high energy missiles.

<u>Loss of Air Does Not Create a New or Different Accident</u>

The wye pattern globe valves will close upon the loss of air or nitrogen. This does not create a new or different accident since MSIV closure has been analyzed. The failure of the air or nitrogen lines between the check valve and actuator is similar to the hydraulic line failure for the ball valves. This failure results in the same action, valve closure, which does not create a new accident.

The wye pattern globe valves will close upon failure of the air line or nitrogen line upstream of the check valve. This failure is similar to the loss of instrument air failure of the ball valves that results in valve closure. This is as discussed in FSAR Section 15.0.4. The ball valves did not close on loss of nitrogen. Since the inadvertent closure of the MSIVs was previously analyzed, the loss of instrument air or nitrogen does not present a new accident. The only possible consideration is inadvertent valve closure which was previously analyzed.

Loss of Air or Nitrogen Does Not Affect the Consequences of an Accident

The instrument air system, nitrogen system and Safety Related pneumatic assist equipment is not directly interconnected with any reactor coolant pressure boundary piping. Therefore this does not increase the probability of an accident. The instrument air piping outside primary containment is non-safety related. The nitrogen systems and pneumatic assist equipment inside primary containment are ASME Section III class piping designed for seismic and environmental conditions. The effect of the modification of the instrument air system is negligible on the diesel generator loading and power distribution system as well as on the instrument air and nitrogen system usage.This does not affect the consequences of an accident, since the loss of air or nitrogen failure was assumed in both (Wye pattern and ball valve design) cases.

Loss of Air or Nitrogen Does Not Affect the Margin of Safety

The loss of instrument air or nitrogen does not affect the margin of safety. Inadvertent valve closure remains unchanged. The loss of pneumatic assist equipment is analogous to the loss of hydraulic fluid which causes valve closure (but not necessarily within 3 to 5 seconds) in both cases. This does not affect the margin of safety. Failure of the wye pattern globe valve actuator is similar to the single failure of the ball valve hydraulic operator, which does not effect margin of safety.

QUESTION 2: What are the differences in the way the ball valves operate versus the way the wye-pattern globe valves operate (e.g. flow characteristics)? Why are there not new kinds of accidents associated with these changes?

RESPONSE 2: Ball valves are hydraulically opened spring-to-close valves which require the ball to rotate 90 degrees from a full open to a full closed position. Wye pattern globe valves use pneumatic pressure to open and spring and pneumatic force to close. They are cylinder type mounted on a 45 degree angle and open and close with a linear action. When full open the ΔP across the wye pattern globe valves is 10 psi higher than the ball valves. The effects of the valve differences on transient and accident analyses are discussed below:

a. System Transient

The existing FSAR transient analyses are based upon an analytical model that bounds the closure characteristics (flow area versus time) of either the ball or globe valves.

In addition, wye pattern globe valves have a 10 psi higher pressure differential when full open, than the ball valves, due to frictional flow losses. Sensitivity studies performed by GE based upon information from a number of plants have shown that the larger Δ P across the steamline volume produces milder transient response. Larger steam line Δ P has a dampening effect on the pressure wave following a closure of turbine stop or control valves.

Furthermore, most other operating BWRs in the United States have the wye pattern globe valve MSIVs. The design basis transient analyses for those plants have been recognized by the NRC as adequate to envelope all postulated transient scenarios. Since the transient cases currently identified and analyzed for NMP2 are similar to other operating BWRs, no new transient scenario is created due to the valve change.

b. Vessel Overpressure Protection

The peak vessel pressure in the overpressure protection analysis is derived from the limiting pressurization transient events among the system transients discussed in 2a above. Therefore, the same conclusion applies. There is no new transient case created due to the valve change.

c. Containment Response to LOCA

The containment response remains the same. Both the limiting pressure and temperature conditions were reviewed as a result of the change to wye pattern globe valves. Since the valve closure time of 3 to 5 seconds remains the same, the containment response is not affected. There is no new transient or accident created due to the valve change.

d. ECCS Response to LOCA

The change in MSIV closure characteristics, resulting from the installation of the wye pattern globe valves has a negligible effect on the ECCS performance analyses. The change to wye pattern globe valves would cause less than 1 degree F. increase in the final peak clad temperature (PCT) for the most limiting large break and less than 2 degrees F. increase for small breaks. Therefore, the acceptance criteria for emergency core cooling systems for light water nuclear power reactors as contained in 10CFR50.46 are satisfied with the globe valves in operation. The modeling of steam flow during MSIV closure remains unchanged and is described in NEDO-10329, page B-9.

Based upon the above assessment, there are no new or different accidents created due to the valve change.

QUESTION 3: Provide an analysis of why the change to the MSIV closure setpoint change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

RESPONSE 3: For the MSIV position scram setpoint, the analytical limit used in transient analysis is changed from "90% open" to "85% open." The corresponding nominal trip setpoint is changed from "$\leq$ 6% closed" to "$\leq$ 8% closed". The setpoint change does not create a new accident as discussed below:

a. LOCA

For a recirculation line, feedwater line, or ECCS line break, MSIV closure is conservatively assumed to occur on Low-Low-Low water level (Level 1). A scram will already have occurred on Low water level (Level 3). Thus, changing the MSIV position scram setpoint has no effect on the ECCS performance analyses.

b. Steamline Break Inside Containment

For a steamline break inside the containment, the scram will occur on high drywell pressure before MSIV closure occurs. Thus, the MSIV position scram setpoint is irrelevant to the system response.

c. Steamline Break Outside the Containment

For steamline break outside the containment, the analysis conservatively starts with the water level at the scram trigger point, Low water level (Level 3). Realistically, a scram is likely to occur earlier due to MSIV closure on high steam line flow, but this input has been conservatively omitted in the analysis. Thus, the analysis is unaffected by the position scram setpoint change.

Therefore, since the scram setpoint for the MSIVs is not used as input in any of the accident analyses, there are no new or different accidents created due to the setpoint change.

QUESTION 4: Other than no change in the critical power ratio, what is the basis for determining there is no significant reduction in any margin of safety resulting from the MSIV closure setpoint change?

RESPONSE 4: Critical Power Ratio is not the only basis for determining the margin of safety. Each section of the FSAR, and hence each aspect of plant design that affects public health and safety was reviewed to determine the effect on margin of safety. Further, the attached FSAR changes were reviewed and have an insignificant effect on the margin of safety. The changes are provided to make the FSAR consistent. The effect of the instrument air, nitrogen and pneumatic actuator changes are

discussed in Response 1. The effect of the change in the position scram setpoint is discussed in Response 6. The change in the FSAR Figure 5.4.7 and Table 3.2-4 are administrative only. These changes have an insignificant effect on the margin of safety.

QUESTION 5: What are the changes in the margins of safety for the manual closure of all MSIVs and the pressure regulator controller failure transients as a result of the MSIV closure setpoint change?

RESPONSE 5: The only safety margin affected by these transients is Δ CPR. The change in Δ CPR for both manual closure of all MSIVs and pressure regulator controller failure transients due to change of MSIV position scram setpoint is insignificant (much less than 0.01).

QUESTION 6: What are the changes in margins of safety for the change from ball to wye pattern globe valves; how were they determined; and how was it determined that there were no others?

RESPONSE 6: The changes in the margin of safety for the change to the wye pattern globe valve are shown below:

COMPARISON OF MSIV CHARACTERISTICS

	BALL	Y
Operating Limit[1] CPR	1.28	1.28
Limiting Transient[1] CPR	0.22	<0.22[2]
Safety Limit MCPR	1.06	1.06
Peak Vessel Pressure (psi)	1268	1268
Allowable Pressure (psi)	1375	1375
Large Break PCT (°F)	1921	1922
Small Break PCT (°F)	1522	1524
Allowable PCT (°F)	2200	2200

(1) Load rejection without bypass Section 15.2.2
(2) Slightly less due to 10 psi higher P across Y valves

COMPARISON OF MSIV POSITION SCRAM SETPOINT CHANGE

Operating Limit CPR	1.28	1.28
MSIV Closure Event [1, 4] (15.2.4)[3] CPR	0.01	<0.01
Safety Limit MCPR	1.06	1.06
Peak Vessel Pressure (psi)	1268	1271
Allowable Pressure (psi)	1375	1375

(1) Only event affected by setpoint change
(2) Load rejection without bypass Section 15.2.2 using ODYN Option A
(3) Slightly less due to 10 psi higher P across Y valves
(4) No change in Limiting Transient

The above values were determined during the review of the transient analysis as part of the change to wye pattern globe valves.

The Final Safety Analysis Report describes the effect of plant design and operation on the health and safety of the public. Each section of the FSAR was reviewed to determine whether the change to the wye pattern globe valves impacts the previously accepted Final Safety Analysis Report. These changes to the FSAR were submitted to the NRC along with the amendments to the Operating License and Technical Specifications. Additional changes are being submitted with these responses. Based upon the review of the information described above, and the systematic review of the FSAR, and the fact that many other BWRs use wye pattern globe MSIV's, Niagara Mohawk has determined that there are no other changes in the margins of safety.

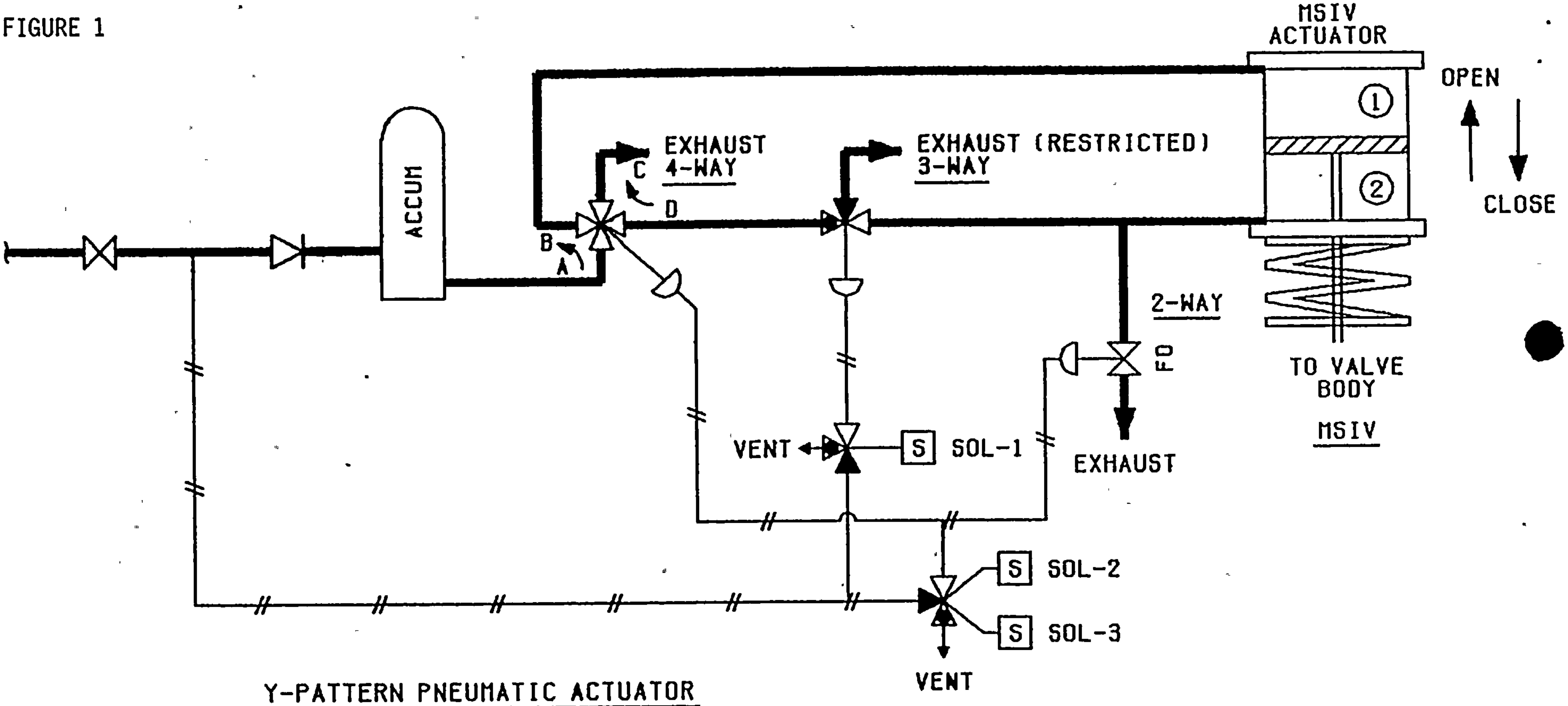
[illegible]

[illegible]

[illegible]

[illegible]

FIGURE 1



Y-PATTERN PNEUMATIC ACTUATOR
(SHOWN IN DE-ENERGIZED/CLOSED CONDITION)

TABLE OF OPERATIONS

MSIV OPEN

(A) SOL-1 IS DE-ENERGIZED- 3-WAY VLV ACTUATED

(B) SOL-2 OR SOL-3 ENERGIZED

a) 2-WAY VLV CLOSES

b) 4-WAY VLV ACTUATED & AIRFLOW REDIRECTED (A→D/B→C) WHICH ALLOWS VOLUME (1) TO EXHAUST VIA B-C & VOLUME (2) TO PRESSURE VIA A-D & 3-WAY VLV.:MSIV OPENS.

RPS TEST

(A) MSIV IS OPEN

(B) SOL-1 IS ENERGIZED

(C) 3-WAY VLV GOES TO EXHAUST POSITION & ALLOWS VOLUME (2) TO VENT THROUGH RESTRICTED EXHAUST.

(D) MSIV SLOW CLOSES UNTIL OPERATORS DE-ENERGIZE SOL-1. AFTER WHICH MSIV RETURNS TO FULL OPEN.

FAST CLOSE (EMERGENCY)

(A) SOL-2 & 3 ARE DE-ENERGIZED.

(B) 4-WAY VLV GOES TO NORMAL. (AIRFLOW IS A - B/D - C)

(C) 2-WAY VLV OPENS.

(D) VOLUME (2) VENTS THROUGH 2-WAY VALVE & 4-WAY VLV (D-C).

(E) VOLUME (1) IS PRESSURIZED VIA 4-WAY VLV (A-B) WHICH FORCES MSIV CLOSED ALONG WITH ACTUATOR SPRING'S.

FSAR CHANGES

TABLE 3.2-4

REACTOR COOLANT PRESSURE BOUNDARY
CLASS I EQUIPMENT CODE APPLICATION

Equipment	MPL/Mark	Code* Edition	Addenda
Reactor pressure vessel	B13-D003	1971	Winter 1972
Main steam system			
Piping		1974	No Addenda
Containment isolation valves	B22-F022A	1977	Summer 1977
	B22-F022B	1977	Summer 1977
	B22-F022C	1977	Summer 1977
	B22-F022D	1977	Summer 1977
	B22-F016	1974	Winter 1975
	B22-F019	1974	Winter 1975
	B22-F028A	1977	Summer 1977
	B22-F028B	1977	Summer 1977
	B22-F028C	1977	Summer 1977
	B22-F028D	1977	Summer 1977
	2MSS*MOV208	1974	Winter 1975
Manual block valve	2MSS*MOV207	1974	Winter 1975
Safety/relief valves	B22-F013	1974	Summer 1976

2. Qualify for the rated nameplate capacity credit for the overpressure protection function.

3. Meet other performance requirements, such as response time, necessary to provide relief functions.

The SRV discharge piping is designed, installed, and tested in accordance with ASME Section III.

5.2.2.1.4 Safety/Relief Valve Capacity

The SRV capacity is adequate to limit the primary system pressure, including transients, to the requirements of the ASME Boiler and Pressure Vessel Code, Section III, Division 1, 1971 Edition up to and including Winter 1972 Addenda. The essential ASME requirements which are all met by this analysis are discussed as follows.

It is recognized that the protection of vessels in a nuclear power plant is dependent upon many protective systems to relieve or terminate pressure transients. Installation of pressure-relieving devices may not independently provide complete protection. The safety valve sizing evaluation assumes credit for operation of the scram protective system which may be tripped by either one of two sources, i.e., a direct or flux trip signal. The direct scram trip signal is derived from position switches mounted on the main steam line isolation valves (MSIVs) or the turbine stop valves or from pressure switches mounted on the dump valve of the turbine control valve hydraulic actuation system. The position switches are actuated when the respective valves are less than or equal to 90-percent fully open. The pressure switches are actuated when a fast closure of the turbine control valves is initiated. Further, no credit is taken for power operation of the SRVs in the relief mode. 13
Credit is taken for the dual-purpose SRVs in the safety mode.

The rated capacity of the SRVs is sufficient to prevent a rise in pressure within the protected vessel of more than 110 percent of the design pressure (1.10 x 1,250 psig = 1,375 psig) for events defined in Section 15.2.

Full account is taken of the pressure drop on both the inlet and discharge sides of the valves. All SRVs discharge into the suppression pool through a discharge pipe from each valve which is designed to achieve sonic flow conditions through the valve, thus providing flow independence to discharge piping losses. Additional measures to counteract

settings are less than or equal to 85% fully open for MSIVs and less than or equal to 90% fully open for the turbine stop valves.

TABLE 5.2-4

SEQUENCE OF EVENTS FOR FIGURE 5.2-1

Time (sec)	Event
0	Closure of all main steam isolation valves (MSIVs) was initiated.
0.3	MSIVs reached 85% open. Failure of direct position scram was assumed.
1.7	Neutron flux reached APRM flux set point and initiated reactor scram.
2.29	Sensed reactor dome pressure reached set point of recirculation pump trip.
2.35	Recirculation pump/motor initiated to coast down.
2.7	Steamline pressure reached Group 1 safety/relief valves pressure set point (spring-action safety mode), while power actuated relief mode was ignored. (See Section 5.2.2.2.2)
3.3	Safety/relief valves all opened due to high pressure.
3.68	Vessel bottom pressure reached its peak value.

Events caused by low water level trips, including closure of MSIVs and initiation of HPCS and RCIC core cooling system functions, are not included in the simulation. Should these events occur, they will follow sometime after the primary concerns of fuel thermal margin and overpressure effects have occurred. These effects are less severe than those already experienced by the system.

A qualitative discussion of this event at low power is provided in Section 15.2.3.3.3, Turbine Trip with Bypass Failure, Low Power.

15.2.3.5 Radiological Consequences

While this event does not result in fuel failures, it does result in the discharge of normal coolant activity to the suppression pool via SRV operation (Section 15.1.2.5).

15.2.4 MSIV Closures

15.2.4.1 Identification of Causes and Frequency Classification

15.2.4.1.1 Identification of Causes

Various steam line and nuclear system malfunctions, or operator actions, can initiate MSIV closure. Examples are low steam line pressure, high steam line flow, high steam line radiation, low water level, or manual action.

15.2.4.1.2 Frequency Classification

Closure of All Main Steam Isolation Valves

This event is categorized as an incident of moderate frequency. To define the frequency of this event as an initiating event and not the byproduct of another transient, only the following contribute to the frequency: manual action (purposely or inadvertent); spurious signals such as low pressure, low reactor water level, low condenser vacuum; and equipment malfunctions such as faulty valves or operating mechanisms. A closure of one MSIV may cause an immediate closure of all the other MSIVs, depending on reactor conditions. If this occurs, it is also included in this category. During MSIV closure, position switches on the valves provide a reactor scram if the valves in three or more main steam lines are less than 85 percent open (except for bypasses which permit proper plant startup). Protection system logic, however, permits the test closure of one valve without initiating scram from the position switches.

All plant control systems maintain normal operation unless specifically designated to the contrary.

15.2.4.2.3 Effect of Single Failures and Operator Errors

Mitigation of pressure increase is accomplished by initiation of the reactor scram via signal imput from the MSIV position switches to the reactor protection system. Relief valves also operate to limit system pressure. All these aspects are designed to single-failure criterion and additional single failures would not alter the results of this analysis.

Failure of a single relief valve to open is not expected to have any significant effect. Such a failure is expected to result in less than a 5 psi increase in the maximum vessel pressure rise. The peak pressure still remains considerably below 1,375 psig. The design basis and performance of the pressure relief system is discussed in Chapter 5.

15.2.4.3 Core and System Performance

15.2.4.3.1 Mathematical Model

The computer model described in Section 15.1.2.3.1 was used to simulate these transient events.

15.2.4.3.2 Input Parameters and Initial Conditions

These analyses have been performed, unless otherwise noted, with plant conditions tabulated in Table 15.0-2.

The MSIVs close in 3 to 5 sec. The worst case for reactor pressure increase transient, the 3-sec closure time, is assumed in this analysis.

Position switches on the valves initiate a reactor scram when the valves are less than 85 percent open.

15.2.4.3.3 Results

Closure of All Main Steam Isolation Valves

Figure 15.2-5 shows the changes in important nuclear system variables for the simultaneous isolation of all main steam lines while the reactor is operating at 105 percent of NBR steam flow. Peak neutron flux reaches 138 percent of rated after approximately 2.4 sec. At this time, the nonlinear valve closure becomes a strong effect and the conservative

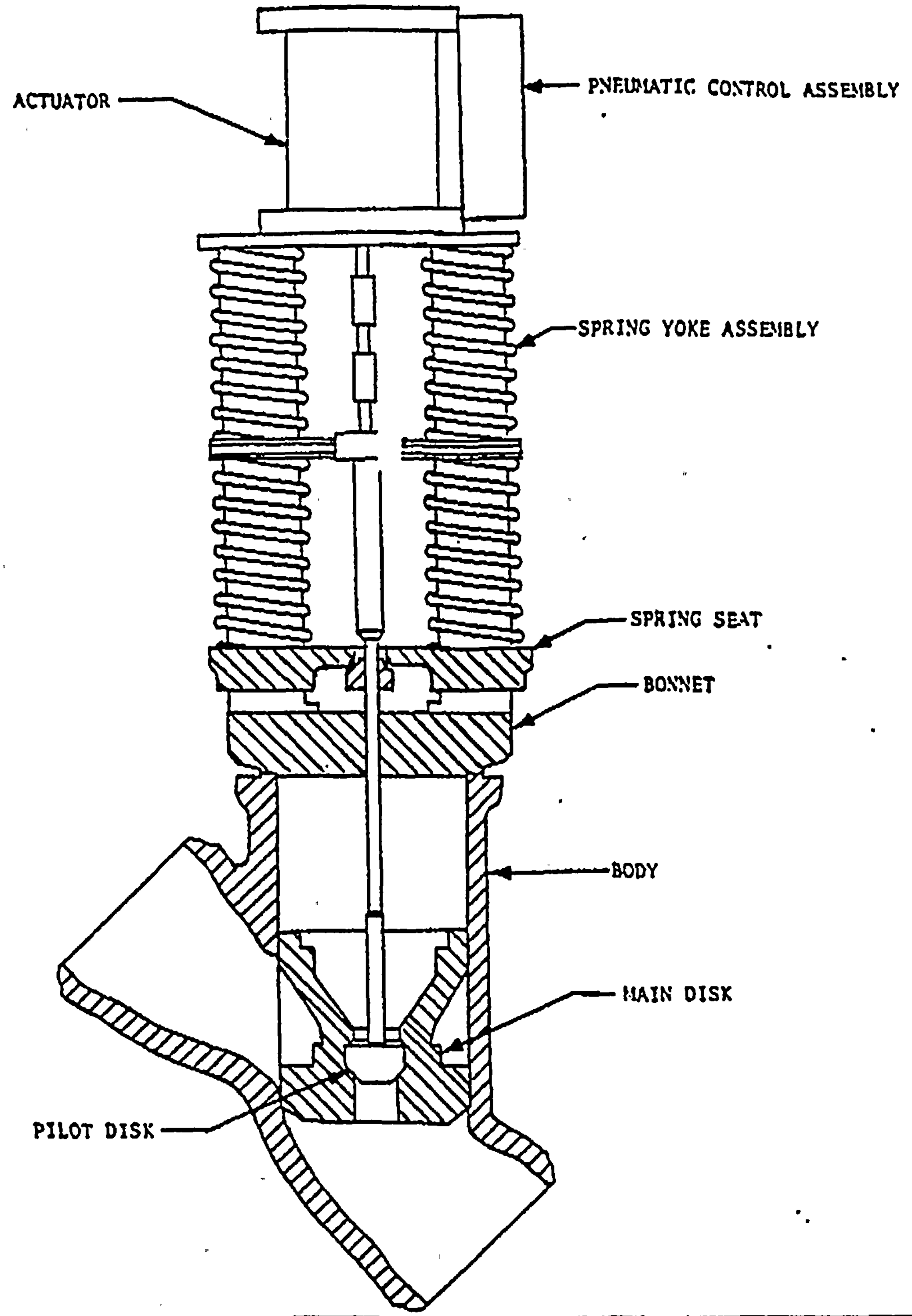


FIGURE 5.4-7

MAIN STEAM ISOLATION VALVE
CUTAWAY VIEW

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

TABLE 15.2-5

CLOSURE OF ALL MAIN STEAM ISOLATION VALVES
SEQUENCE OF EVENTS FOR FIGURE 15.2-5

Time (sec)	Event
0	Initiate closure of all main steam isolation valves (MSIV)
0.3	MSIVs reach 85% open
0.3	MSIV position trip scram initiated
2.4	Dome pressure reaches the set pressures of recirculation pump trip
2.45	Recirculation system starts coastdown
2.7	Group 1 pressure relief valve opening set point is reached
3.0	All MSIVs closed
3.6	All five pressure relief valve groups open
6.9 (est)	Group 5 pressure relief valves start to close
8.9 (est)	All pressure relief valve groups closed

TABLE 3-4

REACTOR BUILDING CRANES - LOADS HANDLED

Crane Load	Crane Mark No.	Weight (tons)	Designated Lifting Device	Governing Handling Procedure	Frequency Handled
Main Outboard Steam Valve(s) 2MSS*AOV7A, B, C, and D	2MHS-CRN7	7	Sling Assembly	*	*
MSS Valve Operators	2MHS-CRN7	6.3	Sling Assembly	*	*
Feedwater Valves	2MHS-CRN7	8	Sling Assembly	*	*
Hatch Cover (Pipe Chase) at El 328'-10"	2MHR-CRN51	5.5	Sling Assembly	*	*
Hatch Cover (Pipe Chase) at El 328'-10"	2MHR-CRN52	4	Sling Assembly	*	*
PSV Valves (PSV-120 to 137)	2MHR-CRN65	1.8	Sling Assembly	*	*
CRD Cart	2MHR-CRN66	1.5	Sling Assembly	*	*
Recirculation Pump Motors	2MHR-CRN364	33.5	Sling Assembly	*	*
RDS Cart	2MHS-CRN1	1	Sling Assembly	*	*
Cooling Coil Cart	2MHR-CRN364	5	Sling Assembly	*	*
Equipment/Personnel Hatch Cover at El 261'-0"	2MHR-CRN1	23	Sling Assembly	*	*
Inboard Steam Valves 2MSS*AOV6A, B C, and D	2MHR-CRN67	6.5	Sling Assembly	*	*
	2MHR-CRN67A	5.0	Sling Assembly	*	*
	2MHR-CRN67B	5.0	Sling Assembly	*	*
	2MHR-CRN67C	5.0	Sling Assembly	*	*
	2MHR-CRN67D	5.0	Sling Assembly	*	*

*Load-handling procedures will be developed to cover load-handling operations for heavy loads that are handled over or in proximity to spent fuel or safe shutdown equipment. Frequency will depend on maintenance guidelines.

7. The ventilation supply isolation dampers to the reactor building ventilation fail closed.

8. The standby gas treatment system will align itself to take suction from the secondary containment.

9. The RCIC steamline drain and RHR heat exchanger steam supply control valves will close upon loss of air. The RHR heat exchanger steam supply is normally closed by a motor-operated valve. RHR steam supply control valves also are normally closed.

10. The minimum flow bypasses for the condensate, condensate booster, and feedwater pumps will open, bypassing feedwater to the condenser. This could cause the reactor water level to drop to Level 3, thereby initiating a scram signal.

11. Automatic hotwell level control is lost as the air-operated makeup valve fails open. Reject valves fail closed.

12. Standby liquid control - The level indication for the storage tank will decrease to zero.

13. MSIV will receive a "Close" signal due to loss of condenser vacuum or on low main steam line pressure with the mode switch in "Run," or loss of instrument air. 26

14. Loss of instrument air has no effect on HPCS.

15. Nonsafety systems which do not affect safe plant shutdown are affected by complete or partial loss of instrument air. However, complete or partial loss of air does not adversely affect any safety systems required to shut down the plant.

The operator response will be based upon the degree and failure of the instrument air system. Depending on the equipment affected, the operator may take the following actions, although not necessarily in this sequence:

1. Confirm that the reactor has scrammed and is subcritical.

2. Operate RCIC and/or HPCS according to normal procedures to maintain normal reactor water level.

3. Continue the cooldown of the reactor with the RHR system after reactor pressure and temperature have decreased to the operating limits of RHR.

4. Upon receipt of alarm of loss of reactor building ventilation, manually initiate operation of the standby gas treatment system.

5. Manually control hotwell level as required.

6. Initiate a scheduled surveillance of the standby liquid control storage tank to confirm proper level.

The instrument air (compressed air) is designed to fail to a position that is consistent with the safe shutdown of the plant. Although specific operator action to shut down the plant safely is not required after a loss of instrument air, the plant procedures will reflect the best actions to be taken.

In the event of the loss of the nitrogen subsystem, the following can be expected to occur in sequence, depending on
7 the location of the failure:

1. The main steam safety/relief valves will not open as a direct result of loss of any nitrogen supply. There is sufficient nitrogen in each accumulator (one for safety relief and ADS, if equipped) to provide actuation of each relief valve with additional capacity available from the nitrogen accumulators in the reactor building for the ADS-designed safety/relief valves.

2. Isolation valves inside the containment which use pneumatic operators are normally closed during operation. They are also fail closed on loss of nitrogen.

3. MSIVs are ~~hydraulic~~ pneumatic to open, spring and pneumatic to close valves, and loss of nitrogen will ~~have no effect on operability.~~ cause the MSIVs to close.

Because of the redundancy and independence of the nitrogen subsystem, no immediate operator actions are generally required to safely shut down the reactor due to such failures.

The response of plant and operator actions are the same as those for a loss of instrument air described above.