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Executive Vice President
Nuclear Generation

April 1, 1992
JPN-92-018

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Subject: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Station Blackout Rule
Response to Safety Evaluation Recommendations

- References:
1. NRC letter, B.C. McCabe to R.E. Beedle, dated November 13, 1991, "Safety Evaluation of the James A. FitzPatrick Nuclear Power Plant Response to the Station Blackout Rule" (TAC 68546).
 2. NYPA letter, R.E. Beedle to the NRC, (JPN-91-066), dated December 18, 1991, "Response to Safety Evaluation Recommendations."

Dear Sir:

Additional Authority responses to the recommendations of the NRC Safety Evaluation (Reference 1) are enclosed as Attachment I. The Authority committed to provide this additional information in Reference 2.

Full responses to three safety evaluation recommendations related to four hour station battery capacity calculations, review of the station blackout procedure, and implementation of an EDG reliability program, will be provided by December 21, 1992.

The specific criteria used to exclude or include each containment isolation valve from station blackout operational and position indication guidelines are identified in Attachments II, III, and IV.

If you have any questions, please contact J. A. Gray, Jr.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'R. Beedle'.

Ralph E. Beedle
Executive Vice President
Nuclear Generation

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Attachments:

- I Additional Responses to Safety Evaluation Recommendations
- II Containment Isolation Provisions During an SBO - Valves Concern
- III Containment Isolation Provisions During an SBO - Excluded Penetrations
- IV Containment Isolation Provisions During a Station Blackout - Individual Penetration Data Sheets

Attachment I to JPN - 92 - 018

April 1, 1992

STATION BLACKOUT RULE

Additional Responses to Safety Evaluation Recommendations

New York Power Authority

James A. FitzPatrick Nuclear Power Plant

Docket Number 50-333

Attachment I to JPN-92-018

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

Introduction

This attachment provides additional responses to the NRC Safety Evaluation (Reference 1*) concerning station blackout. The Authority provided an initial response in Reference 2*. The Authority's initial response did not provide complete answers to all of the safety evaluation recommendations. For those items which were not fully addressed, the Authority committed to provide more complete answers, or completion dates for those answers. This attachment provides those additional responses and submittal dates.

Prior to receipt of the safety evaluation, the Authority had responded to NRC requests for additional information (Reference 3*). That Authority response was received too late to be considered in the NRC safety evaluation. The response did, however, address many of the concerns subsequently presented in the NRC safety evaluation. Accordingly, this response occasionally refers to the answers previously provided in Reference 3.

The safety evaluation makes several recommendations concerning operability and position indication for electrically interlocked containment isolation valves (CIV) that the Authority excluded from SBO procedures. In addition to the response contained in this attachment, the Authority has provided Attachments II, III, and IV to identify, for each CIV, the basis for excluding or including the valve or penetration as an area of SBO concern.

The NRC safety evaluation recommendations are repeated *in italics*. The Authority's response follows the NRC recommendation.

*Note: References are identified on page 14 of this attachment.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

Responses to Individual Safety Evaluation Recommendations

NRC Recommendation:

2.2.2 Class IE Battery Capacity

The licensee should verify and confirm that, with the load shedding proposed for SBO conditions, the batteries have sufficient capacity, plus aging and load growth margins to cope with and recover from an SBO of 4 hours. The verification of battery adequacy should consider loads such as those that are needed for EDG start attempts and switching requirements (breaker controls) at the beginning and the end of the SBO event.

NYPA Response:

Details of the load shedding scheme and calculations to demonstrate the ability of the station batteries to power SBO loads for four hours were described in Reference 3. This calculation was conducted in accordance with the procedures in effect in 1989. The SBO battery capacity calculation (JAF-89-013, revision 2) considered EDG field flashing for EDG start attempts and circuit breaker control loads for breaker reclosure during the load shedding and reconnection sequences for restoration of ac power as loads at the onset of the event. These two loads were not considered as random loads throughout the event nor were they considered as loads during the last minute of the four hour coping period. However, this calculation indicated that for the limiting interval at the end of the duty cycle, the sixteen positive plates in each battery exceeded the calculated minimum number of required plates (12 for 72SB-2 and 13 for 72SB-1) by a significant margin. This calculated margin was considered to be adequate to include EDG field flashing and breaker reclosure loads even during the last minute of the four hour coping period.

A new formal engineering review is being conducted in accordance with current engineering design procedures. This review started with the calculations supporting the two hour duty cycle described in the FSAR. This review encompasses the updating, revision and unification of several existing battery capacity calculations including those performed for the original plant design basis, station battery replacement, and the SBO battery capacity calculation addressed in Reference 3.

Upon completion of the review for the FSAR two hour duty cycle calculations, the calculations will be revised to address SBO criteria and assess the battery capacity relative to the SBO four hour coping period. This adjustment is necessary to accommodate the differences in the battery loads and the duty cycle time limits between the SBO and FSAR criteria.

The Authority anticipates that the revised calculations will be completed by December 21, 1992.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NRC Recommendation:

2.2.5 Containment Isolation

Add the valves that were excluded by the additional criteria (a valve interlocked with another valve) in an appropriate procedure.

Identify actions which are needed to confirm these valves (interlocked valves excluded by methodology) are closed. The valve closure needs to be confirmed by position indication (local, remote, mechanical, process information, etc.) independent of the preferred (off site) or on site power.

NYPA Response:

The Authority has identified 15 valves of concern for the isolation of six containment penetrations during an SBO event. All of these valves are operated by dc motors and have position indication in the control room. These valves and penetrations are identified in Attachment II.

The Authority has not added the valves excluded due to the interlocked criteria, into plant procedures. The reasons for this are presented in the discussion of the penetration-by-penetration methodology, and explanations of the criteria used for excluding interlocked valves and water sealed valves, which are presented in this attachment.

Accordingly, the Authority does not consider it necessary to confirm that interlocked or water sealed valves (excluded by methodology) are closed during an SBO. The Authority does not consider position indication to be needed during an SBO, for the valves excluded by these two criteria. This position is supported by the detailed descriptions of the 26 valves excluded by these criteria provided below.

Eight valves isolating four penetrations were excluded using the series mounted electrically interlocked valve criteria. Eighteen more valves isolating seven penetrations were excluded using water seal isolation criteria. These additional exclusion criteria, and the application of the criteria to the 26 valves excluded, are discussed in detail later in this attachment. Most of the remaining valves and penetrations have been excluded from concern during an SBO using NUMARC criteria.

The valves and penetrations which were excluded from SBO concern are identified in Attachment III. This attachment identifies the specific NUMARC or other criteria, together with the SBO evaluation, that were used to determine the exclusion for each individual valve and penetration from concern during an SBO. Attachment III supersedes and replaces "Table 8" which was previously provided to the NRC in Reference 3. Some information contained in "Table 8" concerning the availability of position indication on the 27MAP panel was not correct.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NYPA Response (continued):

Sketches of each penetration showing the location and arrangement of the excluded isolation valves, together with a short table of data for each valve are provided as Attachment IV. These sketches are provided only as an aid to understanding the application of the interlocked and water sealed valve criteria to specific installations. The sketches and the associated tabular data have not been reviewed, approved or controlled in accordance with procedures for formal engineering calculations and drawings.

Methodology: NUMARC criteria uses a **valve-by-valve** approach to identifying every valve on every containment isolation line and verification of closure. One of the problems with this criteria is that the shorter the coping period determined in accordance with 10 CFR 50.63, the less time is available to close or check every valve. At the FitzPatrick plant, the relatively short required coping period of four hours makes it difficult, if not impossible, to manually close or check the position indication for every CIV valve before the coping period for the SBO event would have ended. For example, some of the CIVs are not accessible without the use of scaffolding.

In contrast to the **valve-by-valve** approach, the Authority used a **penetration-by-penetration** verification. At least one valve on every penetration meets one of the five NUMARC criteria, or the interlocked valve or water seal criteria. Some penetrations such as TIP and feedwater have been excluded for other reasons identified in Attachment III. For example, feedwater check valves (which do not have control room position indication) have been accepted in accordance with Regulatory Guide 1.97 which excluded check valves from requirements for position indication. Valves acceptable under RG 1.97 for LOCA conditions should also be acceptable for an SBO event. In the FitzPatrick methodology, if two valves were in series and one valve met an exclusion criterion, the penetration was excluded even if the second valve did not meet the criteria. This approach provides adequate assurance that all containment penetrations are isolated by at least one valve during an SBO. This approach is consistent with Reference 4 which states that it is not necessary to show that both the inboard and outboard containment isolation valves can be closed during an SBO.

Interlocked Valve Exclusion Criterion: A large number of containment isolation valves are closed during reactor operation. In many cases, the closure of these valves is ensured through interlocks that do not permit the penetration to be opened under operating conditions. This category includes CIVs that isolate low pressure systems from high pressure reactor coolant piping. These valves have been excluded from consideration if interlocks ensure closure of the penetration by at least one CIV during normal operation. With one valve closed and the other valve open on the same penetration, the interlock assures that the closed valve remains closed so long as the other valve is open. An example is the core spray injection line which is isolated by two ac motor operated valves installed in series.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NYPA Response (continued):

Although one CIV may be open during normal operation, interlocks do not permit the second CIV to open unless the reactor pressure is less than 450 psig. (Reactor operating pressure is normally 1000 psig.)

The table previously submitted in Reference 3 identified penetrations with interlocked CIVs installed in series which isolate the same line. This criteria does not apply if the valves were installed on different lines.

The NUMARC criteria would require closing the second valve even though the first valve was already closed. During an SBO, ac power would not be available to close the second valve. To meet the criteria, the open valve would have to be closed manually. Manually closing all of the redundant or interlocked valves, even assuming that a sufficient number of licensed operators could be assembled and devoted exclusively to this task, would not be an efficient use of personnel, does not significantly improve the level of protection provided to the public, and would be likely to require more time to implement than the four hour SBO coping duration.

Application - Exclusion of eight valves using the interlocked valve criterion:
The series mounted electrically interlocked valve criterion has been used to exclude only four penetrations.

Penetrations 39A,B are for the drywell spray lines supplied from the residual heat removal (RHR) system. Isolation of these lines is provided by ac motor operated valves 10MOV-31A,B and 10MOV-26A,B. Therefore, these valves would become inoperable during an SBO event. However, each pair of valves (10MOV-39A and 10MOV-26A) and (10MOV-39B and 10MOV-26B) are electrically interlocked and mounted in series. The interlocks insure that one valve is always closed except during drywell spray operations. Drywell spray requires operation of a key lock switch in the control room and a high drywell pressure signal to override this interlock.

Penetrations 211A,B are for the torus spray line supplied from the residual heat removal (RHR) system. Two ac powered CIVs (10MOV-38A,B and 10MOV-39A,B) are installed in series on each torus spray line. These two CIV valves are electrically interlocked so that when one valve is open, the other must be closed. Thus, one valve is always closed and the line is isolated during routine plant operations. The interlock can only be overridden by use of a key lock switch in the control room and a high containment pressure signal.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NYPA Response (continued):

Application - Exclusion of eighteen valves using the water seal criterion:

An example is the suppression pool cooling line, which taps into the torus spray line between the two valves (10MOV-38 and 10MOV-39) and terminates at the torus (penetration 210A,B) below the minimum suppression pool water level. These torus cooling lines have one isolation valve (10MOV-34A,B) installed on each line. A sketch of this arrangement is included in Attachment IV.

During torus cooling operations, the inboard isolation valves 10MOV-38A,B would be closed isolating penetrations 211A,B. The outboard isolation valves 10MOV-39A,B would be open along with the suppression pool cooling isolation valves 10MOV-34A,B. This would appear to create an unisolated potential pathway for leakage out of the primary containment during an SBO when power would not be available to operate 10MOV-34A,B and 10MOV-39A,B.

However, because the torus cooling line opens within the torus below the minimum suppression pool water level, a water seal is created. The water seal effectively insures isolation of penetration 210A,B during an SBO even though the two isolation valves would not be electrically operable. Because the line opens into the torus below the minimum suppression pool water level, the line remains full of water at all times. Although part of this water seal is outside the primary containment, the NUMARC guide lines assume that no other failure will occur simultaneously with an SBO. Therefore the integrity of the water seal is assumed to remain intact during an SBO. Accordingly penetration 210A,B and valve 10MOV-34A,B have been excluded based on the water seal created by the piping extending below the minimum suppression pool water level.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992NRC Recommendation:

2.2.5 Containment Isolation (continued)

In addition, the licensee should verify that the fail closure of the drywell and torus pressure sensing penetration valves would not cause the loss of pressure indications in the control room for these areas.

NYPA Response:

The instrumentation which would be available to the operator during an SBO and loss of uninterruptible power supply (UPS), was identified in Reference 3.

The concern expressed in the recommendation is believed to be related to the function of two penetrations which are identified in FSAR Table 7.3-1 as follows:

<u>Containment Penetration</u>	<u>Penetration Function</u>	<u>Valve Number</u>	<u>Isolation Signal</u>	<u>Close Time</u>	<u>Normal Status</u>
45	Drywell Pressure Sensing	16-1AOV-101A	A,F,R,Z	N/A	Open
		16-1AOV-101B	A,F,R,Z	N/A	Open
218	Torus Pressure Sensing	16-1AOV-102A	A,F,R,Z	N/A	Open
		16-1AOV-102B	A,F,R,Z	N/A	Open

These two pressure sensing lines are used only for the integrated leak rate testing (ILRT) instrumentation. They do not provide information to the operator during normal operation nor during an SBO. Therefore, isolation of these lines during a station blackout event is acceptable. Control room primary containment pressure instrumentation is served by penetration number 50c "Instrumentation Sensing DW Pressure". Penetration 50c is shown as "typical" and the listed characteristics of the penetration also apply to the instrumentation line penetrations for control room indications of containment pressure.

As a part of the July 1992 update of the FSAR, the Authority will add notations to FSAR Table 7.3-1 in the "Remarks" column to indicate that these two lines are used only for ILRT testing.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NRC Commitment:

2.3 Procedures and Training

The licensee stated that plant procedures have been reviewed and changes necessary to meet NUMARC 87-00 will be implemented in the following areas:

- 1. Station Blackout response (Procedure No. AOP-49, "Station Blackout" will conform to NUMARC 87-00, section 4.2.1.*

NYPA Response:

The procedure will be reviewed and compared to NUMARC 87-00. The changes necessary to meet the guidance of NUMARC 87-00, section 4.2.1 will be implemented by December 21, 1992.

NRC Expectation:

2.3 Procedures and Training

The staff expects the licensee to implement the appropriate training to ensure an effective response to an SBO.

NYPA Response:

The 1991 fourth quarter licensed operator requalification simulator training was conducted in accordance with training department course/lesson plan R91-7.1. The licensed operator cycle 7 simulator training was conducted between 9/23/91 and 10/31/91. The final scenario consisted of a walk through of a station blackout sequence. The scenario was frozen approximately 20 seconds after its initiation. A panel walk down and discussion was then conducted in order to emphasize equipment status, plant parameter indication status, and desired course of action. Following the discussion, the simulator was shifted to "run" to allow the crew to perform the actions of AOP-49, "Station Blackout," up to the steps for restoring electrical busses. The remainder of this scenario was considered to be similar enough to the restoration from a previously simulated event (loss of power due to failure of transformer T1A) to justify the omission of the restoration of power phase of the SBO event.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NYPA Response (continued):

The station blackout scenario will be reviewed periodically in requalification training once every two to four years.

A classroom lesson plan is scheduled for development during 1992 for use with the current license replacement class. It will be developed and taught before October 1992 and will become part of the licensed operator replacement training program permanent curriculum.

NRC Recommendation:

- 2.4 *The licensee should include a full description, including the nature and objectives of the required modifications identified above in the documentation that is to be maintained by the licensee in support of the SBO submittals.*

Note: "identified above" refers to two modifications. One modification will provide an alternate power source to the RCIC enclosure ventilation fans which will eliminate the potential for RCIC system isolation on high ambient temperature during an SBO. The other modification will provide alternate power to selected instrumentation, under SBO conditions, to provide operators with information that would otherwise be lost upon shedding of the UPS MG set after one hour into the SBO.

NYPA Response:

Reference 2 stated that "The design of both modifications is expected to be finalized in February 1992." and that "A more complete description including the nature and objectives of the modifications will be provided by March 23, 1992."

Descriptions of the nature and objectives of the proposed modifications are provided below. These descriptions represent the proposed designs currently in the review and approval process. Changes may be made during this process. The Authority will provide revised descriptions to the NRC if significant changes are made to the nature or objectives of these proposed modifications. Detailed engineering descriptions of both modifications will be completed three months prior to the outage in which they are to be installed. Both modifications are scheduled to be installed during the Reload II / Cycle 12 refueling outage currently scheduled to begin in October, 1993. The modification documentation maintained in plant records will include a full description including the nature and objectives of the modifications.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NYPA Response (continued):

The Authority will provide the NRC with an explanation and justification for a delay in completion of the modifications if changes to the outage starting date would result in installation of the modifications beyond the two year limitation of 10 CFR 50.63(c)(4) which expires on November 18, 1993.

RCIC Enclosure Ventilation Fan Power Supply: (F1-89-159) The two fans which provide ventilation to remove heat from the enclosure for the RCIC system are currently powered from two separate motor control centers (MCC). Fan 13FN-2A starts if the temperature in the RCIC enclosure rises to 90°F. The MCC for this fan receives power from normal station ac power. Any loss of normal station ac power would render this fan inoperable.

Fan 13FN-1A starts if the temperature in the RCIC enclosure rises to 105°F. The MCC supply to this fan, in addition to receiving normal station ac power, is backed up during loss of normal station ac power by reserve station power from off site and from the on site emergency diesel generators. However, during a postulated SBO event, power would also be lost to this fan and it would be inoperable.

Therefore, during a station blackout, the power to both ventilation fans would be lost and the temperature of the RCIC enclosure would increase. The increased temperature could potentially impair the operation of some components of the RCIC system.

To provide for operation during an SBO, a backup power supply to both fans will be added from the QA category I Low Pressure Coolant Injection (LPCI) division I dc to ac inverter. Upon loss of all ac power, the inverter will convert dc power, from the division I LPCI battery to ac power to supply the RCIC enclosure ventilation fans. Both of the RCIC ventilation fans will be powered from this LPCI battery during an SBO. The LPCI battery and inverter have adequate capacity to power these fans and other required equipment during an SBO. The transfer of the power source to the LPCI inverter will be automatic without operator action. Upon completion of the modification the fans will be reclassified as QA category M.

The Authority previously stated in Reference 3 that this modification was tentatively scheduled for installation during the 1992 refueling outage. The schedule for installation of this modification has been changed to the Reload 11/ Cycle 12 refueling outage currently scheduled to start in October, 1993.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NYPA Response (continued):

Monitoring and Analysis Panel 27 (27MAP) power supply: (F1-89-158) The panel is currently powered only from the station ac power. The modification will provide automatic transfer to an alternate dc power source upon loss of all ac power sources (SBO).

The modification, as previously described to the NRC (Reference 3), would have provided alternate power from the LPCI inverters which in turn are supplied by the LPCI batteries. The proposed source of dc power is currently being reviewed and may be changed to the station battery.

Alternate ac power will be provided from new inverters to be installed in the vicinity of the 27MAP panel. When station ac power is lost (SBO), an under-voltage relay will initiate the automatic transfer from the ac supply to the dc power supply which will energize the 27MAP panel ac loads from the new local inverters. The inverters will be classified as QA category I.

The 27MAP panel also supplies a number of dc loads. Currently, these loads receive power from ac-to-dc rectifier power supplies. During an SBO event, the ac power to the rectifiers would be lost and consequently the dc loads would be lost. This modification will install additional dc backup modules inside the 27MAP panel. During an SBO event, the new dc backup modules will automatically connect each dc load to a source of dc power (station battery or LPCI battery).

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NRC Expectation:

2.5 Quality Assurance and Technical Specifications

The staff expects that the plant procedures will reflect the appropriate testing and surveillance requirements to ensure the operability of the necessary SBO equipment.

The licensee should verify that the SBO equipment is covered by an appropriate QA program consistent with the guidance of RG 1.155. This evaluation should be documented as part of the documentation supporting the SBO rule response.

NYPA Response:

SBO equipment coverage by QA program: The plant equipment and systems necessary to meet the requirements of 10 CFR 50.63 (Station Blackout), are currently classified as quality assurance (QA) category I, safety related. Equipment classified as QA category I is controlled under the site Nuclear Safety Related Quality Assurance Program which was established to meet the requirements of 10 CFR 50, Appendix B. This program is described in Chapter 17 of the Final Safety Analysis Report. Implementation of the program is assured by administrative procedure AP 1.7, "Quality Assurance Program Implementation at JAF". This program applies to equipment and activities classified as either QA category I or category M.

NRC Regulatory Guide (RG) 1.155, "Station Blackout" in section C, "Regulatory Position", paragraph 3.5 "Quality Assurance and Specification Guidance for Station Blackout Equipment That Is Not Safety Related", states in part that:

"Appendices A and B provide guidance on quality assurance (QA) activities and specifications respectively for non-safety related equipment used to meet the requirements of 10 CFR 50.63 and not already covered by existing QA requirements in Appendix B or R of Part 50."

The quality assurance program elements identified in Appendix A of RG 1.155 are encompassed entirely within the QA program elements of the FitzPatrick Nuclear Safety Related Quality Assurance program which meets the requirements of 10 CFR 50, Appendix B.

The equipment required to meet station blackout requirements is classified as QA category I. QA category I equipment is controlled under the provisions of the site QA program. The QA program encompasses the guidance of Appendix A to RG 1.155. Therefore, station blackout equipment is covered under an appropriate QA program consistent with the guidance of RG 1.155.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NYPA Response (continued):

Surveillance testing: Equipment and systems which are classified as QA category I are subject to the inspection and testing requirements of the QA program. Because the equipment necessary to meet the SBO rule is classified as QA category I, the existing plant surveillance testing procedures reflect requirements which are appropriate to ensure the operability of the SBO equipment.

Use of equipment not classified as QA category I: Although compliance with 10 CFR 50.63 requirements can be achieved using only equipment which is classified as QA category I, the preferred method of coping with a postulated station blackout involves the use of some equipment which is not classified as category I.

As detailed in Abnormal Operating Procedure AOP-49 "Station Blackout", it is preferable to run the QA Category M Reactor Core Isolation Cooling (RCIC) system instead of the QA Category I High Pressure Coolant Injection (HPCI) system during a blackout. The flow rate of the RCIC system more closely matches the SBO makeup requirements. The use of RCIC also minimizes the potential for level 8 high reactor water isolations, which in turn minimizes the potential for unnecessary cycling of dc motor operator valves and, therefore, extends battery power availability.

Although the preferred source of water for both HPCI and RCIC is from the condensate storage tanks (CSTs), water from the suppression pool (torus) can be used. The torus is classified as a QA category I structure. Section 3.1.3.3 of the Individual Plant Evaluation (IPE) documents the maximum allowable cooling water temperature for sustained HPCI or RCIC turbine operation as 200 °F. Since the predicted time to heat up the torus to 200 °F is in excess of the SBO determined four hour coping duration, the torus would be an acceptable source of water for either HPCI or RCIC.

Station Blackout Safety Evaluation
Additional Responses - April 1, 1992

NRC Recommendation:

2.6 EDG Reliability Program

It is the staff's position that an EDG reliability program should be developed in accordance with the guidance of RG 1.155, section 1.2. If an EDG reliability program currently exists, the program should be evaluated and adjusted in accordance with RG 1.155.

Confirmation that such a program is in place or will be implemented should be included in the documentation that is to be maintained by the licensee in support of the SBO submittals.

NYPA Response:

EDG performance has consistently surpassed, by a significant margin, the reliability goals outlined in Appendix F to NUMARC 87-00. The EDG reliability for the past 20, 50, and 100 demands was presented in Reference 3.

The Authority will implement a program incorporating the guidance contained in Regulatory Guide 1.155 by December 21, 1992. The Authority may revise this program when the NRC's unresolved safety issue B-56 "Emergency Diesel Generator Reliability" is resolved.

- REFERENCES:
1. NRC letter, B.C. McCabe to R.E. Beedle, dated November 13, 1991, "Safety Evaluation of the James A FitzPatrick Nuclear Power Plant Response to the Station Blackout Rule (TAC 68546)."
 2. NYPA letter, R. E. Beedle to the NRC, (JPN-91-066) dated December 18, 1991, "Response to Safety Evaluation Recommendations."
 3. NYPA letter, R. E. Beedle to the NRC, (JPN-91-049) dated September 13, 1991, "Response to Request for Additional Information Regarding Station Blackout."
 4. "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors", August 1991, NUMARC 87-00 Rev.1, Appendix I "Responses to Questions Raised at the NUMARC 87-00 Seminars", page I-22, question 101.

Attachment II to JPN - 92 - 018

April 1, 1992

STATION BLACKOUT RULE

Containment Isolation Provisions During an SBO

Valves of Concern

(Necessary for Isolation During an SBO)

New York Power Authority

James A. FitzPatrick Nuclear Power Plant

Docket Number 50-333

James A. FitzPatrick Nuclear Power Plant
Containment Isolation Provisions During an SBO

VALVES OF CONCERN

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	SBO Indication	SBO Operation																																	
8	3	Main Steam Drains	29MOV-74	Control Rm Panel	DC MOV, operated from Control Room																																	
			29MOV-77			10	3	RCIC Steam Supply	13MOV-15	Control Rm Panel	DC MOV, operated from Control Room	13MOV-16	13MOV-131	11	10	HPIC Steam Supply	23MOV-15	Control Rm Panel	DC MOV, operated from Control Room	23MOV-16	23MOV-60	12	20	RHR Shutdown Cooling	10MOV-18	Control Rm Panel	DC MOV, operated from Control Room	10MOV-17	14	6	RWCU Suction	12MOV-15	Control Rm Panel	DC MOV, operated from Control Room	12MOV-18	12MOV-80	17	4
10	3	RCIC Steam Supply	13MOV-15	Control Rm Panel	DC MOV, operated from Control Room																																	
			13MOV-16																																			
			13MOV-131																																			
11	10	HPIC Steam Supply	23MOV-15	Control Rm Panel	DC MOV, operated from Control Room																																	
			23MOV-16																																			
			23MOV-60																																			
12	20	RHR Shutdown Cooling	10MOV-18	Control Rm Panel	DC MOV, operated from Control Room																																	
			10MOV-17																																			
14	6	RWCU Suction	12MOV-15	Control Rm Panel	DC MOV, operated from Control Room																																	
			12MOV-18																																			
			12MOV-80																																			
17	4	RHR Head Spray	10MOV-32	Control Rm Panel	DC MOV, operated from Control Room																																	
			10MOV-33																																			

Attachment III to JPN - 92 - 018

April 1, 1992

STATION BLACKOUT RULE

Containment Isolation Provisions During an SBO

Excluded Penetrations

New York Power Authority

James A. FitzPatrick Nuclear Power Plant

Docket Number 50-333

Attachment III to JPN-92-018
 James A. FitzPatrick Nuclear Power Plant
 Containment Isolation Provisions During Station Blackout
 EXCLUDED PENETRATIONS

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	NUMARC 87-00 Exclusion Criteria	SBO Evaluation
7A,B,C,D	24	Main Steam	29AOV-80A(B,C,D)	Note 1	NUMARC 87-00 Assumption 2.4.1(2) allows utilities to assume proper operation of the MSIVs. MSIV isolation would occur automatically on "Low Condenser Vacuum" or by operator action during a SBO.
			29AOV-86A(B,C,D)	Note 1	
9A	18	Feedwater, RCIC, RWCU	34FWS-28A	3	Penetration isolation ensured by check valve 34FWS-28A.
			34NRV-111A	3	
			13MOV-21		
			12MOV-69		
9B	18	Feedwater & HPCI	34FWS-28B	3	Penetration isolation ensured by check valve 34FWS-28B.
			34NRV-111B	3	
			23MOV-19		
13A,B	24	RHR (LPCI)	10AOV-68A(B)	3	Penetration isolation ensured by testable check valve 10AOV-68A(B).
			10MOV-25A(B)		
			10MOV-27A(B)		
16A,B	10	Core Spray	14AOV-13A(B)	3	Penetration isolation ensured by testable check valve 14AOV-13A(B).
			14MOV-12A(B)		
			14MOV-11A(B)		
18	3	DW Floor Drain Sump Discharge	20AOV-83	2	20AOV-83 fails closed on loss of air or AC and ensures penetration isolation.
			20MOV-83		
19	3	DW Equipment Drain Sump Discharge	20AOV-95	2	20AOV-95 fails closed on loss of air or AC and ensures penetration isolation.
			20MOV-94		

Attachment III to JPN-92-018
 James A. FitzPatrick Nuclear Power Plant
 Containment Isolation Provisions During Station Blackout
 EXCLUDED PENETRATIONS

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	NUMARC 87-00 Exclusion Criteria	SBO Evaluation
22	1	N ₂ Supply to DW	39IAS-22	3, 5	Penetration excluded based on 1" nominal size. Penetration isolation also ensured by check valve 39IAS-22.
			27SOV-141	5	
23, 24	4	RBCLCW to DW	15AOV-130A (B)		Penetration isolation ensured by check valves 46ESW-16B(A) and 15RBC-24A(B).
			46ESW-16B(A)	3	
			15RBC-24A(B)	3	
25, 71	18	DW Purge Inlet (Air)	27AOV-112	2	Penetration isolation ensured by AOVs failing closed on loss of air and check valves 27CAD-68 and 27CAD-69.
	18		27AOV-111	2	
	14		27AOV-131A	2	
	14		27CAD-68	3	
	14		27AOV-131B	2	
	14		27CAD-69	3	
26A	24	DW Purge Inlet (Air or N ₂)	27AOV-113	3	24" penetration isolation ensured by AOVs failing closed on loss of air. Bypass valves and pipe-within-pipe SOVs are less than 3" nominal size.
	24		27AOV-114	3	
	2		27MOV-113	5	
	2		27MOV-122	5	
	3/8		27SOV-119F1	5	
	3/8		27SOV-119F2	5	
	3/8		27SOV-120E1	5	
	3/8		27SOV-120E2	5	
	3/8		27SOV-122E1	5	
	3/8		27SOV-122E2	5	

Attachment III to JPN-92-018
 James A. FitzPatrick Nuclear Power Plant
 Containment Isolation Provisions During Station Blackout
 EXCLUDED PENETRATIONS

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	NUMARC 87-00 Exclusion Criteria	SBO Evaluation
31Ac,Bc	1	RWR Pump Seal Purge	02-2RWR-13A(B)	3, 5	Penetration excluded based on 1" nominal size. Additionally, isolation ensured by check valve 02-2RWR-13A(B).
			02-2SOV-001	5	
			02-2SOV-002	5	
			02-RWR-40A(B)	5	
31Ad,Bd	1	DW Atmosphere Suction	27SOV-135C	5	Penetration excluded based on 1" nominal size.
			27SOV-135A	5	
			27SOV-135D	5	
			27SOV-135B	5	
35A-D	1.5	Tips A through D	07SOV-104A	5	Penetration excluded based on 1.5" nominal size.
			07EV104A	5	
			07SOV-104B	5	
			07EV-104B	5	
			07SOV-104C	5	
			07EV-104C	5	
37A-D	1	Control Rod Drive (Inlet)	SOV-123	5	Penetrations excluded based on 1" nominal size.
			SOV-120	5	
			AOV-126	5	
			CRD-138	3, 5	
38A-D	1	Control Rod Drive (Outlet)	SOV-122	5	Penetrations excluded based on 1" nominal size.
			SOV-121	5	
			AOV-127	5	

Attachment III to JPN-92-018
 James A. FitzPatrick Nuclear Power Plant
 Containment Isolation Provisions During Station Blackout
 EXCLUDED PENETRATIONS

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	NUMARC 87-00 Exclusion Criteria	SBO Evaluation
39A,B	10	RHR DW Spray	10MOV-31A(B)	Note 2	Penetration excluded based on electrical interlock preventing the opening of 10MOV-31A(B) and 10MOV-26A(B) under normal operating conditions.
			10MOV-26A(B)	Note 2	
41	1	RWR Loop Sample	02-2SOV-39	2, 5	Penetration excluded based on 1" nominal size.
			02-2SOV-40	2, 5	
42	1.5	SBLCS	11SLC-17	3, 5	Penetration excluded based on 1.5" nominal size. Additionally, isolation ensured by check valves 11SLC-17 and 11SLC-16.
			11SLC-16	3, 5	
			11EV-14A(B)	5	
45	0.5	DW Pressure Sensing	16-1AOV-101A	5	Penetration excluded base on 0.5" nominal size. This penetration is pressure sensing for ILRT instrumentation
			16-1AOV-101B	5	
50c	0.75	Instrumentation Sensing DW Pressure	various	5	Penetration excluded based on 0.75" nominal size.
52a, 55b	1	DW Atmosphere Sample (Return)	27SOV-125C	2, 5	Penetrations excluded based on 1" nominal size.
			27SOV-125A	2, 5	
			27SOV-125D	2, 5	
			27SOV-125B	2, 5	
77c	1	CAD Supply to DW Instrumentation	27SOV-145	5	Penetrations excluded based on 1" nominal size.
			39IAS-29	3, 5	
			39IAS-28		

Attachment III to JPN-92-018
 James A. FitzPatrick Nuclear Power Plant
 Containment Isolation Provisions During Station Blackout
 EXCLUDED PENETRATIONS

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	NUMARC 87-00 Exclusion Criteria	SBO Evaluation
58b,c	3/8	DW Hydrogen Sample	27SOV-122F2	2, 5	Penetrations excluded based on 3/8" nominal size.
			27SOV-122F1	2, 5	
			27SOV-120F2	2, 5	
			27SOV-120F1	2, 5	
58d, 59	3/8	DW Hydrogen Sample	27SOV-123F2	2, 5	Penetrations excluded based on 3/8" nominal size.
			27SOV-123F1	2, 5	
			27SOV-123E2	2, 5	
			27SOV-123E1	2, 5	
62, 66	4	RBCLCS/ESW Return from "A, B" DW Cooling Assembly	15AOV-131A(B)	4	Penetrations excluded based on closed loop inside DW not expected to be breached in an SBO.
			15RBC-26A(B)	4	
63, 67	4	RBCLCS/ESW to "B" or Return from "A" RWR Pump and Motor Coolers	15AOV-132A(B)	4	Penetrations excluded based on closed loop inside DW not expected to be breached in an SBO.
			15RBC-21A(B)	3, 4	
			46ESW-15A(B)	3, 4	
64, 68	4	RBCLCS/ESW Return from "A, B" RWR Pump and Motor Coolers	15AOV-133A(B)	4	Penetrations excluded based on closed loop inside DW not expected to be breached during an SBO.
			15RBC-22A(B)	4	
65	1.5	RBCLCS/ESW Return from DW Equipment Sump Cooler	15AOV-134A	5	Penetration excluded based on 1.5" nominal size.
			15RBC-33	5	
202S	20	Reactor Building to Torus Vacuum Breakers	27AOV-101A		Penetration isolation ensured by check valves 27VB-6 and 27VB-7.
			27VB-6	3	
			27AOV-101B		
			27VB-7	3	

Attachment III to JPN-92-018
 James A. FitzPatrick Nuclear Power Plant
 Containment Isolation Provisions During Station Blackout
 EXCLUDED PENETRATIONS

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	NUMARC 87-00 Exclusion Criteria	SBO Evaluation
202E	1.5	RCIC Turbine Exhaust Line Vacuum Breaker	13RCIC-11	5	Penetration excluded based on 1.5" nominal size.
			13RCIC-37	5	
			13RCIC-38	5	
			13MOV-130	5	
			27VB-5	3	
203A	3/8	Suppression Pool Atmosphere Sample Suction	27SOV-119E2	5	Penetration excluded based on 3/8" nominal size.
			27SOV-119E1	5	
203B	1	Primary Containment Analyzer and Post-Accident Sample Return	27SOV-124E2	5	Penetration excluded based on 1" nominal size.
			27SOV-124E1	5	
			27SOV-124F2	5	
			27SOV-124F1	5	
205	20	Suppression Pool Purge Exhaust	27AOV-117	2	Penetration excluded based on AOVs failing closed on loss of air or AC. Bypass line excluded based on 2" nominal size.
	20		27AOV-118	2	
	2		27MOV-117	5	
	2		27MOV-123	5	
210A	16	RHR SPC Test Return Line	10MOV-34A	Note 3	Penetration excluded based on a loop seal provided by a minimum suppression pool level.
	4	RHR Pump Minimum Flow Line	10MOV-16A		
	4	RHR Heat Exchanger Drain	10MOV-21A		

Attachment III to JPN-92-018
 James A. FitzPatrick Nuclear Power Plant
 Containment Isolation Provisions During Station Blackout
EXCLUDED PENETRATIONS

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	NUMARC 87-00 Exclusion Criteria	SBO Evaluation
210A (cont.)	1	RHR Heat Exchanger Vent	10MOV-167A	5	Penetration excluded based on a loop seal provided by a minimum suppression pool level.
	1	RHR Keep Full Minimum Flow	10MOV-95A	5, 3	
	3	Core Spray Pump Minimum Flow	14MOV-5A		
	8	Core Spray Test Return	14MOV-26A		
	1	Core Spray Holding Pump Minimum Flow	14CSP-62A	3, 5	
	2	RCIC Minimum Flow	13MOV-27	2	
210B	16	RHR SPC Test Return Line	10MOV-34B	Note 3	Penetration excluded based on a loop seal provided by a minimum suppression pool level.
	4	RHR Pump Minimum Flow Line	10MOV-16B		
	4	RHR Heat Exchanger Drain	10MOV-21B		
	1	RHR Heat Exchanger Vent	10MOV-167B	5	
	1	RHR Keep Full Minimum Flow	10RHR-95B	3, 5	
	3	Core Spray Test Return	14MOV-5B		
	4	HPCI Minimum Flow	23MOV-25		
	8	CSP Test Throttle	14MOV-26B		
	1	Hold Pump Minimum Flow	14CSP-95B	3, 5	

Attachment III to JPN-92-018
 James A. FitzPatrick Nuclear Power Plant
 Containment Isolation Provisions During Station Blackout
 EXCLUDED PENETRATIONS

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	NUMARC 87-00 Exclusion Criteria	SBO Evaluation
211A,B	16	RHR to Suppression Pool Spray	10MOV-38A(B)	Note 2	Penetration excluded based on electrical interlock preventing opening of both valves under normal operating conditions.
			10MOV-39A(B)	Note 2	
212	8	RCIC Turbine Exhaust	13RCIC-04	3	Penetration isolation ensured by check valves 13RCIC-04 and 13RCIC-05.
			13RCIC-05	3	
214	20	HPIC Turbine Exhaust	23HPI-12	3	Penetration isolation ensured by check valve 23HPI-12.
			23HPI-65	3	
217	2	HPIC Turbine Exhaust Line Vacuum Breaker	23HPI-402	5	Penetration excluded based on 2" nominal size.
	2		23HPI-403	5	
	2		23MOV-59	5	
218	3/8	Torus Pressure Sensing	16-1AOV-102A	2, 5	Penetration excluded based on 3/8" nominal size. This penetration is pressure sensing for ILRT instrumentation.
			16-1AOV-102B	2, 5	
220	20	Torus Purge Inlet (Air)	27AOV-115	2	Penetration excluded based on AOVs failing closed on loss of air.
			27AOV-115	2	
	1.5	Torus Purge Inlet (Nitrogen)	27AOV-132A	5	Penetration excluded based on 1.5" nominal size.
			27CAD-67	5, 3	
		27AOV-132B	5		
		27CAD-70	5, 3		
221	2	RCIC Vacuum Pump Discharge	13RCIC-07	5, 3	Penetration excluded based on 2" nominal size.
			13RCIC-08	5, 3	
222	2	HPIC Turbine Drain Trap to Torus	23HPI-13	5, 3	Penetration excluded based on 2" nominal size.
			23HPI-56	5, 3	

Attachment III to JPN-92-018
 James A. FitzPatrick Nuclear Power Plant
 Containment Isolation Provisions During Station Blackout
 EXCLUDED PENETRATIONS

Penetration Number	Nominal Valve Size (in.)	System	Valve IDs	NUMARC 87-00 Exclusion Criteria	SBO Evaluation
224	6	RIC Suction From the Suppression Pool	13MOV-41	K, e 3	Penetration excluded based on loop seal provided by a minimum suppression pool level.
			13MOV-39		
225	20	RHR Pump Suction	10MOV-13A	Note 3	Penetration excluded based on loop seal provided by a minimum suppression pool level.
			10MOV-13C		
225B	4	RHR to Radwaste	10MOV-57	Note 3	Penetration excluded based on loop seal provided by a minimum suppression pool level.
			10MOV-57		
226	16	RHR Pump Suction	10MOV-13B	Note 3	Penetration excluded based on loop seal provided by a minimum suppression pool level.
			10MOV-13D		
227A	16	KPCI Suction from the Suppression Pool	23MOV-58	Note 3	Penetration excluded based on loop seal provided by a minimum suppression pool level.
			23MOV-57		
228	10	Core Spray Pump Suction from the Suppression Pool	14MOV-7A	Note 3	Penetration excluded based on loop seal provided by a minimum suppression pool level.
			14MOV-7B		
		Condensate to Suppression Pool	33CND-102	1	Penetration excluded based on locked closed manual valve 33CND-102.

TABLE 1-1 NOTES

- Note 1 NUMARC 87-00 assumption 2.4.1(2) allows utilities to assume proper operation of the MSIVs.
- Note 2 Electrical interlock exists preventing the opening of both valves under non-accident conditions.
- Note 3 Containment isolation not required based on a water seal maintained with Suppression Pool level at or above minimum level.

Attachment IV to JPN - 92 - 018

April 1, 1992

STATION BLACKOUT RULE

Containment Isolation Provisions During a Station Blackout

Individual Penetration Data Sheets

NOTICE: The working sketches in this attachment are provided only as an aid to understanding the applications of the penetration and valve exclusion criteria to specific installations. The sketches and associated tabular data have not been reviewed, approved, or controlled in accordance with procedures for formal engineering calculations and drawings.

Note: In the tabular data for each valve, the last item "SBO Exclusion," refers to the exclusion criteria 1 through 5 identified in section 7 of NUMARC 87-00 Rev. 1 guidelines.

New York Power Authority

James A. FitzPatrick Nuclear Power Plant

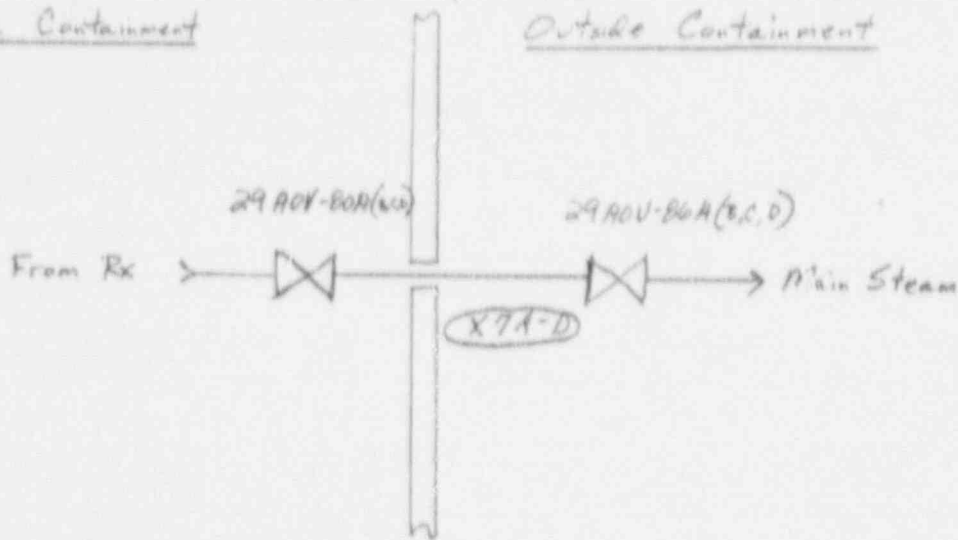
Docket Number 50-333

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Main Steam

Fm-29A

Function	Inside MSIV	Outside MSIV			
Valve Number	29A0V-80A(R.S.V)	29A0V-86A(R.S.V)			
Size	24"	24"			
Control Power					
Normal Status	Open	Open			
Failure, Loss AC					
Failure, Loss Air					
SBO Indication	2) Panel 9-3 Graphic Display	1) Panel 9-2 Graphic Display			
SBO Exclusion	()	()			

Notes:

- (1) NUMARC B7-00 assumption 24.1 (2) allows utilities to assume proper operation of the MSIVs. MSIV isolation would occur automatically on "Low Condenser Vacuum" or by operator action during a SBO.
- (2) Graphic display powered from UPS

EXCLUDED

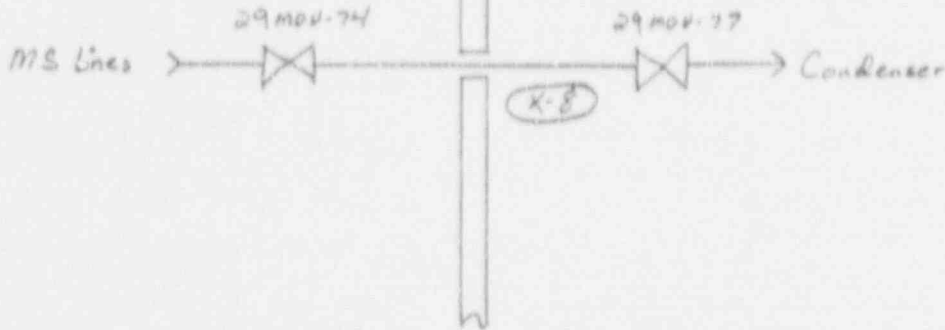
Penetration Number 7A-D

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Main Steam Drain

FM-29A

Function	Inside I/V	Outside I/V			
Valve Number	29 MOV-74	29 MOV-77			
Size	3"	3"			
Control Power	mcc-C152 (1)	DC			
Normal Status	Closed	Closed			
Failure, Loss AC		N/A			
Failure, Loss Air	N/A	N/A			
SBO Indication	(1) Panel 9-3 Graphic display	(2) Panel 9-3 Graphic Display			
SBO Exclusion					

Notes:

(1) 29 MOV-74 is AC MOV

(2) Graphic display powered from UPS.

Penetration Number

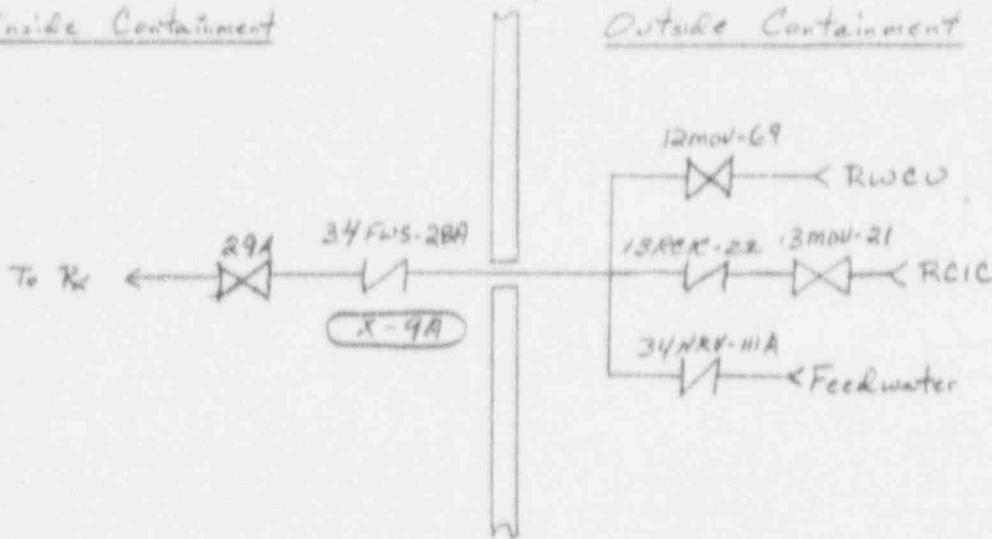
8

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Feedwater, RCIC Discharge, RWCU Return
Fm-22A, Fm-34A

Function	Inside Check	Outside Check	RCIC IV	RWCU IV
Valve Number	34FWS-28A	34NRV-11A	13MOV-21	12MOV-69
Size	18"	18"		
Control Power	N/A	N/A	DC	AC
Normal Status	Open	Open	Closed	Open
Failure, Loss AC	N/A	N/A		
Failure, Loss Air	N/A	N/A		
SBO Indication	—	—	Panel 9-2 Graphic Display	Panel 9-3 Graphic Display
SBO Exclusion	3	3		

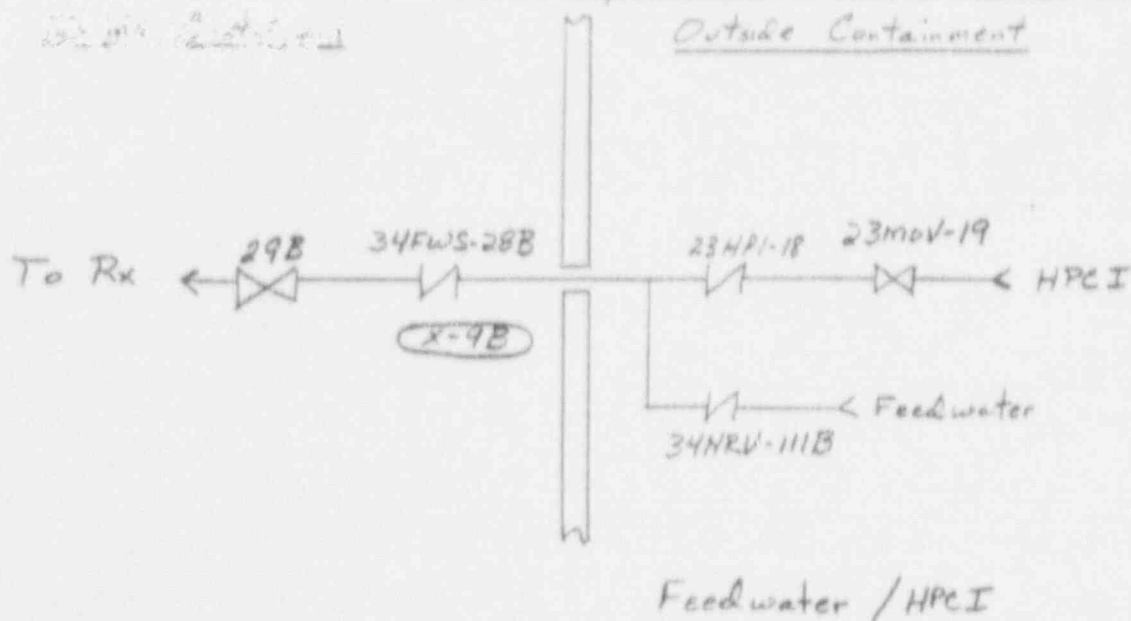
Notes:

EXCLUDED

Penetration Number 9A

Tenn. & A. & P. Patrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)



FM-25A, FM-34A

Function	Inside IV	Outside IV	Outside IV	
Valve Number	34 FWS-28B	34 NRV-111B	23 MOV-19	
Size	18"	18"	14"	
Control Power	N/A	N/A	DC	
Normal Status	Open	Open	Closed	
Failure, Loss AC	N/A	N/A	N/A	
Failure, Loss Air	N/A	N/A	N/A	
SBO Indication	—	—	Panel 4-3 Graphic Display	
SBO Exclusion	3	3		

Notes:

- (1) FW valve 29B
- (2) HPCI valve 18

EXCLUDED

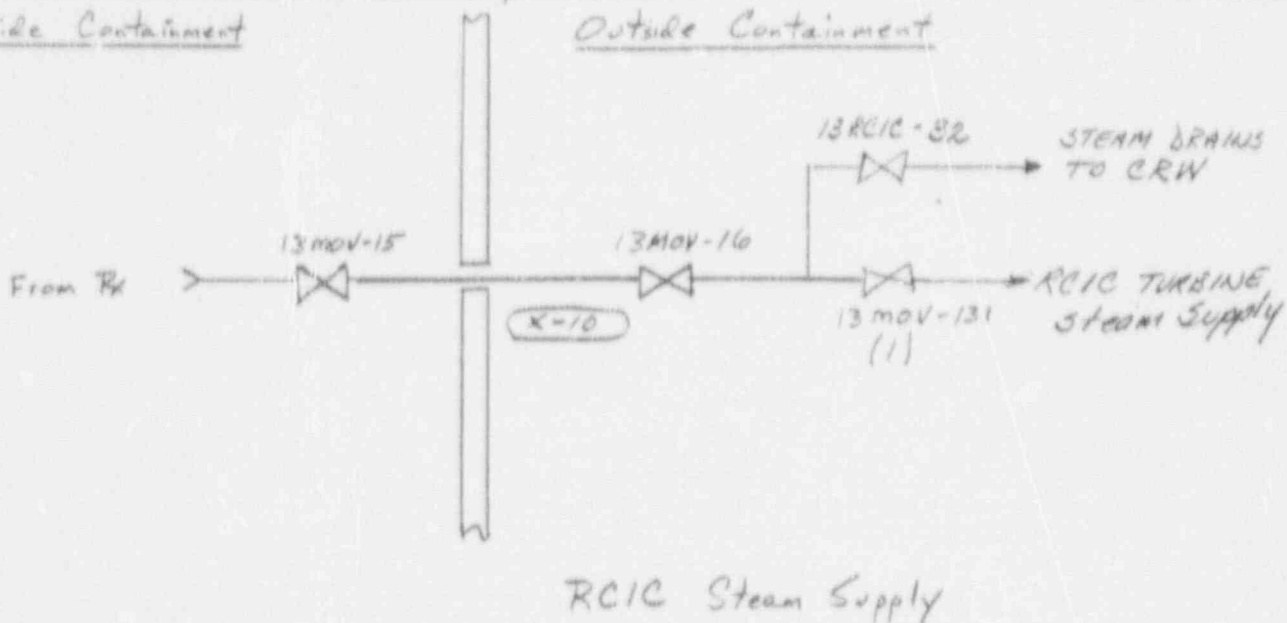
Penetration Number 9B

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



FM-22A

Function	Inside IV	Outside IV	TURBINE STEAM SUPPLY
Valve Number	13MOV-15	13MOV-16	13MOV-131(1)
Size	3"	3"	3"
Control Power	AC	DC	DC
Normal Status	Open	Open	Closed
Failure, Loss AC	AS-Is	N/A	N/A
Failure, Loss Air	N/A	N/A	N/A
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display	
SBO Exclusion			

Notes:

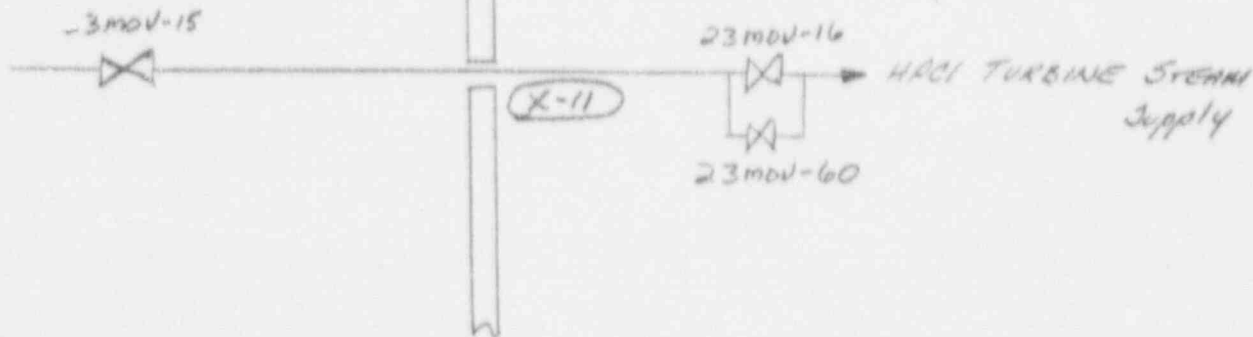
- (1) TURBINE STEAM SUPPLY NOT LISTED IN TECH. SPECS.
(13MOV-131)

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



HPCI Steam Supply

Fm-25A

Function	Inside IV	Outside IV	Outside Bypass		
Valve Number	23MOV-15	23MOV-16	23MOV-60		
Size	10"	10"			
Control Power	AC	DC	DC		
Normal Status	Open	Closed	()		
Failure, Loss AC	As - Is	N/A	N/A		
Failure, Loss Pwr	N/A	N/A	N/A		
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display		
SBO Exclusion					

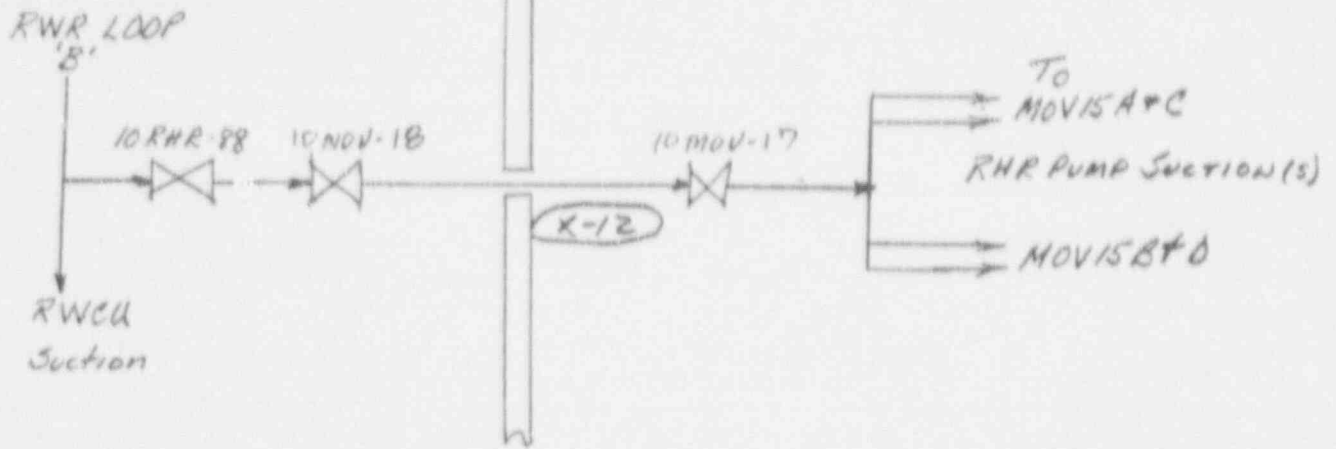
Notes:

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



RHR Shutdown Cooling Suction

Fm-20A

Function	Inside IV	Outside IV			
Valve Number	10 MOV-18	10 MOV-17			
Size	20"	20"			
Control Power	AC	DC			
Normal Status	Closed	Closed			
Failure, Lo AC	As-Is	N/A			
Failure, Loss Air	N/A	N/A			
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display			
SBO Exclusion					

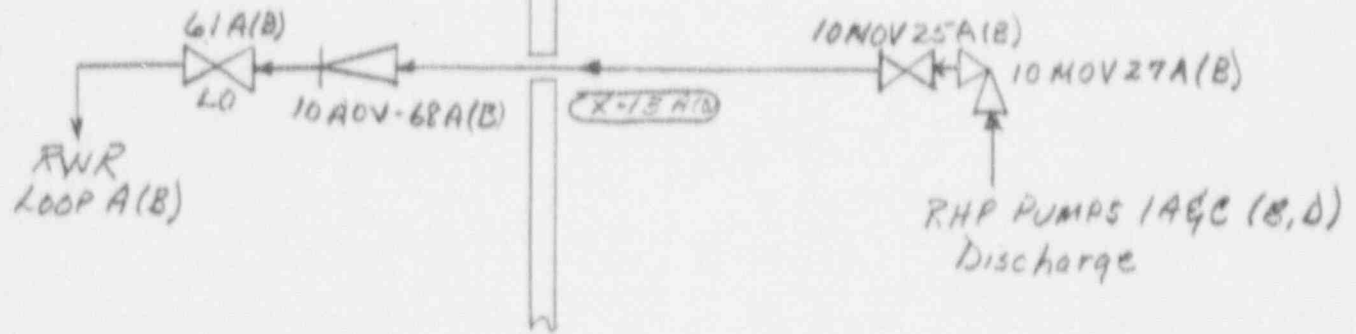
Notes:

James FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



RHR Shutdown Cooling and
LPCI to Rx

FM-20A

Function	Testable Check	Inboard	Outboard		
Valve Number	10ADV-68A(B)	10MOV-25A(B)	10MOV-27A(B)		
Size	24"	24"	24"		
Control Power	N/A	AC (1)	AC (1)		
Normal Status	Closed	Closed	Open		
Failure, Loss AC	N/A				
Failure, Loss Air	N/A	N/A	N/A		
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display			
SBO Exclusion	3	(2)	(2)		

Notes:

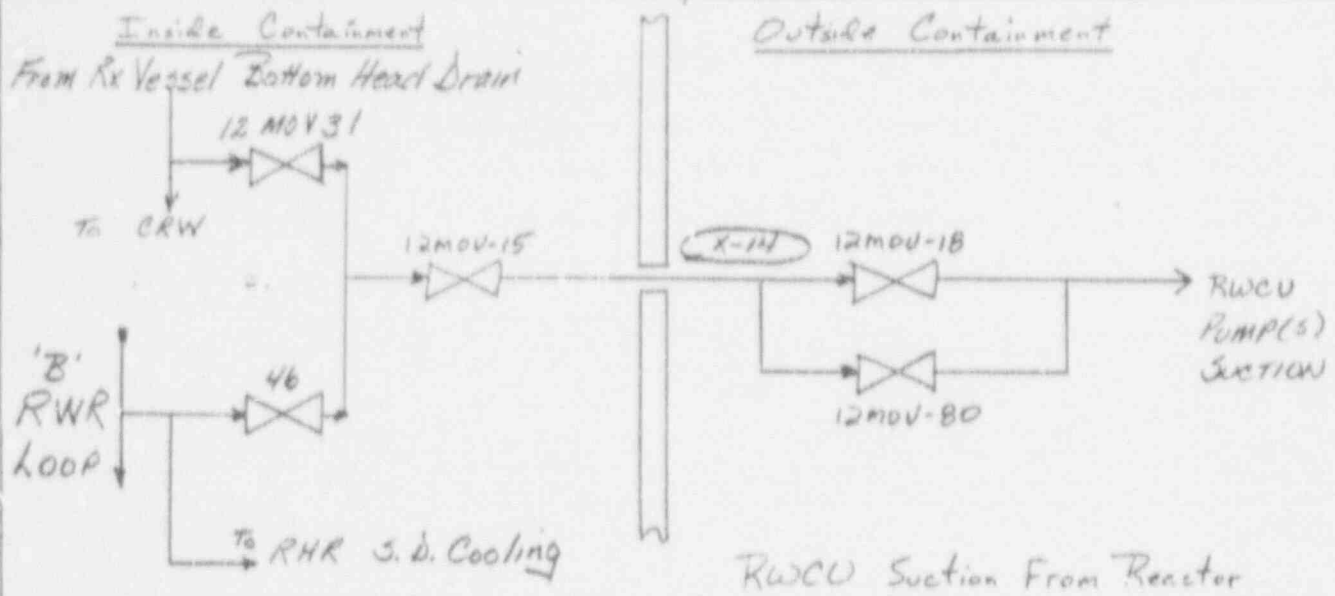
- (1) MOVs powered from LPCI Independent Power Supply
- (2) Inter-lock prevents opening a paired 25 and 27 valve at same time when > 350 psig.
- (3) 10-RHR-61A(B) is Locked Open.

EXCLUDED

Penetration Number 13 A, B

James A. Fitz Patrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (-80)



Fm-24A

Function	Inside IV	Outside IV	Warm Up		
Valve Number	12MOV-15	12MOV-18	12MOV-80		
Size	6"	6"			
Control Power	AC	DC	DC		
Normal Status	Open	Open	Closed		
Failure, Loss AC		N/A	N/A		
Failure, Loss Air	N/A	N/A	N/A		
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display		
SBO Exclusion					

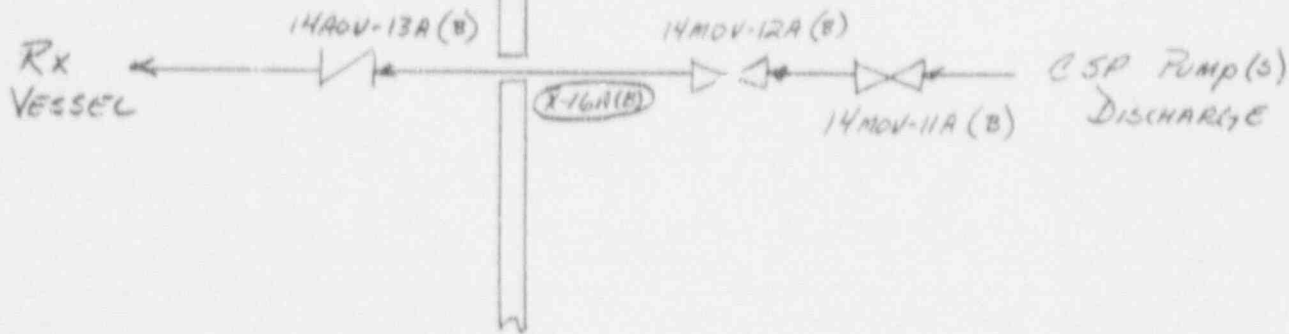
Notes:

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



CORE SPRAY INJECTION

Fm-23A

Function	Testable Check	Inboard IV	Outboard IV		
Valve Number	14MOV-13A (B)	14MOV-12A (B)	14MOV-11A (B)		
Size	10"	10"	10"		
Control Power		AC	AC		
Normal Status	Closed	Closed	Open		
Failure, Loss AC					
Failure, Loss Air		N/A	N/A		
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display			
SBO Exclusion	3	(1)	(1)		

Notes:

(1) Interlock prevents opening paired 12 and 11 valves at same time when reactor pressure > 425 psig

EXCLUDED

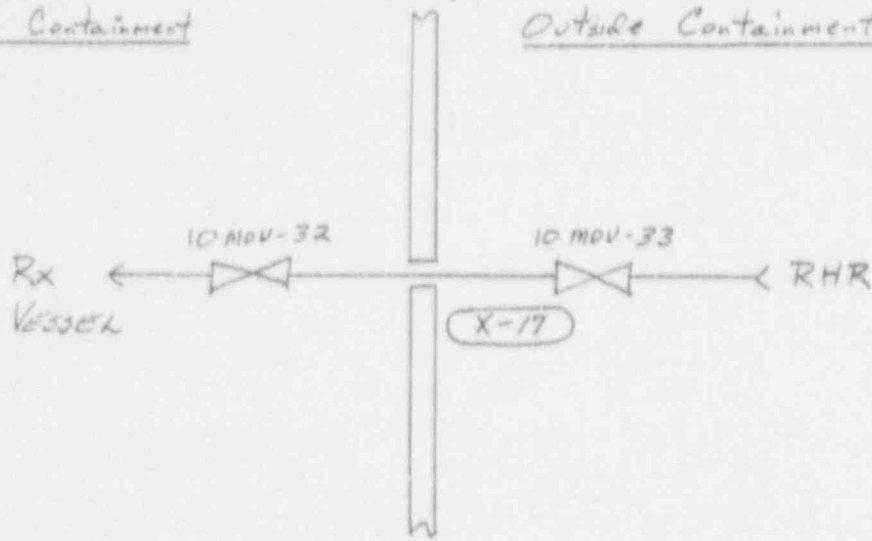
Penetration Number 16A, B

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



RHR Head Spray

FM-20A

Function	Inside IV	Outside IV			
Valve Number	10 MOV-32	10 MOV-33			
Size	4"	4"			
Control Power	AC	DC			
Normal Status	closed	closed			
Failure, Loss AC		N/A			
Failure, Loss Air	N/A	N/A			
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display			
SBO Exclusion					

Notes:

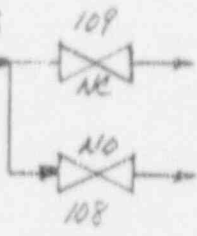
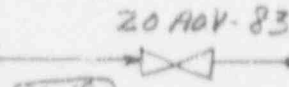
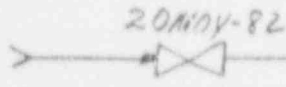
James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment

D/W
FLOOR
DRAIN
SUMP
PUMP(S)
DISCHARGE



FLOOR DRAIN
COLLECTOR TANK
(RAD WASTE)
WASTE COLLECTOR
TANK

Drywell Floor Drain Sump Discharge

FM-17A

Function	Inside IV	Outside IV			
Valve Number	20ADV-82	20ADV-83			
Size	3"	3"			
Control Power	AC	1 ϕ			
Normal Status	Open	Open			
Failure, Loss AC		Closed			
Failure, Loss Air	N/A	Closed			
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display			
SBO Exclusion		2			

Notes:

Exclusion

Penetration Number	18
--------------------	----

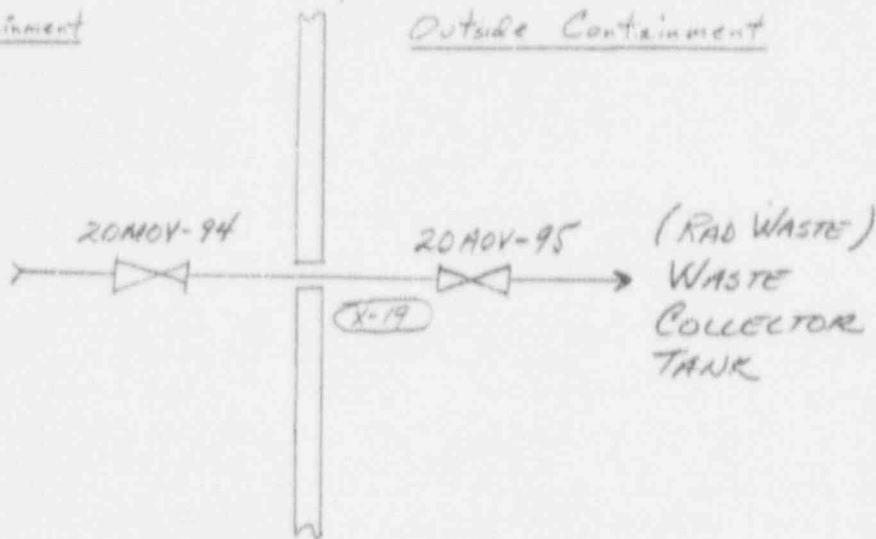
James A. Fitz Patrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment

D/W
EQUIPMENT
DRAIN
SUMP
PUMP(S)
DISCHARGE



Drywell Equipment Drain Sump Discharge

FM-17A

Function	Inside I/V	Outside I/V		
Valve Number	20MOV-94	20AOV-95		
Size	3"	3"		
Control Power	AC	AC		
Normal Status	Open	Open		
Failure, Loss AC		Closed		
Failure, Loss Air	N/A	Closed		
SBO Indication	Panel 9-2 Graphic Display	Panel 9-3 Graphic Display		
SBO Exclusion		2		

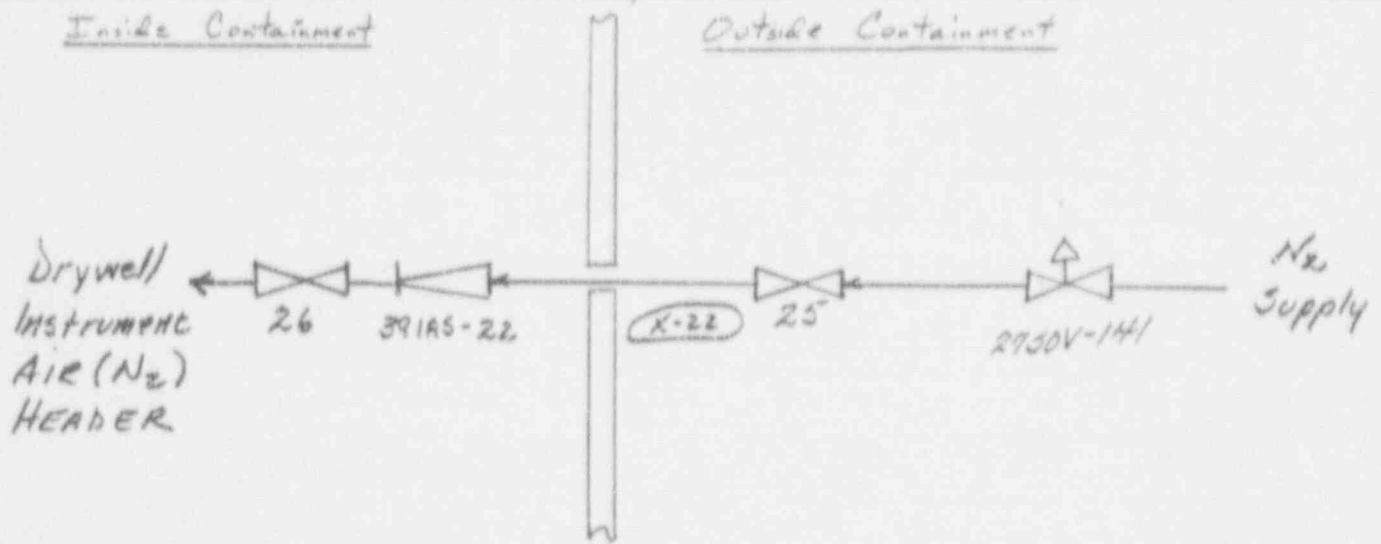
Notes:

Excluded

Penetration Number 19

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)



Instrument Air (Nitrogen) Supply to DRYWELL

FM-39A

Function				
Valve Number	39IAS-22	27SOV-141		
Size	1"	1"		
Control Power				
Normal Status	Open	Open		
Failure, Loss AC	N/A	Open (1)		
Failure, Loss Air				
SBO Indication		(2)		
SBO Exclusion	3, 5	5		

Notes:

(1) SOV fails open to ensure adequate pneumatic supply to DW under accident conditions

(2) Indication on 27CAD Panel

EXCLUDED

Penetration Number 22

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

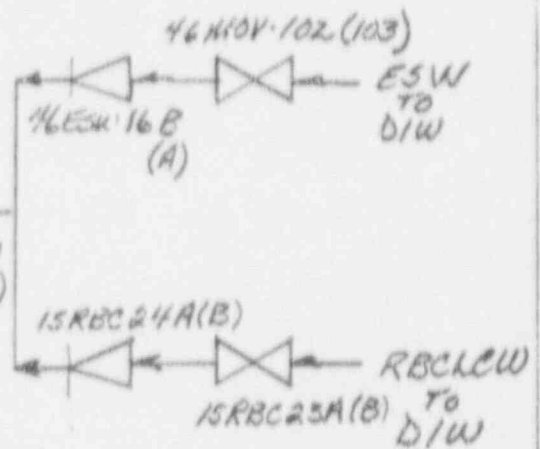
Inside Containment

Outside Containment

Drywell Cooler
Assembly 'A'
(B)
DWIEDS
Cooler (A only)



15A0V130A
(B)
X 23 (24)



RBC CW & ESW to Drywell

Fm-15B

Function		Check	Check		
Valve Number	15A0V-130A(B)	15 RBC-24A(B)	46 ESW-16B(A)		
Size	4"	4"	4"		
Control Power	DC				
Normal Status	Open	Open	Closed		
Failure, Loss AC		N/A	N/A		
Failure, Loss Air		N/A	N/A		
SBO Indication					
SBO Exclusion		3	3		

Notes:

EXCLUDED

Penetration Number 23, 24

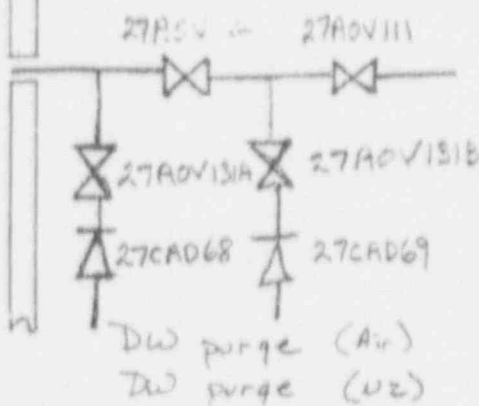
James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment

(25,71)



FM-188

Function	DW Purge Air	DW Purge Air	DW Purge N ₂	DW Purge N ₂ ^{check}	DW Purge N ₂
Valve Number	27ADV-112	27ADV-111	27ADV-131A	27CAD-68	27ADV-131B
Size	18"	18"	14"	14"	14"
Control Power				N/A	
Normal Status	Closed	Closed	Closed	Closed	Closed
Failure, Loss AC	Closed	Closed	Closed	N/A	Closed
Failure, Loss Air	Closed	Closed	Closed	N/A	Closed
SBO Indication	① 27MAP ^{PCP} not PV	① 27MAP ^{PCP} not PV	② 27MAP ^{CAD} not PV		③ 27MAP ^{CAD} not PV
SBO Exclusion	2	2	2	3	2

Notes:

KV letter Air: 2 ADVs, N₂: 1 check; 2 ADVs
 T.S. Air: 2 ADVs, N₂: 2 check; 2 ADVs

- ① Indication on 27PCP
- ② Indication on 27CAD

^{check} DW Purge N ₂
27CAD-69
14"
N/A
Closed
N/A
N/A
3

Excluded

Penetration Number 25,71

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

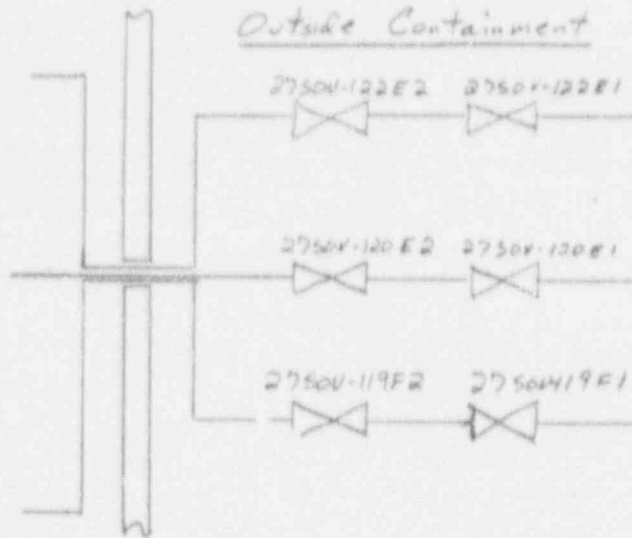
Inside Containment

el. 343

el. 310

el. 250

Outside Containment



Drywell Atmosphere Sample Suction
FM-180

Function	el. 250	el. 250	el. 310	el. 310	el. 343
Valve Number	2750V-119F2	2750V-119F1	2750V-120E2	2750V-120E1	2750V-122E2
Size	3/8	3/8	3/8	3/8	3/8
Control Power					
Normal Status	Closed	Closed	Open	Open	Closed
Failure, Loss AC	Closed	Closed	Closed	Closed	Closed
Failure, Loss Air	N/A	N/A	N/A	N/A	N/A
SBO Indication	✓ 27MAP ^{not} _{out}	✓ 27MAP ^{not} _{out}	✓ 27MAP ^{not} _{out}	✓ 27MAP ^{not} _{out}	✓ 27MAP ^{not} _{out}
SBO Exclusion	5	5	5	5	5

Notes:

See also 26A, B

Verified all are actually on 27MAP.

These pipes are inside 24" pipe normally considered penetration
26A

el. 343
2750V-122E1
3/8
Closed
Closed
N/A
✓ 27MAP ^{not} _{out}
5

EXCLUDED

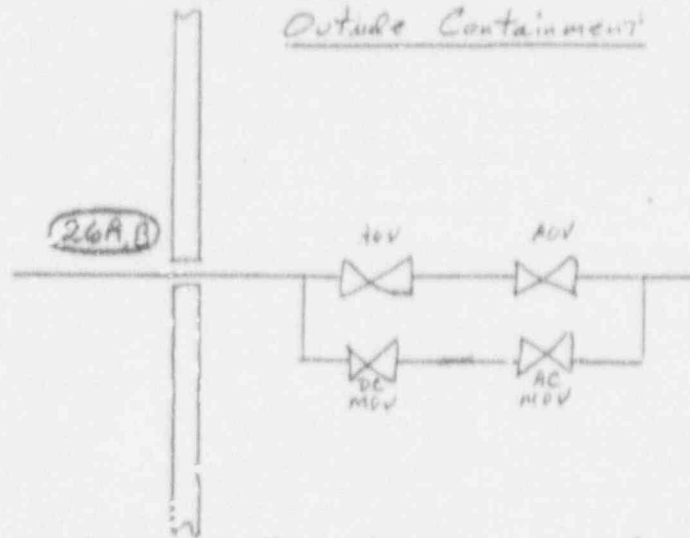
Penetration Number 26A

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



FM-186

Function			Bypass	Bypass
Valve Number	27ADV-113	27ADV-114	27MOV-113	27MOV-122
Size	24"	24"	2"	2" (1)
Control Power			AC	DC
Normal Status	Closed	Closed	Closed	Closed
Failure, Loss AC	Closed	Closed		N/A
Failure, Loss Air	Closed	Closed	N/A	N/A
SBO Indication	(3) 27PCP? not FY	(3) 27PCP? not FY	(3) 27PCP? not FY	(3) 27PCP? not FY
SBO Exclusion	3	2	5	5

Notes:

See other 26A for pipes within pipe

- (1) Limiting Summary has this as a 3" valve
- (2) Indication on 27PCP

Exclude

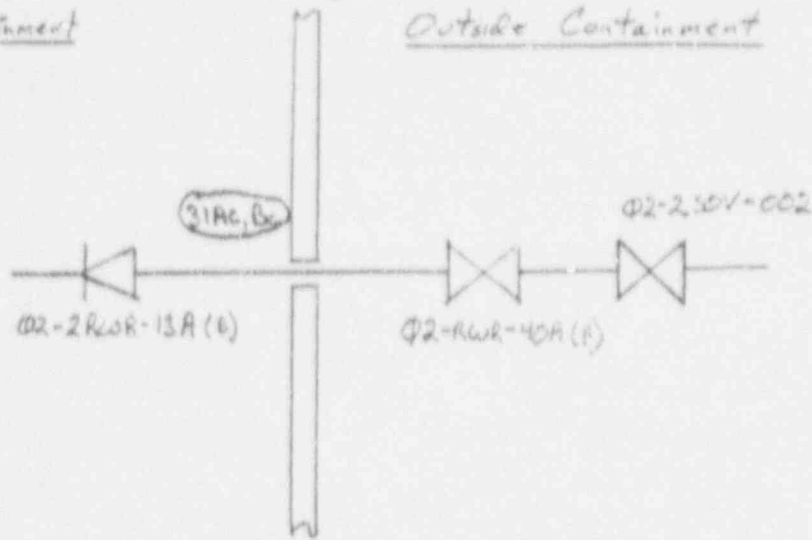
Penetration Number 26A

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Recirculation Pump Seal Purge

Fm-26A

Function	Check		check		
Valve Number	02-2RWR-13A	02-250V-001	02-2RWR-13B	02-250V-002	02-RWR-40A(B)
Size	1"	1"	1"	1"	
Control Power	N/A	DC	N/A	DC	
Normal Status	Open	Open	Open	Open	
Failure, Loss AC	N/A	(1)	N/A	(1)	
Failure, Loss Air	N/A	N/A	N/A	N/A	
SBO Indication		Control Room		Control Room	
SBO Exclusion	3, 5	5	3, 5	5	

Notes:

(1) F-AOP-49 calls for seal purge isolation in the event of a SBO.

EXCLUDED

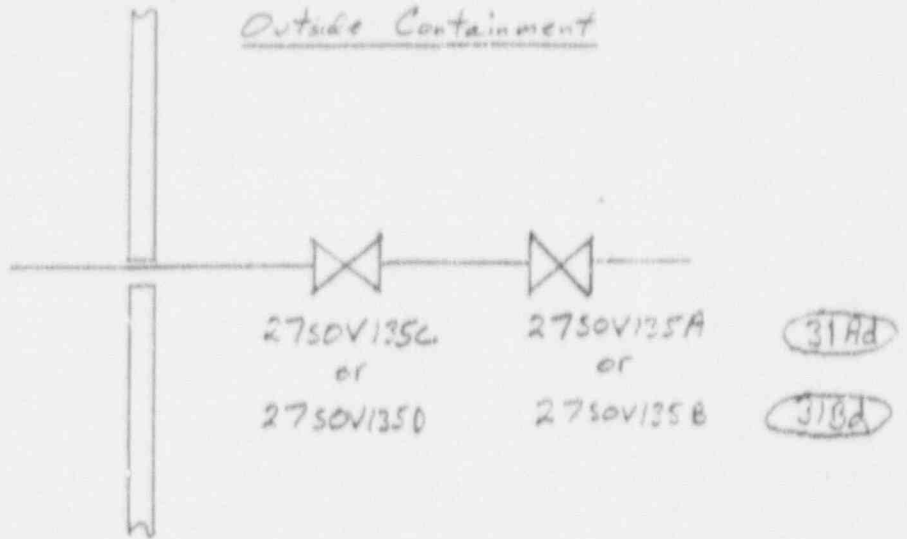
Penetration Number 31Ac, Bc

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Drywell Atmosphere Sample Suction

Fm-18B

Function	e/ 276 → Rad Mon	e/ 276 → Rad Mon	e/ 296 → Rad Mon	e/ 296 → R. L. Mon
Valve Number	2750V-135C	2750V-135A	2750V-135D	2750V-135B
Size	1"	1"	1"	1"
Control Power				
Normal Status	Open	Open	Open	Open
Failure, Loss AC	Closed	Closed	Closed	Closed
Failure, Loss PWR	N/A	N/A	N/A	N/A
SBO Indication	PCP 27WAP Not FU	PCP 27WAP Not FU	PCP 27WAP Not FU	PCP 27WAP Not FU
SBO Exclusion	5	5	5	5

Notes:

① Indication on 27 PCP.

EXCLUDED

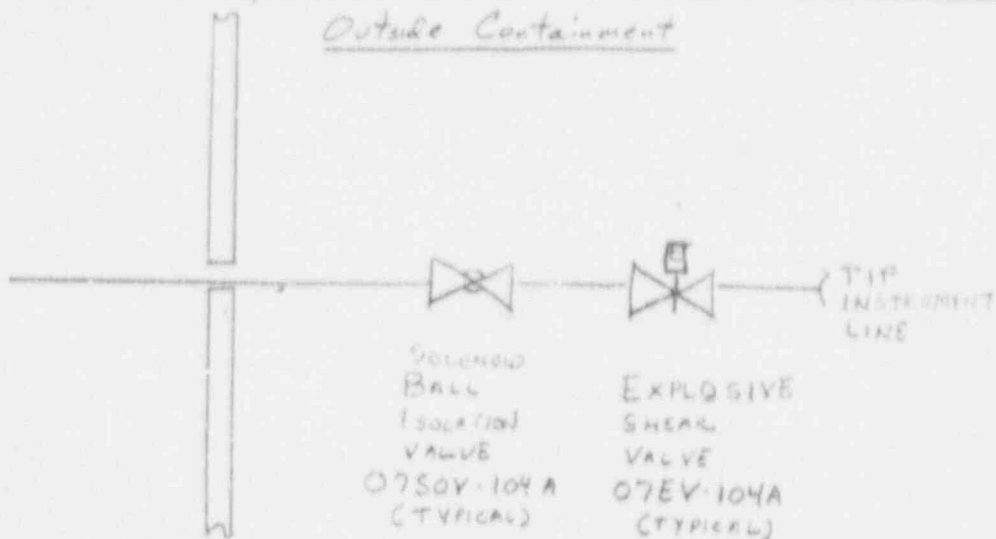
Penetration Number 3/22, Ed

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



TIPs A through C

	Pen 35B	Pen 35B	Pen 35D	Pen 35D	Pen 35C
Function	TIP A Ball	TIP A Shear	TIP B Ball	TIP B Shear	TIP C Ball
Valve Number	07SOV-104A	07EV-104A	07SOV-104B	07EV-104B	07SOV-104C
Size	1.5	1.5	1.5	1.5	1.5
Control Power		DC		DC	
Normal Status					
Failure, Loss AC		N/A		N/A	
Failure, Loss Air	N/A	N/A	N/A	N/A	N/A
SBO Indication					
SBO Exclusion	5	5	5	5	5

Notes:

T.S. lists 3 penetrations (35A min)

1.5" may only be 1"
 L^{xy} table 1

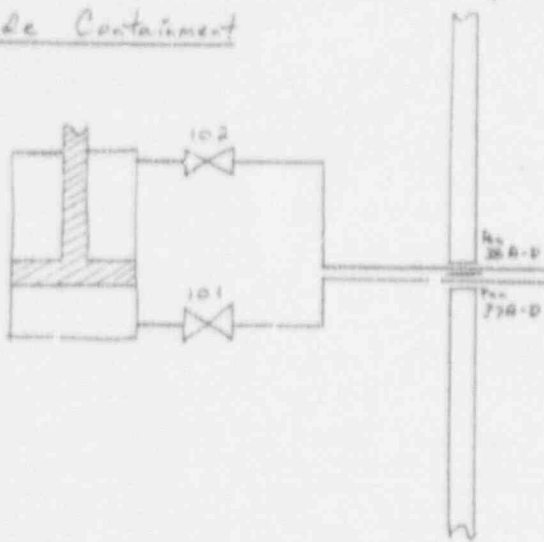
Pen 35C		
TIP C Shear		
07EV-104C		
1.5		
DC		
N/A		
N/A		
5		

EXCLUDED
 Penetration Number 35A-D

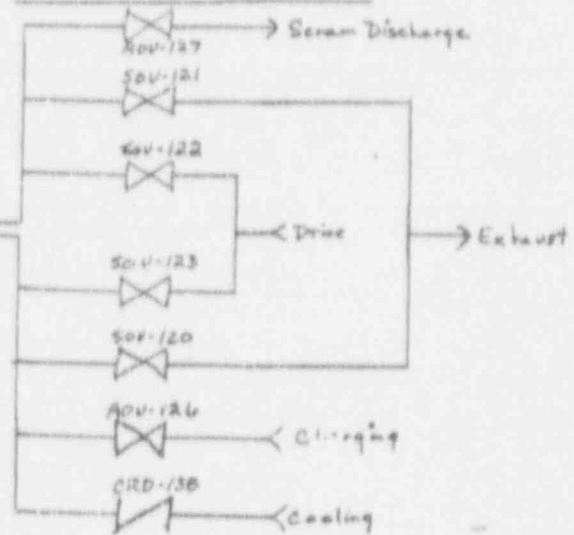
James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment



Outside Containment



Control Rod Drive
Typical of 137 HCVs

FM-27B

Function	Insert Exhaust	Withdraw Supply	Scram Outlet	Withdraw Exhaust	Insert Supply
Valve Number	SOV-121	SOV-122	ADV-127	SOV-120	SOV-123
Size	1"	1"	1"	1"	1"
Control Power					
Normal Status	closed	closed	closed	closed	closed
Failure, Loss AC					
Failure, Loss Air			Open		
SBO Indication	—	—	—	—	—
SBO Exclusion	5	5	5	5	5

Notes:

Scram Inlet	Cooling Check
ADV-126	CRD-138
1"	1"
closed	Open
	N/A
Open	N/A
—	—
5	3,5

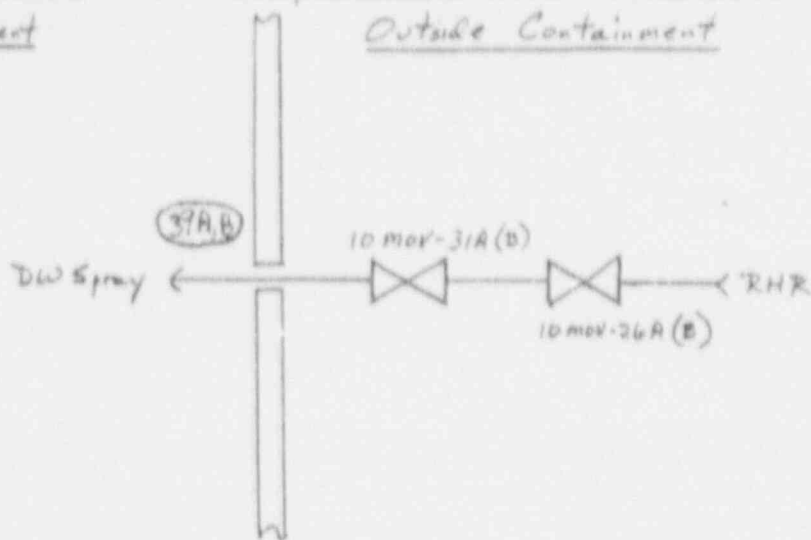
EXCLUDED
Penetration Number 37A-D
38A-D

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



RHR DW Spray

FM-20A

Function	Inboard IV	Outboard IV			
Valve Number	10MOV-31A (B)	10MOV-26A (B)			
Size	10"	10"			
Control Power	AC	AC			
Normal Status	Closed	Closed			
Failure, Loss AC					
Failure, Loss Air	N/A	N/A			
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display			
SBO Exclusion	(S)	(S)			

Notes:

(1) Paired valves are interlocked preventing both open during non-accident conditions.

Interlocking valves

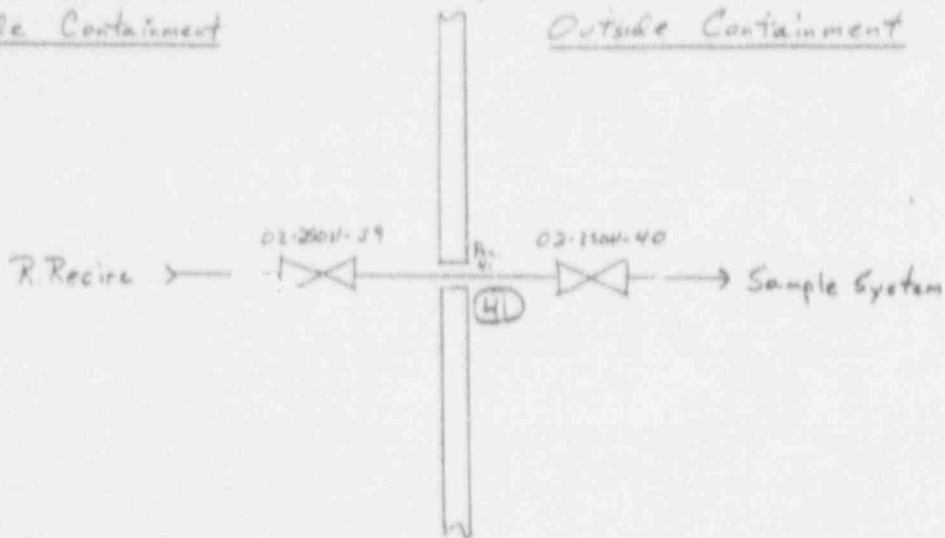
Penetration Number 39A,B

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Recirc Loop Sample

FM-26A

Function	Inside IV	Outside IV			
Valve Number	02-250V-39	02-250V-40			
Size	1"	1"			
Control Power					
Normal Status	Open	Open			
Failure, Loss AC	Closed	Closed			
Failure, Loss Air	N/A	N/A			
SBO Indication	Panel 9-3 Graphic Display	Panel 9-3 Graphic Display			
SBO Exclusion	2, 5	2, 5			

Notes:

EXCLUDED

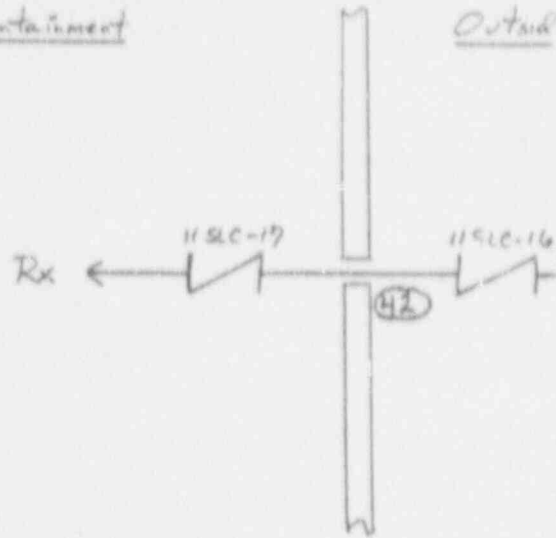
Penetration Number 41

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Static Blackout (SBO)

Inside Containment

Outside Containment



Standby Liquid Control

Function	Inside Check	Outside Check	Explosive
Valve Number	11SLC-17	11SLC-16	11EV-17A(1)
Size	1.5"	1.5"	1.5"
Control Power	N/A	N/A	A
Normal Status	Closed	Closed	Close
Failure, Loss AC	N/A	N/A	As - 1
Failure, Loss Air	N/A	N/A	N/A
SBO Indication	—	—	—
SBO Exclusion	3,5	3,5	5

Notes:

(1) Not in T.S. as Ct isol valve

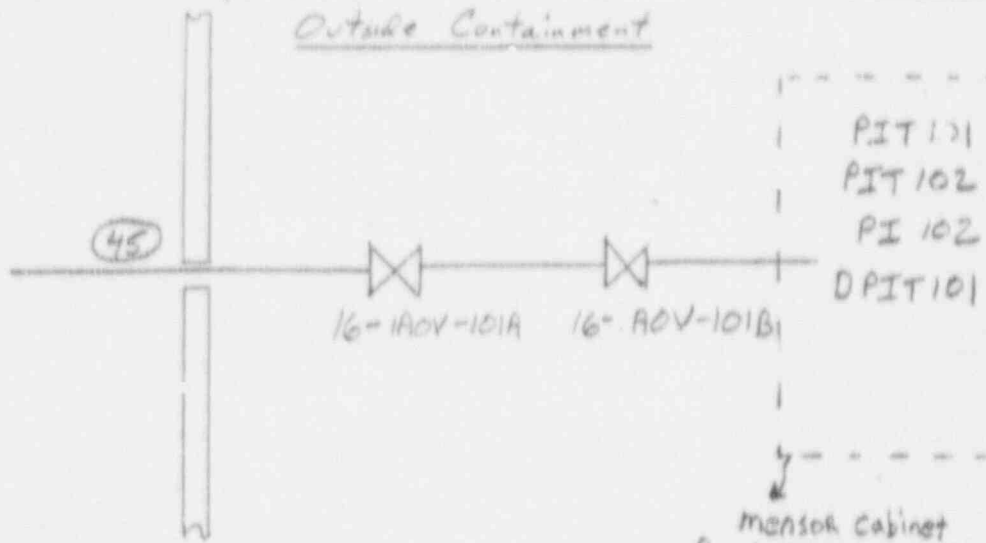
Escalated
Procedural Steps

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Penetrations During a Station Blackout (SBO)

Inside Containment

Outside Containment



Drywell Pressure Sensing

FM-49A

Function				
Valve Number	16-1ADV-101A	16-1ADV-101B		
Size	0.5"	0.5"		
Control Power				
Normal Status	Open	Open		
Failure, Loss AC	Closed	Closed		
Failure, Loss Air				
SBO Indication	27 ^{PCP} WAP	27 ^{PCP} WAP		
SBO Exclusion	5	5		

Notes:

This penetration supplies ILRT pressure instruments.

③ Indication on 27 PCP

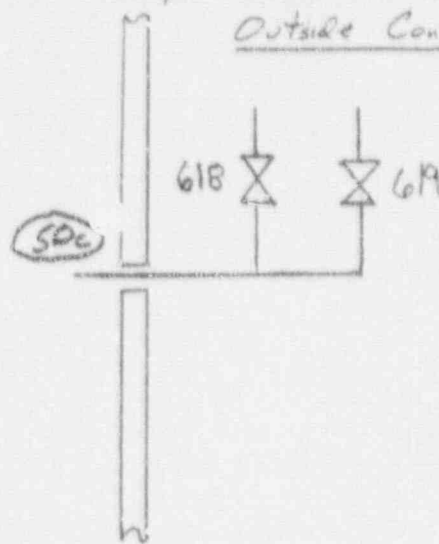
EXCLUDED
Penetration Number 45

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Instrumentation Sensing DW Pressure

Fm-188

Function					
Valve Number	Various				
Size	3/4"				
Control Power					
Normal Status	Open				
Failure, Loss AC					
Failure, Loss Air					
SBO Indication					
SBO Exclusion	5				

Notes:

Typical of Group B instrumentation penetrations

NE ISOLATION

Excluded

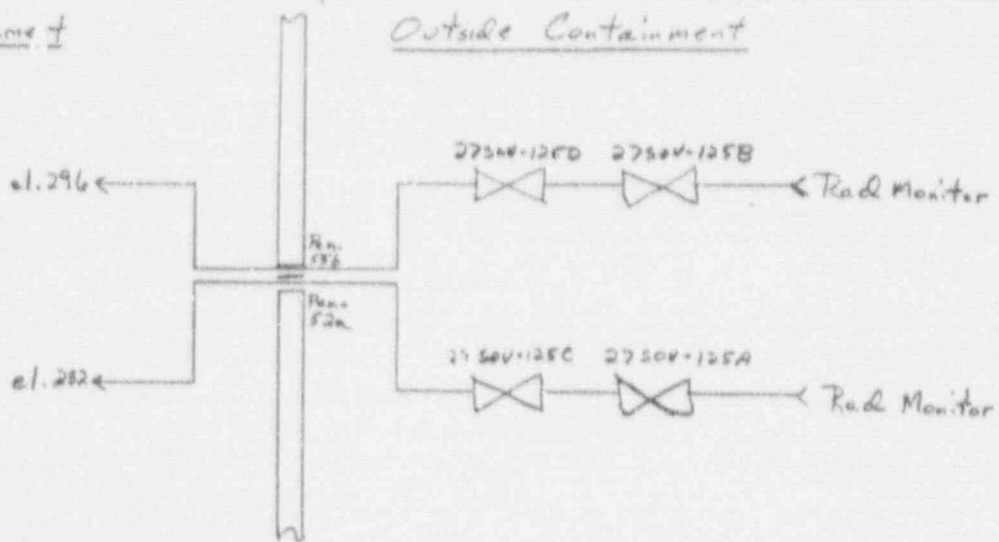
Penetration Number 50c

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Drywell Atmosphere Sample Return

Fm-186

Function	Rad Mon → el. 282	Rad Mon → el. 282	Rad Mon → el. 296	Rad Mon → el. 296
Valve Number	2750V-125C	2750V-125A	2750V-125D	2750V-125B
Size	1"	1"	1"	1"
Control Power				
Normal Status	Open	Open	Open	Open
Failure, Loss AC	Closed	Closed	Closed	Closed
Failure, Loss Air	N/A	N/A	N/A	N/A
SBO Indication	① 27PCP	① 27PCP	① 27PCP	① 27PCP
SBO Exclusion	2.5	2.5	2.5	2.5

Notes:

① Indication on 27PCP

EXCLUDED

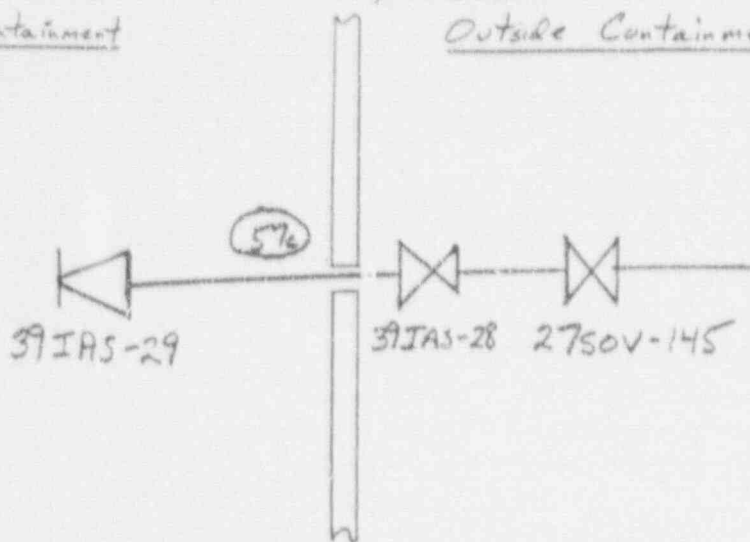
Penetration Number 52a, 55L

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



CAD Supply to Instrumentation in DW

FM-39A

Function		Check		
Valve Number	27SOV-145	39IAS-29	39IAS-28	
Size	1"	1"		
Control Power				
Normal Status	Open	Closed		
Failure, Loss AC	Open ⁽¹⁾	N/A		
Failure, Loss Air	N/A	Closed		
SBO Indication	② —	—		
SBO Exclusion	5	3, 5		

Notes:

(1) Fails open to ensure pneumatic supply. Note: Under SBO conditions the supply pressure would be > DW pressure thus ensuring inleakage.

② Indication also on 27CAD

EXCLUDED

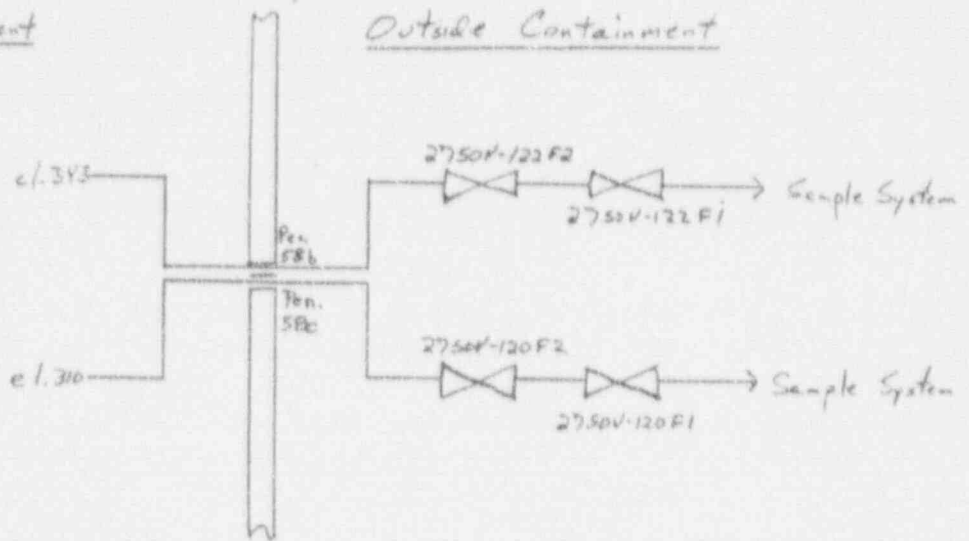
Penetration Number 57C

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Drywell H₂ Sample

FM-180

Function	SBo from e.l. 343	SBo from e.l. 343	SBo from e.l. 310	SBo from e.l. 310
Valve Number	2750V-122 F2	2750V-122 F1	2750V-120 F2	2750V-120 F1
Size	3/8"	3/8"	3/8"	3/8"
Control Power				
Normal Status	Closed	Closed	Open	Open
Failure, Loss AC	Closed	Closed	Closed	Closed
Failure, Loss Air	N/A	N/A	N/A	N/A
SBO Indication	✓ 27MAP ^{FF} F4	✓ 27MAP ^{FF} F4	✓ 27MAP ^{FF} F4	✓ 27MAP ^{FF} F4
SBO Exclusion	2.5	2.5	2.5	2.5

Notes:

EXCLUDED

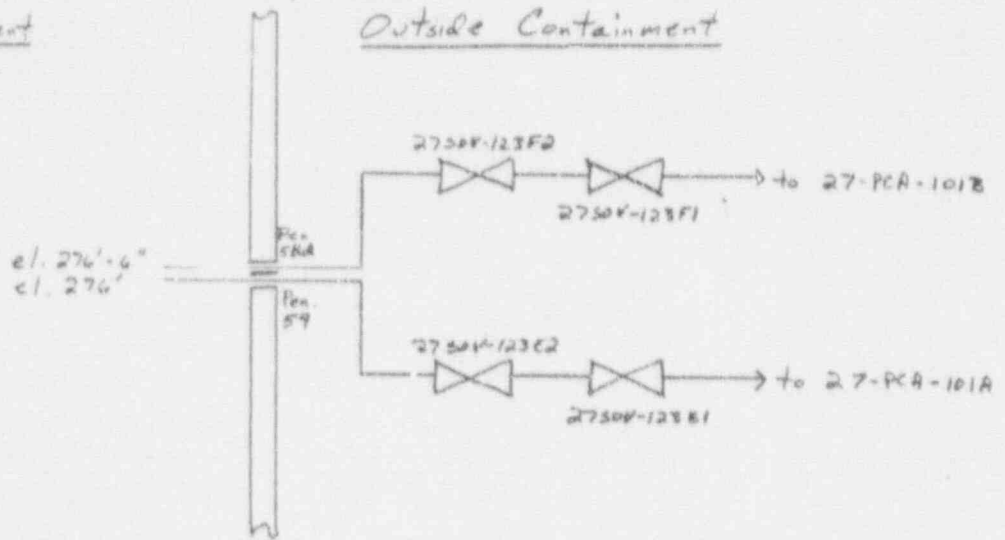
Penetration Number 586,c

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Drywell HZ Sample

Fm-180

Function	58A from el. 276'-6"	58A from el. 276"	59 from el. 271'	59 from el. 276'
Valve Number	2750V-123F2	2750V-123F1	2750V-123E2	2750V-123E1
Size	3/8"	3/8"	3/8"	1/8"
Control Power				
Normal Status	closed	closed	closed	closed
Failure, Loss AC	closed	closed	closed	closed
Failure, Loss Air	N/A	N/A	N/A	N/A
SBO Indication	✓ 27MAP ^{ext}	✓ 27MAP ^{ext}	✓ 27MAP ^{ext}	✓ 27MAP ^{ext}
SBO Exclusion	2,5	2,5	2,5	2,5

Notes:

EXCLUDED

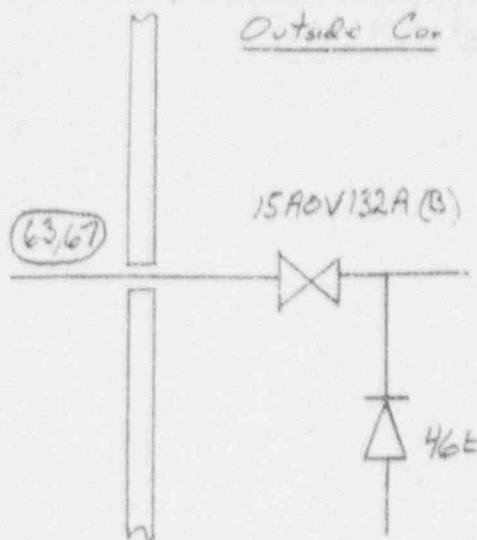
Penetration Number 58A, 59

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Black

Inside Containment

Outside Con



RBCLC & ESW to RRP A and
Motor Coolers

	RBCLC	RBCLC	ESW
Function		Check	Check
Valve Number	15A0V-132A(B)	15RBC-21A(B)	46ESW-15A(B)
Size	4"	4"	4"
Control Power			
Normal Status	Open	Open	Closed
Failure, Loss AC		N/A	N/A
Failure, Loss Air		N/A	N/A
SBO Indication	2, 3, 4	2, 3, 4	2, 3, 4
SBO Exclusion	4	3, 4	3, 4

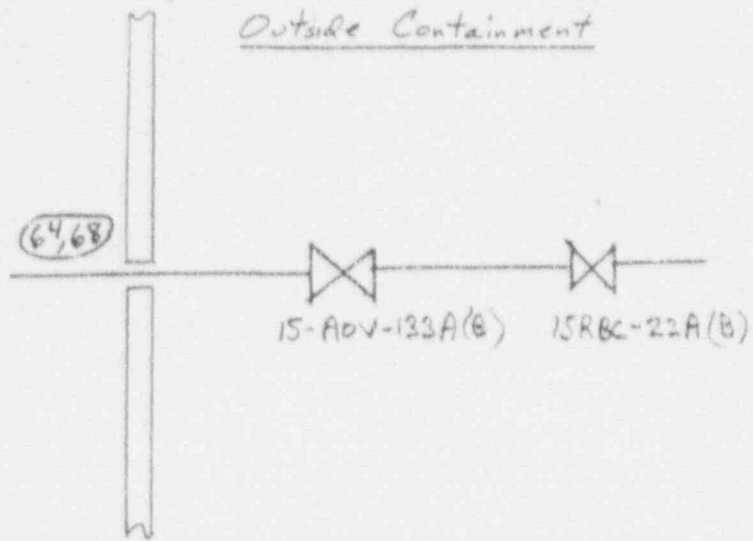
Notes:

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



RBCLC or ESW from DW.
Recirc Pump A and Motor Coolers.

Fm-15B

Function				
Valve Number	15ADV-133A(B)	15RBC-22A(B)		
Size	4"	4"		
Control Power				
Normal Status	Open	Open		
Failure, Loss AC	Open			
Failure, Loss Air	Open			
SBO Indication	27MAP	27MAP?		
SBO Exclusion	4	4		

Notes:

EXCLUDED

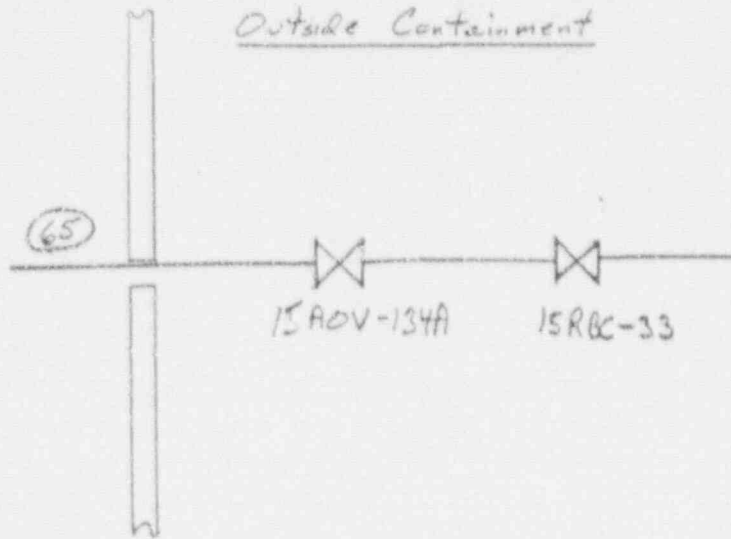
Penetration Number 64/68

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



RBCLC or ESW from DW.
From DW Equipment Sump Cooler.

FM-15B

Function				
Valve Number	15AOV-134A	15RBC-33		
Size	1.5"	1.5"		
Control Power				
Normal Status	Open	Open		
Failure, Loss AC	Open			
Failure, Loss Air	Open			
SBO Indication	27-PT	27-PT		
SBO Exclusion	5	5		

Notes:

EXCLUDED

Penetration Number 65

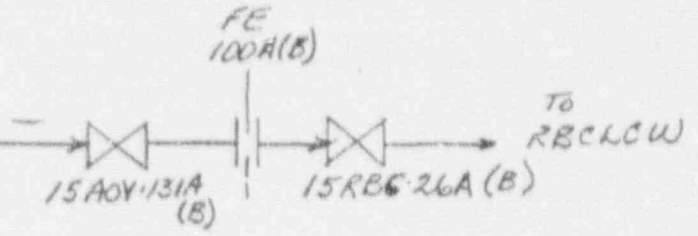
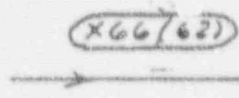
James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment

FROM
DRYWELL
COOLING ASSEMBLY
A(B)



7 RBCLCW OR ESU FROM DRYWELL

Fm-15B

(X-66)

(X-62)

Function		MANUAL		MANUAL
Valve Number	15A0V-131A	15RBC-26A	15A0V-131B	15RBC-26B
Size	4"	4"	4"	4"
Control Power				
Normal Status	Open	Open	OPEN	OPEN
Failure, Loss AC	Open		OPEN	
Failure, Loss Air	OPEN		OPER	
SBO Indication				
SBO Exclusion	4	4	4	4

Notes:

EXCLUDED

Penetration Number 66, 62

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

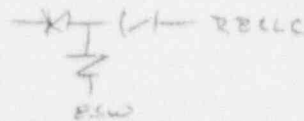
Inside Containment

Outside Containment



SAME AS penetration 63

RBCLC and ESW to DW.
To RRP B and Motor Coolers.



Function	RB	RB Check	ESW Check		
Valve Number	15ADV-132B	15RBC-21B	46ESW-15A		
Size	4"	4"	4"		
Control Power					
Normal Status	Open	Open	Closed		
Failure, Loss AC		N/A	N/A		
Failure, Loss Air		N/A	N/A		
SBO Indication	27MAP	27AT	27MAP		
SBO Exclusion	4	4	4		

Notes:

EXCLUDED

Penetration Number 67

James A. FitzPatrick Nuclear Power Plant

Containment Isolation Provisions During a Station Blackout (SBO)

Inside Containment

Outside Containment



Same as Penetration 64

RTBCLC or ESW from DW.
From RRP B and Motor Coolers.

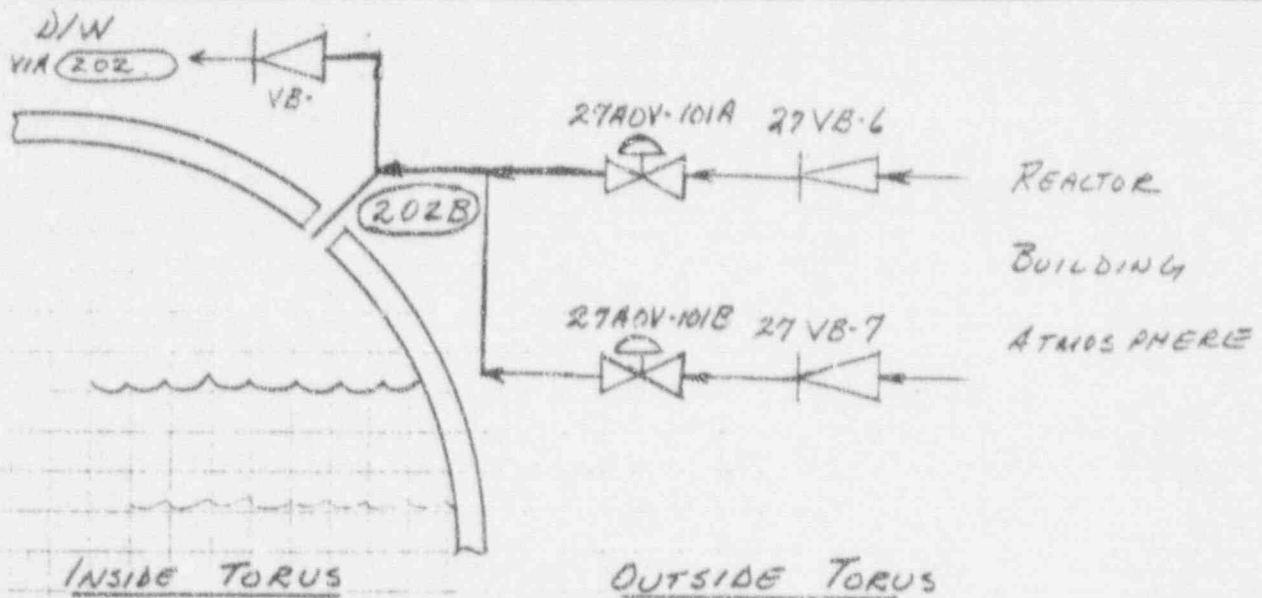
Function				
Valve Number	15A0V-133B	15RBC-22B		
Size	4"	4"		
Control Power				
Normal Status	Open	Open		
Failure, Loss AC	Open			
Failure, Loss Air	Open			
SBO Indication	27MAP	27MAP?		
SBO Exclusion	4	4		

Notes:

EXCLUDED

Penetration Number 68

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (SBO)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



RB TO TORUS VACUUM BREAKER

FM-188

FUNCTION	ISOLATION	CHECK		ISOLATION	CHECK
VALVE NUMBER	27 ADV 101A	27 VB-6		27 ADV 101B	27 VB-7
SIZE	20"	20"		20"	20"
CONTROL POWER		N/A			N/A
NORMAL STATUS	CLOSED	CLOSED		CLOSED	CLOSED
FAILURE LOSS AC		N/A			N/A
FAILURE LOSS AIR	CLOSED	N/A		CLOSED	N/A
SBO INDICATION	①	①		①	①
SBO EXCLUSION		3			3

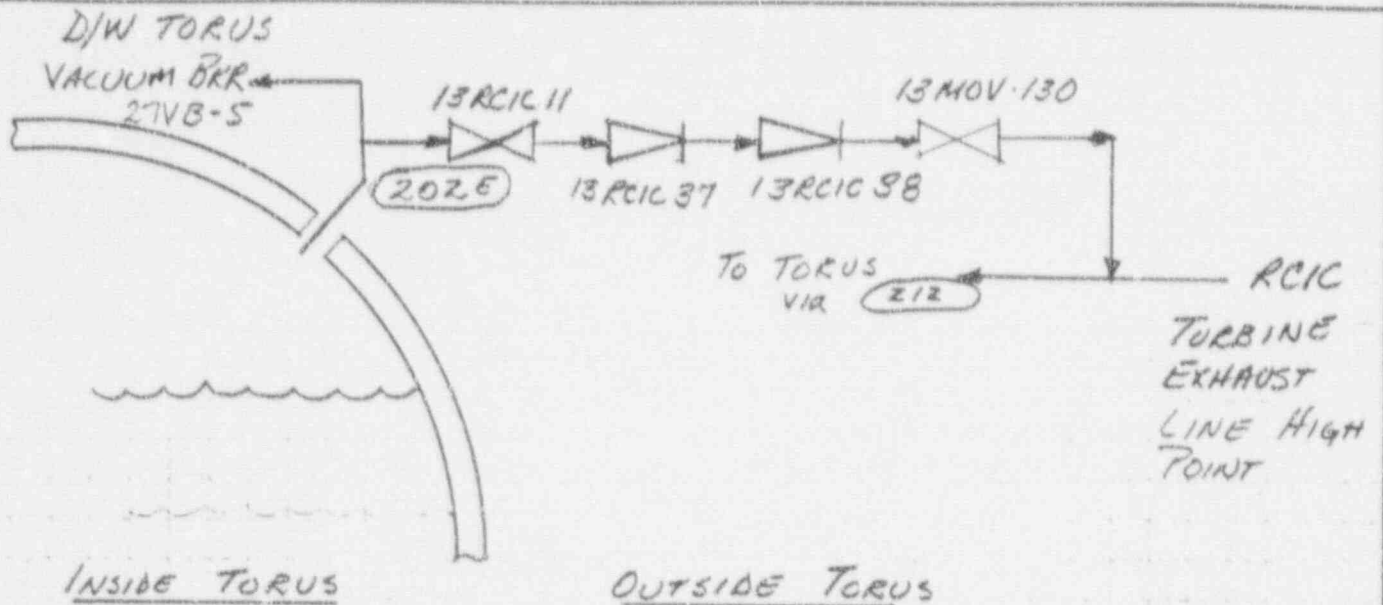
NOTES:

① Indication on 27 PCP,

EXCLUDED

PENETRATION No. 202 B

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (580)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



RCIC TURBINE EXHAUST LINE VACUUM BREAKER Fm-22A

FUNCTION		CHECK (2)	CHECK (2)		check
VALVE NUMBER	13RCIC 11	13RCIC 37	13RCIC 38	13 MOV 130	27VB-5
SIZE	1 1/2"	1 1/2"	1 1/2"	1 1/2"	
CONTROL POWER		N/A	N/A	DC	
NORMAL STATUS	OPEN	CLOSED	CLOSED	OPEN	
FAILURE LOSS AC		N/A	N/A	N/A	
FAILURE LOSS AIR		N/A	N/A	N/A	
SBO INDICATION				Graphic display	
SBO EXCLUSION	5	5	5	5	3

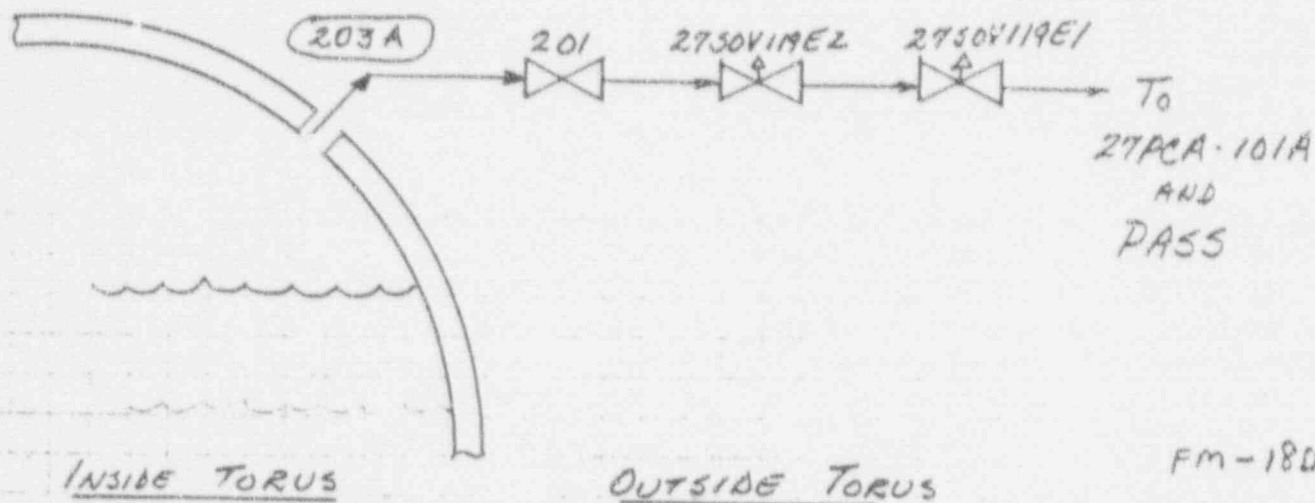
NOTES:

- (1) NOT LISTED IN TECH SPECS
- (2) DO NOT SEAL LINE AGAINST TORUS PRESSURE

EXCLUDED

PENETRATION No. 20ZE

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (580)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



SUPPRESSION CHAMBER ATMOSPHERE SAMPLE SUCTION

FUNCTION	SR GAS SAMPLE	SR GAS SAMPLE			
VALVE NUMBER	2750V19E2	2750V19E1			
SIZE	3/8"	3/8"			
CONTROL POWER					
NORMAL STATUS	CLOSED	CLOSED			
FAILURE LOSS AC	CLOSED	CLOSED			
FAILURE LOSS AIR	N/A	N/A			
SBO INDICATION	✓ 27MAP	✓ 27MAP			
SBO EXCLUSION	5	5			

NOTES:

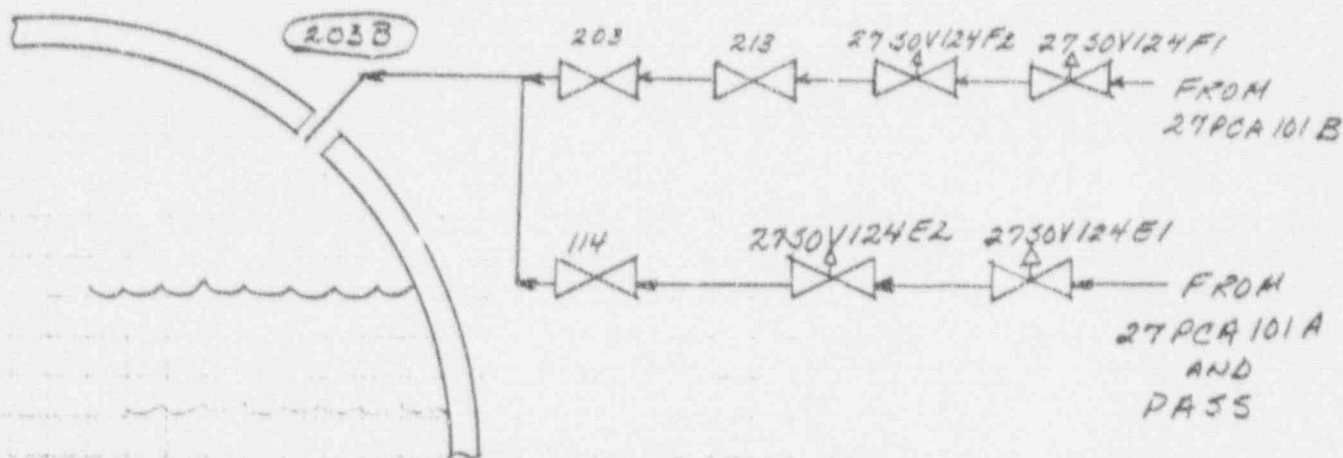
EXCLUDED

PENETRATION No. 203A

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

(SBO)

CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



INSIDE TORUS

OUTSIDE TORUS

Fm-180

PRIMARY CONTAINMENT ANALYZER AND PASS SAMPLE RETURN

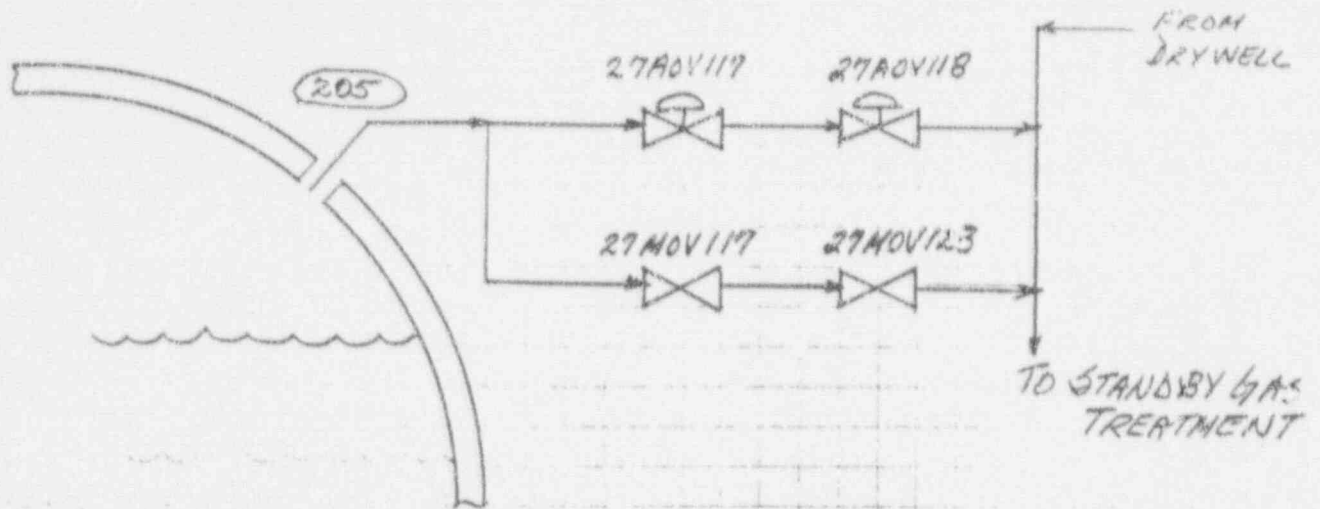
FUNCTION	'A' PASS RETURN	'A' PASS RETURN	'B' RETURN	'B' RETURN
VALVE NUMBER	2750V124E2	2750V124E1	2750V124F2	2750V124F1
SIZE	1"	1"	1"	1"
CONTROL POWER				
NORMAL STATUS	OPEN	OPEN	OPEN	OPEN
FAILURE LOSS AC				
FAILURE LOSS AIR	N/A	N/A	N/A	N/A
SBO INDICATION	✓ 27MAP	✓ 27MAP	✓ 27MAP	✓ 27MAP
SBO EXCLUSION	5	5	5	5

NOTES:

EXCLUDED

PENETRATION No. 203B

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (580)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



INSIDE TORUS OUTSIDE TORUS
 TORUS PURGE EXHAUST (N₂ AND AIR)

FM-18B

FUNCTION			INBOARD	OUTBOARD
VALVE NUMBER	27AOV117	27AOV118	27MOV117	27MOV123
SIZE	20"	20"	2"	2"
CONTROL POWER			AC	DC?
NORMAL STATUS	CLOSED	CLOSED	CLOSED	CLOSED
FAILURE LOSS AC	CLOSED	CLOSED	AS-13	N/A
FAILURE LOSS AIR	CLOSED	CLOSED	N/A	N/A
SBO indication	⓪	⓪	⓪	⓪
SBO Exclusion	2	2	5	5

NOTES:

↑
 Says 20" (should be smaller)

⓪ Indication on 27PCP, DC?

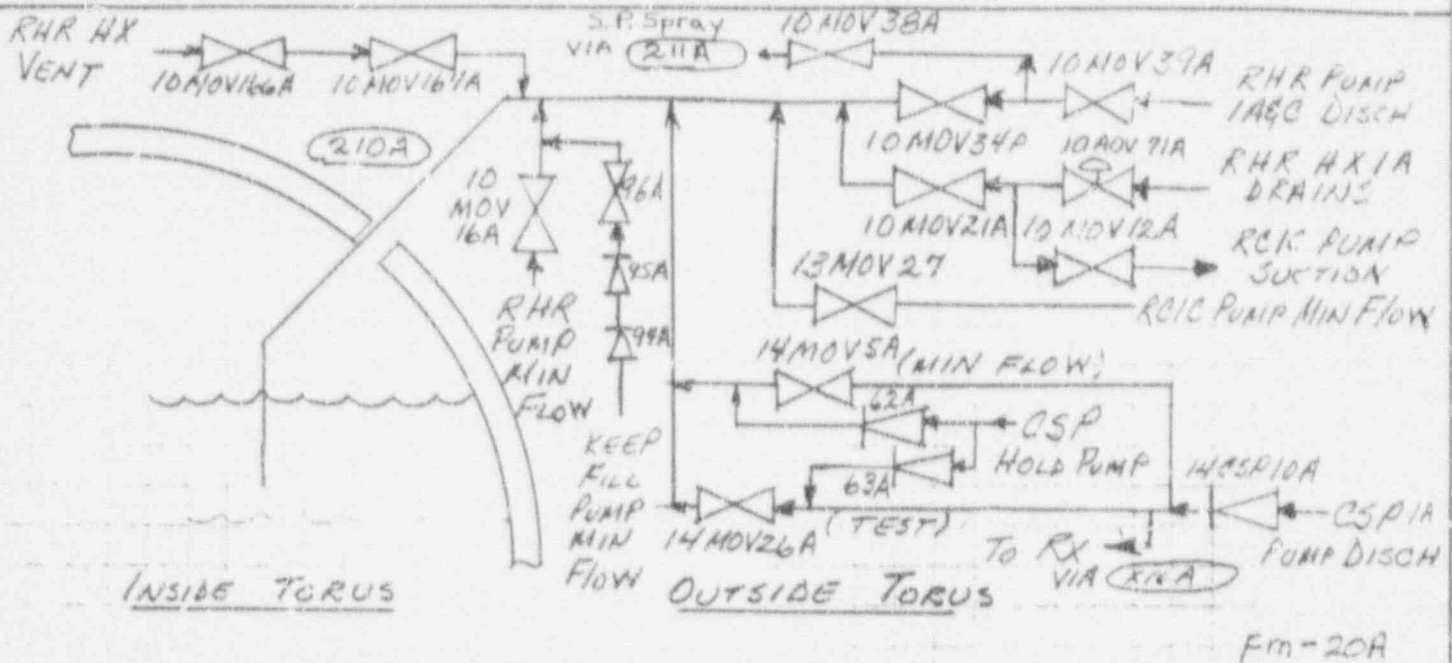
Excluded

PENETRATION No. 205

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

(580)

CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



FUNCTION	RHR TEST THROTTLE	RHR MIN FLOW	RHR HX DRAIN	RHR HX VENT	KEEP FILL MIN FLOW
VALVE NUMBER	10MOV34A	10MOV16A	10MOV21A	10MOV167A	10MOV95A
SIZE	16"	4"	4"	1"	1" CHECK
CONTROL POWER	AC	AC	AC	AC	n/c
NORMAL STATUS	CLOSED	CLOSED	CLOSED	CLOSED	OPEN
FAILURE LOSS AC					n/a
FAILURE LOSS AIR	n/a	n/a	n/a	n/a	n/a
SBO INDICATION					
SBO EXCLUSION				5	5,3

NOTES:

(1) NOT TYPE C Tested Seal by S.P. Water

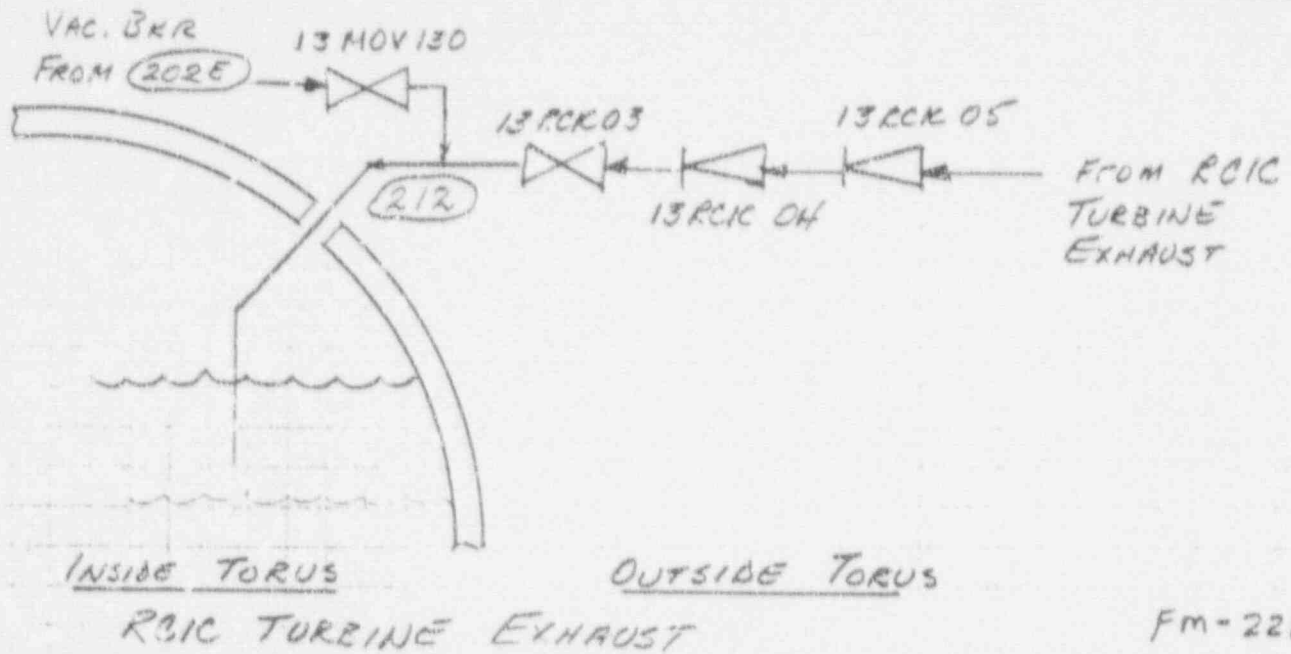
(2) 10MOV34A Type C Tested WITH 211A VALVES.

RCIC MIN FLOW	CSP TEST THROTTLE	CSP MIN FLOW	HOLD PUMP MIN FLOW
13MOV27	14MOV26A	14MOV5A	14CSP62A
2"	8"	3" ?	1" CHECK
DC	AC	AC	n/a
CLOSED	CLOSED	OPEN	OPEN
			n/a
n/a	n/a	n/a	nb
5		5"	5,3

Excluded
~~Atmosphere~~ suction is below minimum water level.

PENETRATION No. 210A

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (580)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



FUNCTION		CHECK	CHECK		
VALVE NUMBER		13 RCK 03	13 RCK 05		
SIZE		8"	8"		
CONTROL POWER		n/a	n/a		
NORMAL STATUS		CLOSED	CLOSED		
FAILURE LOSS AC		n/a	n/a		
FAILURE LOSS AIR		n/a	n/a		
SBO Indication					
SBO Exclusion		3	3		

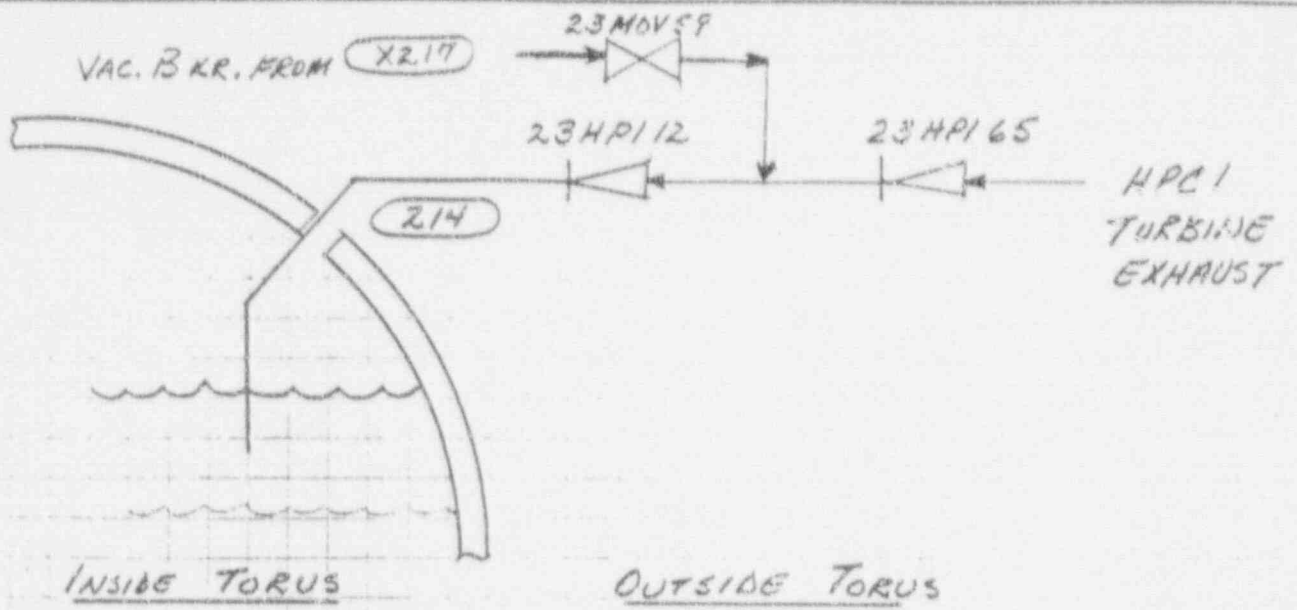
NOTES:

(1) NOT Type C Tested Sealed by S.P. Water

EXCLUDED

PENETRATION No. 212

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (SBU)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



HPCI TURBINE EXHAUST

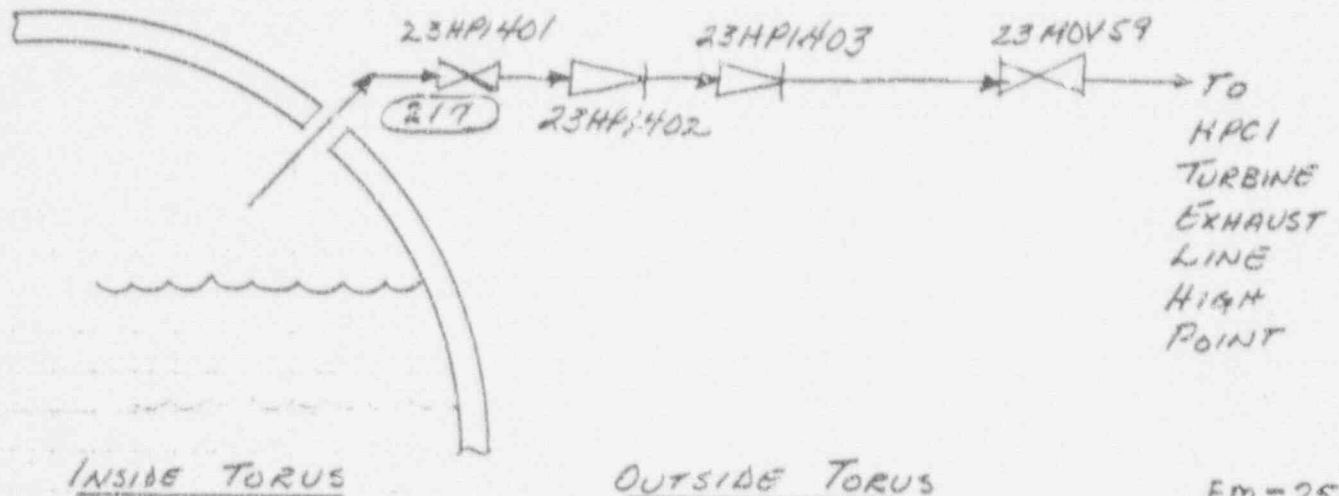
Fm-25A

FUNCTION	CHECK	CHECK			
VALVE NUMBER	23-HPI-12	23-HPI-65			
SIZE	20"	20"			
CONTROL POWER	n/a	n/a			
NORMAL STATUS	CLOSED	CLOSED			
FAILURE LOSS AC	n/a	n/a			
FAILURE LOSS AIR	n/a	n/a			
SBO INDICATION	-	-			
SBO EXCLUSION	3	3			

NOTES:
 NOT TYPE C TESTED SEALED BY S.P. WATER

EXCLUDED
 PENETRATION No. 214

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (SBO)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



HPCI TURBINE EXHAUST LINE VACUUM BREAKER

FM-25A

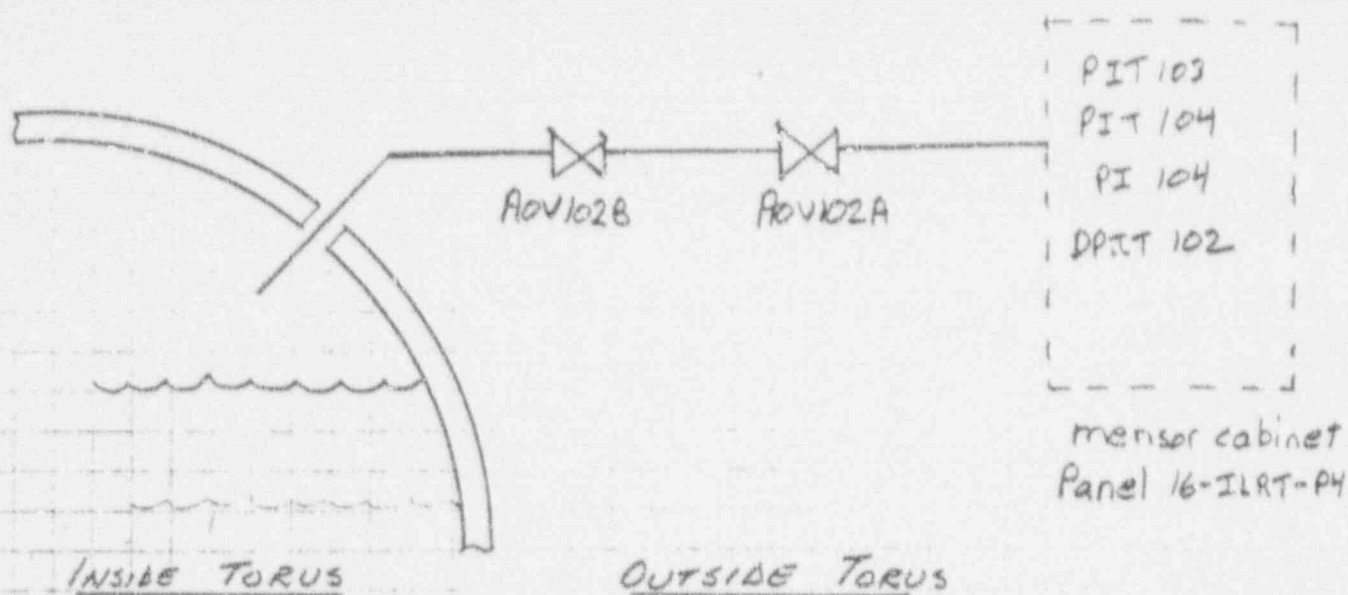
FUNCTION	CHECK (2)	CHECK (2)	
VALVE NUMBER	23HP1402	23HP1403	23MOV59
SIZE			
CONTROL POWER	N/A	N/A	DC
NORMAL STATUS	CLOSED	CLOSED	OPEN
FAILURE LOSS AC	N/A	N/A	N/A
FAILURE LOSS AIR	N/A	N/A	N/A
SBO INDICATION			Graphic Display
SBO EXCLUSION			

NOTES:

- (1) NOT LISTED IN TECH SPECS
- (2) DO NOT SEAL LINE AGAINST TORUS PRESSURE

~~check graphic display for~~
~~23MOV59~~

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (380)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



FUNCTION				
VALVE NUMBER	16-1A0V-102A	16-1A0V-102B		
SIZE	3/8"	3/8"		
CONTROL POWER				
NORMAL STATUS	OPEN	OPEN		
FAILURE LOSS AC	Closed	Closed		
FAILURE LOSS AIR	Closed	Closed		
SBO Indication	① 27 PCP	① 27 PCP		
SBO Exclusion	2,5	2,5		

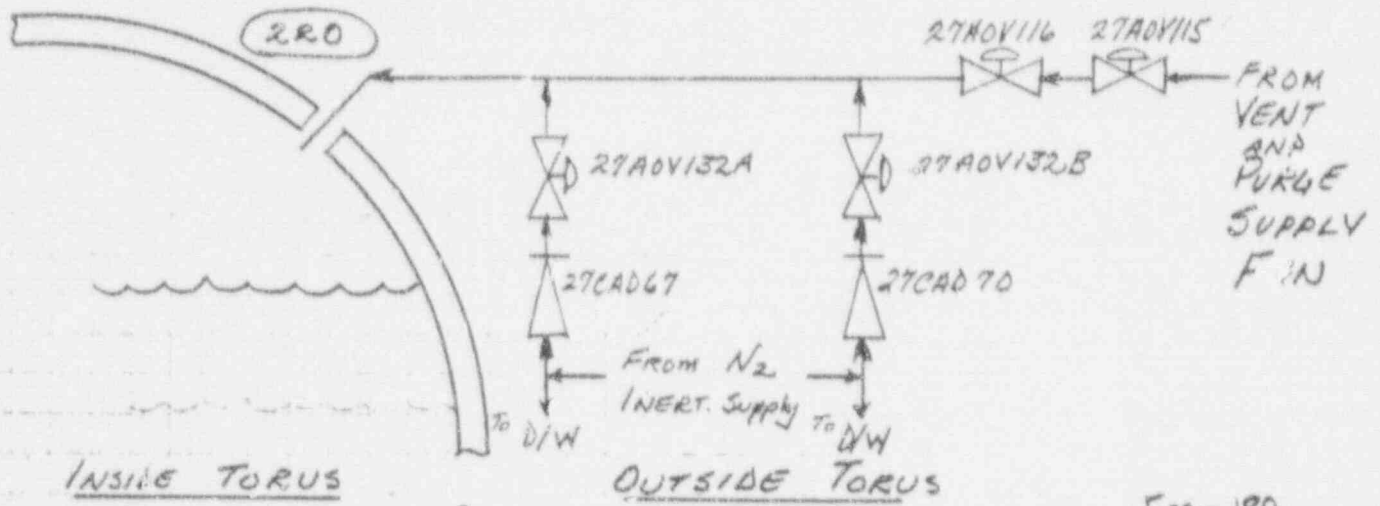
NOTES:

① Indication on 27 PCP,

Pressure sensing for ILRT instrumentation

Excluded

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (SBO)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



TORUS PURGE INLET (N₂ AND AIR)

FM-18B

FUNCTION	PURGE SUPPLY	PURGE SUPPLY	N ₂ INERT SUPPLY	CHECK
VALVE NUMBER	27A0V 116	27A0V 115	27A0V132A	27CAD-67
SIZE	20"	20"	1.5"	1.5"
CONTROL POWER				N/A
NORMAL STATUS	CLOSED	CLOSED	CLOSED	CLOSED
FAILURE LOSS AC	CLOSED	CLOSED	CLOSED	N/A
FAILURE LOSS AIR	CLOSED	CLOSED	CLOSED	N/A
SBO INDICATION	①	①	②	
SBO EXCLUSION	2	2	5	5, 3

NOTES:

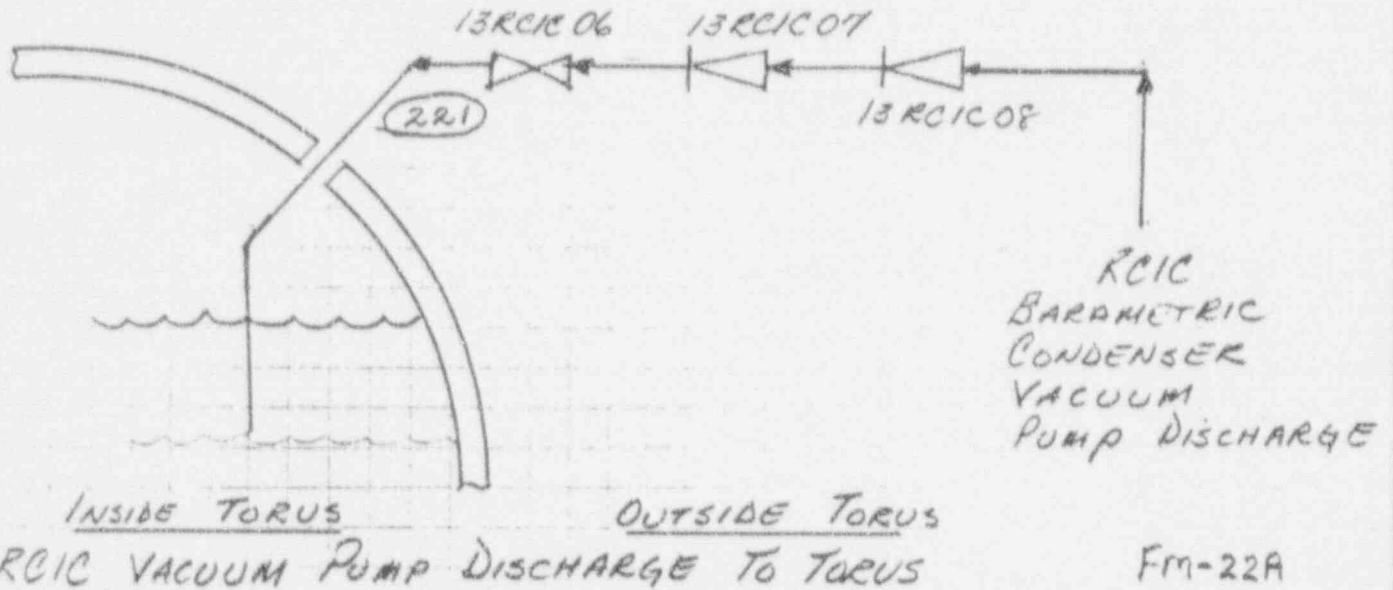
- ① Indication on 27PCP
- ② Indication on 27CAD.

N ₂ INERT SUPPLY	CHECK
27A0V132B	27CAD-70
1.5"	1.5"
	N/A
CLOSED	CLOSED
CLOSED	N/A
CLOSED	N/A
②	
5	5, 3

EXCLUDED

Penetration No. 220

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (SBO)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



FUNCTION		CHECK	CHECK		
VALVE NUMBER		13 RCIC 07	13 RCIC 08		
SIZE		2"	2"		
CONTROL POWER		N/A	N/A		
NORMAL STATUS		CLOSED	CLOSED		
FAILURE LOSS AC		N/A	N/A		
FAILURE LOSS AIR		N/A	N/A		
SBO INDICATION					
SBO EXCLUSION		5,3	5,3		

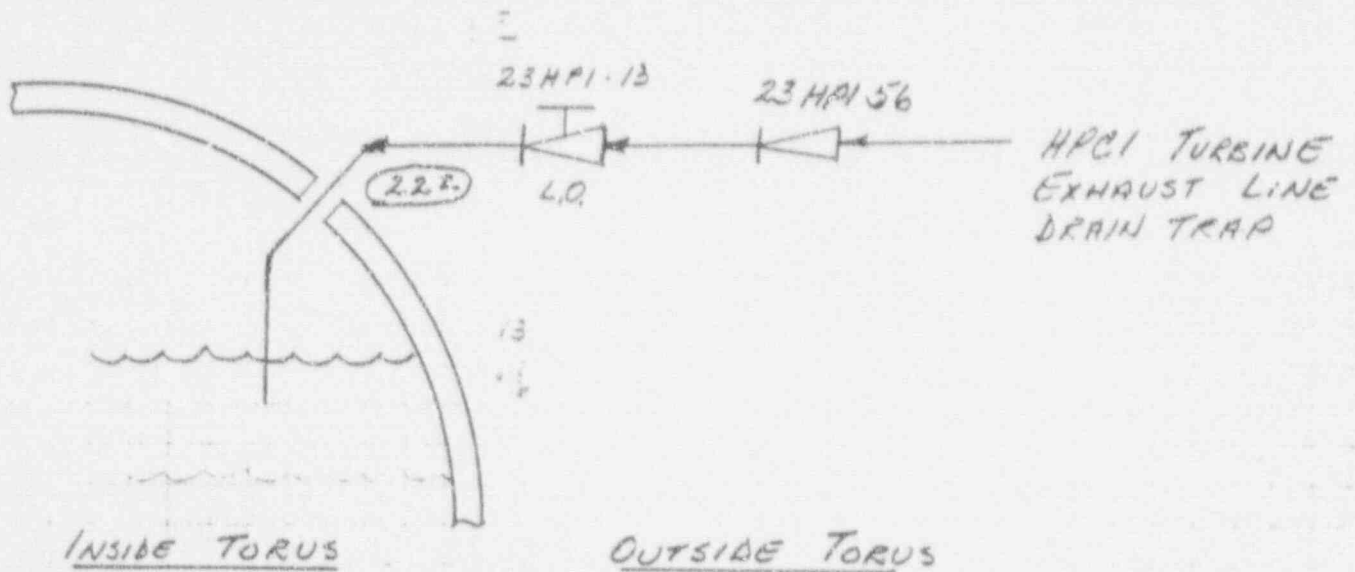
NOTES:

NOT TYPE C TESTED SEALED BY S.P. WATER

EXCLUDED

PENETRATION No. 221

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (580)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



HPCI TURBINE EXHAUST DRAIN TRAP

FM-25A

FUNCTION	STOP CHECK	CHECK		
VALVE NUMBER	23HPI-13	23HPI-56		
SIZE	2"	2"		
CONTROL POWER	N/A	N/A		
NORMAL STATUS	CLOSED (2)	CLOSED		
FAILURE LOSS AC	N/A	N/A		
FAILURE LOSS AIR	N/A	N/A		
SBO INDICATION				
SBO EXCLUSION	5,3	5,3		

NOTES:

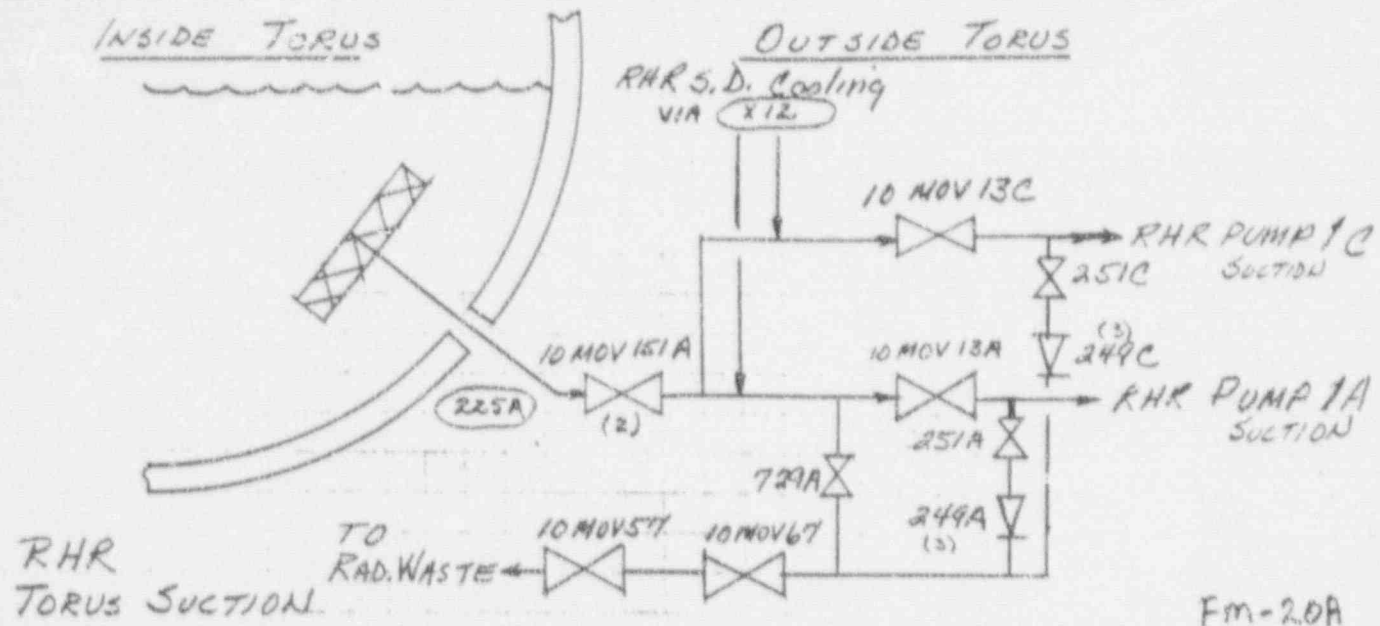
- (1) NOT Type C Tested Sealed by S.P. WATER
- (2) 23HPI-13 handle is locked open

EXCLUDED

PENETRATION No. 222

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT (SBO)



Fm-2.0A

FUNCTION	RHR Pump 1A Sect.	RHR Pump 1C Sect.	RHR to R. W.	RHR to R. W.
VALVE NUMBER	10 MOV-13A	10 MOV-13C	10 MOV-57	10 MOV-67
SIZE	20"	20"	4" THROTTLE	4"
CONTROL POWER	AC	AC	AC	DC (BMCC-2)
NORMAL STATUS	OPEN	OPEN	CLOSED	CLOSED
FAILURE, LOSS AC				n/a
FAILURE, LOSS AIR	n/a	n/a	n/a	n/a
SBO Indication				Panel 9-3
SBO Exclusion				

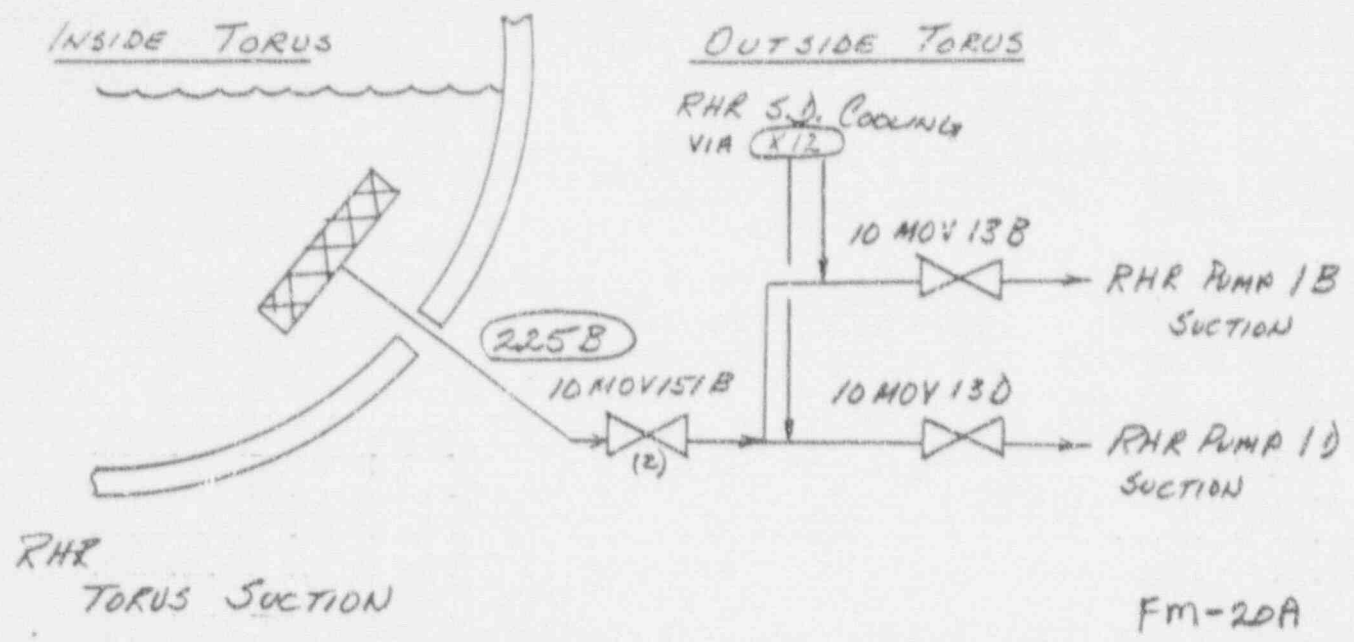
NOTES:

- (1) NOT TYPE C TESTED SEALED BY S.P. WATER
- (2) 10 MOV 151A MOTOR IS "DEACTIVATED" in OPEN POSITION
- (3) 10 RHR 249 A(C) Do Not Seal against Torus Pressure

EXCLUDE D

PENETRATION No. 225A

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT (SBO)



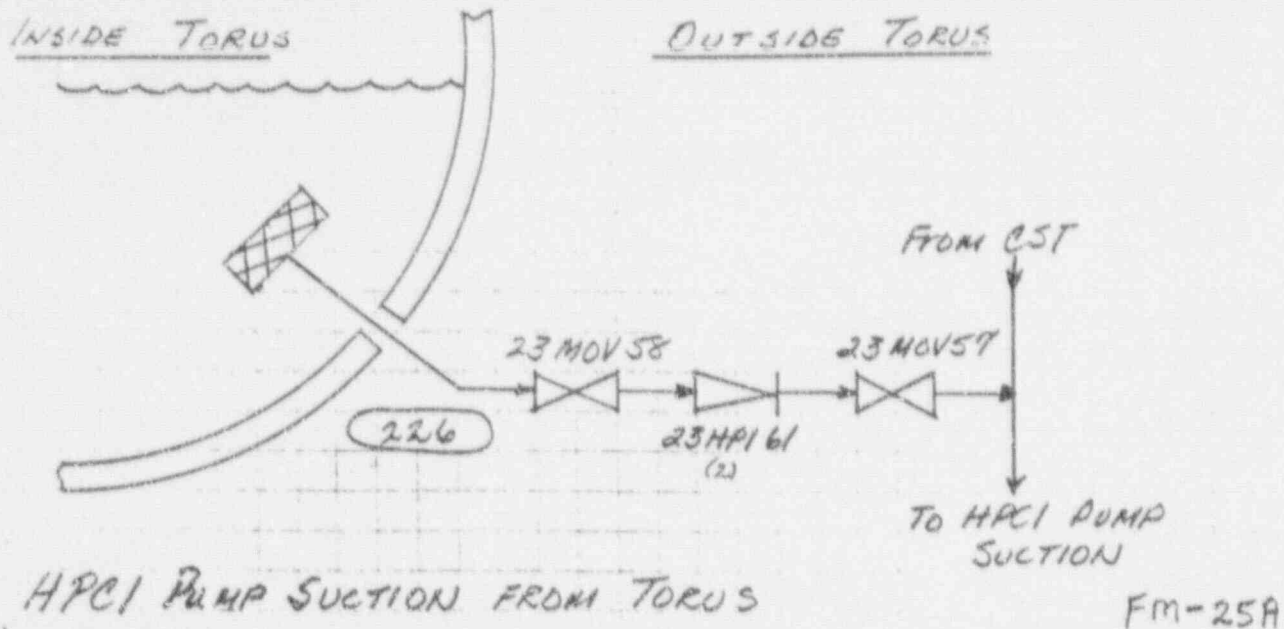
FUNCTION	RHR Pump 1B Suct	RHR Pump 1D Suct			
VALVE NUMBER	10 MOV-13B	10 MOV 13D			
SIZE	20"	20"			
CONTROL POWER	AC	AC			
NORMAL STATUS	OPEN	OPEN			
FAILURE, LOSS AC					
FAILURE, LOSS AIR	N/A	N/A			
SBO Indication					
SBO Exclusion					

- NOTES:
- (1) NOT TYPE C TESTED SEALED BY S. P. WATER
 - (2) 10 MOV 151 B MOTOR IS "DEACTIVATED" IN OPEN POSITION

EXCLUDED
 PENETRATION No. 225B

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT (SBO)



FUNCTION			
VALVE NUMBER	23 MOV 58		23 MOV 57
SIZE	16"		16"
CONTROL POWER	DC		DC
NORMAL STATUS	CLOSED		CLOSED
FAILURE, LOSS AC	N/A		N/A
FAILURE, LOSS AIR	N/A		N/A
SBO Indication			
SBO Exclusion			

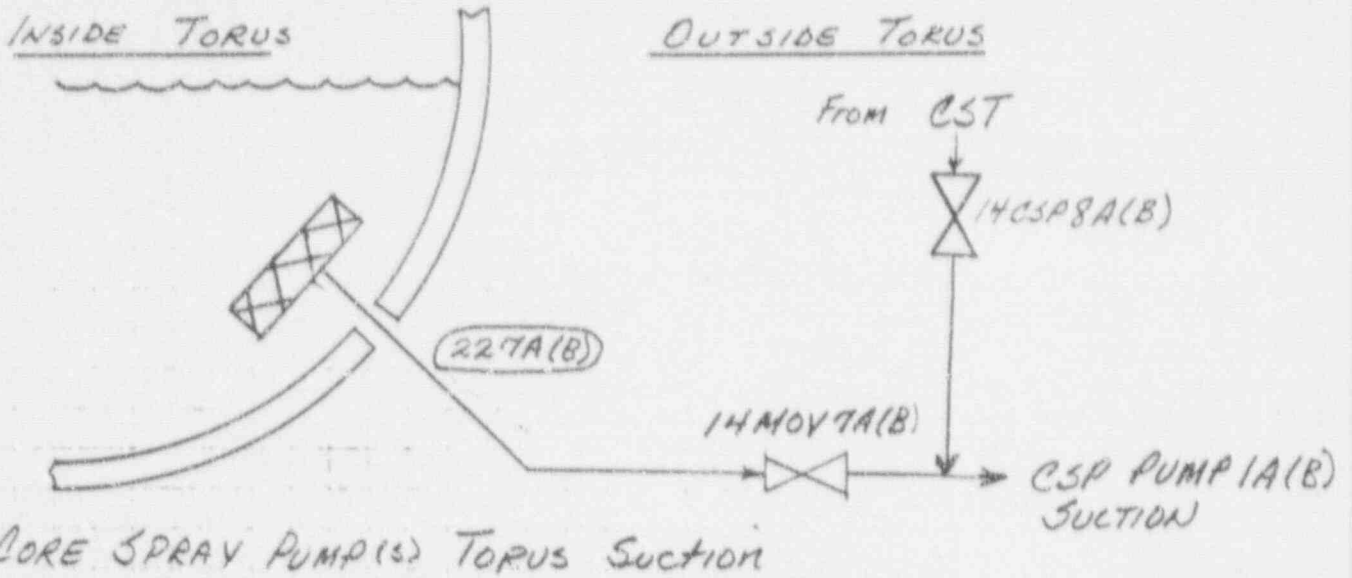
NOTES:

- (1) NOT Type C Tested sealed by S.P. Water
- (2) 23 HPI 61 Does NOT seal against Torus Pressure

EXCLUDED

PENETRATION No. 226

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT (SBO)



CORE SPRAY PUMP(S) TORUS SUCTION

FM-23A

	(227A)	(227B)		
FUNCTION	CSP 1A Suct.	CSP 1B Suct		
VALVE NUMBER	14MOV 7A	14MOV 7B		
SIZE	16"	16"		
CONTROL POWER	AC	AC		
NORMAL STATUS	OPEN	OPEN		
FAILURE, LOSS AC	AS IS	AS IS		
FAILURE, LOSS AIR	NR	N/A		
SBO Indication				
SBO Exclusion				

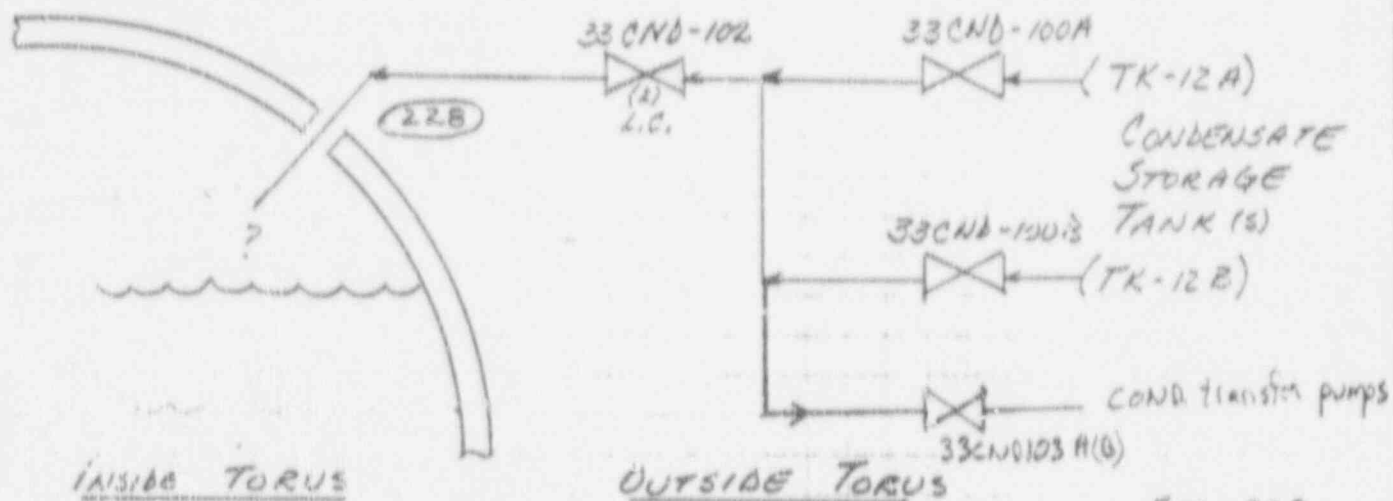
NOTES:

- NOT TYPE C TESTED SEALED BY S.P. WATER

EXCLUDED

PENETRATION No. RZ7A(B)

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (SBO)
 CONTAINMENT ISOLATION PROVISIONS DURING A STATION BLACKOUT



FUNCTION	HANDUAL				
VALVE NUMBER	33CND-102				
SIZE	10"				
CONTROL POWER	n/a				
NORM. STATUS	CLOSED (2)				
FAILURE LOSS AC	n/a				
FAILURE LOSS AIR	n/a				
SBO INDICATION	-				
SBO EXCLUSION	1				

NOTES:

- (1) NOT TYPE C TESTED SEALED BY S.P. WATER (1)
- (2) 33 CND-102. Locked Closed

excluded

PENETRATION No. 228