# TECHNICAL EVALUATION REPORT

## OVERRIDE AND RESET OF CONTROL CIRCUITRY IN THE VENTILATION/PURGE ISOLATION AND OTHER ENGINEERED SAFETY FEATURE SYSTEMS (B-24)

VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION UNITS 1 AND 2

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*Prepared by*

Franklin Research Center
20th and Race Street
Philadelphia, PA 19103

Author: I. Sargent

FRC Group Leader: J. Stone

*Prepared for*

Nuclear Regulatory Commission
Washington, D.C. 20555

Lead NRC Engineer: J. Calvo

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| Prepared by: | Reviewed by: | Approved by: |
|---|---|---|
| [signature] | [signature] | S. Pandey |
| Principal Author: | Group Leader | Department Director (Acting) |
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Franklin Research Center
A Division of The Franklin Institute
The Benjamin Franklin Parkway, Phila., Pa. 19103 (215) 448-1000

# ABSTRACT

This report documents the technical evaluation of the design of electrical, instrumentation, and control systems provided at the North Anna Power Station, Units 1 and 2, to initiate automatic closure of valves to isolate the containment. The evaluation was conducted in accordance with NRC criteria, based on IEEE Std 279-1971, for assuring that containment isolation and other engineered safety features will not be compromised by manual overriding and resetting of the safety actuation signals. It was concluded that the electrical, instrumentation, and control systems at North Anna Power Station, Units 1 and 2, partially conform to the NRC criteria.

# FOREWORD

This Technical Evaluation Report was prepared by Franklin Research Center under a contract with the U.S. Nuclear Regulatory Commission (Office of Nuclear Reactor Regulation, Division of Licensing) for technical assistance in support of NRC operating reactor licensing actions. The technical evaluation was conducted in accordance with criteria established by the NRC.

Mr. I. Sargent contributed to the technical preparation of this report through a subcontract with WESTEC Services, Inc.

## CONTENTS

## FIGURES

# 1. INTRODUCTION

Several instances have been reported at nuclear power plants where automatic closure of the containment ventilation/purge valves would not have occurred because the safety actuation signals were either overriden or blocked during normal plant operations. These events resulted from procedural inadequacies, design deficiencies, and lack of proper management controls. These events also brought into question the mechanical operability of the containment isolation valves themselves. These events were determined by the U.S. Nuclear Regulatory Commission (NRC) to be Abnormal Occurrences (#78-5) and were, accordingly, reported to the U.S. Congress.

As a followup to these Abnormal Occurrences, the NRC staff is reviewing the electrical override aspects and the mechanical operability aspects of containment purging for all operating power reactors. On December 11, 1978, the NRC issued a letter entitled "Containment Purging During Normal Plant Operation" [1]* to boiling water reactor (BWR) and pressurized water reactor (PWR) licensees. In a letter dated January 17, 1979 [2], the Virginia Electric and Power Company (VEPCO), Licensee for North Anna Power Station (NAPS), replied to the NRC generic letter.

In a letter dated October 30, 1979 [3], the NRC stated that their review of Reference 2 indicated that a commitment to meet certain interim requirements related to minimizing containment purge and vent operations, including keeping the purge and vent isolation valves closed whenever the plant was not in a cold shutdown condition, was required. On December 20, 1979 [4], VEPCO reported that they had determined that they operate in conformance with the NRC's Interim Position, noting that NAPS Technical Specifications require containment pressure to be subatmospheric when the reactor coolant system temperature is above 200°F and that this requirement precludes opening the containment purge and vent valves during plant conditions after the cold shutdown.

*Numbers in brackets refer to citations in the list of references, Section 5.

On July 25, 1980 [5], the NRC requested that additional information be provided concerning the electrical bypass and reset of engineered safety feature (ESF) signals at NAPS. Their request for information provided six evaluation criteria which were to be applied to all ESF systems and thus, while related to prior investigations of containment venting and purging, was of substantially greater scope than the prior review and interim position. Further, this letter requested that VEPCO provide certain detailed circuit information sufficient to support an independent, schematic level, circuit design review. In a letter dated July 1, 1981 [6], VEPCO responded to this request for information indicating compliance with Criteria 1, 2, 3, and 5, noting that Criterion 4 had been discussed in prior correspondence [7, 8], and indicating that a previous review of the resetting of ESF signals had resulted in certain control circuit modifications. No control circuit schematic diagrams were provided. A site visit, arranged and monitored by the NRC, was conducted on September 30-October 2, 1981. Observations from this site visit were incorporated into a draft Technical Evaluation Report (TER) and provided for NRC and VEPCO staff review. On December 22, 1981 [9], VEPCO provided a preliminary response which indicated that certain circuit modifications were under consideration pending the review of the equipment supplies. On February 19, 1982 [10], VEPCO indicated that they had completed their review with the equipment supplier and provided a revised response addressing each issue raised in the draft TER. On June 8, 1982 [11], VEPCO provided additional information pertaining to the availability of indication for the status of certain ESF output devices. This report is based on information obtained during the site visit as well as that provided by the Licensee in the submittals identified.

This document addresses only the electrical, instrumentation, and control design aspects of ESF systems at NAPS.

## 2. REVIEW CRITERIA

The primary intent of this evaluation is to determine if the following NRC staff criteria are met for the safety signals to all ESF equipment:

- o Criterion 1. In keeping with the requirements of General Design Criteria (GDC) 55 and 56, the overriding* of one type of safety actuation signal (e.g., radiation) should not cause the blocking of any other type of safety actuation signal (e.g., pressure) for those valves that have no function besides containment isolation.

- o Criterion 2. Sufficient physical features (e.g., key lock switches) are to be provided to facilitate adequate administrative controls.

- o Criterion 3. A system-level annunciation of the overridden status should be provided for every safety system impacted when any override is active. (See NRC Regulatory Guide 1.47.)

Incidental to this review, the following additional NRC staff design criteria were used in the evaluation:

- o Criterion 4. Diverse signals should be provided to initiate isolation of the containment ventilation system. Specifically, containment high radiation, safety injection actuation, and containment high pressure (where containment high pressure is not a portion of safety injection actuation) should automatically initiate CVI.

- o Criterion 5. The instrumentation and control systems provided to initiate the ESF should be designed and qualified as safety-grade equipment.

- o Criterion 6. The overriding or resetting+ of the ESF actuation signal should not cause any valve or damper to change position.

Criterion 6 in this review applies primarily to other related ESF systems because implementation of this criterion for containment isolation has been reviewed by the Lessons Learned Task Force, based on the recommendations in NUREG-0578, Section 2.1.4. Automatic valve repositioning upon reset may be

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*Override: the signal is still present, and it is blocked in order to perform a function contrary to the signal.

+Reset: the signal has come and gone, and the circuit is being cleared in order to return it to the normal condition.

acceptable when containment isolation is not involved; consideration will be given on a case-by-case basis. Acceptability will be dependent upon system function, design intent, and suitable operating procedures.

# 3. TECHNICAL EVALUATION

## 3.1 CONTAINMENT VENTILATION ISOLATION SYSTEMS

The North Anna Power Station (NAPS) is designed and operated with a subatmospheric containment. Plant technical specifications require the maintenance of subatmospheric conditions at all times when the average reactor coolant temperature is equal to or greater than 200°F, thus precluding containment venting or purging during plant conditions other than cold shutdown. The containment vacuum pump suction isolation valves, which may be open during operation, are isolated by containment isolation Phase A. Consequently, the criteria of Section 2 are not applicable to CVI systems at NAPS.

## 3.2 CONTAINMENT ISOLATION SYSTEMS

### 3.2.1 Circuit Description

#### 3.2.1.1 Logic Circuits for Trip, Seal-in, and Reset

Containment isolation systems Phase A (CIA) and Phase B (CIB) are provided on each of two electrical trains, A and B. Safeguards actuation is initiated either by signals processed through the solid state protection system (SSPS) circuitry or by manual push buttons to operate a relay logic component actuation system as shown in Figure 1.*

The following initiation signals are provided for each train:

Containment Isolation Phase A

Automatic Safety Injection Actuation Signal (automatic)
Manual Safety Injection (automatic)
Containment Isolation Phase A (manual)

Containment Isolation Phase B

High-High Containment Pressure (automatic)
Containment Isolation Phase B (manual).

The automatic safety injection actuation signal is derived from any of the following:

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*All figures may be found after Section 5, References.

- o High containment pressure
- o Low pressurizer pressure
- o High steamline flow coincident with either low steamline pressure or low-low T average
- o High steamline differential pressure.

Automatic containment isolation actuation signals are processed in a SAF-OUT board, consisting of a "resettable" solid-state latching circuit with a power conditioning output circuit, to energize a master relay coil. CIA and CIB manual actuation directly energizes the master relay coil. Master relay contacts control current flow to the latch coils of the associated latching-type (MG6) slave relays. Slave relay contacts are connected in the control circuits for the solenoid operators and motor operators used to position ESF valves and dampers. A manually operated "reset" switch (simple unprotected pushbutton) is provided with multiple contacts to operate the unlatch coils of the slave relay system and to provide a reset signal to the SAF-OUT board. This "reset" signal will de-energize the master relay and cause the SAF-OUT board to remain in a signal blocking (i.e., output signal removed and will not be reinstituted by a new actuation signal) mode until the initiating signal has been removed. Thus, this "reset" feature performs as an override for processed input signals but will not preclude manual actuation of the master relay.

#### 3.2.1.2 Individual Valve Control Circuits

Valve control circuitry provided for both motor-operated and solenoid-operated valves in the CIA and CIB system is designed so that, in general, valves and dampers, once closed, can be reopened only by actuation of a local control switch. A typical arrangement for motor-operated valves is illustrated in Figure 2. Local control is accomplished by a normally open (momentarily closed) switch contact in series with the valve-opening coil. An auxiliary contact in the valve opening coil in parallel with the switch contact provides a current path while the valve opening coil is energized. Any ESF signal, energizing appropriate slave relays, causes contacts in the valve closing circuitry to close, thus supplying power to the motor operator closing coil.

Removal of the ESF signal, while de-energizing the slave relay, and unlatching it if the removal is accomplished through "reset," cannot cause the valve to change position.

Solenoid valve control circuitry behaves similarly, as shown in Figure 3a. When the solenoid is energized (valve open), an auxiliary contact provides a circuit path around the open contact of the manual control switch. This network is connected in series with the contact from the slave relay. When a slave relay is energized, its contact in the valve control circuit opens to de-energize the solenoid. Upon "reset," the slave relay contacts reclose, but the solenoid remains de-energized since both the manual switch contact and the solenoid auxiliary contact remain open.

The single instance observed during the audit of Licensee-supplied circuit diagrams associated with CIA and CIB where a valve will change position upon reset was the air ejector vent to atmosphere. As shown in Figure 3b, the slave relay contacts are in a simple series arrangement with the solenoid (i.e., without any auxiliary hold in contact).

### 3.2.2 Containment Isolation System Design Evaluation

"Reset" switches provide for SAF-OUT devices employed in CIA and CIB are actually overrides which will block an output signal with an input signal present and will not allow reactuation by a second input signal unless the first signal has cleared. SAF-OUT devices for these systems are, however, actuated by a single parameter signal (safety injection actuation for CIA, high-high containment pressure for CIB).

No special physical features have been provided to facilitate administrative controls over the use of these overrides. The overriden status of these systems is not annunciated.

The Licensee has stated [6] that all instrumentation and control systems associated with ESF systems were defined as safety-grade equipment and met applicable safety standards at the time of purchase and installation.

An audit of valves actuated by CIA and CIB has revealed one valve (air ejector vent to atmosphere) which will reposition upon ESF "reset" (i.e., override). This valve is not a containment isolation valve in the accepted sense of the term (e.g., 10CFR50 Appendix J). It isolates the noncondensable gas discharge from the air ejector after condenser. The auxiliary steam supply to the air ejector is tripped shut by CIA and will not change position upon CIA reset. Further, the air ejector vent isolation valve is normally (i.e., unless tripped by CIA) controlled by a high radiation signal and can be open only when a high radiation signal is not present. This feature shuts the isolation valve when required by plant conditions (i.e., high radioactivity in the condenser).

## 3.3 OTHER ENGINEERED SAFETY FEATURE SYSTEMS

### 3.3.1 Circuit Description

#### 3.3.1.1 Logic Circuits for Trip, Seal-in, and Reset

Feedwater isolation and containment spray circuitry were reviewed. Containment spray trip, seal-in, and reset is essentially identical to that previously described (Section 3.2.1.1) for CIB, except that two simultaneous, independent actions are required to manually initiate spray.

The feedwater isolation system, shown in Figure 4, is formed from a complex of subsystems operating on three groups of components (i.e., turbine and main feed pumps, bypass control valves, and feedwater control valves). The main feedwater isolation valves are part of the first group. Each of these groups will be actuated by either high steam generator water level (control system trip) or safety injection. In addition, the feedwater control valves will be closed by low T avg coincident with reactor trip.

A pushbutton "reset" is provided for the bypass valves only. The SAF-OUT devices for the feed pump/turbine trip and feedwater control valves act as non-inverting drivers (although they may be reset through the multiposition test circuitry). Latching-type slave relays are not used in these two circuits and, consequently, slave relays will de-energize and their contacts will return to their normal (i.e., non-ESF) condition upon input signal clearance. In the case of the feedwater control valves, a reactor trip input will seal in the output signal from the universal board until all initiating trip signals have cleared and the reactor trip breakers have been manually reset.

3.3.1.2 Individual Valve Control Circuits

In general, motor- and solenoid-operated valve control circuits in the containment spray and feedwater isolation systems are designed to preclude valve repositioning upon reset or signal clearance. These systems use control circuitry fundamentally equivalent to that described in Section 3.2.1.2 and shown in Figures 2 and 3a. Two exceptions were noted. Circuits for the feedwater bypass control valves, illustrated in Figure 5a, and feedwater flow control valves, shown in Figure 5b, are designed so that these valves will be restored to their modulate position (i.e., position called for by the feedwater control system) when the appropriate slave relay is de-energized.

3.3.2 Other Engineered Safety Feature System Design Evaluations

SAF-OUT devices used in the containment spray and feedwater isolation systems are identical to those used in the CIA and CIB systems. They are capable of being overriden to block a safeguards output with an input signal present and will not allow reactuation by a second signal unless the first signal has cleared.

Pushbutton-type switches are provided for the SAF-OUT devices employed in the containment spray system and feedwater bypass valve subsystem of the feedwater isolation system. The containment spray SAF-OUT device is actuated by a single parameter signal (i.e., high-high containment pressure) and thus poses no violation of Criterion 1. The feedwater bypass valve SAF-OUT device, however, is actuated by either of two parameters (i.e., safety injection actuation or high-high steam generator water level) and, since the overriding of one signal will block the other, constitutes a violation of Criterion 1.

Pushbutton-type reset switches are not provided for the feed pump/turbine trip or feedwater control valve subsystems of the feedwater isolation system.

No special physical features have been provided to facilitate administrative controls for the "resets" (overrides) associated with the containment spray system or feedwater bypass valve portion of the feedwater isolation system. The overridden status of these systems is not annunciated.

The Licensee has stated [6] that all instrumentation and control systems associated with ESF systems were defined as safety-grade equipment and met applicable safety standards at the time of purchase and installation.

An audit of valves actuated by containment spray and feedwater isolation systems has revealed two groups of valves which will reposition upon ESF "reset." Both the feedwater flow control valves and the feedwater bypass valves will return to their modulate (i.e., that dictated by the controller) position when associated slave relays de-energize.

In the case of the feedwater flow control valves, no manual (i.e., pushbutton) reset is provided. The SAF-OUT device for these valves is a non-inverting driver which will de-energize its master relay when its input signal, from an upstream logic device, clears. This logic device incorporates a signal seal-in based on the status of the reactor trip breaker to prevent automatic clearing when the isolation signal is accompanied by a reactor trip. A review of the feed and condensate system has determined that the reopening of the feedwater control valves following a feedwater isolation signal will not reduce below two the number of isolation barriers between the steam generator (or auxiliary feed pump discharge connection) and the low pressure portion of the feed and condensate system for either isolation signal that might not be accompanied by a reactor trip (i.e., manual safety injection actuation or high steam generator water level). In either case, the initiating signal will shut the main feedwater isolation valves and trip the main feed pumps. The main feed pump trip will cause the feed pump discharge valves to shut. Neither valve will automatically reopen upon the clearing of the isolation signal.

In the case of the feedwater bypass valves, repositioning will follow a single operator action (depressing the feedwater bypass valves blocked "reset" pushbutton), regardless of the status of isolation signals. Further, the reopening of these valves, since they bypass the feedline isolation valves, results in there being only two valves (the feed pump discharge valve and the feedline check valve) between the feed pump and the steam generator. In the unlikely situation of the failure of the feed pump to trip in response to the isolation signal, only the check valve will remain, and steam generator feed will occur should the bypass valves be open.

# 4. CONCLUSIONS AND RECOMMENDATIONS

The electrical, instrumentation, and control aspects of the engineered safety feature (ESF) systems at NAPS were reviewed and found to be in substantial compliance with the NRC design criteria. The following section identifies (1) the extent of compliance with each criterion, (2) the Licensee's position concerning these criteria, (3) conclusions and recommendations, and (4) proposed modifications based on existing conditions, where appropriate.

## 4.1 CONTAINMENT VENTILATION ISOLATION SYSTEM

Staff criteria do not apply to the CVI system at NAPS as discussed in Section 3.1.

## 4.2 OTHER ENGINEERED SAFETY FEATURE SYSTEMS

### 4.2.1 Criterion 1

#### 4.2.1.1 Existing Condition

Circuitry provided for the control of the feedwater bypass valves does not satisfy Criterion 1. The "reset" provided at the SSPS SAF-OUT board for this subsystem is actually an override. The override will terminate an output signal and block system actuation by a second input signal until the first is cleared.

#### 4.2.1.2 Licensee Position

"A two position, "Normal - S/G Wet Layup" keylock switch located in each Train A and B system protection rack will be added to the FW bypass valve circuitry such that when the switch is in the "Normal" position (station in any operating mode except cold shutdown or refueling) the FW bypass valve reset switch will not permit opening the valves until the trip signal is cleared. When the station is preparing to place the steam generators in wet layup, the above mentioned keylock switch will be placed in the "S/G Wet Layup" position which will allow the FW bypass reset switch to perform its reset function. In this case, the signal being blocked (Hi-Hi SG level) is not considered to be a safety signal. Keylock switch operation will be administratively controlled in the Station's Operating Procedures."

4.2.1.3 Conclusions and Recommendations

The proposed keylock switch, a two-position switch to be located between the pushbutton contact and the R input to the bypass control valves SAF-OUT device, will prevent an override of the SAF-OUT device when open. With this switch open, depressing the reset pushbutton will unlatch the bypass control valve subsystem slave relay (K636), allowing the slave relay to change position if the master relay (K520) is de-energized. With a continuous open at the R input, the SAF-OUT device acts as a non-inverting driver, de-energizing the master relay only when all input signals are cleared. This modification, combined with the Licensee's provisions to ensure that the proposed keylock switch will be closed only during cold shutdown or refueling, meets the intent of Criterion 1.

4.2.2 Criterion 2

4.2.2.1 Existing Condition

Systems employing pushbutton-actuated "resets" (i.e., containment isolation Phase A and Phase B, containment spray, and feedwater bypass valve isolation) do not comply with Criterion 2. These "resets" actually function as overrides and require appropriate physical features to ensure that they cannot be operated inadvertently and are operated only with proper supervisory control.

4.2.2.2 Licensee Position

"Based on NRC interpretation of Criterion 2, Vepco will initiate a modification that involves the addition of covers to the pushbutton reset switches for Containment Isolation - Phase A and Phase B, Containment Spray, and Feedwater Bypass Valve Isolation. Because of the modification that will be made to address Criterion 1, it will not be necessary to include the Feedwater Bypass Valve Isolation under this criterion."

4.2.2.3 Conclusions and Recommendations

The modification described should prevent inadvertent operation of the reset pushbuttons. If the covers are supplemented by suitable instruction (e.g., warning criteria) to the operator concerning the effect of these pushbuttons or the authority necessary to operate them, Criterion 2 will be satisfied.

#### 4.2.3 Criterion 3

##### 4.2.3.1 Existing Conditions

Systems employing pushbutton-actuated resets which are operable during plant conditions other than cold shutdown or refueling partially comply with Criterion 3. These systems are provided with an annunciator window that indicates the status of the associated master relay. These annuciators are illuminated upon receipt of ESF actuation signal and will clear on system "RESET."

##### 4.2.3.2 Licensee Position

It is the Licensee's contention that existing indication supplemented by appropriate operating and annunicator response procedures is sufficient to satisfy Criterion 3. Since a safeguards actuations signal will illuminate the appropriate annunciator window, the operator will know that such a signal exists. Likewise, since the only way to extinguish this annunciation is to operate the appropriate reset pushbutton, the operator will be able "to verify that a signal has been reset (overridden)."

The Licensee has further stated that provision for additional annunciation is, in their opinion, redundant and would require extensive changes to the SSPS, including alterations to the safeguards driver printed circuit board.

##### 4.2.3.3 Conclusions and Recommendations

The existing system is judged to partially satisfy Criterion 3 in that it can indeed indicate to the operators when a system has been overridden (i.e., the RESET pushbutton depressed with a signal present) since the indicating light will be extinguished when the master relay is deenergized. This arrangement will not, however, in itself unequivocally identify the plant status since the same indication will be provided when the system is reset (i.e., the RESET pushbutton depressed after the initiating signal clears).

The Licensee has agreed to update operating and annunciation response procedures to indicate that the containment isolation and containment spray annunciators "provide information as to the reset status of the associated ESF signal." While such a simple statement would not appear to adequately address the staff's concern, it is likely that the existing annunciation in conjunction with appropriate procedural warnings and supported by additional information available to the operator (e.g., plant parameter values and memory board indication of universal board status) could be used to ensure that the operator is aware of the fact that a safety signal has been overridden (rather than just RESET). The NRC staff should require that the Licensee provide a comprehensive approach to determining system status using installed annunciation.

4.2.4 Criterion 4

Criterion 4 is not applicable at NAPS.

4.2.5 Criterion 5

ESF instrumentation and control systems at NAPS comply with Criterion 5.

4.2.6 Criterion 6

4.2.6.1 Existing Conditions

Three instances were found where the resetting of an ESF signal will cause valves to change position:

- o air ejection vent to atmosphere isolation valves
- o feedwater flow control valves
- o feedwater bypass control valves.

4.2.6.2 Licensee Position

o Air Ejector Vent to Atmosphere Isolation Valves -

"Vepco does not intend to make any changes under Criterion 6 concerning the circuitry for the air ejector vent to atmosphere isolation valves, since the present circuitry receives a high radiation signal and a containment isolation Phase A signal even though this valve is not a containment isolation valve. For this circuit, if containment isolation were reset and there was a high radiation condition, the air ejector vent to atmosphere isolation valves would remain closed. If no high radiation condition were present, no detrimental situation would be encountered if the valve opened after resetting containment isolation."

- <u>Feedwater Flow Control Valves</u> -

  "In the case of the feedwater flow control valves no manual (i.e., pushbutton) reset is provided. The SAF-OUT device for these valves is a non-inverting driver which will de-energize its master relay when its input signal, from an upstream logic device, clears. This logic device incorporates a signal seal-in based on the status of the reactor trip breaker to prevent automatic clearing when the isolation signal is accompanied by a reactor trip. Review of the feed and condensate system indicates that the reopening of the feedwater control valves following a feedwater isolation signal will not reduce below two the number of isolation barriers between the steam generator (or auxiliary feed pump discharge connection) and the low pressure portion of the feed and condensate system for either isolation signal that might not be accompanied by a reactor trip (i.e., manual safety injection actuation or high steam generator water level). In either of these cases the initiating signal will shut the main feed line isolation valves and trip the main feed pumps. The main feed pump trip will cause the feed pump discharge valves to shut. Neither valve will automatically reopen upon the clearing of the isolation signal. Based on the foregoing Vepco does not intend to make any circuit modification with report to the valves."

- <u>Feedwater Bypass Control Valves</u> -

  "Upon completion of the modification as described under Criterion 1 above, during normal operations it will take two (2) operator actions to reset the FW bypass valves following the initiation of a SI signal: (1) reset of SI and (2) reset of FW bypass valves. The resetting of the bypass valves following a steam generator Hi-Hi level signal will be possible only after the signal has cleared and is really not an issue under Criterion 6 since the Hi-Hi level signal is not an ESF signal. It was added to the design to provide equipment protection (prevents moisture carryover to the turbine)."

4.2.6.3 Conclusions and Recommendations

- <u>Air Ejector Vent to Atmosphere Isolation Valves</u> - The present circuitry is considered to be an acceptable deviation from Criterion 6.

- o <u>Feedwater Flow Control Valves</u> - The present circuitry is considered to be an acceptable deviation from Criterion 6.

- o <u>Feedwater Bypass Control Valves</u> - The circuit modification proposed by the Licensee is such that, in the more important case of feedwater bypass control valve isolation consequent to an SI signal, two operator actions are required to reset the slave relay for these valves. While not altering the fact that the individual valve control circuitry remains in violation of Criterion 6 (i.e., the bypass control valves may change position upon reset notwithstanding the number of operator actions required to cause the reset), this modification provides additional assurance that this repositioning will be undertaken deliberately and under stable plant conditions. This result is similar to the situation which would exist if the individual valve control circuits were modified to require a separate operator action to reposition the valve following reset (in conformance with Criterion 6). The difference between the two situations is that in the former case, proposed by the Licensee, the repositioning action takes place at a pushbutton labeled "reset," whereas in the latter case the repositioning action takes place at a switch suitably labeled, presumably, to identify the device controlled. Consequently, the arrangement at NAPS should be found in compliance with Criterion 6 if the feedwater bypass control valve reset pushbutton is relabeled or provided with an appropriate warning sign to identify the consequences of depressing the button.

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8 June 1982

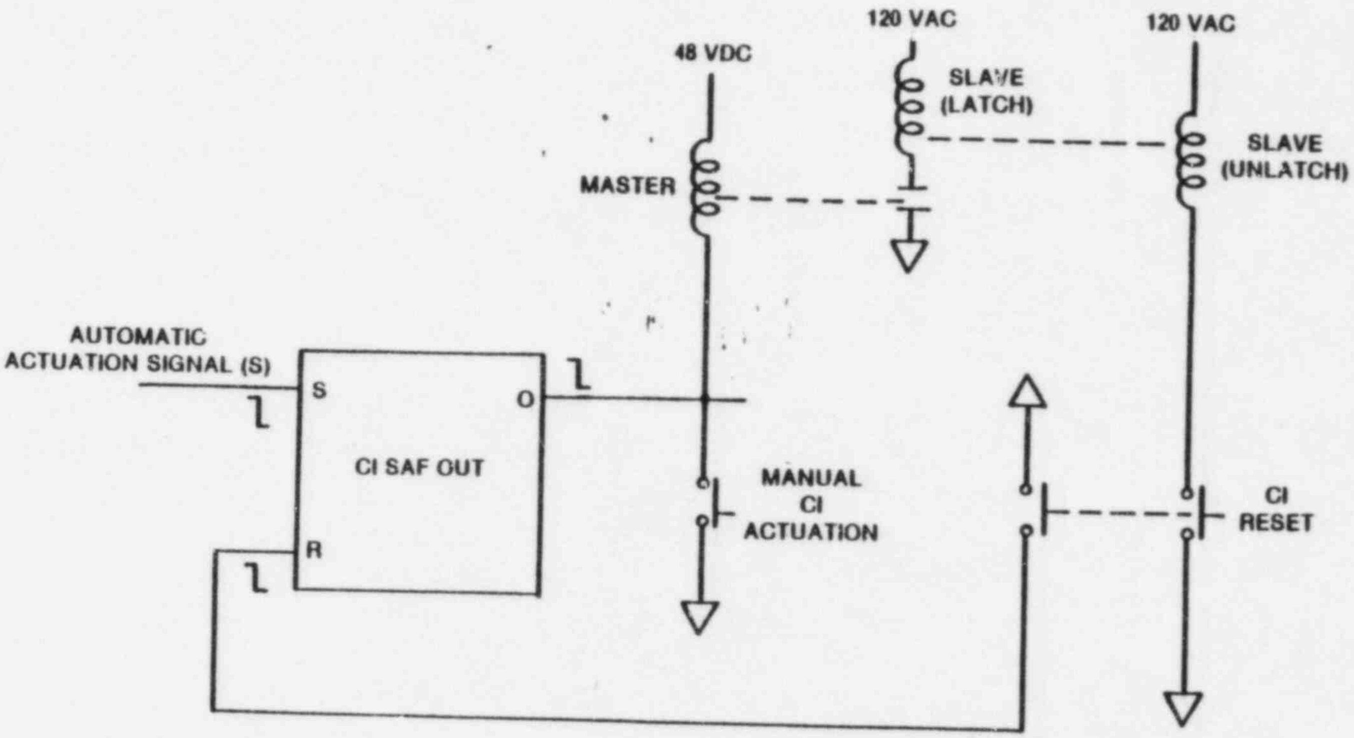


Figure 1. Containment Isolation Phase A/B

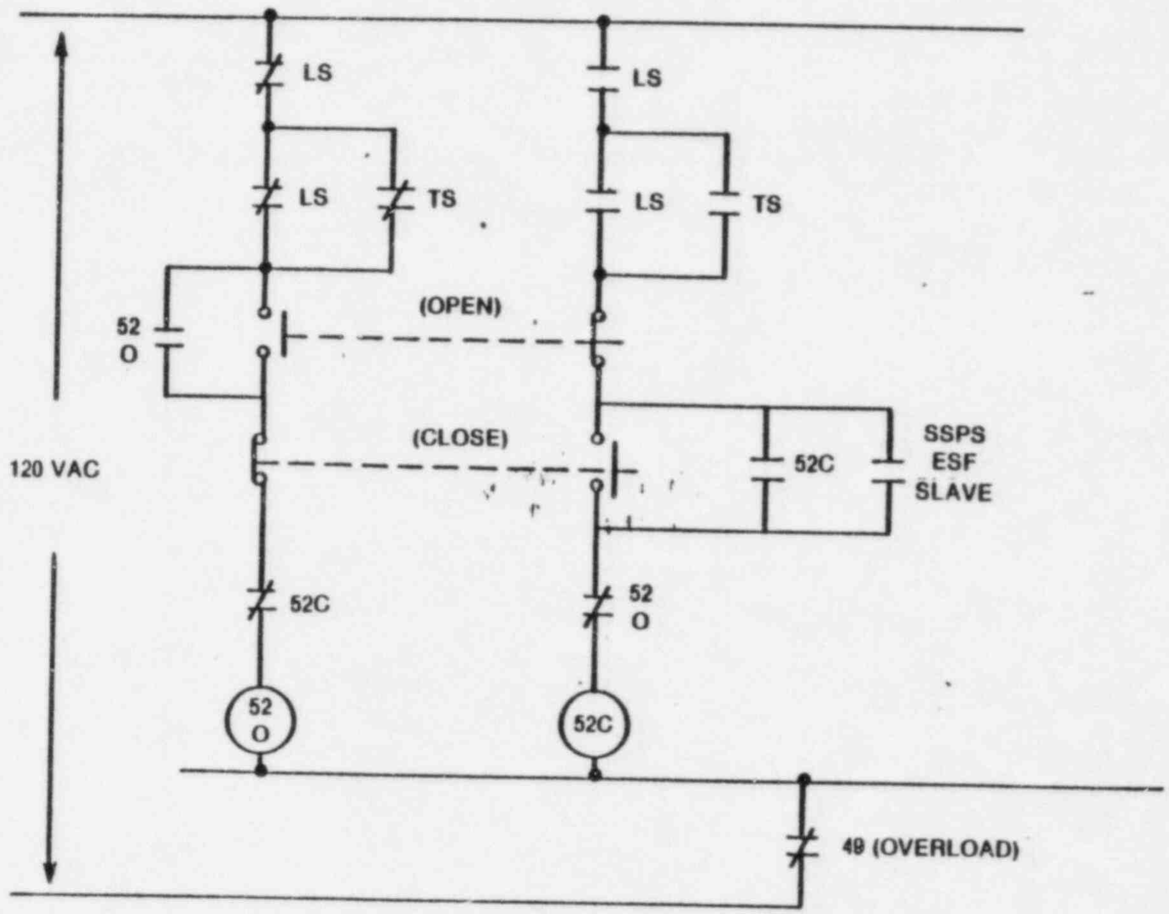


Figure 2. Typical Motor-operated Valve Contsol Circuit

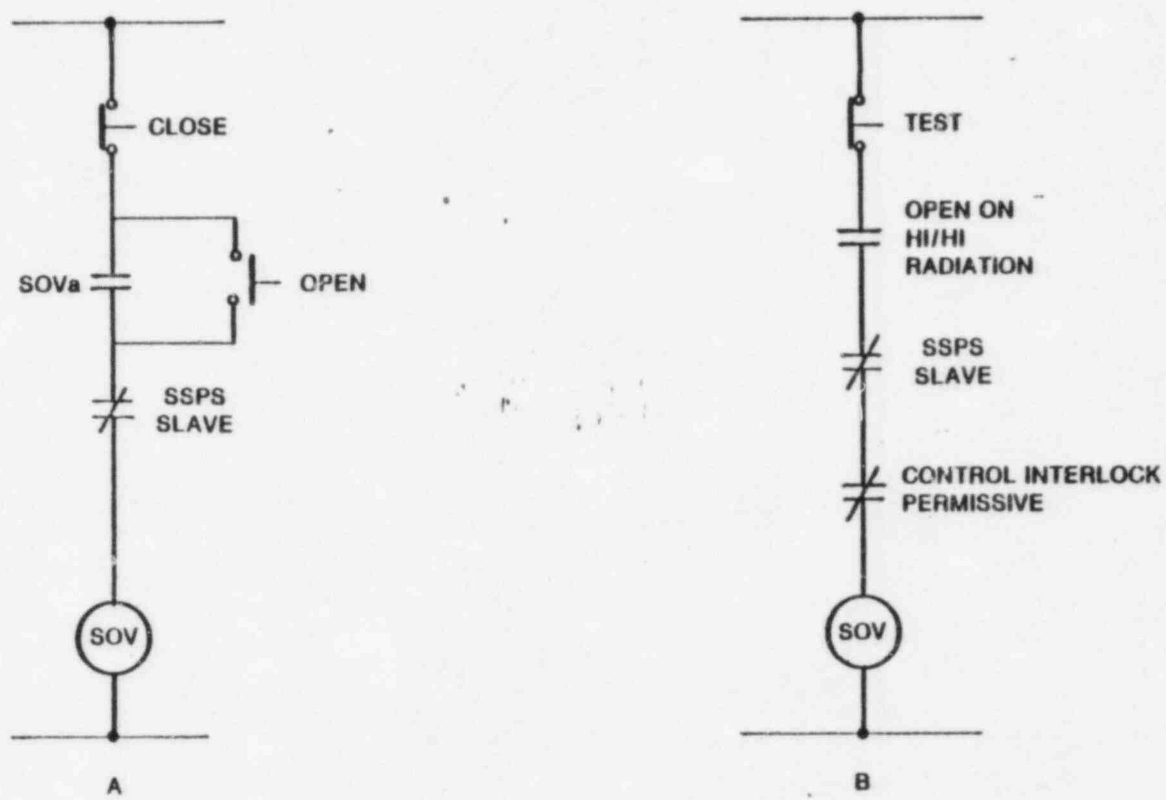


Figure 3. Typical Solenoid-operated Valve Control Circuits

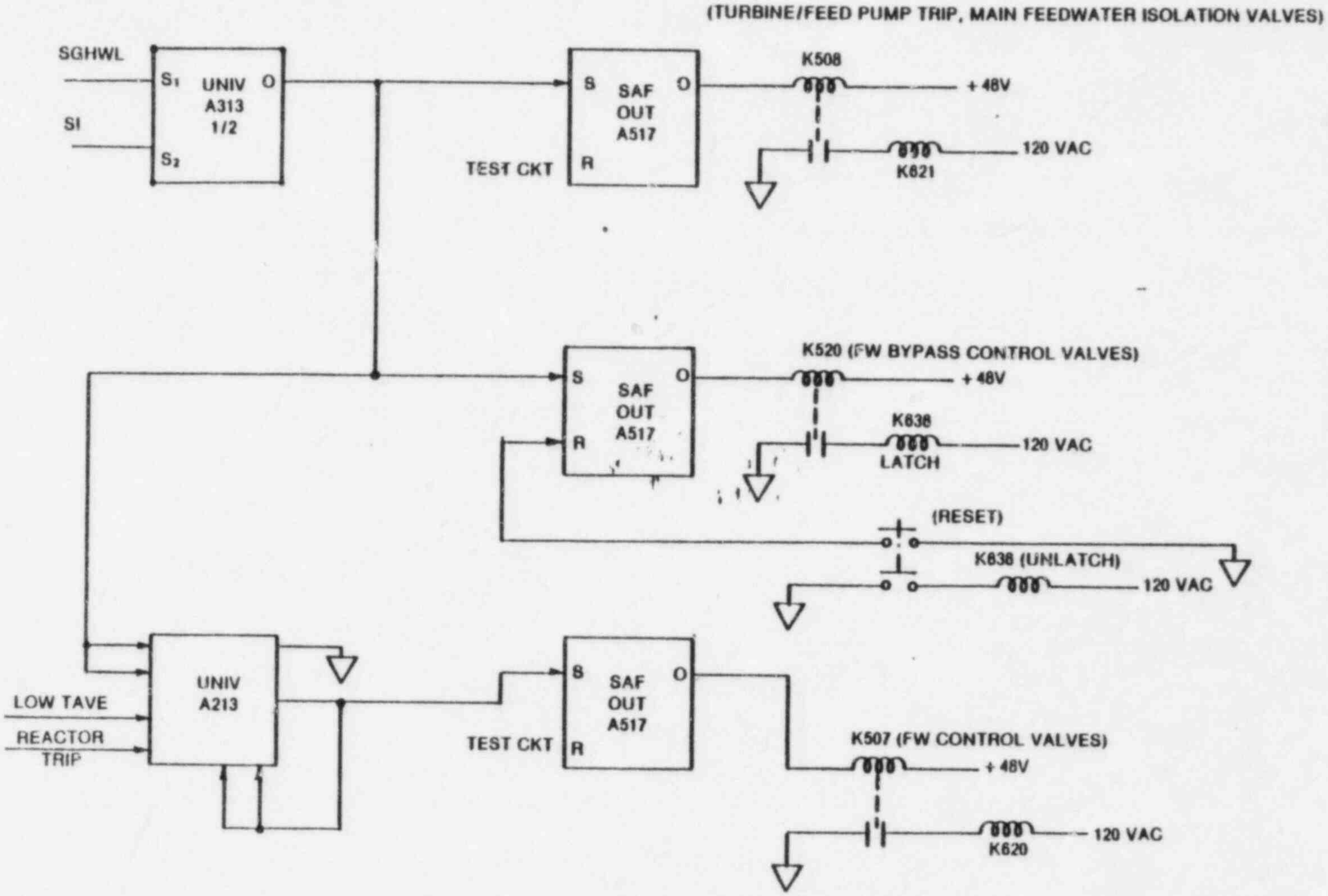


Figure 4. Feedwater Control Logic

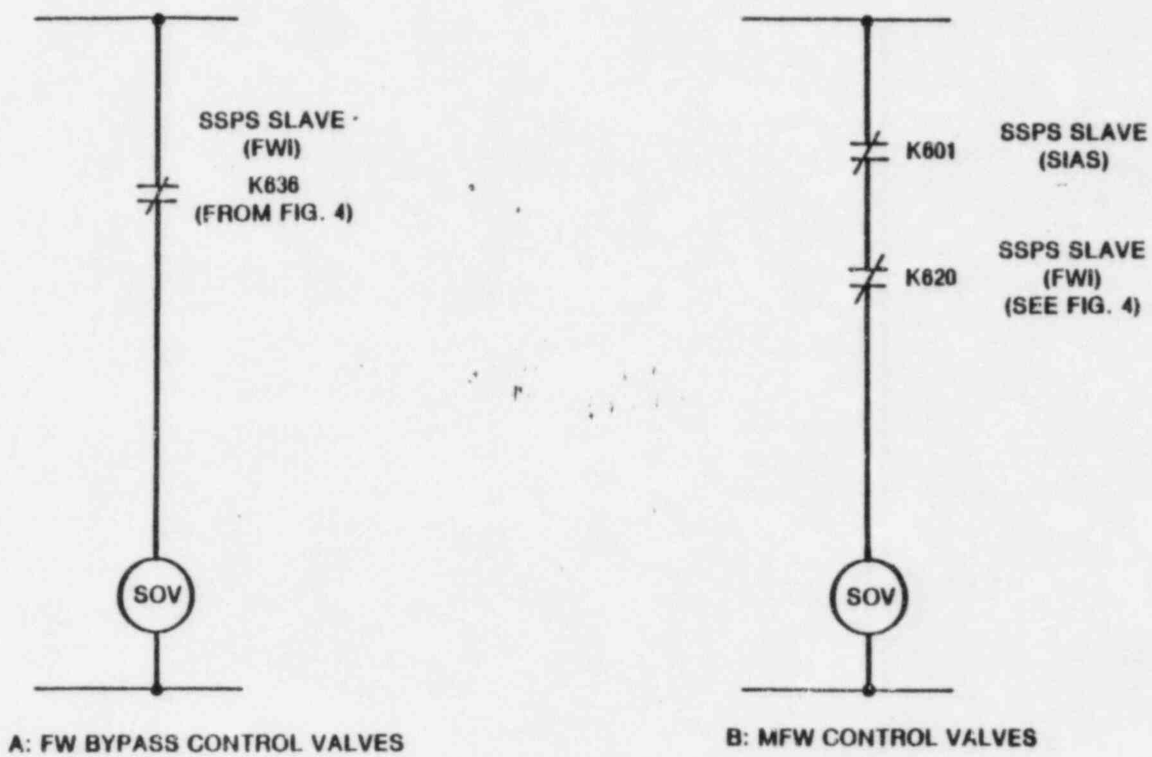


Figure 5. Feedwater Solenoid-operated Valve Control Circuits



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# APPENDIX A - RESOLUTION OF DRAWING DISCREPANCIES

## A.1 UNIVERSAL BOARD INTERNAL WIRING

The circuit diagram provided for the Universal Board (Ref. Dwg. 1046F57-A) showed a connection between the output of the logic gates and the output of the multiplex systems used to provide monitoring information to the computer. This connection was questioned, and a check was made against the generic Westinghouse drawing Universal Board Schematic Diagram 1046F57. The connection in question does not exist on the generic drawing. This discrepancy has been noted in a prior review and was determined, in that case, to be an error on the plant-specific drawing.