FACILITY DESIGN CHANGES

NORTH ANNA POWER STATION UNITS 1 AND 2

COMPLETED IN 1980

DC 78-07 Feedwater Tilting Disc Check Valve Modification (Unit 1)

Description: Three tilting disc check valves supplied by Crane Manufacturing Company were reported by the supplier to be susceptible to excessive vibration allowing the disc to become free and unrestrained in the valve body. The subject valves are located in the feedwater pump discharge lines. The resolution was to install a new higher strength pivot pin supplied from a Crane retrofit kit.

SUMMARY OF SAFETY ANALYSIS: The change was incorporated into a non-safety related system with no additional system interfacing, therefore the probability of an unreviewed safety question is neither created nor increased. The margin of safety is not reduced since the system is not related to safety nor does it affect a safety related system.

DC 78-32 Accumulator and Pressurizer Relief Tank N_2 Supply Valves Replacement (Unit 1)

Description: The nitrogen supply valves to the accumulator (PCV-1846) and to the pressurizer relief tank (PCV-1473), which were self-actuated valves with a flow coefficient, C_v, of 0.12 were replaced with air-operated control valves having pressure controllers and a larger C_v but within the guidelines of Westinghouse.

SUMMARY OF SAFETY ANALYSIS: The pressure controllers added in conjunction with the replacement valves were an integral part of the valves replaced. Therefore, the probability of the occurrence of an accident or malfunction to safety related equipment was not increased.

DC 78-51 Containment Air Transfer Fans Modification (Unit 1)

Description: This modification installed three fans in the reactor containment on the operating floor. The fans draw air from the cubicles and discharge upwards toward the dome to prevent stratification of containment air.

SUMMARY OF SAFETY ANALYSIS: This modification added three (3) category II fans supported by Category I seismic supports and contained by category I missile shields on fan discharges to protect adjacent structures and components from potential blade missiles. This modification did not interfere with system operation and does not create a safety problem. These fans are not required for safe operation or post accident heat removal.

78-55 Emergency Diesel Generator Control Switch Postion Annunciation (Unit 1)

Description: The two 4160V emergency diesel generators at North Anna Unit 1 each have a "MANUAL REMOTE-MANUAL LOCAL-AUTO REMOTE" mode selector switch as part of its emergency start control circuitry. Each switch is located on its respective control panel in the main control room. Should either switch be placed out of the "AUTO REMOTE" position, its respective emergency diesel generator could be blocked from automatic starting.

Design Change Request DC-78-55 added annunciation in the control room if either mode selector switch were removed from the "AUTO REMOTE" postion. A spare contact from each switch was wired to the main control board annunciator 1-EI-CB-21H windows A-6 and A-7 to accomplish this addition.

SUMMARY OF SAFETY ANALYSIS: The addition will use an existing spare contact of the diesel generator control switch for annunciation only and will not affect system capacity, method of operation (normal or abnormal) nor design basis for any of the postulated accidents. Therefore, this addition does not infringe upon the margin of safety.

78-57 Steam Generator Blowdown Trip Valve Circuitry Modification (Unit 1)

Description: The steam generator blowdown system includes three containment isolation trip valves per steam generator. These trip valves are normally open and fail closed upon loss of air or loss of electrical power to the associated solenoid valve. A flow switch contact in the control circuitry for trip valves TV-BD100B, D, F, G, H and J is present for the intended functioning of isolating a high flow condition caused by possible downstream pipe break. Upon initial pressurization of the downstream piping, these flow switches sense a high flow condition and trip closed their associated trip valves.

Design Change DC-78-57 changed the circuitry to prevent high flow trips on the steam generator blowdown lines during initial pressurization. This was accomplished by blocking the flow switch trip signal during the initial pressurization of the blowdown lines. Once pressurized, the blocking signal automatically cleared and thus will not defeat the intended function of the high flow trip for downstream pipe breaks.

SUMMARY OF SAFETY ANALYSIS: Operation of a high flowrate steam generator blowdown trip is not assumed in any FSAR accident analysis and this modification would only delay actuation of this trip for a short time under very infrequent circumstances.

78-67 L. W. Demineralizer System (Unit 1)

Description: Due to the small processing capacity (6 gpm) of the Waste Disposal Evaporator (LW-EV-1), a portable filtration-demineralization system was added to process high level liquid waste at a rate of 20 to 30 gpm.

The demineralization system was hose-connected into the in-plant source of waste water, while the effluent side of the system is hose-connected to the in-plant systems for hold-up, monitoring and discharge.

SUMMARY OF SAFETY ANALYSIS: This design will have no adverse effect on station operations or the operation of safety related equipment. The design specifications will meet the specifications of the existing system, and all existing system and all additional piping will be located in areas previously designated for liquid waste processing.

The main shielding used to limit personnel exposure was achieved by the site location of the demineralization system. The system was designated to be located within a protected, shielded area normally used for the handling and solidification of radioactive waste.

The control panel, with all the functions and indications necessary for the safe operation or shutdown of the system, was located outside of the walled-in area. Personnel entry into the walled-in area was for short duration for minor manual adjustment and control of the system.

78-68F, G, I, J, L Fire Protection Modifications (Units 1 and 2)

Description: NRC letter No. 282/093076 committed Vepco to perform a fire hazards analysis to compare the existing fire protection provisions of the station with the guidelines set forth in Appendix A to Branch Technical Position 9.5-1. This analysis is contained in "Fire Protection Systems Review", dated April 1, 1977. Subsequent discussions with the NRC (see NRC letter nos. 505/110377, 458/080178, and 493/082278) have resulted in Supplements 2 and 3 to this report, dated December 15, 1977, January 2, 1978, and October 1, 1978, respectively.

In order to meet the NRC positions, Vepco committed in the above referenced documents to modify the fire protection systems of the station. These modifications are outlined below.

78-68F Reactor Containment Vertical Cable Tray Fire Stops (Units 1 and 2)

The Nuclear Regulatory Commission requires, and Vepco has committed to, installing fire stops in the vertical cable trays inside the reactor containment. The modification as described herein complied with this commitment.

Fire stops were installed in all vertical cable tray risers in the reactor containment as described below and in the Final Design Implementation and Testing Procedure.

78-68F (Continued)

A continuous vertical riser which may have more than one raceway identification number was considered to be "one" riser for purposes of installing fire stops, i.e., 1TK110N (17 ft riser) and 1TK111N (2 ft riser) was considered to be one 19 ft riser. Cable trays which have portions of their routing installed vertically had fire stops installed in the vertical section(s) only, if applicable as described herein.

A. Cable Penetration Area

Located between el. 259'-6" and el 291'-10" and between col. 9 and col. 7. In this area, fire stops were installed at midheight for risers between 10 ft. and 30 ft. or at no greater than 15 ft. intervals for risers more than 30 ft. high.

B. Outside of Cable Penetration Area

Vertical risers in these had fire stops installed at each floor/ceiling level (on the floor side), and between levels, fire stops were installed at no greater than 30 ft. intervals.

78-68G Battery Room Ventilation Loss of Air Flow Modification (Unit 1)

Description: Each of the four station battery rooms in North Anna Unit 1 has a ventilation system consisting of a fan, intake and exhaust ducts and associated fire dampers. This system, which is powered from the Emergency MCC's, mixes and exchanges air in the battery rooms to maintain room temperature equal to that of the pressure envelope and to maintain hydrogen (evolved from the batteries) concentration below one percent by volume.

The Nuclear Regulatory Commission required, and Vepco committed to, installing flow switches in the ventilation duct of each battery room which will alarm in the control room upon loss of air flow. The modification added those flow switches.

The modification also changed power sources for ventilation fans in battery room 1-II and 1-III to be consistent with their associated instrumentation channels. The modification will not affect system operation, capacity, nor starting logic.

78-68I Fire Dampers

Description: The present 1 1/2 hour fire-rated damper was replaced in the Unit 2 service building cable vault and tunnel exhaust duct with a 3 hour rated damper.

78-68J Fire Doors

Description: The present door between the Turbine Building chiller room and Emergency Switchgear Air Conditioning Room for both Units 1 and 2 was replaced with a 3 hour fire-rated door.

DC 78-68L Emergency Lights (Units 1 and 2)

Description: Individual battery pack emergency lighting units were added for the following areas:

	LOCATION	DESCRIPTION
1.	Unit 1 and Unit 2 Control Rooms	8 hr battery packs
2.	Unit 1 and Unit 2 Cable Vault and Tunnel and MCC Rooms	2 hr battery packs for egress
3.	Unit 1 and Unit 2 Emergency Switchgear and Instrument Rooms	8 hr battery packs for auxiliary shut-down panel
4.	Unit 1 and Unit 2 Emergency Diesel Generator Cubicles	2 hr batter packs for egress
5.	Auxiliary Building	2 hr battery packs for egress
6.	Unit 1 and Unit 2 Quench Spray Pumphouses	2 hr battery packs for egress
7.	Unit 1 and Unit 2 Safeguards Areas	2 hr battery packs for egress
8.	Unit 1 and Unit 2 Main Steam	2 hr battery packs for egress
9.	Fuel Building	8 hr battery packs for proposed auxiliary monitoring panel
		2 hr battery packs for egress

SUMMARY OF SAFETY ANALYSIS: Fire protection modifications do not create an unreviewed safety question. The changes are designed to have systems meet NRC specifications. These modifications help reduce the consequences or the probability of occurrence of a fire.

DC 79-S16 Fire Protection Modification - Auxiliary Monitoring Panel (Units 1 & 2)

Description: Design Change 79-S16 concerns the addition of instrument cables and indicators, that are physically separated from existing instrument loops, to monitor primary plant conditions to prevent common failure due to a fire. These indicate pressurizer level, pressurizer pressure, and primary loop temperature. New level and pressure transmitters have been installed, and tap off of existing piping. An existing temperature element has been used for temperature indication. The cables associated with these indicators have been brought out of containment into the Fuel Building. The Auxiliary Monitoring panel, 2-EI-CB-97A, is located on the north wall of the Fuel Building. It houses the indicators and an uninterruptible power supply consisting of a battery and charger. The charger has been fed from a power source capable of being fed from either Unit 1 or 2, therefore supplying continuous power for these indicators.

IMAGE EVALUATION
TEST TARGET (MT-3)

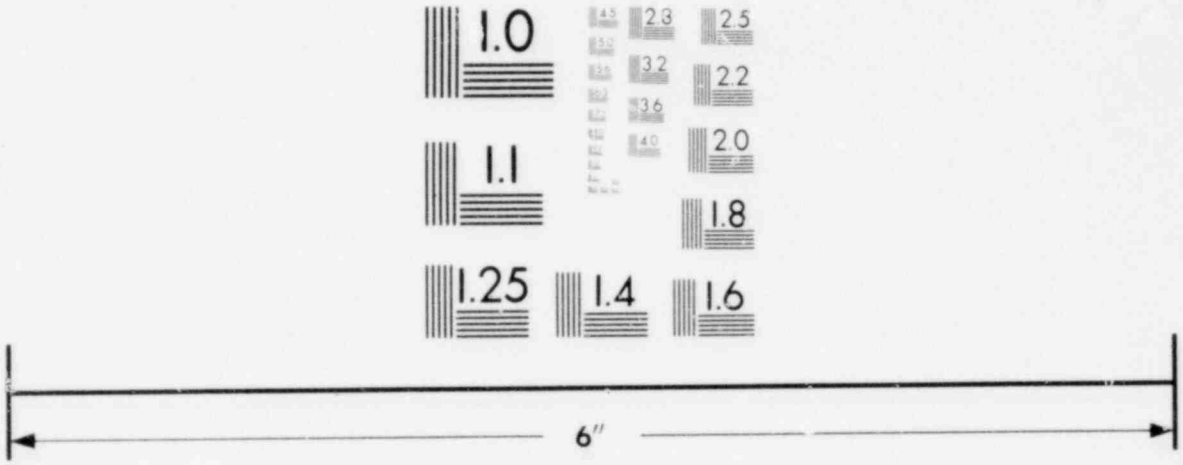
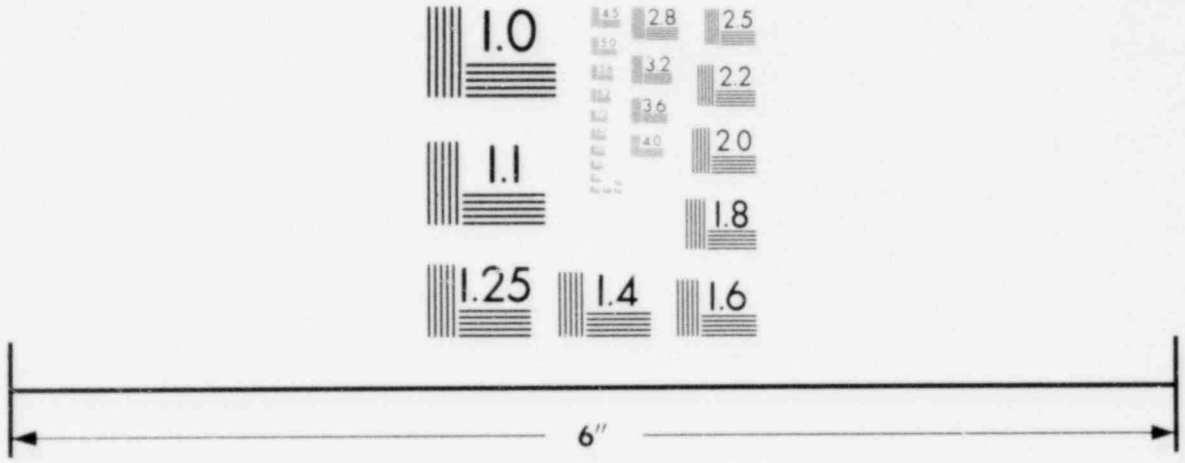


IMAGE EVALUATION
TEST TARGET (MT-3)



DC 79-S16 (Continued)

SUMMARY OF SAFETY ANALYSIS: The design change does not create an unreviewed safety question, because the Auxiliary Monitoring Panel is independent of existing primary loop instrumentation. The transmitters and RTD associated with this panel are of the same type or better than the present safety-related instruments. Any accident or malfunction of these transmitters would be the same as that previously evaluated for the safety-related transmitters. No electrical fault in the proposed panel or instruments would disable existing Reactor Coolant instrumentation.

DC 79-25 Installation of Charcoal Filter Timers (Units 1 and 2)

Description: The purpose of this design change is to provide a method for determining total operation time for: the Gaseous Waste Charcoal Filters, 1-GW-FL-1A, B (T.S. 4.6.4.3.c); Control Room and Switchgear Room Emergency Ventilation Systems Charcoal Filters, 1-HV-FL-8, 9 and 2-HV-FL-8, 9 (T.S. 4.7.7.1.c). Before there was no satisfactory method for determining filter operation time. Technical Specifications required that a laboratory analysis be performed on charcoal filters that operate for 720 hours.

For the Gaseous Waste Filters (1-GW-FL-1A, B), a pressure differential activitated switch was connected in parallel with differential pressure indicators (PDI's) PDI-GW-135A-1 and PDI-GW-135B-1. Each switch can control an individual timer as the filter is being used. Isolation valves have been placed on either side of the switch to facilitate maintenance and service of the timers and switches (See drawing 79-25-01.).

For the Safeguards Area Filters (1-HV-FL-3A, B), a switch-timer arrangement similar to the one for the Gaseous Waste Filters has been utilized. The differential pressure switches have been connected in parallel to PDI's PDI-HV-169A and PDI-HV-169B. Power for the timers in both of the above systems is supplied from nearby electrical outlet service lines.

The Control Room and Switchgear Room Emergency Ventilation System Filters immediately present a solution different to those above. Each filter in this system is supplied with its own fan. When a fan is on, its associated filter is in operation. Therefore, a timer was connected across the fan operation indicator light. In this way, the timer was operating as long as the fan, thus providing a control panel located record of charcoal filter use time.

SUMMARY OF SAFETY ANALYSIS: The installation of timers to log cumulative filter run time does not create an "unreviewed safety question", as defined in 10CFR50.59. The original design basis of the ventilation system have not been changed. The level of integrity of the ventilation system is not changed.

DC 79-S31 Instrument Air to Reactor Containment Instrument Air Cross Connect (Unit 1)

Description: The design of the reactor building instrument air system was such that air for instrumentation and control is normally supplied from the reactor containment instrument air compressors. Should this system malfunction, a manual cross connect valve allowed air to be supplied from the auxiliary building plant instrument air compressors. When this supply was required, an operator must have been stationed at the containment penetration to close the valve should the need have arisen.

To avoid the need to continuously station someone at the cross connect during periods when the auxiliary building source is used, an air operated cross connect/containment penetration valve arrangement was supplied. This arrangement consists of two air operated, fail closed containment penetration valves. In addition, required indication and controls have been added in the plant control room. These valves were installed at penetration no. 47 in place of existing valve 1-IA-54.

A phase B signal will initiate containment isolation of the cross connect line.

SUMMARY OF SAFETY ANALYSIS: Installing air operated valves in place of existing valve 1-IA-54 at penetration 47, is in accordance with the design criteria specified in FSAR section 6.2.4.1, and does not constitute an unreviewed safety question.

DC 79-36 Installation of Main Feedwater Pump Flexibility Loop and Warm-Up Line (Unit 1)

Description: Operational difficulties were experienced on Main Feedwater Pump 1-FW-P-1B. These difficulties included internal rubbing that occurs when the pump and its suction and discharge pipes were heated. The rubbing appeared to be associated with piping loads. In addition to rubbing, pump displacements were noted at the pump motor coupling.

In order to reduce the pump nozzle loads, a flexibility loop was installed on the discharge side of the "B" pumps. The installation of the flexibility loop required the relocation of MOV-FW150B. The flexibility loop was fabricated of 18 inch class 901 pipe. Pipe supports and spring hangers were also added to the suction piping to reduce the loads on the pump nozzles.

With two feedwater pumps operating and the third on standby, the casing and internals of the idle pump cool to well below the normal operating temperature. In order to reduce thermal expansion forces and moments when the idle pump is placed into service, a warm-up line was installed around the feedwater pump discharge check valves and motor operated isolation valves, MOV-FW150A, B, & C.

DC 79-36 (Continued)

The warm-up line was also fabricated from class 901 pipe. The warm-up line had a multistage orifice installed and a 1 1/2 inch globe valve as a downstream isolation.

Since the warm-up lines cross connect the high pressure side with the low pressure side of the feedwater pumps, the installation of a relief valve in each of the pumps' suction lines was required. The relief valve protected the suction lines from overpressurization should the suction piping isolation valves be closed when the warm-up line is open. The size of the relief valve is 3/4" x 1".

SUMMARY OF SAFETY ANALYSIS: The flexibility loop and warmup line will be installed in the non seismic portion of the feedwater system and does not contribute to or affect any safety related item. Therefore, installation of the flexibility loop and the warm-up line does not create an "unreviewed safety question" as defined in 10 CFR 50.59.

DC 79-S39 Security System - Remove Safety Bus Electrical Feed (Unit 1)

Description: A new feed to the station security system from a non-safety bus, with a back-up power system, has been installed. The security system 480V feeder from safety MCC 1H1-1 (1-EP-MC-10), cable number 1SCA NNL110, is no longer required. This cable was disconnected from the MCC breaker and from transformer "Trans-131" in the security building (CAS).

SUMMARY OF SAFETY ANALYSIS: The proposed changes do not create an "unreviewed safety question" defined in 10CFR50.59 because: this change disconnects the feeder cable for the non-class IE security system. (An alternate non-safety bus feed has been used for this system.) Removal of this cable from safety related MCC 1H1-1 reduces the bus loading, and therefore does not increase the probability of occurrence or the consequences of an accident.

DC 79-S42 Addition of Load Cell Readout to Manipulator Crane (Units 1 and 2)

Description: This design change adds an additional load cell readout next to the ZZ axis tape on the manipulator crane to enable the operator easier access to this data during fueling operations.

The additional load cell meter was permanently mounted on a sheet metal bracket. This bracket was mounted adjacent to the ZZ axis tape readout. Permanent 1/2" steel conduit tubing was run from the main Dillion load meter to the new auxiliary meter. This conduit was mounted at the sheet metal bracket and on top of the manipulator crane control panel. Two conductor 12 AWG wires were used to connect the auxiliary meter to the main load cell meter external output terminals. These connections were made in accordance with the instructions supplied with the auxiliary meter.

DC 79-S42 (Continued)

SUMMARY OF SAFETY ANALYSIS: This design change does not constitute an "unreviewed safety question" as defined in 10 CFR 50.59 because no protective circuits will be altered. Only manufacturer provided "External Devices" terminals were used; this design did not alter the function of the original equipment, and no protective functions were altered. This design change helps to eliminate potentially hazardous distractions that occur during the refueling evolution.

DC 79-S54A and B Indication of Pressurizer Safety Valve Flow (Units 1 and 2)

Description (A Package): The valve monitoring system cabinet (1-EI-CB-190) was located adjacent to the diesel generator control panel (1-EI-CB-08A). The cabinet was mounted flush with the acoustic floor onto parallel W-16 I-beam spacers, which were anchored to the concrete floor beneath. Additional cabinet support was provided by horizontal bracing secured to the top of the cabinet and was attached to the control room wall.

Originally, the area designated for the new cabinet was lacking the W-16 I-beam necessary to support the cabinet's rear vertical load and the angle iron necessary to attach the top bracing to the control room wall.

A piece of I-beam was added to extend the rear I-beam and new angle iron was attached to the control room wall to provide a means of securing the top cabinet bracing. Both the I-beam and the angle iron were secured in the concrete with Hilti-Kwik bolts.

Description (B Package): An acoustical monitoring system was installed in order to provide a positive indication of pressurizer safety valve position for SV-1551A, B, and C as required by NUREG-0578, TMI-2 Lessons Learned Task Force, Section 2.1.3.2. The acoustical monitoring system was provided by Babcock & Wilcox. Two acoustic sensors were secured to the surface of each safety valve; therefore, the pressure boundary of the piping system was not penetrated. The sensors were connected to a new panel, 1-EI-CB-190, located in the Unit 1 side of the Control Room beside 1-EI-CB-08A. DC-79-S54A provided details for installation and seismic support of this panel. Indicators and an alarm for each unit will alert operators that flow is detected through any pressurizer safety valve(s). Panel 1-EI-CB-190 is common to both Units 1 and 2. The power supply is capable of being fed from either Unit 1 or 2: voltage monitoring relays will provide automatic transfer on loss of power from either unit.

SUMMARY OF SAFETY ANALYSIS: Installation of the direct indication of pressurizer safety valve position does not create an "unreviewed safety question", as defined in 10CFR50.59, because this modification increased the system reliability by enabling the operator to respond more quickly to an open safety valve. No existing safety related equipment was affected and additional equipment was installed to original station design requirements.

DC 79-59 MSR/Heating Supply Line Modifications (Unit 1)

Description: Originally, the moisture separator reheater supply lines for 1-MS-E-1A, B, C or D were subject to main steam pressure and temperature during initial startup. Should any flow control valve FCV-MS-104A, B, C, and D leak, the reheater tube bundle would be pressurized causing premature and uneven heating of the tubes, with the potential for subsequent tubes bowing and/or failure.

Also, it was desirable to monitor for increased MSR heating system supply flow which would indicate reheater tube leakage.

To prevent pressurization of the reheater tube bundle during startup, each MSR heating supply line was modified to incorporate a 1" drain line. The line was attached to an existing pressure tap downstream of each MSR's respective flow control valve, and terminated in a pressure tap on an existing header for condenser penetration 55. Installed in this drain line was a trip valve which will be controlled by the flow control valve position via a solenoid operated air isolation valve. This provided a leak-off path during initial startup and also allowed the drain line to be automatically isolated during normal operation. In supply line upstream of the flow control valve FCV-MS-104A, B, C, or D. Attached to the flow control valve was a 1 1/4" branch line to provide valving and piping for the local flow indicator. This modification provided a means of monitoring MSR steam supply flow.

The modification of the MSR heating supply lines was performed and tested in accordance with original code requirements.

SUMMARY OF SAFETY ANALYSIS: The main steam reheater modifications are not safety related and therefore this change does not constitute an "unreviewed safety question" as defined in 10CFR50.59. These modifications should result in improved system reliability.

DC 79-61 Local Indication of Feedwater Flow (Unit 2)

Description: The modification consisted of installing three differential pressure flow transmitters (identified as FT-FW-202A, B, C) to the sensing lines for FT-2477, 2478, and 2497. These flow transmitters draw current from a common power supply. Each flow transmitter sends a signal to a digital meter mounted near the power supply.

Tees were originally existing on sensing lines for FT-2477, 2487, and 2497; therefore, no cutting or welding or existing pipe was needed. Gould S-valve assemblies lead from the tees to the transmitter FT-202A, B, C which were mounted next to FT-2477, 2487, and 2497 on the upper right side of the cabinet.

DC 79-61 (Continued)

SUMMARY OF SAFETY ANALYSIS: The installation of the flow transmitters will not affect feedwater flow nor will this design change affect the performance of the existing feedwater flow transmitters which input to the steam/feedwater flow mismatch. For these reasons, the installation of the flow transmitters will not create an "unreviewed safety question", as defined in 10 CRF50.59.

DC 79-S64B, D, E, F, G, and H Primary Protection Modification - Electrical Penetration (Unit 1)

Design Change Request DC 79-S64 provided a change that was made to reduce the possibility of degrading the penetration seals during electrical fault conditions.

Description (B Package): The electrical penetration assemblies are used to carry electrical conductors through the wall of the reactor containment structure while maintaining the mechanical integrity of the containment. The penetration assemblies integrity and thus the containment integrity, after installation, is assured by first the Viton "O" ring seals for the flange and the penetration feed through assemblies seals. The design limits of the feed through seals are a function of the time/current heating effects of the conductors contained within the feed through. Assurance that the feed through seals are maintained, requires coordination between the penetration time/current heating limits and the electrical protective device characteristic tripping curves throughout the full range of potential electrical overloads or faults.

During a review of containment penetrations electrical protection, prompted by NRC letter "Staff Position on Electrical Protection of Containment Penetrations for North Anna Unit 2", dated August 3, 1979, it was revealed that primary electrical protection for all fault conditions is not adequate to assure the integrity of all containment penetrations within their design limits. This lack of primary protection for intermediate electrical faluts for some penetrations could degrade the penetration feed through seals, thereby causing an increase in containment leakage.

Description (D Package): Design Change DC-79-S64D provided complete primary protection for the penetrations by upgrading the overload relays and contactors for size 1 MCC starters of loads inside the containment.

DC 79-S64 (Continued)

Description (E Package): Final Design DC 79S64E details adding breakers in the lighting transformers' secondary for the A-C lighting circuits and changing to a smaller breaker for the D-C lighting circuit inside the containment. These breaker additions and changes provided complete protection for the electrical penetrations.

Description (F Package): Final Design DC 79-S64F details adding 70 amp fuses in the pressurizer heaters and the steam generator support heaters which are fed via no. 4 AWG penetration conductors. These fuse additions provided complete protection for the electrical penetrations.

Description (G Package): Final Design Change DC 79-S64G will provide complete primary protection for the penetrations by upgrading the overload for size 2 MCC starters of loads inside the containment.

Description (H Package); Final Design DC 79-S64H detailed adding 15 AMP fuses in the incore drive dehumidifier power circuits inside 1-EP-CB-96B as noted in the controlling procedure. These fuses additions provided complete protection for the electrical penetrations.

SUMMARY OF SAFETY ANALYSIS (DC 79-S64B, D, E, F, G and H): The electrical penetration primary protection modication does not constitute an "unreviewed safety question" as defined in 10CFR 50.59. The modification will provide primary protection of the electrical power penetrations for all postulated faults. The modification increased reliability of containment integrity but did not affect starting logic nor capacity of any loads being protected.

DC 79-S65A Reactor Coolant System - Subcooling Monitor System (Unit 1)

Description: The Reactor Coolant System Subcooling Monitor System requires input from various Reactor Coolant System pressure and temperature sensors. These inputs are presently wired to the plant computer input/output cabinets and will be paralleled for the Reactor Coolant System Subcooling Monitor System. The Reactor Coolant Loops 1, 2, and 3 Hot and Cold Leg Temperatures, Reactor Coolant System pressure, and the pressurizer pressure inputs are wired to the plant computer from the Westinghouse primary plant process racks via m-conductor cables terminated by plugs. The above inputs to the Reactor Coolant System Subcooling Monitor System required the addition of new terminal blocks in the plant computer I/O cabinet and connecting paralleling wires to the pins of the plug receptacles for the appropriate inputs. The other end of the paralleling wires were terminated at the new terminal blocks.

DC 79-S65A (Continued)

This addition is confined to the plant computer I/O cabinet 02 (1-EI-CB-18C) and the RCS Subcooling Monitor System inputs provided via the receptacles which are located on panel 023Y. The remaining RCS Subcooling Monitor System installation details will be covered in Design Change DC 79-S65B to be issued later.

SUMMARY OF SAFETY ANALYSIS: Installation of the Reactor Coolant System subcooling monitor system does not create an "unreviewed safety question", as defined in 10CFR50.59. This modification increases the operator's awareness of reactor coolant system margin to saturation. The RCS subcooling monitoring system does not affect automatic or manual operation of any safety system nor does it revise protection or logic schemes of any equipment important to safety previously evaluated in the safety analysis report.

The installation of the RCS subcooling monitor system is in conformance with TMI-2 NUREG-0578 and subsequent clarifications contained in the NRC letter dated October 30, 1979. The design basis for the RCS subcooling monitor system is the proposed revision 2 of the Regulatory Guide 1.97, as referenced in the NRC clarifications letter dated October 30, 1979.

DC 79-S65B Reactor Coolant System - Subcooling Monitor System (Unit 1)

Description: Two subcooling monitor systems per unit will be installed to provide indication on the main control board of reactor coolant margin to saturation conditions as required by TMI-2 NUREG-0578, section 2.1.3b and subsequent clarifications contained in the NRC letter dated October 30, 1979. The subcooling monitor systems will be provided by Westinghouse. Each system consists of a microprocessor and subcooling meter. The two microprocessor units were installed above the incore instrument cabinets located in the control room. The two subcooling meters were located on the vertical board section 1-1.

Each subcooling monitoring system utilizes inputs from existing hot and cold leg temperature loops (wide range), reactor coolant system pressure loops (wide range), pressurizer pressure loops (narrow range), eight selected incore thermocouples (two per quadrant), and the incore thermocouple reference junction box RTD. The above-mentioned inputs are provided by paralleling existing computer input terminations for the instrument loops and wiring them to each microprocessor unit.

The microprocessors calculate the saturation temperature for the existing Reactor Coolant System pressure and determines the margin to saturation based on the various temperature inputs. The output of the microprocessors are wired to two subcooling meters which are located on the main control board to provide indication of reactor coolant margin to saturation conditions.

The power supplies for the subcooling monitor systems are from diverse semi-vital busses.

DC 79-S65B (Continued)

SUMMARY OF SAFETY ANALYSIS: Installation of the reactor coolant system subcooling monitor system does not create an "unreviewed safety question", as defined in 10CFR50.59. This modification increases the operator's awareness of reactor coolant system margin to saturation. The RCS subcooling monitor system will not affect automatic or manual operation of any safety system nor does it revise protection or logic schemes of any equipment important to safety previously evaluated in the safety analysis report.

DC 79-66 High Range Effluent Monitors (Units 1 and 2)

Description:

Auxiliary Building

This portion of this final design involved the rerouting of existing effluent sampling lines of the process vent, vent stack "A", and vent stack "B", radiation monitors (RM-VG 103/104, RM-VG 112/113, and RM-GW 101/102 to accommodate the addition of the new high-range effluent monitors (RM-GW 173, RM-VG 174, and RM-VG 175).

The present effluent radiation monitors for the process vent, vent stack "A", and vent "B" are located on the 291 ft-10 in level of the auxiliary building. The sample suction line was rerouted through a detector shield in which a series of detectors will measure the radiation associated with a representative sample of the desired reference release path. The new line contains a spool piece of 1 in stainless steel pipe, which will be replaced by an integral spool piece and shield later.

Main Steam Lines

This portion of the final design involves the addition of radiation monitors to measure activity that might be relased via main steam safety valves or atmospheric dump and decay heat release valves. The detectors and their associated shields will be mounted on the main steam valve house south interior wall facing the 32 in safety valve riser, 32 in-SHP-22, 23, or 24. The supports for the detector shields for RM-MS 170, 171, and 172 will be installed on an existing W12 190 wide flange beam imbedded in the south interior wall at el 292 ft-1 in. of the steam valve house.

SUMMARY OF SAFETY ANALYSIS: Modification of the radiation monitoring system by the incorporation of effluent monitors does not constitute an "unreviewed safety question" as defined in 10CFR50.59. This modification provides expanded monitoring capabilities for the present radiation monitoring system. The installation of additional high range effluent monitors provides assurance that the necessary monitoring capabilities for anticipated release paths are available during and after an accident. Therefore, the modification has no effect on the operation of safety-related equipment.

DC 79-S70 Modification to the Control Room Bottled Air System (Units 1 and 2)

Description: The control room bottled air system pressure controllers PC-HV1305A and B were damaged and prevented the bottled air system from releasing air into the control room on September 25, 1979. The bottled air system was modified to prevent damage from reoccurring to the pressure controllers. These modifications consisted of relocating the pressure sensing lines for PC-HV1305A and B, installing pressure limiting devices on each pressure controller sensing line, modifying the piping to include lateral fitting in lieu of tees, and making controller setpoint changes for PC-HV1305A and B, alter the opening times of TV-HV1306A and B, and retesting the system.

SUMMARY OF SAFETY ANALYSIS: The modifications to the bottled air system do not create an "unreviewed safety question" as defined in 10CFR50.59. This modification increased the system reliability. The modification does not affect the operation of the bottled air system, nor does it revise protection or logic schemes of any equipment important to safety previously evaluated in the safety analysis report.

The modification does not affect system capacity, method of operation, or design basis for any safety-related components or systems for any postulated accidents.

The modifications to the bottled air system provides design changes that will prevent the pressure controllers from damage and thus assures that the bottled air system will function as required and designed.

DC 79-S72 Pipe Support Work Due to ARS Revisions (Unit 1)

Description: Portions of the following systems were involved in this Design Change:

1. Main Steam - Refs. 1.7 and 1.16
2. Auxiliary Feedwater - Refs. 1.8 and 1.17
3. Component Cooling - Refs. 1.9, 1.14, 1.15, 1.18, 1.23, and 1.24
4. Service Water - Refs. 1.9 and 1.18
5. Quench Spray - Refs. 1.10 and 1.19
6. Safety Injection - Refs. 1.10 and 1.19
7. Charging System - Refs. 1.10 and 1.19
8. Boron Recovery - Refs. 1.10 and 1.19
9. Fuel Pool Cooling - Refs. 1.13 and 1.22
10. Refueling Purification - Refs. 1.15 and 1.24
11. Containment Vacuum - Refs. 1.15 and 1.24

The following steps were taken to ensure a complete review of all calculations and resolution of problems which arose:

2.1 Determined which calculations (MSK's) required review. This effort has been completed and 44 separate MSK's were reworked.

DC 79-S72 (Continued)

2.2 Reworked the referenced MSK's using the proper ARS curve. Determined whether pipe stress was acceptable using the existing pipe support arrangement.

2.3 If the pipe stress was not acceptable, the pipe was resupported and the MSK's rerun until the stress levels were acceptable.

2.4 Each existing hanger was then reviewed using the new loads. If required, modification of existing hangers or the design of new hangers was made.

2.5 The sketches (MFSK's) for modification of existing or design of new hangers were implemented into this design change (section 3 of Final Design) by field change.

Modifications were then made as detailed on the MRSK and implemented in accordance with the Final Design Controlling Procedure of this Design Change.

2.6 If revised pipe loads to equipment nozzles or supports were greater than the present vendor allowable loads, this was resolved with the vendor.

2.7 Reference 1.16 includes three MSK's which have high energey lines (11715-MSK-101G, H, and J). These three problems were also reviewed using pipe rupture criteria established in the FSAR Appendix C. Pipe whip restraints or impingement shields were added by MFSK, if required.

SUMMARY OF SAFETY ANALYSIS: The proposed modifications were intended to bring systems into conformance with the FSAR commitments, and therefore, do not change any systems as described in the FSAR. The proposed modifications do not involve an unreviewed safety question as defined in 10CFR50.59.

DC 79-S73 VCT Relief Valve Rerouting (Unit 1)

Description: During normal operation, the Volume Control Tank (VCT) contains a gas-to-liquid volumetric ratio of approximately 2:1. VCT relief valve relieves from the VCT gas space and discharges to the high-level waste tank in the liquid waste system. With the previous arrangement, the potential existed that a surge or radioactive gas mixture could have been sent to the high-level drain tank as a result of the VCT relief valve lifting. A backup of gasses in the high-level drain tank might possibly result in a release to the atmosphere via the low-level drain tank overflow line. The liquid waste system high-level drain tank is better capable of collecting and disposing of liquid releases than a gaseous release from the VCT.

To better contain and dispose of radioactive release from the VCT, should the VCT relief valve lift, the inlet line of the VCT relief, RV-1257, was connected to the liquid space of the VCT. RV-1257 remained at its previous location. The discharge path to the high-level drain tank remained

DC 79-S73 (Continued)

unchanged. This resulted in pressure relief of the tank by the discharge of liquid which contained gasses rather than a quantity of gasses only. This lessens the likelihood of a gas backup in the liquid waste sweep system. The Tank Code relief protection requirements will not be compromised by this change since the existing relief valve, RV-1257, is rated to pass the required 350GPM of water with a set pressure of 75 psig (design pressure of the VCT).

SUMMARY OF SAFETY ANALYSIS: Rerouting of the VCT relief valve inlet line to the VCT liquid space does not create an "unreviewed safety question" as defined in 10CFR50.59. The intent of this change was to relieve liquid from the VCT rather than radioactive gas which is more difficult to dispose of. This change minimizes the problems associated with the control and disposal of radioactive and hydrogen gasses. This modification does not constitute change to the present design change nor does it compromise the Tank Code relief protection requirements.

DC 79-S74 Pipe Hanger Modification Due to NRC Bulletin I.E. 79-14 (Unit 1)

Description: NRC IE Bulletin 79-14 (79-14) requires that as-built configurations of safety-related piping systems adequately conform to the design criteria and documents, which were used as input to the seismic analysis.

In complying with the objective of 79-14 all seismic calculations (87) which includes in-line valves, had valve and valve operator weights re-verified and documented.

If the as-built weights varied by ± 10% from the weights used in the original calculation, an engineering evaluation was made. The evaluation determined if dynamic analysis (SHOCK III) was to be rerun using the as-built weights.

If rerun of SHOCK III was required as a result of the engineering evaluation, piping or pipe supports which were found to be inadequate were modified to be acceptable under the revised loading. Equipment nozzle loading and support loading was reviewed. If the load was unacceptable, approval of the new loads or redesign of the nozzle or support was obtained. Revised structural loading at anchor points and equipment supports was evaluated and changes made as required.

Some of the calculations contain high energy lines. These lines were reviewed using the revised loading and existing high energy pipe break criteria. If required, new or different break points were postulated and the effect analyzed. Pipe whip restraints, impingement shields, etc., were added or modified as necessary.

SUMMARY OF SAFETY ANALYSIS: The proposed modifications are intended to bring systems into conformance with the FSAR commitments, and therefore, do not change any systems as described in the FSAR. The proposed modifications do not involve an unreviewed safety question as defined in 10CFR50.59.

DC 79-S77 Control Room Supply and Exhaust A.O.D. S.I. Reset Mod. (Unit 1)

Description: Evaluation of individual system performance following a plant trip and subsequent safety injection (SI) revealed that the control room habitability system supply and exhaust dampers AOD-HV-160-1 and AOD-HV-161-1 returned to their open on non-safety position when SI was reset. These components are part of the engineered safety feature (ESF) equipment.

This does not agree with FSAR comment 7.4 and section 7.3.1.3.5 paragraph i which states that two independent actions are necessary to return the engineered safety feature (ESF) actuated equipment to the non-safety mode. In order to require two independent actions to alter the ESF mode from safety to non-safety for AOD-HV-160-1 and AOD-HV-161-1 dampers various changes were made to their control circuits.

In order to return the dampers to their normal open position, the following independent actions must be taken:

1. SI switches 1-ISIRA, 1-ISIRB must be placed in the "reset" position.

2. Damper control switch 43-1HVCA06 must be placed in the "reset" position.

SUMMARY OF SAFETY ANALYSIS: Modification of the control room supply and exhaust air operated damper SI reset circuitry does not constitute an "unreviewed safety question" as defined in 10CFR50.59. This modification will insure proper reset action of the dampers after a safety injection. The modification does not alter the original intent of the operation of ESF related equipment.

DC 79-S78 Inside/Outside Recirc. Spray Pumps CDA Reset Mod. (Unit 1)

Description: Evaluation of individual system performance following a plant trip and subsequent safety injection (SI) revealed that the Inside/Outside Recirculation Spray Pumps 1-RS-P-1A and 1B and 1-RS-P-2A and 2B would not start should the containment depressurization actuation signal (CDA) be reset before the completion of pump start timer function. These components are part of the engineered safety features (ESF) actuated equipment.

This does not agree with FSAR comment 7.4 and section 7.3.1.3.5, paragraph i., which state that two independent actions are necessary to return the ESF actuated equipment to the nonsafety mode. Also, since the automatic start signal would be prevented or cancelled once the CDA signal is reset, a condition of noncompliance with IEEE standards was created.

In order to require two independent actions to return the recirculation spray pumps to the nonemergency mode, various control circuit revisions were made.

DC 79-S78 (Continued)

In order to return the pumps to the nonemergency mode, the following independent actions must be taken:

1. Reset CDA switches 1-1CSRA and 1-1CSRB.

2. Pump control switch 1-RSOA01 must be placed in either the "stop" or "pull-to-lock" position.

SUMMARY OF SAFETY ANALYSIS: Modification of the inside/outside recirculation pump CDA reset circuitry does not constitute an "unreviewed safety question" as defined in 10CFR50.59. This modification will ensure proper reset action of the dampers after a containment depressurization actuation. The modification does not alter the original intent of the operation of ESF-related equipment.

DC 79-S80 Containment Recirc. Cooling Fans CDA Reset Mod. (Unit 1)

Description: Evaluation of individual system performance following a plant trip and a subsequent safety injection (SI) signal revealed that the containment recirculation cooling fans 1-HV-F-1A and 1B restarted after the containment depressurization actuation (CDA) signal is reset. These components, while not a part of the engineered safety feature (ESF) actuated equipment, would represent an unnecessary start of a large load on an emergency bus during the post-accident period. This single action (resetting of the CDA signal) and the subsequent starting of the recirculation fans do not agree with FSAR comment 7.4 and section 7.3.1.3.5 paragraph i., which state that two independent actions are necessary to return the engineered safety feature (ESF) actuated equipment to the non-safety mode after receiving a safety signal.

In order to require two independent actions to restore operating state for 1-HV-F-1A and 1B fans after a CDA trip signal has been received, various changes were made to their control circuits.

In order to restart the fans after a CDA signal the following independent actions must be taken:

1. Reset CDA switches.

2. Fan selector switch 1-HVRA03 must be placed in the "START" position.

SUMMARY OF SAFETY ANALYSIS: Modification of the containment recirculation cooling fan CDA reset circuitry does not constitute an "unreviewed safety question" as defined in 10CFR50.59 because there is no credit taken for the operation of these fans during a design basis accident (DBA). This modification insures proper reset action of the fans after a containment depressurization actuation.

DC 79-S80 (Continued)

The modification does not affect the original intent of the operation of containment recirculation cooling system. The modification of the containment recirculation cooling fan reset circuitry reduces the possibility for an accident or malfunction by improving system response after a CDA.

DC 79-S82 Safeguards Area Exhaust Fans SOV CDA Reset Mod. (Unit 1)

Description: Evaluation of individual system performance following a plant trip and subsequent safety injection (SI) revealed that the safeguards area ventilation system and its associated charcoal filter isolation and bypass air operated dampers AOD-HV-128-1, -2, -3, -4 returned to the bypass position or non-safety mode after the containment depressurization (CDA) signal is reset. These components are part of the engineered safety feature (ESF) activated equipment.

This does not agree with FSAR comment 7.4 and Section 7.3.1.3.5, paragraph i, which states that two independent actions are necessary to return the ESF equipment to the non-safety mode.

In order to require two independent actions to change from the safety to non-safety position for AOD-HV-128-1, 2, 3, or 4 dampers various changes were made to their control circuits.

In order to return the ventilation system to its non-emergency mode, the following independent were taken:

1. CDA switches were reset.

2. AOD selector switch re-1HVRN04 was placed in the "Bypass" position.

SUMMARY OF SAFETY ANALYSIS: Modification of the safeguards area AOD's CDA reset circuitry does not constitute an "unreviewed safety question" as defined in 10CFR50.59. This modification insured proper reset action of the dampers after a containment depressurization actuation.

The modification does not alter the original intent of the operation of ESF related equipment.

DC 79-S83 Iodine Filter Bank AOD CDA Reset Mod. (Unit 1)

Description: Evaluation of individual system performance following a plant trip and subsequent safety injection (SI) revealed that the iodine filter bank air operated dampers AOD-HV-107A-1, A-2, A-3, and A-4 and AOD HV-107B-1, B-2, B-3, B-4 returned to the divert position or non-safety mode after the containment depressurization actuation (CDA) signal is reset. These components are part of the engineered safety feature (ESF) actuated equipment.

DC 79-S83 (Continued)

This does not agree with FSAR comment 7.4 and section 7.3.1.3.5 paragraph i which state that two independent actions are necessary to return the engineered safety feature (ESF) equipment to the non-safety mode.

In order to require two independent actions to alter the ESF mode from safety to non-safety for AOD-HV-107A-1, A-2, A-3, A-4 and AOD-HV107-B-1, B-2, B-3, B-4 dampers various changes were made to their control circuits.

In order to return the iodine filter bank system to its non-emergency mode the following independent actions were taken:

1. CDA switches were reset.

2. AOD selector switch (43-1HVPA04) was returned to the "OPEN" position.

SUMMARY OF SAFETY ANALYSIS: Modification of the iodine filter bank air operated damper CDA reset circuitry does not constitute an "unreviewed safety question" as defined in 10CFR50.59. This modification will insure proper reset action of the dampers after a containment depressurization actuation. The modification does not alter the original intent of the operation of ESF related equipment.

DC 79-85 Temporary Post-Accident Sampling System (Unit 1)

Description: A temporary post-accident sampling system is needed to provide the capability to obtain a primary coolant sample after an accident. The temporary system will be used until the permanent post-accident sampling facility is installed.

The modifications involved adding temporary lead shielding, a one liter sample cylinder, a holding tank, a shielded lead pig and several manually operated valves to existing station sampling equipment.

SUMMARY OF SAFETY ANALYSIS: The modifications are made outside of the containment isolation valves in a nonsafety related portion of the sampling system. This modification does not create an "unreviewed safety question" as defined in 10CFR50.59. The equipment being installed and the part of the sampling system being modified are not safety-related.

DC 79-S86 Replacement of Switches in Control Room Air Conditioning (Unit 1)

Description: During a review of the differential pressure switches, for compliance to IE Circular 78-08, it was determined that the PDIS's across two self-cleaning strainers, 1-HV-S-1A and 1-HV-S-1B, have no seismic qualification data.

The previously existing differential pressure switches were replaced with qualified differential pressure switches. The Barton model 288A was qualified for use where seismic qualification is necessary.

DC 79-S86 (Continued)

SUMMARY OF SAFETY ANALYSIS: Replacement of the differential pressure switches does not create an "unreviewed safety question" as defined in 10CFR50.59. The replacement switches have been qualified to the North Anna Unit 1 seismic qualification. Therefore, this work does not change the plant design.

DC 80-S07 Pipe Support Work Due to ARS Spreading Revisions (Unit 1)

Description: During completion of the review of the ARS problems associated with DC 79-S72, a further problem area was discovered in the spreading of adjacent peaks on certain ARS curves. After review, the problem was found to be limited to the main steam valve house, fuel building, and auxiliary building. Eleven stress calculations (13 MSK's) could be affected as it contains piping in the buildings of concern.

The stress reanalysis of the subject MSK's determined the need for 11 new supports, all within the main steam valve house. These supports were then added to the system.

SUMMARY OF SAFETY ANALYSIS: The proposed modifications are intended to bring systems into conformance with the FSAR commitments, and therefore do not change any systems as described in the FSAR. The proposed modifications do not involve an unreviewed safety question as defined in 10CFR50.59.

DC 80-S08 Support Modifications Resulting From ECCS Low Temperature Review (Unit 1)

Description: Several lines in the low and high head safety injection (LHSI and HHSI) system had not been analyzed for fluid temperatures below 70°F. The subject lines transport water from the refueling water storage tank (RWST) to the reactor coolant system cold legs during the injection phase of the emergency core cooling system (ECCS) and recirculate flow back to the RWST. As such, these lines can be exposed to temperatures in the 40° - 50°F range. Pipe stresses were reviewed and determined acceptable.

To ensure adequate design of the pipe supports and equipment nozzles/supports in the affected piping sections, a pipe stress analysis was rerun using the revised temperature conditions. After completion of the stress analysis, existing supports were reviewed to the new loading. Supports found to be inadequate have been modified and/or new supports added. Equipment nozzle loading and support loadings were reviewed and changes made as required. All supports have been designed to original design criteria.

SUMMARY OF SAFETY ANALYSIS: The proposed modifications are intended to bring systems into conformance with the FSAR commitments, and therefore, do not change any systems as described in the FSAR. The proposed modifications do not involve an unreviewed safety question as defined in 10CFR50.59.

DC 80-S11 Containment Air Ejectors SI Reset Modifications (Units 1 and 2)

Description: In an emergency, when a LOCA in the containment simultaneously exists with a high-high radioactivity in the main condenser, the main condenser air ejectors air discharge trip valves close on a containment isolation phase A signal.

Resetting the CI-ØA signal will automatically open the valve moving the valves into a non-safety mode. Hence, the single action by the operator will open the main condenser air ejector air discharge trip valves. In order to comply with FSAR Section 7.3.1.3.5 paragraph i which requires two independent actions to return emergency equipment to the non-emergency mode, a control circuit modification was required.

The control circuit modification consists of designating relay 3-ISVSNO1 as Train A air removal to containment trip valve interlocking relay, sealing in the 3- relay with its own contact installing a reset swtich on the main control board, converting relay K614 to normally open.

SUMMARY OF SAFETY ANALYSIS: Modification of the main condenser air ejectors air discharge trip valves reset circuitry does not constitute an "unreviewed safety question" as defined in 10CFR50.59. This modification insured proper reset action of the trip valves after a safety injection.

DC 80-S13 Battery Room Fans and Duct Modifications (Unit 1)

Description: The battery room fans provide ventilation to the battery rooms to keep potential hydrogen concentrations with the room below 1 percent. The fans have been determined to be a major contributor to the noise levels within the Control Room. Duct silencers have been added to the inlet and outlet ducts of the battery room.

Redesign of the fan supports and additional duct supports have been required to accomodate the new duct silencers. The supports have been designed to seismic class I criteria, as originally designed.

SUMMARY OF SAFETY ANALYSIS: The proposed modifications are intended to improve existing plant conditions and do not change any systems from that described in the FSAR. The proposed modification does not involve an unreviewed safety qeustion as defined in 10CFR50.59.

DC 80-S14 Main Control Boards Device Relocation (Unit 1)

The Essex Corporation Report on North Anna - Unit 2 Control Room, Item No. 1, called for relocation of selected devices on the main control bench and vertical boards to provide improved functional grouping. This modification has been completed on Unit 2, this design change package has relocated the necessary devices on the Unit 1 main control boards such that similarity between the control rooms of the two units is maintained.

DC 80-S14 (Continued)

SUMMARY OF SAFETY ANALYSIS: The modification does not introduce an "unreviewed safety question" as defined in 10CFR50.59, because this modification does not introduce an "unreviewed safety question" as defined in 10CFR50.59, because this modification does not change the function of any system as described in the FSAR.

DC 80-S15 Hagan Controllers Modifications (Unit 1 and 2)

Description: A human engineering evaluation of control room design was made on the North Anna - Unit 2 control room by the Essex Corporation. A review of the evaluation results shows that a number of the Hagan process controllers operate inconsistently with human engineering standards and practices. These Hagan controllers have been modified so that the raise and lower push buttons reflect the response action of the process variable.

SUMMARY OF SAFETY ANALYSIS: Rewiring of the Hagan process controllers does not create an "unreviewed safety question" as defined in 10CFR50.59. This modification will increase the system reliability by decreasing the risk of operator error.

DC 80-S17 Control Room Emergency Lighting (Unit 1)

Description: The Essex Corporation Report on North Anna Unit 2 Control Room called for an increase in control room emergency lighting to reduce the potential for human error during an emergency. This was accomplished for Unit 2, and this design change has provided it for Unit 1, by removing the normal control room lighting panel from a non-safety power source and supplying it from an emergency power source.

SUMMARY OF SAFETY ANALYSIS: The proposed modification does not introduce an "unreviewed safety question" as defined in 10CFR50.59. This modification allows the control room lighting system to perform its intended purpose. This change will not affect the functioning of any safety-related systems, and will add to control room lighting reliability.

DC 80-S19 Replacement of MOV-2867A (Unit 2)

Description: MOV-2867A passed its torque setting and rammed the disc into the seat resulting in a fractured disc. Since the disc and seat are matched, the problem could not be corrected without replacement of the valve. Therefore, the valve has been replaced with a Velan model 3GM-78FN; the Velan recommended replacement model for the now obsolete 3GM-58FN.

SUMMARY OF SAFETY ANALYSIS: The replacement of the motor operated valve does not create an "unreviewed safety question". The combined weight of new valve is within 2.2% of that of the old valve and operator; no seismic piping reanalysis will be required. The new valve has its

DC 80-S19 (Continued)

own Limitorque motor operator which meets the FSAR required operation time of 10.0 seconds or less. The replacement valve (Velan model 3GM-78FN) meets the same dimensional and pressure requirements of the now obsolete Velan model 3GM-58FN. The new motor operated valve meets the requirements of Westinghouse Certification (LQ-4785) and is ASME III, Class I.

DC 80-S20 Main Steam Isolation Trip Valve Modification (Units 1 and 2)

Description: In the process of performing tests to check the movement of the discs for main steam isolation trip valves, TV-MS101A, B, C one of the valves unintentionally closed creating a high steamline flow conincident with low steamline pressure and initiating a safety injection signal. The procedure is to test one main steam trip valve at a time by pressing the local test pushbutton for example PB-SOV-MS101A-3. This energizes the solenoid, SOV-MS101A-3, which vents air through a throttled vent to allow TV-MS101A to close slowly. When the valve disc has moved approximately 3 degrees, a limit switch deenergizes the solenoid and thus restores the air pressure and returns the piston and disc to the full open position. During one of these tests, the solenoid did not become deenergized to prevent the valve from closing.

In reviewing the procedure which was used to reopen the main steam isolation trip valve, a nonconformance with the FSAR was discovered. The FSAR states that "once the main steam line isolation valve is fully closed, a limit switch seals the solenoids in the energized position" which will keep the valve in the closed position until the seal-in is broken. This limit switch seal-in did not exist in the circuitry.

To make the change that an additional action be required to open the main steam isolation trip valves, TV-MS101A, B, C (TV-MS201A, B, C for Unit 2) after a main steamline trip, the circuitry for these valves have been altered to seal-in the applicable solenoids in the energized position, but contrary to the FSAR the seal-in will be by a relay contact as opposed to a limit switch contact. This is in keeping with the intent of the FSAR.

SUMMARY OF SAFETY ANALYSIS: This modification to the main steam isolation trip valves does not constitute an "unreviewed safety question" as defined in 10CFR50.59. This modification will ensure proper reopening of the main steam isolation trip valves after a main steam line isolation trip.

DC 80-S24 Replacement of Mission Check Valve Bearings (Units 1 and 2)

Description: The TRW-Mission insert check valves listed contained teflon body and plate lug bearings. These valves are located in areas where the calculated 40 year normal plus accident integrated radiation dose exceeds the published radaiation resistance for teflon.

DC 80-S24 (Continued)

2-CC-194
2-CC-199
2-CC-302
2-CC-289
2-CC-276
2-CC-27
2-CC-10
2-CC-104
2-SW-94
2-SW-84
2-SW-74
2-SW-68
2-SW-70

Replacement of the lug and plate bearings was made to comply with the requirements of TMI-2 lessons learned NUREG-0578, section 2.1.6b. The replacement of the bearing required isolation of the check valve, removal of the check valve disc and replacement of the bearings on the disc.

SUMMARY OF SAFETY ANALYSIS: No change to the Technical Specifications or FSAR were required by this Design Change, nor did this change create an "unreviewed safety question" because the replacement of the lug and plate bearings is consistent with Codes and Standards of the existing valves. This modification does not change the characteristics of any system and will improve the radiation capability of the valve.

DC 80-S26 Protection of Exposed Controls (Units 1 and 2)

Description: After review of the Unit 2 control boards by the Essex Corporation, the panels listed below had protection devices (stainless steel tubing and plexiglass) installed over exposed controls. Unit 1 control boards were modified in like manner to maintain similarity between the two units' control rooms.

Main Control Bench Boards:	1-EI-CB-01 1-EI-CB-02 2-EI-CB-01 2-EI-CB-02
Main Control Vertical Boards:	1-EI-CB-05 2-EI-CB-05
Intake Structure Controls Panels:	1-EP-CB-06 2-EP-CB-06
Bearing Cooling Control Boards:	1-EI-CB-80 2-EI-CB-80

DC 80-S26 (Continued)

Emergency Diesel Generator Panels: 1-EI-CB-08A & B
2-EI-CB-08A & B

SUMMARY OF SAFETY ANALYSIS: Technical Specifications and the FSAR do not address the presence of physical protection barriers on the control boards. The operation of any system is not changed by installation of barriers. For the preceeding resasons an "unreviewed safety question" is not created.

DC 80-S27 Visual Alarm Addition to Diesel Generator Rooms (Units 1 and 2)

Description: I.E. Bulletin No. 79-18 identified a need to improve methods of personnel evacuation from high noise areas. Visual evacuation notification devices in the diesel generator rooms were installed. These visual alarms were in the form of red 200 watt rotating alarm lights. One alarm per Emergency Diesel cubicle will activate when a station alarm is initiated.

SUMMARY OF SAFETY ANALYSIS: The Technical Specifications and FSAR were not changed by this modification. The added flashing beacon will improve post accident communication. This modification did not create an "unreviewed safety question".

DC 80-S29B Post Accident Monitoring Panel (Units 1 and 2)

Description: This modification installed seismically qualified Panel (PAMC-1 for Unit 1 and PAMC-2 for Unit 2) to house various post-accident monitoring control devices and monitoring equipment required by TMI-NUREG 0578 and NRC clarification letter of October 30, 1979.

The Unit 1 panel (PAMC-1) is located beside the Vertical Board 1-3B between the Unit 1 and Unit 2 control rooms, and the Unit 2 Panel (PAMC-2) is located beside the vertical board 2-3B in the Unit 2 control room.

SUMMARY OF SAFETY ANALYSIS: Installation of the post-accident monitoring panels did not create an "unreviewed safety question" as defined in 10CFR50.59. The modifications do not affect automatic or manual operation of any safety systems as it is designed to the Category I requirements of NUREG-0578, nor does it revise the protection and logic functions of any systems important to safety previously evaluated in the safety analysis report.

DC 80-S53A Alternate Power Feed For Annunciator (Unit 2)

Description: During a review of equipment supplied with power from vital, semi-vital and 125V DC busses, prompted by NRC IE Bulletin No. 79-27, it was determined that power should be restored to certain vital bus loads after the loss of the vital bus in order to simplify the cooldown

process. One of these loads is the Main Annunciator Cabinet (2-EI-CB-21).

This modification allows power to be restored to this cabinet in the event of the loss of vital bus power. This was accomplished by running an alternate feeder cable from one of the junction boxes installed in the Emergency Switchgear Room as part of DC-80-S54A.

SUMMARY OF SAFETY ANALYSIS: Provision of an alternate power feed for the annunciator does not create an "unreviewed safety question" as defined in 10CFR50.59. The modification does not affect the logic or capacity of any equipment important to safety which was previously evaluated in the Safety Analysis Report. All new materials and components used for the modification are compatible (relative to design, quality, and functional requirements) with original materials and components.

The modification will increase the system reliability by providing an alternate feed for the annunciator to simplify the cooldown process after the loss of Vital Bus I, but it will not affect the normal operation of the annunciator or the vital bus.

DC 80-54A Alternate Power Feed for Vital SOV and Instrument Panel (Unit 2)

Description: The modification installed two junction boxes in the emergency switchgear room, fed from the 480V orange and purple emergency motor control centers in the cable tunnel, by means of voltage-regulating transformers also located in the emergency switchgear room. Alternate feeder cables will be run from these boxes to each panel but will be terminated only at the junction box. These alternate feeds will be taped and coiled at the panel end and will be connected for use only after the loss of vital bus power to a panel. The panels affected by this modification are the main control board vital SOV panels A and B and the vital instrument distribution panel 2-I and 2-III.

SUMMARY OF SAFETY ANALYSIS: Provision of an alternate power feed for the vital SOV and vital instrument distribution panels does not create an "unreviewed safety question" as defined in 10CFR50.59. Since the alternate feeds will only be connected after the loss of vital Bus I and/or III, the modification does not compromise the integrity of the present vital bus system. The modification does not affect the logic or capacity of any equipment important to safety which was previously evaluated in the safety analysis report. The modification will increase the system reliability by providing alternate feeds for the vital SOV and vital instrument distribution panels to simplify the cooldown process after the loss of vital bus I and/or III, but it will not affect the vital bus system and its connected loads during normal operation. All new materials and components used for the modification are compatible (relative to design, quality, and functional requirements) with original materials and components.

DC 80-S60B Post Accident Sample System Containment Return Line (Unit 2)

Description: Inside containment a line was connected to a spare tube of the multi-tube penetration no. 111 and connected to the common steam

DC 80-S60B (Continued)

generator blowdown drain line which open ends at the containment sump. Outside containment a line was connected to the same penetration and run to the Post Accident Sample System. There are two containment isolation valves located outside the containment. These valves are normally closed and receive a Phase A signal to assure they are tripped closed on a SIS. The new containment isolation valves are air-operated trip valves.

SUMMARY OF SAFETY ANALYSIS: This modification requires changes to section 3/4.6.3 of the Technical Specifications and section 6.2.4 of the FSAR. The addition of a Post Accident Sample System Containment Return Line does not constitute an unreviewed safety question as defined by 10CFR50.59. The sample return line is designed consistent with codes and standards of the existing systems. The use of two containment isolation valves outside the containment has precedent with systems required to function after a LOCA. This modification does not change the characteristics of any system in operation during reactor operation.

DC 80-S63 Centrifugal Charging Pump Interim Modification (Units 1 and 2)

Description: Westinghouse provided interim modifications that were carried out by the Station which involved removing the safety injection initiation automatic closure signal from the CCP mini-flow isolation valves.

SUMMARY OF SAFETY ANALYSIS: The removal of the safety injection initiation automatic closure signal from the CCP miniflow isolation valves does not create an "unreviewed safety question" as defined in 10CFR50.59. The purpose of this modification is to provide an interim means of preventing the possible damage of the centrifugal charging pumps due to operating without minimum flow.

DC 80-S67 Steam Generator Modification to Moisture Carryover (Unit 2)

Description: On October 15, 1980 Startup Test 2-SU-40, "Steam Generator Moisture Carryover Measurement" was performed and results indicated an abnormally high carryover percentage. Westinghouse implemented mechanical modifications consisting of the addition of three steam chimneys, eight secondary dryer drains and three steam water deflectors for each steam generator.

SUMMARY OF SAFETY ANALYSIS: The FSAR and Technical Specifications are unaffected by this modification. The modification will help ensure the steam quality levels originally designed for are obtained. These modifications are fully compatible with original equipment design.

The modification also does not unduly impede or restrain steam flow, thus the performance of the steam generators will remain virtually unchanged. This modification, consisting of adding additional moisture separator assemblies to the ones already in existence does not constitute an "unreviewed safety question" as defined in 10CFR50.59.

SPECIAL TESTS

NORTH ANNA POWER STATION UNIT NO. 1

COMPLETED IN 1980

1-ST-9: Voltage Profile

Description: The purpose of this test is to verify that plant equipment voltage profiles remain above an acceptable level during a transient initiated by one unit tripping simultaneously with a second unit starting up. The load from both units remains on the Reserve Station Transformer. Recorders were installed to monitor the voltage profiles on A.C. busses. A trip was simulated on Unit 2 by using an installed test switch to trip all three Station Service breakers. After voltages stabilized, Unit 2 returned to Station Service.

1-ST-10: Emergency Diesel Generator 24 Hour Run Test

Description: The purpose of this test is to demonstrate the operability of the diesel generators during sustained full-load operation. The Emergency Diesel Generators were placed in service. The diesel generator load was raised to greater than or equal to 3025 kw and voltage adjusted to give approximately 50 Kvars. The generator was run for at least 120 minutes at this load, and was run at least 22 hours at not less than 2750 kw.

1-ST-13: Motor Driven Auxiliary Feedwater Pump Endurance Test

Description: The purpose of this test is to ensure the Motor Driven Auxiliary Feedwater Pumps remain within design limits during a 48 hour endurance run. With a temporary test flow loop, including a temporary heat exchanger connected to chilled water, the pumps were run for 72 hours while the following parameters were being monitored: vibration, fluid temperature, bearing oil temperature, and environmental conditions.

1-ST-15: Safety Injection and CDA Reset

Description: The purpose of this test is to verify proper operation of equipment that did not function properly during 1-PT-57.4 (9/27/79) and 1-PT-66.3 (9/27/79) and to verify proper operations of equipment modified in DC-79-577, 582, 583, 5-78, and 5-80. RCS temperature was less than 200° F; steam generators were above the low level setpoints. A simulated safety injection was initiated and specified equipment (charging pumps, service water pumps, valve TV-CC-105B, main steam valve 111A, HCV-1936, control room ventilation dampers, iodine filter dampers, feedwater pump 1B, SAVS dampers, inside/outside recirculation spray pumps, containment recirculation cooler fans) was checked for proper responses and/or operation.

1-ST-17: Degraded Voltage/Loss of Voltage Response Time Test

Description: The purpose of this test is to measure the response times for Emergency Bus 1H and 1J degraded voltage and loss of voltage protection circuits. No undervoltage testing was being conducted elsewhere on either emergency bus and no undervoltage conditions existed on either emergency bus. A start signal was sent to specified relays (relays: 27A-1H1, 27B-1H1, 27C-1H1, 27A-1H3, 27B-1H3, 27C-1H3, 27A-1J1, 27B-1J1, 27C-1J1, 27A-1J3, 27B-1J3, and 27C-1J3), and their response time was measured.

1-ST-18: Degraded Voltage Functional Test

Description: This test functionally checks the undervoltage relays associated with the 1H and 1J busses. After voltage is degraded with SI signal, specified equipment will be tripped and/or started to verify relay operation as functional. (Relays: 27A, 27B, 27D, 27E, 27Y, and 27Z)

1-ST-19: Leak Check of the Gas Stripper Liquid Piping and Gas Piping

Description: The purpose of this test is to walkdown the gas stripper liquid piping and gas piping to check for leaks at flanges, drain valves, vent valves, pump seals, valve packings and any other sources of possible leakage. With the gas stripper having a nominal water level or letdown available, bubbling agent is used to leak check the gas section of the stripper and a visual check is made of the liquid section.

1-ST-20: Leak Check of the High Level Liquid Drain Piping

Description: The purpose of this test is to pressurize the high level waste drain piping and stop all leakage or reduce to as low as practical. After the valve lineup was accomplished, the auxiliary building sump pumps were used to pressurize the system. A walkdown of the liquid waste was done and all leakage estimated.

1-ST-21: Reactor Coolant System Loose Parts Monitoring System Data Collection Test

Description: The purpose of this test is to collect loose parts monitoring system data on the reactor coolant system while all full length control rod drive shafts are under a loaded condition. The unit was in Mode 3 with a boron concentration of greater than 1100 and Tave greater than 500°F. Shutdown rod banks were fully withdrawn. Control banks A, B, C, and D were each at ~ 20 steps. With all combinations of RCP's running; vibrational data was recorded.

1-ST-24: Hydrogen Analyzer Pump Differential Pressure

Description: The purpose of this test is to measure the pressure differential across the hydrogen analyzer vacuum pump. A differential pressure cell was connected across the hydrogen analyzer vacuum pump, the isolation valves were opened, and data recorded.

1-ST-26: Diesel Generator "1H" Start Demonstration Test

Description: The purpose of this test is to demonstrate continuous successful starts on "1H" diesel generator. The diesel was started from ambient condition and accelerated to at least 900 RPM in less than or equal to 10 seconds.

1-ST-32: RTD Cross Calibration At Power

Description: The purpose of this procedure is to provide a periodic functional checkout and cross calibration data check for the reactor coolant RTD's. Any RTD deviating from the average by greater than $\pm$ 0.3°F will be appropriately corrected. Measurements were performed by making four data runs in sequence as rapidly as possible while maintaining the highest possible degree of accuracy. The appropriate averages were calculated on data sheets to make conversions to degrees Fahrenheit.

1-ST-34: Emergency Bus Residual Voltage Bus Transfer Modification Functional Test

Description: This is a functional test of the emergency bus residual voltage bus transfer modification, of an installed two second time delay on automatic closure, and verifies that the emergency bus modification has not affected normal operation of the emergency diesel generator output breakers. For each breaker (15H2 and 15J2) the emergency diesel was allowed to reach steady state operation at approximately 900 RPM and 4160 volts. Diesel loading on the specified bus was executed for at least 30 minutes and breaker response recorded.

1-ST-36: Pump Head Verification For 1-CH-P-2D

The purpose of this test is to verify the pump head for 1-CH-P-2D is consistent with the manufacturer's specifications. The valves were aligned as specified; the pump started and the pressures were recorded for different flows. The data was then compared to the manufacturer's specifications.

SUMMARY OF SAFETY ANALYSES: For all of the above referenced Special Tests, an individual Safety Analysis has been performed and in each case it has been determined that the probability of occurrence or the consequences of an accident or equipment malfunction important to safety previously evaluated in the safety analysis report would not be increased by the test. Also the possibility of an accident or malfunction of a different type other than any evaluated previously in the safety analysis report had not been created nor was the margin of safety, as defined in the basis for any technical specification, reduced.

SPECIAL TESTS

NORTH ANNA POWER STATION UNIT NO. 2

COMPLETED IN 1980

2-ST-2: Hydyrostatic Test of Steam Generators - Shell Side

Description: The purpose of this test is to verify the integrity of the shell side of the steam generator, after weld repair on steam generator feedwater nozzle, by the performance of a hydrostatic test of 1356 psig (1.25X design pressure of 1085 psig). The steam generators were filled with heated water from the condensate system at a temperature between 70°F and 130°F. System pressure was raised in steps, until 1356 psi was reached. This pressure was held for between 10 and 30 minutes. Pressure was slowly lowered to 1085 and a visual examination performed. Afterward the pressure was slowly lowered to atmospheric.

2-ST-3: Motor Driven Auxiliary Feedwater Pump Endurance Test

Description: The purpose of this test is to ensure the Motor Driven Auxiliary Feedwater Pumps remain within design limits during a 48 hour endurance run. A temporary flowpath was installed between check valves; the pump was then run for at least 48 hours while the fluid, pump and motor bearing temperatures were being monitored. The pumps were cooled for eight hours after the 48 hour run, until bearing temperatures were within 2°F of initial readings.

2-ST-4: Safety Injection and CDA Reset Test

Description: The purpose of this test is to verify that equipment operates properly after the reset of an SI or CDA signal. A simulated safety injection was initiated and specified equipment (radiation monitoring pumps, CRDM fans, SAVS dampers, control room ventilation dampers, iodine filter dampers, inside/outside recirculation spray pumps, containment recirculation cooler fans) was checked for proper responses and/or operation.

2-ST-18: Leak Check of Gas Stripper Liquid and Gas Piping to TV-BR-110B

Description: The purpose of this test is to walkdown the gas stripper liquid piping and gas piping to check for leaks at flanges, drain valves, vent valves, pump seals, valve packings and any other sources of possible leakage. With the gas stripper having a nominal water level or letdown available, bubbling agent is used to leak check the gas section of the stripper and a visual check is made of the liquid section.

2-ST-19: Control Room Lighting Test

Description: The purpose of this test is to determine lighting levels in the Unit 1 and 2 control room under both normal and emergency conditions. The test reduced the lighting level in the control room by slowly extinguishing one circuit of lighting at a time. Breakers on emergency lighting panels were closed prior to the test, then opened. Batteries were verified on float with respsective battery chargers energized.

2-ST-20: Emergency Diesel Generator Lockout Features Test

Description: The purpose of this test is to verify that the remote local selector switch and the emergency stop switch of the diesel generator lockout prevent the diesel generator from starting, except when required. The control switch was in "manual local"; loss of offsite power was simulated, specified switches were activated and the results were verified.

2-ST-21: NDT Overpressure Protection Functional Check - Circuitry

Description: The purpose of this procedure is to test the NDT Overpressure Protection Circuitry by verifying proper operation of PORV's in response to a simulated NDT overpressurization protection signal.

The unit was in operational mode 5 or 6. Specified conditions (valve position, loop temperature, jumper position) were established and direct observation was used to verify the opening and closing of PORV's (PCV-2455C and PCV-2456) with the trip and reset of their associated comparators. The PORV's opened and closed with the trip and reset of their assocaited comparators. The Trip and Reset setpoints of the comparators were verified to be within the desired tolerances specified in the test.

2-ST-22: Steam Generator Water Hammer Demonstration Test

Description: The purpose of this test is to demonstrate that the possibility of water hammer, following steam generator feed ring recovery has been emliminated by J-tube installation and feedwater loop seal arrangements. For the first demonstration, the steam generator temperature was approximately 450°F and level 3% - 5% and for the second demonstration, SG temperature was approximately 547°F level 40% to 50%. Feedwater flow was initiated while the flow, level and sound were being monitored.

2-ST-24: Turbine Driven Auxiliary Feedwater Pump Endurance Test

Description: The purpose of this test is to ensure that the Turbine Driven Steam Generator Auxiliary Feedwater Pump remains within design limits during a 48 hour endurance run. With a temporary test flowpath, installed between the feedwater check valve and the manway, including a temporary heat exchanger connected to cooling water, the pump was then run for 48 hours while the following parameters were being monitored: fluid temperature, bearing oil temperature, vibration displacements, and environmental conditions.

2-ST-29: Feedline Support Evaluation Test

Description: The purpose of this test is to reduce stresses caused by thermal expansion so inspection and repair of the monoball sliding restraints may be affected. The unit was less than or equal to 50% full power, enabling the removal of the feedwater heaters so feedwater temperature could be reduced to approximately 200°F without exceeding a 50°F/hr cooldown rate. Monoball sliding restraints were inspected, shimmed if necessary to enhance sliding and the feedwater lines heated back up to check for correct pipe movement. After feedline support members were inspected and adjusted as required, the unit feedwater system was returned to normal without exceeding a 50°F/hr heatup rate.

2-ST-31: Emergency Bus Residual Voltage Bus Transfer Modification Functional Test

Description: This is a functional test of the emergency bus residual voltage bus transfer modification, of an installed two second time delay on automatic closure, and verifies that the emergency bus modification has not affected normal operation of the emergency diesel generator output breakers. For each breaker the emergency diesel was allowed to reach steady state operation at approximately 900 RPM and 4160 volts. Diesel loading on the specified bus was executed for at least 30 minutes and breaker response recorded.

SUMMARY OF SAFETY ANALYSES: For all of the above referenced Special Tests, an individual Safety Analysis has been performed and in each case it has been determined that the probability of occurrence or the consequences of an accident or equipment malfunction important to safety previously evaluated in the safety analysis report would not be increased by the test. Also the possibility of an accident or malfunction of a different type other than any evaluated previously in the safety analysis report had not been created nor was the margin of safety, as defined in the basis for any technical specification, reduced.