CONNECTICUT YANKEE ATOMIC POWER COMPANY

BERLIN, CONNECTICUT
P. O. BOX 270 HARTFORD, CONNECTICUT 06101

TELEPHONE
203-666-6911

March 15, 1983

Docket No. 50-213
B10723

Director of Nuclear Reactor Regulation
Attn: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

References: (1) W. G. Counsil letter to D. M. Crutchfield, dated December 29, 1982.

(2) D. M. Crutchfield letter to W. G. Counsil, dated September 30, 1982.

Gentlemen:

Haddam Neck Plant
Systematic Evaluation Program Integrated Assessment

In Reference (1), Connecticut Yankee Atomic Power Company (CYAPCO) provided a response to each open issue identified in Reference (2) that resulted from the reviews of the SEP Topics applicable to the Haddam Neck Plant. CYAPCO representatives met with members of the NRC Staff on March 8, 1983 to discuss certain issues where additional information is needed in order for the Staff to concur in our proposed approach for resolution. Following that meeting, CYAPCO was requested to submit a supplement to Reference (1) providing this additional information. The purpose of this submittal is to provide that information and identify areas where CYAPCO's intended actions differ from that stated in Reference (1).

Attachment 1 contains a brief description of the open issue followed by a summary of CYAPCO's intended actions to address the issue. The information presented in Attachment 1 is intended to modify that provided in Reference (1). For those open issues not addressed in Attachment 1, the proposed resolution provided in Reference (1) remains valid.

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We trust the Staff will find the attached information sufficient to ensure that adequate resolution of the outstanding issues will be achieved in a mutually acceptable manner.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

W. G. Counsil

W. G. Counsil
Senior Vice President

Docket No. 50-213

Attachment 1

Haddam Neck Plant

Systematic Evaluation Program

Integrated Assessment Supplement

March, 1983

TOPIC NO.	TITLE
V-10.B	RHR System Reliability
V-11.B	RHR Interlock Requirements (Systems)

10 CFR 50 (GDC 34), as implemented by SRP 5.4.7 and Branch Technical Position RSB 5-1, requires, in part, that a system to remove residual heat be provided with suitable redundancy to assure that for onsite electrical power system operation the system safety function can be accomplished, assuming a single failure.

1. Because of the potential for Residual Heat Removal (RHR) overpressurization, the staff has determined that the following modifications should be considered for backfit during the integrated plant safety assessment:

   a. Interlocks on the RHR-to-core deluge motor-operated valves to prevent opening until RCS pressure is below design pressure.

   b. Modification of the technical specifications to require placing the overpressure protection system in operation whenever RHR cooling is in progress.

2. The staff concludes that the Haddam Neck systems fulfill the safety objectives of reliable plant shutdown capability using safety-grade equipment provided that plant operating procedures are modified to instruct operators how to perform shutdown and cooldown functions with the systems identified in the minimum systems list.

3. The staff noted during the safe shutdown evaluation that no Technical Specification requirement governs the allowed outage time of an ECCS train. The need for this requirement will be evaluated under SEP Topic XVI, "Technical Specifications."

4. Based on our review, the staff concludes that procedural shortcomings exist with respect to shutdown from outside the control room in the areas of maintenance of batteries for portable instruments, the assignment of shutdown duties for shift personnel and emergency communication methods. The licensee should modify his procedures to alleviate these shortcomings.

CYAPCO Response

1.a. The response provided in W. G. Counsil letter to D. M. Crutchfield dated December 29, 1982 remains unchanged.

1.b. CYAPCO will modify the Technical Specifications to require the overpressure protection system to be in service prior to initiation of RHR cooling and to remain in service at all times RHR cooling is in progress and alternate venting means (e.g. - vessel head removed) are not provided. This change will be implemented as part of the conversion to Standard Technical Specifications.

2. The response provided in W. G. Counsil letter to D. M. Crutchfield dated December 29, 1982 remains unchanged.

3. The response provided in W. G. Counsil letter to D. M. Crutchfield, dated December 29, 1982 remains unchanged.

4. The response provided in W. G. Counsil letter to D. M. Crutchfield, dated December 29, 1982 remains unchanged.

TOPIC NO.	TITLE
VI-1	Organic Materials and Post-Accident Chemistry

10 CFR 50 (GDC 1, 4, 14, 31, 35, 41, and Appendix B), as implemented by SRP Sections 6.1.1 and 6.1.2 and Regulatory Guide 1.54, requires, in part, that structures, systems and components important to safety be designed to accommodate the effects of and be compatible with the environemntal conditions associated with normal operating and postulated accident conditions. In particular, paints and organic materials used inside containment and post-accident water chemistry should not adversely effect ESF functions.

Post Accident Chemistry - Based on the staff evaluations, we conclude that, although the Haddam Neck Plant can be operated with an acceptable degree of safety under normal conditions when containment spray and sump water recirculation are not required, the post accident water chemistry does not meet the acceptance criterion of Standard Review Plan Section 6.1.1 and Branch Technical Position MTEB 6-1 and is, therefore, not acceptable. In order to reduce the potential of stress corrosion cracking of the engineered safety feature equipment inside the containment following a design basis accident, the licensee should either show that the post accident water chemistry meets the acceptable criterion II.B.1 in Standard Review Plan 6.1.1 and Branch Technical Position MTEB 6-1, or provide an acceptable alternative.

CYAPCO Response

To raise the pH of the water in the containment sump used for recirculation mode cooling following an accident from 5.2 to 7.0, CYAPCO intends to install Trisodium Phosphate (TSP) baskets in the sump area. CYAPCO intends to install the TSP baskets during the 1984 refueling outage.

The design of the TSP baskets will be the same as that used at Millstone Unit No. 2, which was approved by the Staff in Supplement 1 to the Safety Evaluation Report for Millstone Unit 2 (Reference: O. D. Parr letter to D. C. Switzer, dated March 7, 1975.) Although the exact location for the TSP baskets has not yet been finalized, CYAPCO intends to locate the baskets in the area of the containment sump, and as close to the sump suction as is practical. Surveillance requirements for the TSP baskets will be included in the conversion to Standard Technical Specifications.

TOPIC NO.	TITLE
VI-4	Containment Isolation System

10 CFR 50 (GDC 54, 55, 56, and 57), as implemented by SRP 6.2.4 and Regulatory Guides 1.11 and 1.141, establish explicit requirements for isolation valving in lines penetrating the containment. Specifically, they address the number and location of isolation valves (for example, redundant valving with one located inside containment and the other located outside containment), valve actuation provisions (for example, automatic or remote manual isolation valves), valve position (for example, locked closed, or the position of greater safety in the event of an accident or power failure) and valve type (for example, a simple check valve is not a permissible automatic isolation valve outside containment).

At Haddam Neck, the staff determined that the licensee does not comply with current licensing criteria in the following areas:

1. Both containment isolation valves are located outside of containment.

2. Use of simple check valve outside containment as a containment isolation valve.

3. Use of remote manual valves without provisions to inform operator when isolation is required.

4. The use of hand operated manual valves for containment isolation with no indication that these valves are sealed closed or otherwise under administrative control.

5. Containment penetrations with no valving identified for isolation purposes.

6. Containment penetrations will only one valve identified as an isolation valve.

7. Use of blind flanges without indicating if barriers are leak tested.

CYAPCO RESPONSE

Penetrations P-12A, P-12B, P-13, P-23A, P-33, P-41, P-62, and P-64 have both isolation valves located outside containment whereas GDC 55 and 56 require one isolation valve inside containment and one valve outside containment. The relative benefit of locating one valve inside containment and one valve outside has been evaluated on a probabilistic basis for other SEP Plants (e.g.- NUREG-0820, Appendix D and NUREG-0821, Appendix D). Since the probability of failure of both valves is greater than the probability of failure of the line between the containment and the first isolation valve, only a small increase in safety results from moving one valve inside the containment. Therefore, based on low importance to risk and the cost associated with relocating isolation valves inside containment, CYAPCO concludes that no modifications to those penetrations are warranted.

Penetrations P-30, P-46 thru P-49, P-68, and P-81 have a simple check valve outside containment rather than an MOV. The results of PRA's for other SEP plants (e.g. - NUREG-0820, Appendix D and NUREG-0821, Appendix D) showed that replacing check valves with motor operated valves resulted in little reduction in risk. Therefore, no modifications to these penetrations are warranted.

Penetrations P-4, P-11A thru P-11D, P-14, P-22, P-23D, P-34, P-38, P-50 thru P-58, P-60, P-61, P-67, P-69, P-71, P-74 thru 77, and P-78 all have only one valve identified as an isolation valve. CYAPCO is presently evaluating the isolation provisions for these penetrations in conjunction with the criteria of 10CFR50, Appendix J. At the conclusion of this review, CYAPCO will identify any modifications required to meet the requirement for double barrier isolation. CYAPCO will inform the Staff of the required modifications and provide a schedule for implementation by July 29, 1983.

The final SER for Topic VI-4 also identified a concern related to the position of isolation valves under a loss of power. For those valves that do not fail in the closed position, CYAPCO will evaluate the isolation provisions and propose modifications if necessary. This review will be coordinated with the evaluation noted above, and the results forwarded to the Staff by July 29, 1983.

There are also a number of branch lines such a vent or drain lines that contain local manual valves. These valves will be locked closed and adminstratively controlled. These controls will be implemented before start-up from the 1984 refueling outage.

TOPIC NO.	TITLE
VI-7.C.1	Independence of Redundant Onsite Power Systems

10 CFR 50 (GDC 17) as implemental by Regulatory Guide 1.6 and IEEE Std. 308-1974 requires that onsite electrical power supplies and their onsite distribution systems shall have sufficient independence to perform their safety function assuming a single failure.

The Haddam Neck onsite standby AC and DC power systems do not comply with current licensing criteria. In each case, a manual breaker exists which allows paralleling of the two power divisions; no interlocks or procedures prevent this. Additionally, the DC power system design permits all four inverters to be supplied from a single battery.

CYAPCO Response

There are three manual tie breakers in the AC system (between MCC's 8-5 and 8-6, 3-4 and 3-7, and 4-4 and 4-7) that would allow paralleling of the redundant divisions. The purpose of these tie breakers is to facilitate maintenance. Although the tie breaker on each MCC is entirely manual, the feeder breaker between each bus and MCC is provided with protective trips. Therefore, should a fault be transfered between MCC's 8-5 and 8-6 (for example), the feeder breaker would open to prevent damage to the redundant power division. CYAPCO intends to provide locking devices and administrative controls for the manual tie breakers identified here. CYAPCO concludes that these controls and the protection offered by the feeder breakers is sufficient to satisfy the intent of current criteria for this topic.

For the manual tie breaker between DC buses 1 and 2, CYAPCO will provide a locking device and administrative control. Since by design this breaker cannot physically be removed from its compartment, CYAPCO concludes that these controls are adequate.

All four inverters can be powered from one battery only by tying the two DC buses together and removing one battery from service. This not only powers all four inverters from one battery but also powers the entire DC system, both divisions, from one battery. As discussed above, this will be administratively prevented during power operation.

Each of the four inverters supplies a separate vital AC bus. Each of the vital buses has an alternate source of power which can be switched into service manually. The alternate source breaker for each vital bus is interlocked with the normal source breaker so that both cannot be closed at the same time. Presently, however, the alternate source of power for each vital bus is supplied by an inverter from the redundant division. Thus, if one vital bus is fed from its alternate source, three vital buses would be receiving power through two inverters from one battery. CYAPCO intends to modify the existing alternate feeds to the vital buses so that the alternate source for each vital bus is taken from the other inverter in the same division. Therefore, it will not be possible to power three vital buses from one battery. Sketches of the existing and proposed arrangements are attached. CYAPCO intends to complete these modifications in conjunction with the modifications planned as a result of the Appendix R Fire Protection review.

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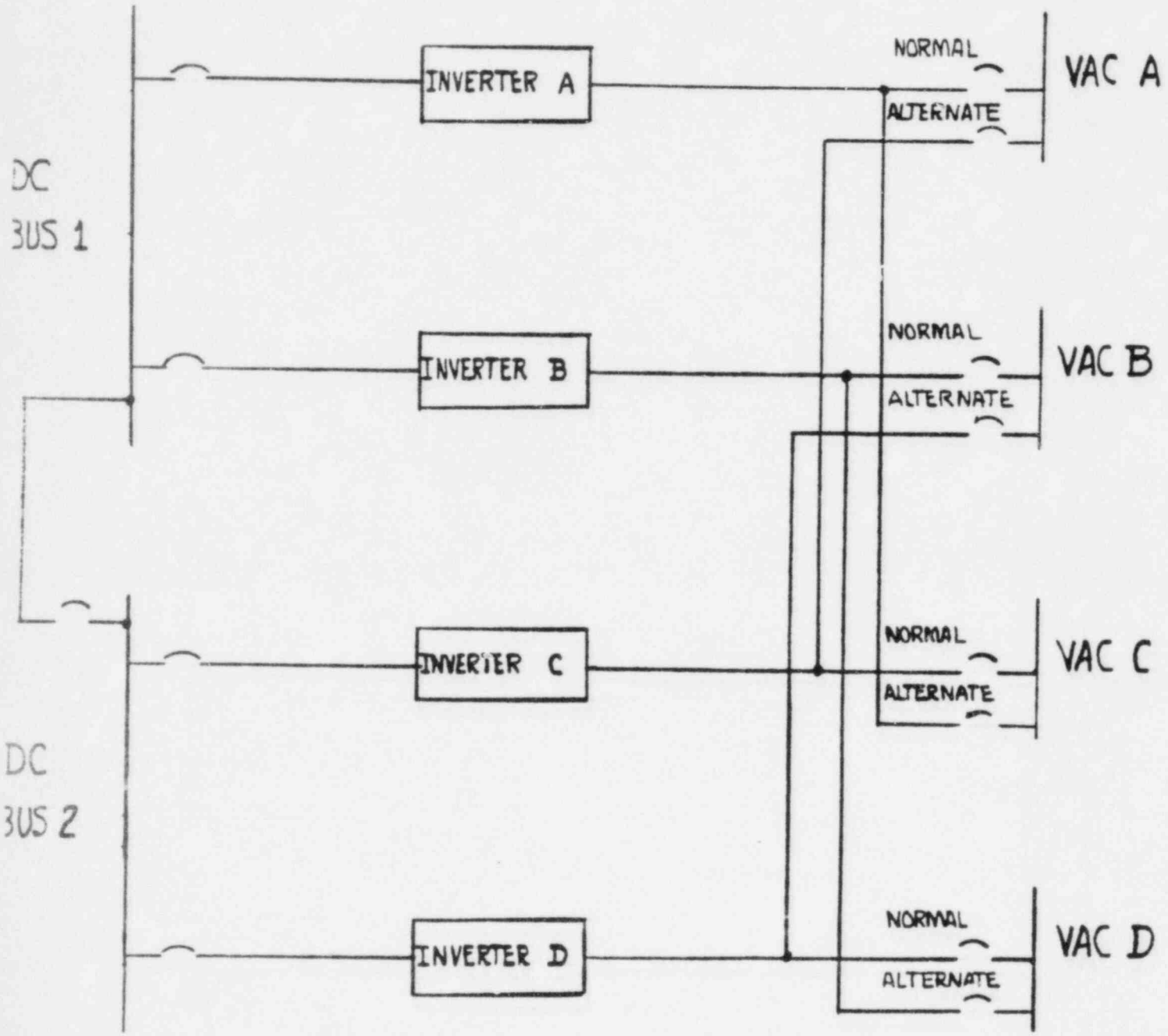
PRESENT DC BUS / VITAL AC BUS ARRANGEMENT



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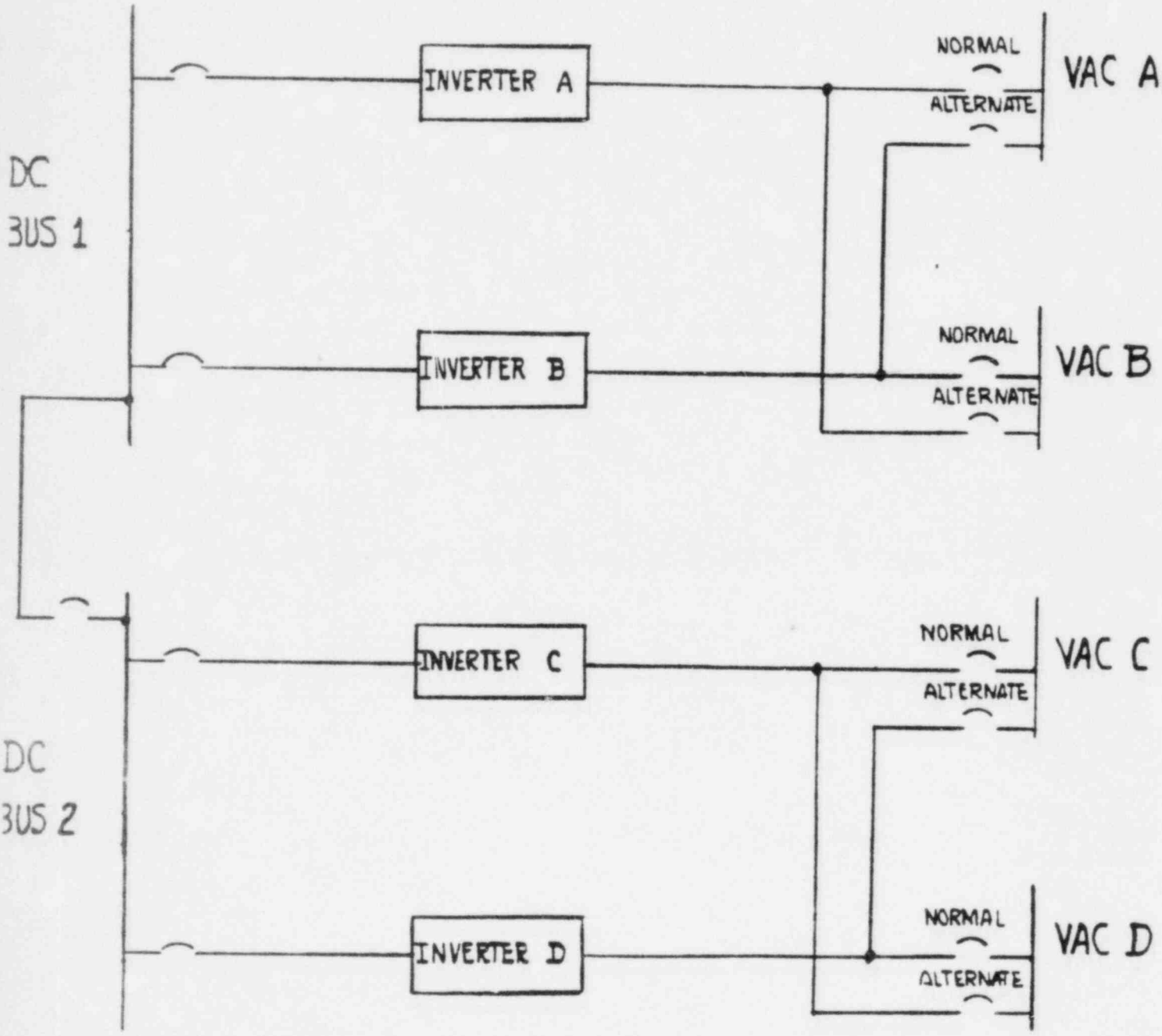
PROPOSED DC BUS / VITAL AC BUS ARRANGEMENT



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TOPIC NO.	TITLE
VI-10.A	Testing of Reactor Trip System and Engineered Safety Features, Including Response Time Testing.

10 CFR 50 (GDC 21), as implemented by IEEE Stds. 279-1971 and 338-1977, and Regulatory Guide 1.22, requires that the reactor protection system be designed to permit periodic testing of its functioning, including a capability to test channels independently.

The staff proposes that the following corrections by made to existing programs by making suitable changes in the Hadam Neck procedures and Technical Specifications:

1. The licensee should provide for channel checks of Steam Flow Channels in the Technical Specifications.

2. The licensee should design, provide suitable test equipment for, and conduct periodic response time tests of those channels and systems that are required for the protection of public health and safety.

CYAPCO

The above difference summary differs from that provided by the Staff in Reference (2) so as to accurately reflect the conclusions of the Staff's final SER for this topic, which was issued by letter dated December 3, 1982.

1. The Haddam Neck Plant is presently converting to Standard Technical Specifications. Following completion of this effort, channel checks of the steam flow channels will be required on a once per shift basis by the Technical Specifications. Requirements for channel checks, functional tests, and calibration will be included in the conversion effort for all Reactor Protection System parameters. Therefore, conversion to STS will resolve this concern.

2. CYAPCO presently performs response time testing only on selected pieces of equipment (e.g., diesel generators, containment isolation valves). CYAPCO does not feel that the cost associated with implementing a response time test program for the Reactor Protection System is justified by the marginal increase in safety that would be realized. Therefore, no further action on this issue is warranted.

TOPIC NO.	TITLE
VIII-1.A	Potential Equipment Failures Associated With a Degraded Grid Voltage.

10 CFR 50 (GDC 17), as implemented by IEEE Standards 279-1971 and 308-1977 and staff positions defined in an NRC Generic Letter to Connecticut Yankee Atomic Power Company, dated August 8, 1979, requires, in part, that an offsite electric power system be provided to permit functioning of systems important to safety. This topic looks at the effects of a sustained degradation of the offsite power source voltage that could result in the loss of capability of redundant safety loads, their control circuitry and the associated electrical components required to perform safety functions.

The staff has reviewed and found with the exception of operating procedures, Haddam Neck's design is acceptable.

CYAPCO Response

The development of procedures for coping with a degraded grid voltage will be integrated with the development and implementation of the sympton-oriented Emergency Procedure Guidelines (EPG's) required as a result of NUREG-0737 Item I.C.1. Based on our March 8, 1983 meeting with the Staff, we understand that the Staff does not want procedures for a degraded grid voltage to be submitted separately in advance of the entire EPG package. CYAPCO strongly prefers this coordinated approach, but had previously docketed its intent to submit these procedures separately in response to two NRC requests. These were the D. M. Crutchfield letter to W. G. Counsil dated July 22, 1982 on SEP Topic VIII-1.A, which specifically states that "The operating procedures should be provided for Staff review", and D. M. Crutchfield letter to W. G. Counsil dated July 9, 1982 on Degraded Grid Protection for Class IE Power Systems, which stated that CYAPCO should provide appropriate plant operating procedures and that "the procedures will be considered as an unresolved issue in the integrated assessment for Haddam Neck." However, based on our present understanding, we do not intend to submit operating procedures for review.

TOPIC NO.	TITLE
VIII-3.A	Station Battery Test Requirements

IEEE Standard 450-1975, IEEE Standard 308-1974, BTP EICSB 6 and the "Standard Technical Specifications for Westinghouse Pressurized Water Reactors' (NUREG-0452). The required tests are as follows:

1. At least once per 18 months, during shutdown, a battery service test should be performed to verify that the battery capacity is adequate to supply and maintain in operable status all of the actual emergency loads for 2 hours.

2. At least once per 60 months, during shutdown, a battery discharge test should be performed to verify that the battery capacity is at least 80% of the manufacturer's rating.

The technical specifications for the Haddam Neck Plant do not include any requirements for station battery tests. Therefore, the Haddam Neck Plant does not comply with current licensing requirements for station battery tests.

CYAPCO Response

The Haddam Neck Plant is presently converting to Standard Technical Specifications, (STS), which include the above requirements for battery testing. Therefore, conversion to the STS should resolve the Staff's concern. CYAPCO expects to implement the STS during the latter part of 1983.

During the 1983 refueling outage new batteries were installed. Prior to shipment from the manufacturer, the batteries were successfully subjected to a battery discharge test that fully meets the criteria of IEEE 450-1975. Subsequent to installation, the batteries successfully passed a battery service test that was performed in accordance with IEEE 450-1975, with the exception that a short duration current spike was not modeled in the service test.

TOPIC NO.	TITLE
VIII-3.B	DC Power System Bus Voltage Monitoring and Annunciation

10 CFR 50.55a (h), as implemented by SRP Section 8.3.2 and Regulatory Guide 1.47, requires that the dc power system be monitored to the extent that it is shown ready to perform its intended function. This monitoring is considered necessary in order to asure the design adequacy of the dc power system battery and bus voltage monitoring and annunciation schemes such that the operator can (1) prevent the loss of an emergency dc bus; or (2) take timely corrective action in the event of loss of an emergency dc bus.

The Haddam Neck Plant control room does not meet current licensing criteria. Specifically, the staff proposes that as a minimum, the following additional indications and alarms of the Class IE dc power system(s) status shall be provided in the control room.

Battery current (ammeter-charge/discharge)
Battery charger output current (ammeter)
DC bus ground alarm (for ungrounded system)
Battery breaker(s) or fuse(s) open alarm
Battery charger output breaker(s) or fuse(s) open alarm
DC bus voltage (voltmeter)

CYAPCO Response

By letter dated November 21, 1980, the Staff forwarded the evaluation of Topic VIII-3.B, which stated that the Haddam Neck control room has no indication of battery current, battery high discharge rate, bus overvoltage, or charger output breaker/fuse status. The November 21, 1980 SER, however, acknowledged that charger output breaker/fuse status could be inferred from the charger ammeter. Charger current is indicated in the control room. By letter dated January 22, 1981, CYAPCO concurred in the Staff's SER and offered no additional comments.

The Staff issued the final SER for Topic VIII-3.B on August 28, 1981. The final SER stated that the Haddam Neck control room has no indication of battery current or charger output breaker/fuse status. However, the final SER did not credit charger current indication as an indirect indication of charger output breaker/fuse status, as did the November 21, 1980 SER. CYAPCO did not comment on the final SER. However, it should be noted that the Haddam Neck control room is equipped with a battery charger output breaker/fuse status alarm. Control room indication of battery current will be installed during the 1984 refueling outage.

TOPIC NO.	TITLE
IX-3	Station Service and Cooling Water Systems

10 CFR 50 (GDC 44, 45 and 46), as implemented by SRP Sections 9.2.1 and 9.2.2, requries that a cooling water system be provided, inspected and tested, and that the system be capable of transferring heat from structures, systems and components important to safety to the ultimate heat sink.

The staff has determined that the design of the service and cooling water systems is adequate, except for the following:

Component Cooling Water System - The need for system modification to eliminate potential passive single failures will be evaluated during the integrated assessment.

Service Water System - The licensee should verify that those motor operated valves relied on for system isolation in the event of the loss of offsite AC power receive emergency power, have a fail closed design, or that sufficient time is available for operator action to close the valves.

The licensee should demonstrate by test or analysis that adequate procedures exist to balance system flow requirements and maintain system components below design thermal limits for a single active failure.

The licensee should demonstrate the ability to provide power to a second SWS pump with one pump out of service. (Assuming that the active failure was a diesel generator.)

The licensee should demonstrate that single passive failures (pipe break in containment fan cooler supply header) would not compromise containment integrity or core cooling in the event of a LOCA.

CYAPCO Response

o Component Cooling Water System

A passive failure in the component cooling water system would not prohibit the plant from achieving safe shutdown. The plant is operated with component cooling water isolated from the RHR heat exchangers so that in the event of an accident, service water would cool the RHR heat exchangers and RHR pump seals, and backflow through the CCW system would not occur. CCW flow to the reactor coolant pump thermal barrier is not essential since seal injection flow alone (from charging pumps) is sufficient to maintain seal integrity. The only other safety-related function of the CCW system is to service the charging pump oil coolers, however, the coolers are also equipped with fans which are adequate to perform this function. Based on the above, CYAPCO considers the Component Cooling Water System to be non-essential, and no action is required.

o Service Water System

The motor operated valves, SW-MOW-1 and SW-MOV-2 at the beginning of the secondary plant header automaticaly close to isolate the secondary plant service water supply in the event off-site power is lost. These motor operated valves automatically receive emergency power from either diesel generator. All other isolation valves are air operated and fail closed on loss of offsite power or instrument air. These valves are also accessible for manual operation if required.

CYAPCO is presently performing an analysis of the service water system to demonstrate that adequate procedures exist to balance system flow requirements and maintain system components below design thermal limits for a single active failure. This analysis, which will require extensive modeling of the service water system, is scheduled for completion by July 1, 1983.

Power for one service water pump is included in the capacity of the emergency diesel generators. Upon a loss of normal power, a timer is actuated to load the first service water pump in 33 seconds. Should the first pump fail to start, the second pump on that diesel generator bus will start automatically at 38 seconds. If the first pump does start, the second pump is inhibited from starting, so as not to overload the diesel generator. Therefore, it is always possible to provide power to an alternate service water pump with one pump out of service and failure of a diesel generator.

TOPIC NO.	TITLE
IX-5	Ventilation Systems

10 CFR 50 (GDC 5, 19, 60, and 61), as implemented by SRP Sections 9.4.1, 9.4.2, 9.4.3, 9.4.4., and 9.4.5, requires that ventilation systems be provided and have the capability to provide a safe environment for plant personnel and for the operation of engineered safety features.

The ventilation systems for the Haddam Neck Plant were found to be in conformance with criteria for this topic except for the following:

1. The spent fuel pool area ventilation system is neither single failure proof nor powered from emergency sources. To resolve this issue the licensee should either demonstrate that the results of a fuel handling accident without credit for area ventilation, are acceptable or propose corrective system modifications.

2. The primary auxiliary building ventilation system supply portion is not single failure proof. The licensee should evaluate the effects of degraded PAB ventilation on both equipment and personnel. If necessary corrective modifications should be provided.

3. The cable vault ventilation system is subject to several disabling failures. The licensee should either demonstrate that the operation of vital equipment located within this area would not be affected by loss of area ventilation or propose corrective system modifications.

4. The ventilation system associated with each of the emergency diesel generator rooms are subject to disabling single failures. The licensee should either demonstrate that the loss of ventilation will not significantly affect diesel generator availability of propose corrective modifications.

5. The switchgear room ventilation system is susceptible to disabling single failures. The licensee should either demonstrate that vital equipment located within this area would be unaffected by loss of area ventilation or propose corrective system modifications.

6. Supporting information to enable the staff to perform an independent assessment of the cable spreading areas, was not provided. The adequacy of room openings to maintain suitable service conditions should be evaluated.

CYAPCO Response

CYAPCO is presently reevaluating the ventilation systems for the spent fuel pool area and the primary auxiliary building relative to the concerns of items 1 and 2, above. CYAPCO will inform the Staff of the results of this evaluation and any required corrective actions by July 1, 1983.

The cable vault is a large volume area located below grade adjacent to the containment. This area was walked through with members of the Integrated Assessment team on October 7, 1982. The large volume of the cable vault and the very minimal heat load in the area make it highly unlikely that a loss of ventilation would result in adverse consequences. Also, should ventilation be lost, opening of the cable vault doors and hatches would provide sufficient flow of air through the area. If needed, temporary fans could also be provided. Based on this, CYAPCO concludes that the existing ventilation system is adequate and no modifications are required.

Concerning ventilation in the diesel generater rooms, it is noted that the individual diesel generator units themselves are not single failure proof and therefore, a single failure proof ventilation system should not be required. Analyses already assume failure of one diesel generator (for unspecified reasons), which is the most limiting single failure. Should the ventilation system for a diesel fail, opening of the doors to the room would provide sufficient cooling. Therefore, no modifications are planned in this area.

Ventilation in the switchgear room was discussed with the Integrated Assessment team during the October 7 site visit. The switchgear room is a very large area; most equipment in the room would not be operating following an accident. Heat loads in the area would be limited to the 480 volt switchgear, a motor control center, and the DC system equipment. Essential 4160 switchgear is not located in this area. Given the large volume of the area and the low heat load, it is CYAPCO's opinion that failure of the ventilation system would not inhibit safe shutdown. There is also a door leading directly to the outdoors which could be opened to provide air flow should the ventilation fail and heat buildup become a problem. Therefore, it is unlikely that a loss of ventilation would prevent the plant from achieving a safe shutdown. However, since this is a rather sensitive area of the plant due to the relative importance of equipment in the area, CYAPCO will analyze the effects of a loss of ventilation to determine if any modifications are desirable. CYAPCO will inform the Staff of the results of this analysis by July 29, 1983.

The cable spreading area at the Haddam Neck Plant is not an enclosed room and therefore does not have a dedicated ventilation system. The fact that this area does not require a dedicated ventilation system during operation provides assurance that ventilation following an accident would not be a problem. For information, drawings showing the cable spreading area have been forwarded to the Haddam Neck Integrated Assessment Project Manager. Based on the fact that sufficient open area exists to preclude overheating, CYAPCO considers this issue resolved and no further action is required.

TOPIC NO.	TITLE
XV-19	Loss of Coolant accidents Resulting From a Spectrum of Piping Breaks Within the Reactor Coolant Pressure Boundary

10 CFR 100, as implemented by SRP Section 15.6.5 Appendices A and B, TID-14844 and Regulatory Guide 1.4, requires, in part, that exposure guidelines not be exceeded for design basis LOCA resulting in containment leakage or in leakage outside containment from the engineered safety features.

Based on the review of the licensee's analysis and our independent evaluations, we conclude that the offsite doses from a postulated design basis loss-of-coolant accident at Haddam Neck are within the guidelines of 10 CFR 100.11.

However, for the reasons set forth in the evaluation, the operation of the containment spray system to assure the effectiveness of the internal filter system will be considered in the integrated assessment of this plant.

CYAPCO Response

CYAPCO has evaluted the need for operation of the containment spray system to assure the effectiveness of the internal filter system and concluded that no hardware or procedural changes are warranted for the following reasons:

- The containment air recirculation fans are located at the 22 ft. level of the containment in the outer annulus. They are "line-of-sight" shielded from the reactor, steam generators, and primary loops by the crane wall, which extends 26 ft. above the fans. The area directly above the fans suction is shielded by horizontal ducting; airborne debris would tend to plate out on these large flat surfaces.

- The inlet for each fan contains a chevron moisture separater and mist extraction filter. The tortuous path through the chevrons would cause particulate or small debris to drop out of the air stream.

- The above nothwithstanding, generation of large amounts of particulates in the containment atmosphere would require a degree of core damage that is well beyond the design basis of currently operating nuclear power plants (i.e. - core melt).

- The Haddam Neck Plant does not have dedicated containment spray pumps. Containment spray is initiated, during the recirulation mode of core cooling, by opening two motor operated valves (in parallel) leading from the discharge of the RHR pumps to the spray header. Therefore, initiation of the containment spray would divert water from the core, which is most undesirable as inadequate core cooling could result.

- Operation of the containment spray is not required to prevent the containment post-accident internal pressure from exceeding the design pressure.

Based on the above, CYAPCO has concluded that no procedural or hardware changes are warranted. Generation of sufficient aerosols and particulates to cause plugging of the fan filters would require conditions that are beyond the design basis of the plant.

Since operation of the containment spary would divert RHR flow from the core, CYAPCO concludes that the spray should only be used to prevent the containment internal pressure from exceeding the design pressure, although, as noted above, use of the containment spray system is not expected to be required. This is consistent with the guidance currently provided in EOP 3.1-4, Loss of Coolant. The existing plant design and engineered safety features comply with all applicable NRC requirements. Therefore, no further action on this issue is planned.