UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 68

TO FACILITY OPERATING LICENSE NO. DPR-54

SACRAMENTO MUNICIPAL UTILITY DISTRICT

RANCHO SECO NUCLEAR GENERATING STATION

DOCKET NO. 50-312

I. INTRODUCTION

A. DESCRIPTION OF PROPOSED ACTION

This Safety Evaluation addresses an application by the Sacramento Municipal Utility District (the licensee or SMUD) to amend the operating license of the Rancho Seco Nuclear Generating Station (the facility) to reflect modifications to the facility electrical distribution system. The Safety Evaluation also addresses the acceptability of certain of these modifications.

B. BACKGROUND INFORMATION

As a result of the issuance of NUREG-0737, "Clarification of TMI Action Plan Requirements" and NUREG-0696, "Functional Criteria for Emergency Response Facilities", the licensee initiated design of the following:

1. Provisions for early start and automatic sequencing of auxiliary feedwater pumps.

2. A Technical Support Center, along with the required instrumentation, data collection and data processing equipment.

3. Improvements to the habitability of the Control Room (CR) to meet the requirements of NUREG-0800, Standard Review Plan (SRP) Section 6.4, "Control Room Habitability System" with the addition of redundant, safety-related air conditioning and filtration systems.

4. A Post Accident Sampling System.

5. Additional Instrumentation.

Due to the limited spare electrical capacity available to power this new equipment and the need to have the capability to start the

auxiliary feedwater pumps early in the electrical loading sequence following an accident or loss of offsite power, the licensee has added the following electrical equipment to the plant: two diesel generators, two trains of independent Class 1E 4160/480V power, four trains of independent Class 1E 120V control and instrumentation power supplies, and some additional non-Class 1E equipment.

To house this new equipment, the licensee has constructed two new Category 1 structures: a Diesel Generator Building and a Nuclear Service Electrical Building (NSEB).

As construction of these buildings and installation of the new equipment was completed, the licensee energized the new buses using Class 1E bus ducts and cable ties between the existing Auxiliary Building and the NSEB. A portion of the equipment listed above was energized at the beginning of the recently concluded Cycle 6.

The licensee originally planned to energize the balance of the new loads prior to operation in Cycle 7. However, due to identification of generic problems with the new diesel generators, these units will not be available for use when originally planned. Nonetheless, the licensee has identified means by which a portion of the remaining new loads can be energized pending qualification of the new diesel generators. The licensee has proposed revisions to the facility Technical Specifications to reflect this temporary mode of operation.

C. SCOPE OF REVIEW

This review considers the following:

1. The acceptability of the revisions to the electrical and fire protection Technical Specifications proposed for the period during which the plant electrical systems are loaded, configured and operated as described in this evaluation.

2. The acceptability of the design of the Nuclear Service Electrical Building and the acceptability of the electrical distribution system while it is configured and operated as described herein.

3. The acceptability of the design of the fire protection system as installed in the Nuclear Service Electrical Building.

In performing this review, we have considered the suitability of the electrical design with respect to the applicable General Design Criteria, NRC Regulatory Guides and the Branch Technical Positions and Industry Codes and Standards listed in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants", Section 8.1. In reviewing the structural design of the Nuclear Service Electrical Building, we have used the guidance

set forth in NUREG-0800, Sections 3.7.1 and 3.8.4. In reviewing the suitability of the design of the Nuclear Service Electrical Building with respect to fire protection, we have utilized the applicable criteria set forth in NUREG-0800, BTP CMEB 9.5-1, Sections C.5, C.6 and C.7 and Sections III.G and III.J of Appendix R to 10 CFR 50. In reviewing the proposed changes to the Technical Specifications, we have compared the proposed revisions with the present facility specifications to verify the revisions were consistent with and appropriate to the facility changes and did not introduce an unreviewed safety question or reduce the overall level of safety of operations.

II. EVALUATION

A. DESCRIPTION OF MODIFICATIONS

1. Electrical Distribution System

In order to accommodate the additional electrical loads required by NUREG-0737, "Clarification of TMI Action Plan Requirements", the licensee has undertaken a significant expansion of the electrical distribution and standby electrical systems of the facility. For comparison purposes, the applicable safety-related portions of the original AC and DC systems are shown in Figures 1 and 2 (some non-safety related components and circuits are also shown). When all presently planned modifications are complete, the AC circuits shown in Figure 1 will appear as shown in Figure 3; and the DC circuits of Figure 2 will be supplemented by the additional equipment and circuits shown in Figure 4.

Examination of Figures 1 and 3 shows the principal changes to the AC system are the addition of:

- 4.16 KV Buses 4A2 and 4B2
- Diesel Generators GEA2 and GEB2
- 480 Volt Buses 3A2 and 3B2
- Transformers X43A2 and X43B2A
- Bus Duct Extensions to Buses 4A2 and 4B2
- Cable Interties between Buses 3A/3A2 and 3B/3B2
- Associated Circuit Breakers

As shown in Figure 4, the additions to the DC systems include four safety-related batteries, "A2", "B2", "C2" and "D2", with the associated battery chargers and inverters; and three non-safety related batteries "GA", "GB" and "N1", with associated chargers and inverters. In addition to a dedicated battery charger, each of the new safety-related batteries has a spare charger that can be placed in service if needed. As in the original plant design, each spare charger serves as a backup for two batteries.

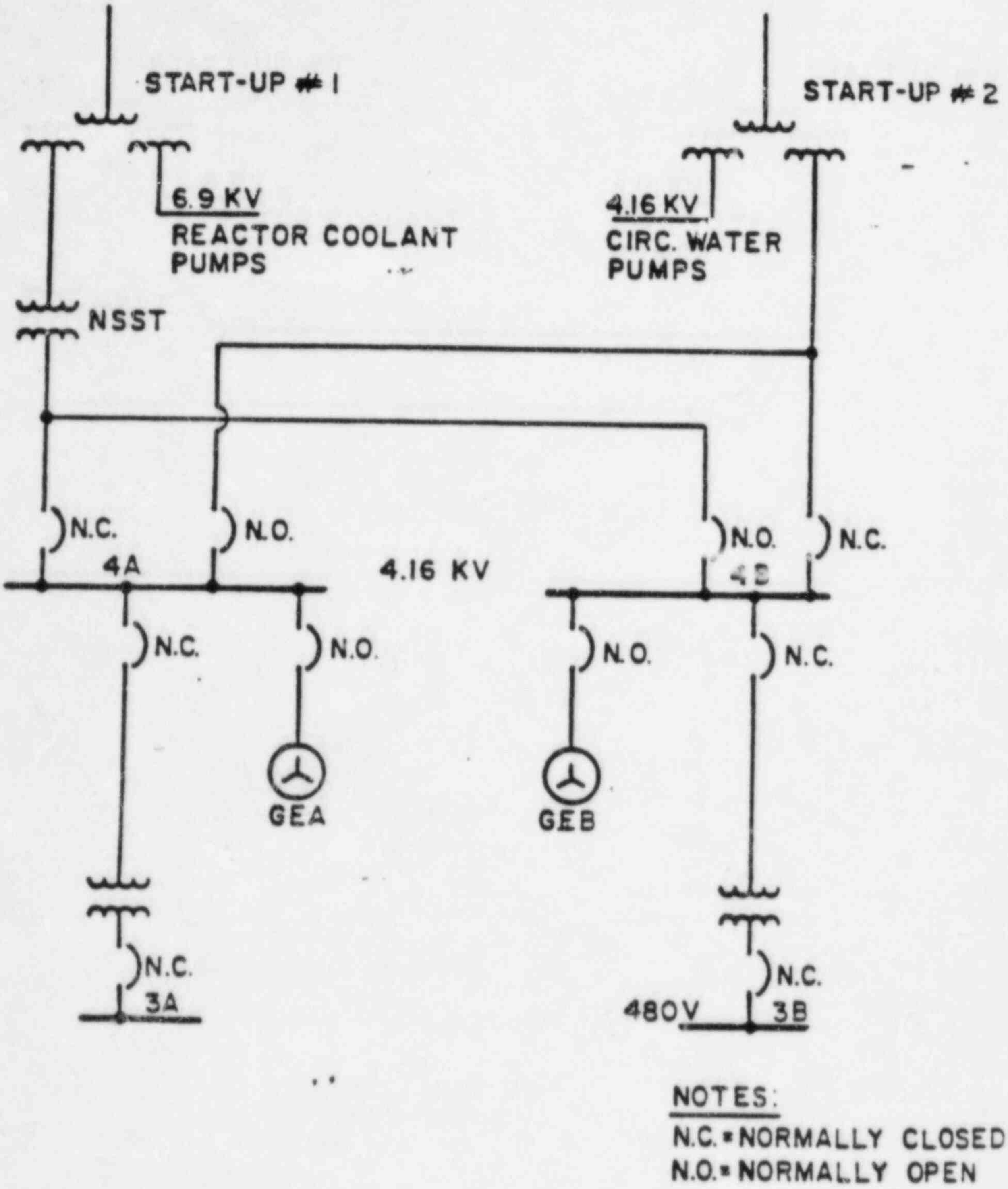
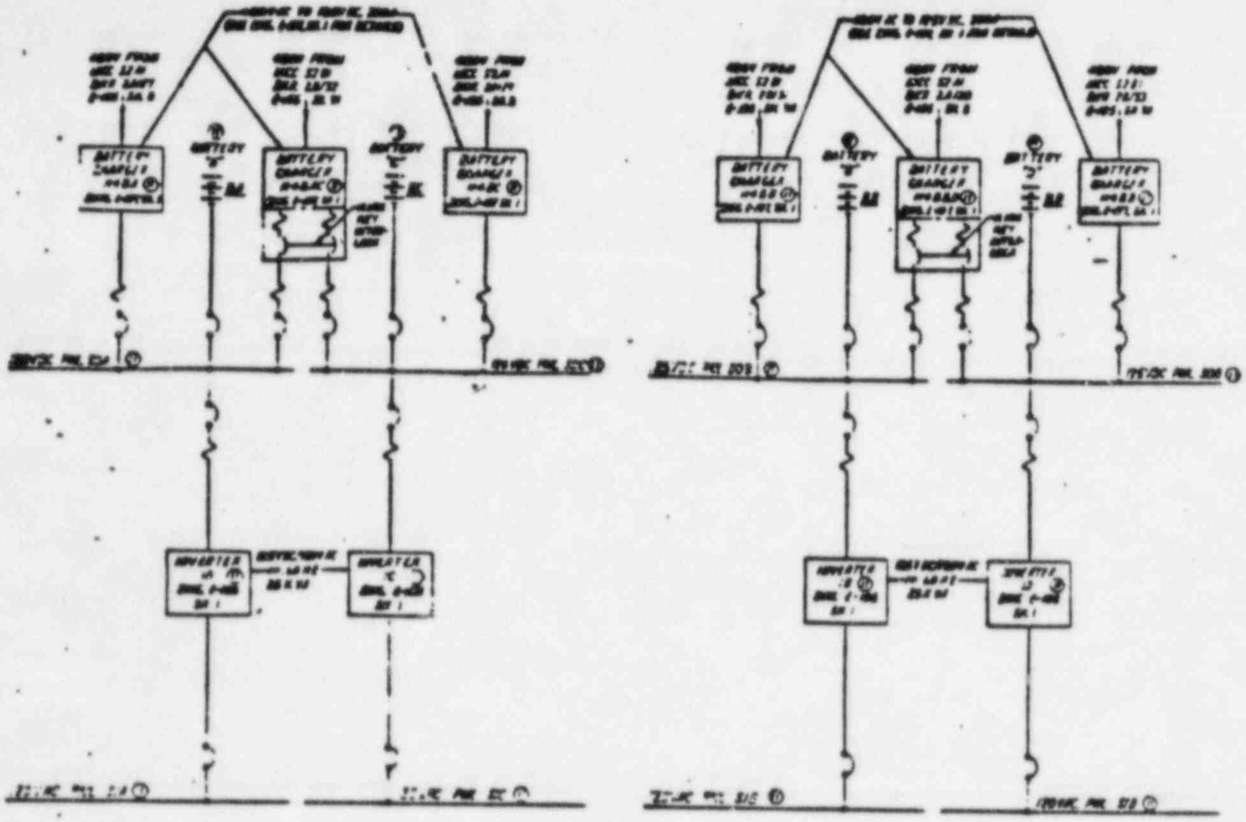


FIGURE 1

ORIGINAL A.C. SYSTEM



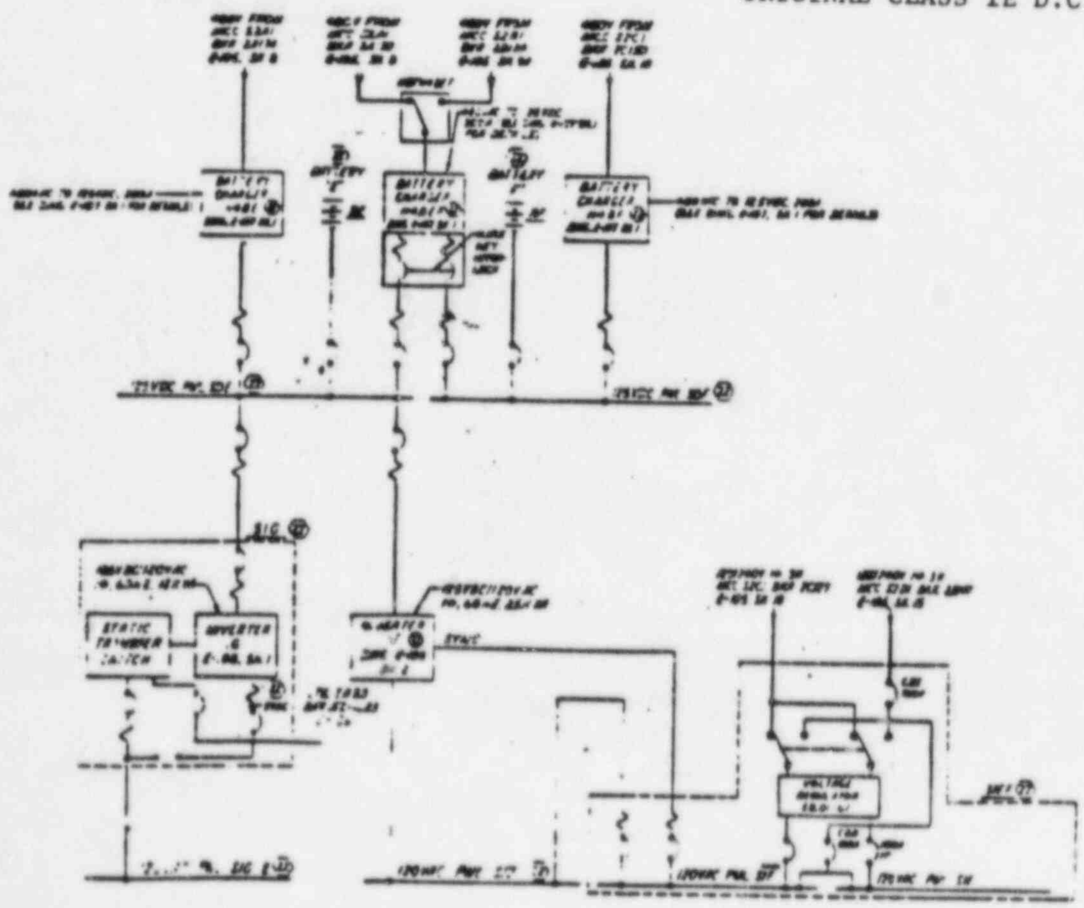


FIGURE 2

ORIGINAL CLASS IE D.C. SYSTEM

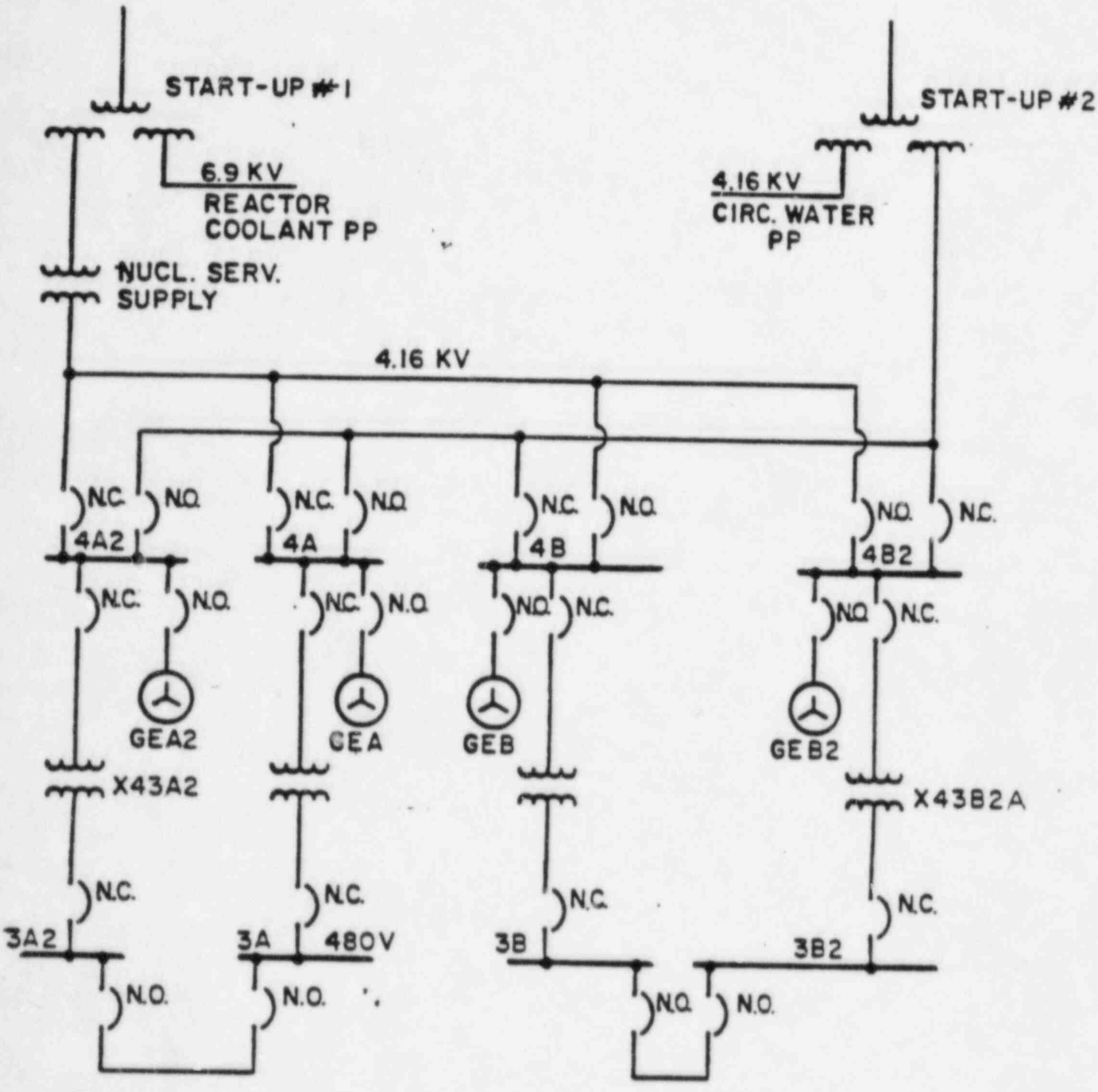


FIGURE 3

FINAL A. C. SYSTEMS

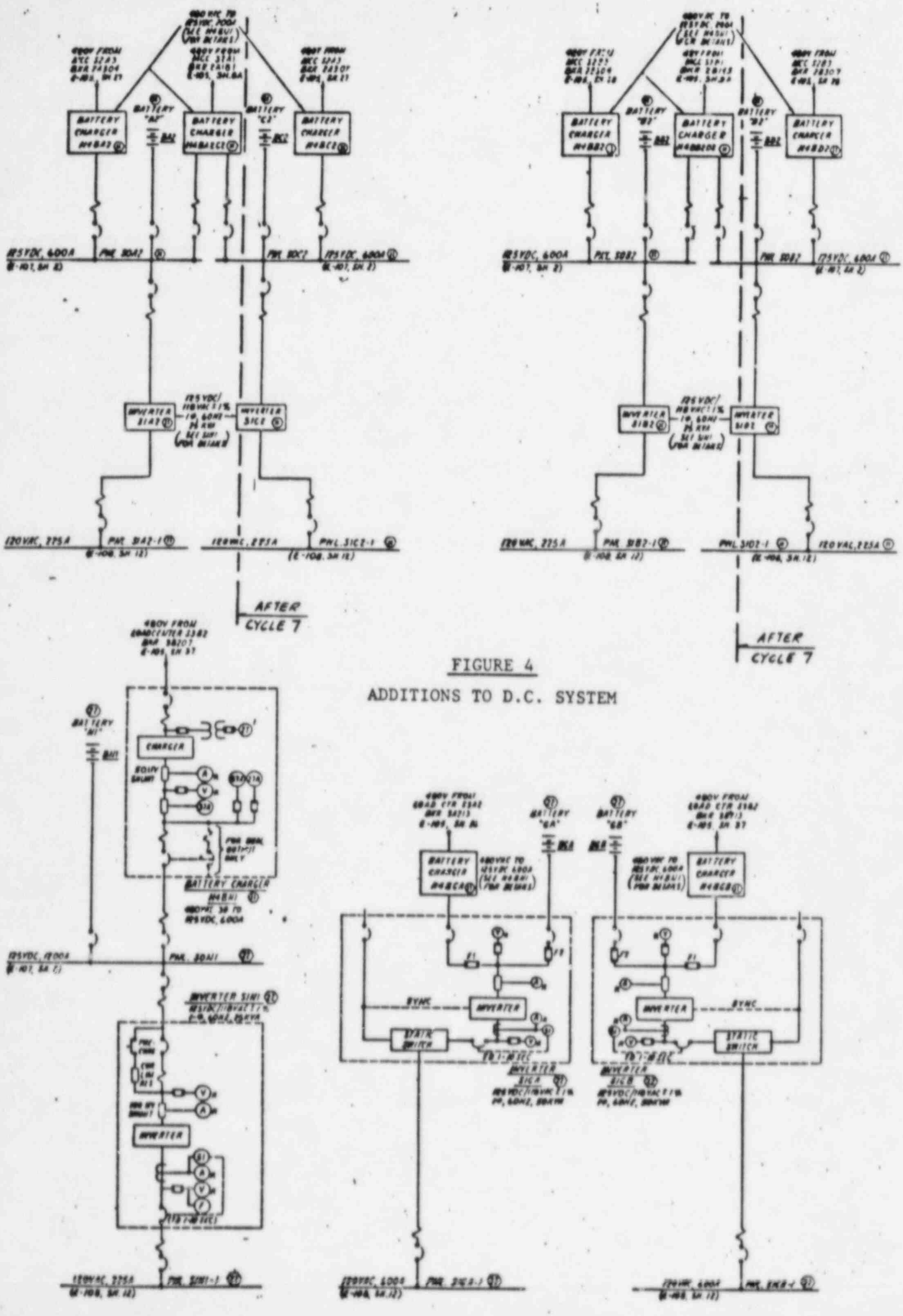


FIGURE 4

ADDITIONS TO D.C. SYSTEM

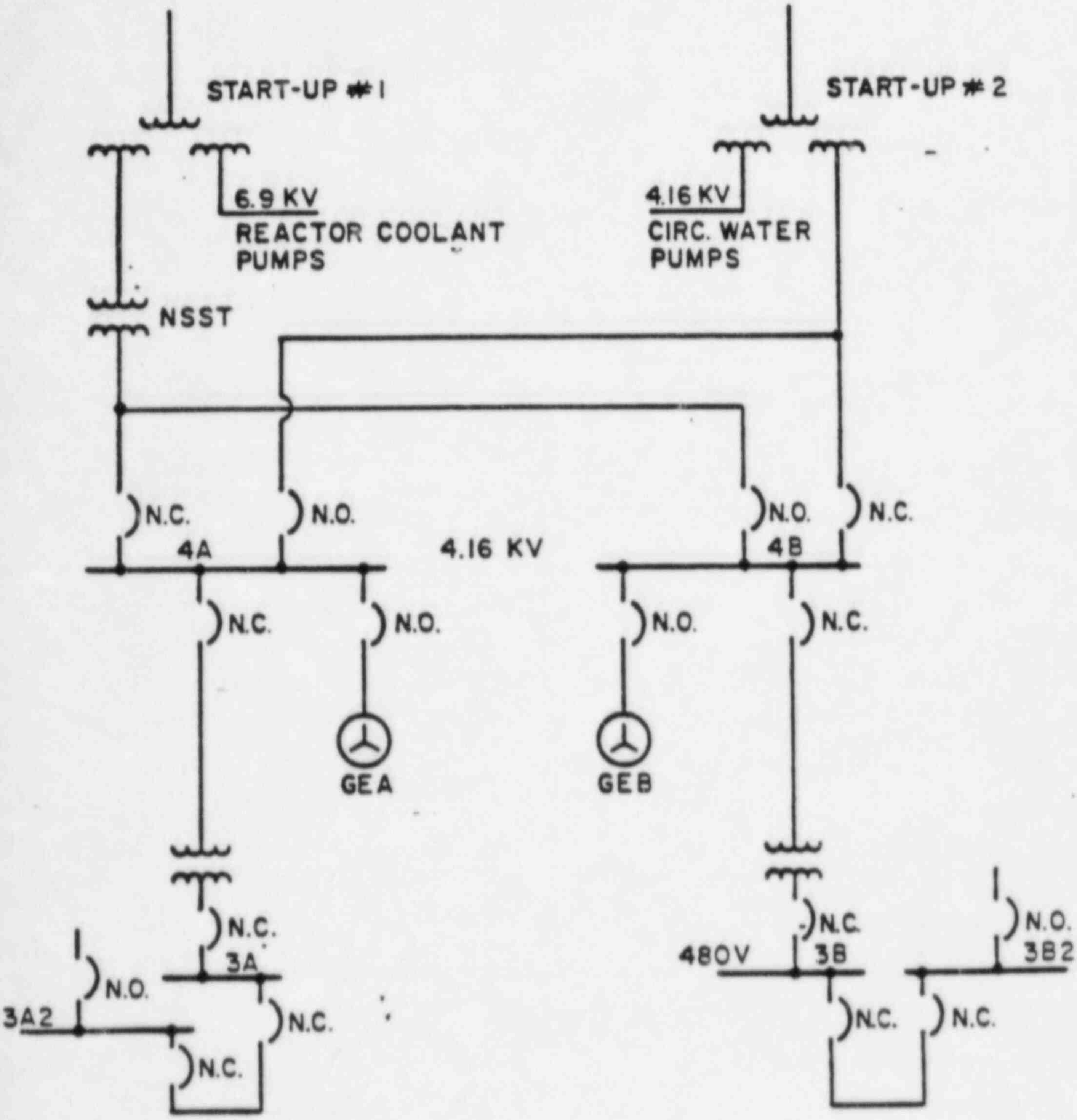


FIGURE 5

INTERIM SYSTEM - CYCLE 6

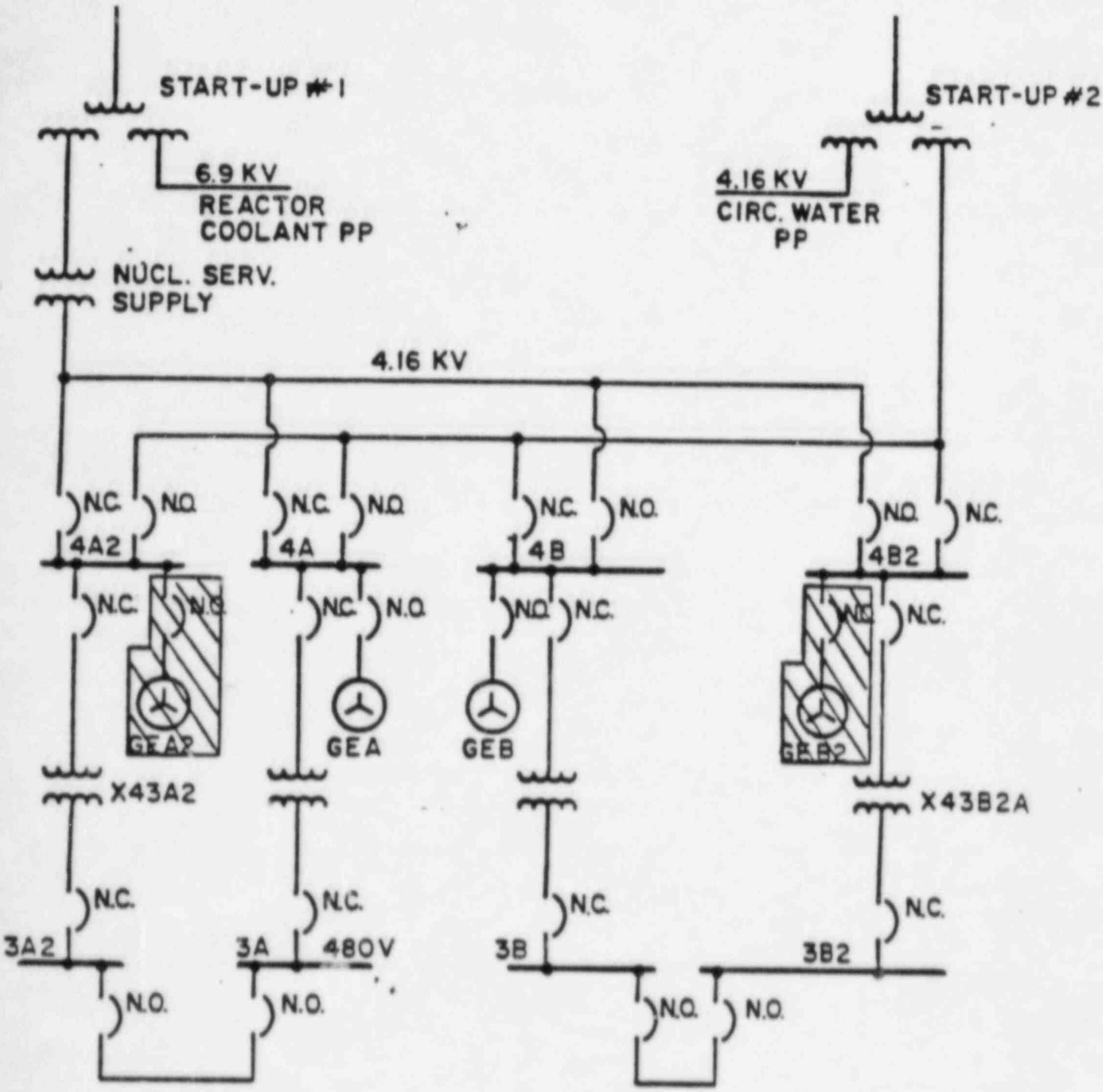


FIGURE 6

INTERIM SYSTEM - CYCLE 7

2. Nuclear Service Electrical Building (NSEB)

The NSEB is a three story, 13,000 square-foot, reinforced concrete structure. This building will house much of the electrical distribution system and other support hardware for the required TMI modifications. This equipment includes the new 4160 Volt switchgear, the new 480 Volt load centers, batteries and chargers, inverters, relay panels, isolation panels, auxiliary feedwater system control panels and computer systems for various display functions. The licensee defines the NSEB as a quality and seismic Class 1 structure.

In order to provide the physical and electrical separation required for buildings of this type, the building is divided into a train "A" side and a train "B" side. The licensee states these areas are separated by an eight foot corridor with three hour rated fire walls. In addition, each side of the building has a separate cable shaft with three hour interior fire walls, and a separate tunnel connecting to the Auxiliary Building. Each side of the building also has a separate 16-inch diameter electrical raceway for connecting 480 Volt power and control circuits to the Auxiliary Building. Separate HVAC systems (both normal and essential) are also provided for each side of the building. The licensee states that all train "A" cable trays are confined to the train "A" section of the NSEB and all train "B" cable trays are in the train "B" section of the building.

3. NSEB Fire Protection System

Fire suppression equipment installed in the NSEB includes Carbon Dioxide and Halon 1301 vapor systems, and Wet Sprinkler, Pre-Action Sprinkler and Spray water systems. In addition, fire hoses and portable extinguishers are provided. Fire detection systems include heat and ionization smoke detectors. In most areas important to safety, both types of detectors are used and are connected in a cross-zoned configuration. Manual fire alarm and Pull stations are also provided.

B. ELECTRICAL SYSTEM OPERATION IN CYCLE 7

As major portions of these modifications have been completed, the increased capabilities have been implemented. The initial change was made for the recently concluded operating cycle (Cycle 6), and consisted of energizing the new 480 Volt buses, 3A2 and 3B2, via cable interties from buses 3A and 3B, respectively. This configuration is shown in Figure 5, where it is seen the circuit breakers connecting buses 3A and 3A2, and buses 3B and 3B2, are shown as normally closed (N.C.).

Because the new diesel generators, GEA2 and GEB2, are not expected

to be qualified for service at the beginning of the next operating cycle (Cycle 7), the licensee cannot fully implement all of the remaining modifications at this time. Instead, the licensee proposes to implement only those additional modifications and electrical loads that can be energized within the present capacity and component ratings. As proposed by the licensee, this implementation will involve two modes of operation: (1) operation when there has been a loss of offsite power sources (LOOP) and (2) operation when there has not been a loss of offsite power sources (NLOOP). These two modes are needed because of the substantial difference in the amount of power available to energize safety loads in the two modes.

Figure 6 shows the proposed operational configuration when there is not a loss of offsite power. It is seen that for this configuration, the 4160 volt buses of the "A" train (buses 4A and 4A2) are individually powered from Startup Transformer No. 1, and the corresponding buses of the "B" train are powered from Startup Transformer No. 2. Power to new 480 volt bus 3A2 is supplied from new 4160 volt bus 4A2 via new transformer X43A2. A similar arrangement is seen to be employed for the "B" train via new transformer X43B2A.

For a loss of offsite power (LOOP) condition, the arrangement in Figure 6 is changed by the automatic opening of the circuit breakers supplying power to buses 4A, 4B, 4A2, 4B2, 3A2 and 3B2. Under these conditions, power is automatically supplied to buses 4A and 3A and buses 4B and 3B by diesel generators GEA and GEB respectively. Train "B" sequencing will include automatic closure of the Class 1E train "B" electrical cable tie breakers between the old 480 volt switchgear 3B and the new 480 volt loadcenter 3B2, thereby energizing bus 3B2. This sequencing will also automatically re-energize the train "B" Control Room essential HVAC which is supplied from bus 3B2. The operator will manually close the train "A" Class 1E electrical cable tie breakers between the old 480 volt switchgear 3A and the new 480 volt loadcenter 3A2. Automatic loading of bus 3B2 is provided as an interim measure (pending qualification of new diesel generators GEA2 and GEB2) to retain the current capability for automatic restoration of power to the Control Room HVAC.

As for the four new Class 1E batteries added by the licensee, these batteries will normally be maintained charged by battery chargers powered by the new buses 3A2 and 3B2. The backup chargers for these batteries, however, are powered from existing buses 3A and 3B.

C. ACCEPTABILITY OF NSEB STRUCTURE

By letters dated November 26, 1980 and November 15, 1984, the licensee provided information concerning the design criteria and codes and standards applicable to the construction of the NSEB.

These commitments were as follows:

Codes and Standards

American Concrete Institute, Standard 349-76 and 1979 Supplement to Code Requirements for Nuclear Safety-Related Concrete Structures.

American Institute for Steel Construction (AISC) Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, adopted February 12, 1969, and Supplements Nos. 1, 2 and 3.

American Institute for Steel Construction (AISC), Specification for Structural Joints Using ASTM A 325 or A 490 Bolts Approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation, February 4, 1976.

American Welding Society (AWS), Structural Welding Code (AWS D1.1-72, Rev. 1-1973).

Other nationally recognized industry standards, such as those published by the American Society for Testing and Materials (ASTM), to describe material properties, testing procedures, fabrication and construction methods.

NRC Regulatory Guides

1.60, Design Response Spectra for Seismic Design of Nuclear Power Plants

1.61, Damping Values for Seismic Design of Nuclear Power Plants

1.76, Design Basis Tornado for Nuclear Power Plants

1.142, Safety-Related Concrete Structure for Nuclear Power Plants (other than Reactor Vessels and Containment)

Bechtel Topical Reports

BC-TOP-3A, Tornado and Extreme Wind Design Criteria for Nuclear Power Plants

BC-TOP-4A, Seismic Analysis of Structures and Equipment for Nuclear Power Plants

BC-TOP-9A, Design of Structures for Missile Impact

In designing the NSEB to these codes, standards and guides, the licensee stated that where a conflict occurred between existing codes, the more restrictive design code was deemed to govern.

The licensee also provided information concerning the loads and load combinations used in the design, and the specifications for the major construction materials. The licensee stated the building design was based on maximum ground accelerations for the Operating Basis Earthquake (OBE) and the Safe Shutdown Earthquake (SSE) conditions of 0.13g and 0.25g respectively. We note these are the same earthquake values previously used by the licensee in the design of the other Class 1 structures at this site.

On April 29 and 30, 1985, a staff reviewer visited the Rancho Seco facility to review the Design Report for the NSEB and selected calculations. As a result of this visit, the staff concluded the licensee had acceptably implemented the design criteria listed above.

Although the licensee did not reference Regulatory Guide 1.91, "Evaluations of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plants" and Regulatory Guide 1.115, "Protection Against Low Trajectory Turbine Missiles," we have examined the NSEB with respect to this guidance and conclude that because of distance from transportation routes and the specific onsite location, the NSEB conforms to this guidance.

Based on the foregoing, we conclude:

The licensee's conformance with the recommendations of Regulatory Guides 1.60 and 1.61 assures that the seismic inputs to the analysis of the NSEB are adequately defined so as to form a conservative basis for the design of this building to withstand seismic loadings.

The criteria used in the analysis, design and construction of the NSEB to account for anticipated loadings and postulated conditions that may occur during its service lifetime are in conformance with established criteria, codes, standards, and specifications acceptable to the staff. These include Regulatory Guides 1.91, 1.115, 1.142 and industry standards ACI-349 and AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings."

The use of the guidance and criteria listed above provides reasonable assurance that, in the event of winds, tornados, earthquakes, and various postulated accidents, the structures will withstand the specified design conditions without impairment of structural integrity or the performance of required safety functions.

D. <u>ACCEPTABILITY OF ELECTRICAL MODIFICATIONS</u>

By letters dated November 15, 1984 and March 15, 1985, the licensee provided information concerning the design criteria, regulatory

guidance and industry codes and standards used in the design, analysis and installation of the electrical modifications described above. The documents referenced included the following:

General Design Criterion 2	-	Design Basis for Protection Against Natural Phenomena.
General Design Criterion 4	-	Environmental and Missile Design Bases.
General Design Criterion 5	-	Sharing of Systems, Structures and Components.
General Design Criterion 17	-	Electrical Power Systems.
General Design Criterion 18	-	Inspection and Testing of Electrical Power Systems.
Regulatory Guide 1.6 Rev. 0	-	Independence Between Redundant, Standby (Onsite) Power Sources and Between Their Distribution Systems.
Regulatory Guide 1.9 Rev. 2	-	Selection, Design, and Qualification of Diesel Generator Units Used as Standby (Onsite) Electric Power Systems at Nuclear Power Plants.
Regulatory Guide 1.32 Rev. 2	-	Use of IEEE Standard 308, "Criteria for Class 1E Power Systems for Nuclear Power Generating Stations."
Regulatory Guide 1.47 Rev. 0	-	Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems.
Regulatory Guide 1.75 Rev. 2	-	Physical Independence of Electric Systems.
Regulatory Guide 1.89 Rev. 0	-	Qualification of Class 1E Equipment for Nuclear Power Plants.
Regulatory Guide 1.100 Rev. 1	-	Seismic Qualification of Electric Equipment for Nuclear Power Plants.
Regulatory Guide 1.118 Rev. 2	-	Periodic Testing of Electrical Power and Protection Systems.

Regulatory Guide 1.128 Rev. 1	-	Installation Design and Installation of Large Lead Storage Batteries for Nuclear Power Plants.
Regulatory Guide 1.129, February 1978	-	Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants.
Regulatory Guide 1.131, August 1977	-	Qualification Tests of Electric Cables, Field Splices, and Connections for Light-Water-Cooled Nuclear Power Plants.
Branch Technical Position ICSB-21	-	Guidance for Application of Regulatory Guide 1.47.
Branch Technical Position PSB-1	-	Adequacy of Station Electric Distribution System Voltages.
ANSI N45.2-1977	-	Quality Assurance Program Requirements for Nuclear Power Plants.
ANSI N45.2.2-1978	-	Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants.
IEEE Standard 279-1971	-	Criteria for Protection Systems for Nuclear Power Generating Stations.
IEEE Standard 308-1974	-	Criteria for Class 1E Power Systems for Nuclear Power Generating Stations.
IEEE Standard 323-1974	-	Qualifying Class 1E Equipment for Nuclear Power Generating Stations.
IEEE Standard 338-1977	-	Criteria for Periodic Testing of Nuclear Power Generating Station Safety Systems.
IEEE Standard 344-1975	-	Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations.
IEEE Standard 383-1974	-	Type Test of Class 1E Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations.

IEEE Standard 384-1981	-	Criteria for Independence of Class 1E Equipment and Circuits.
IEEE Standard 387-1977	-	Criteria for Diesel Generator Units Applied as Standby Power Supplies for Nuclear Generating Stations.
IEEE Standard 450-1980	-	Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.
IEEE Standard 484-1975	-	Recommended Practice for Installation Design and Installation of Large Lead Storage Batteries for Generating Stations and Substations.
IEEE Standard 535-1979	-	Qualification of Class 1E Lead Storage Batteries for Nuclear Power Generating Stations.
IEEE Standard 650-1979	-	Qualification of Class 1E Static Battery Chargers and Inverters for Nuclear Power Generating Stations.

In referencing the foregoing documents, the licensee stated that when there is not complete agreement between Industry Standards and NRC documents, NRC documents take precedence.

While providing an overall commitment to the guidance contained in the above documents, the licensee also noted several areas where exceptions exist. Each of these is discussed below.

General Design Criterion 17

The licensee notes that during Cycle 7, the train "A" Control Room essential heating, ventilating and air conditioning (HVAC) system will not normally be capable of being powered by the onsite power source. This is because this new HVAC system was designed to be powered by the new diesel generator, GEA2. As noted previously, this new diesel is not yet qualified for service; therefore, the planned source of onsite power for this system is not available. When allowance is made for the maximum possible required safety loads on the existing "A" train diesel generator, GEA, there is insufficient capacity to assure the capability of also powering the train "A" Control Room HVAC from this source. The licensee notes, however, and we agree that it is probable that if an accident did

occur, the specific nature of the accident would allow some of the "required safety loads" to be shut down after an initial period of operation. For example, if the accident was a "large break LOCA", there would be no need for high pressure injection and this load could be removed. Conversely, if the accident was a "small break LOCA", there would be no need for low pressure injection. Thus, sufficient power could probably be made available for operation of this HVAC system.

Notwithstanding the foregoing, it is noted that the other (train "B") Control Room essential HVAC will be capable of being powered by onsite power. This is because of the extra capacity available from the existing "B" train diesel generator, GEB. This additional capacity is available because in contrast with train "A", the train "B" diesel is not needed to power the train "B" auxiliary feedwater pump. This, in turn, is because this train is normally aligned to use the steam turbine drive as the prime mover for the train "B" auxiliary feedwater pump - rather than the electric motor drive which must be used on train "A".

Thus, because of the limited electrical capacity available pending qualification of the new diesel generators, a loss of offsite power would result in (at least a temporary) situation where the Control Room HVAC system was non-redundant. This is not a change, however, because prior to this modification, the facility (as originally constructed) only had a single non-redundant Control Room HVAC system. Therefore, we conclude the proposed temporary condition does not constitute a reduction in the present level of safety, and is a step in the process of providing an increased level of safety when the new diesel generators are available. Accordingly, we find operation in the proposed mode acceptable during Cycle 7 and ending prior to startup in Cycle 8.

Regulatory Guide 1.32/IEEE 308-1974

The licensee states the physical position of the battery charger output circuit breaker is not monitored as required by Section 5.3.4(5)C of IEEE Standard 308-1974. The licensee justifies this on the basis the DC output breaker of the charger is considered to be closed at all times when the charger is in service. Further, the licensee states the molded case type of breaker can automatically trip open only for an internal fault inside the charger because the breaker trip point is above the maximum output level of the charger. In addition, there will be an alarm any time the charger output breaker automatically trips open due to internal faults, and charger failure will be alarmed. In addition, the licensee states that manual opening of the charger breakers is administratively controlled, and is only done when the charger is to be taken out of service - at which time the spare charger is immediately switched on.

While we agree administrative controls can be effectively utilized to assure operability for systems important to safety, we also believe monitoring provides defense in depth against operational errors. Therefore, in response to the staff's inquiry into this matter, the licensee, by letter dated March 21, 1985, agreed to provide battery bank voltage as an input to the plant monitoring computer prior to operation in Cycle 8. We believe the monitoring proposed by the licensee is effectively equivalent to monitoring battery charger output circuit breaker position.

On the basis of the existing alarms for signaling battery charger malfunctions, the licensee's existing administrative controls, the licensee's commitment to install battery bank voltage monitoring prior to operation in Cycle 8, and because certain of the loads to be powered by these new battery banks are those required by NUREG-0737 and thus contribute to the safety of plant operations, we conclude that operation in Cycle 7 with existing alarms and administrative controls is acceptable.

Regulatory Guide 1.128/IEEE 484-1975

The licensee has presented calculations which indicate that average hydrogen concentrations in the battery rooms in the NSEB will be well below the two percent limit specified by this Regulatory Guide. The staff has performed independent calculations for the worst case situation which confirm these results. Nevertheless, while inspecting these rooms, the staff noted the air supply and air return registers were installed on duct extensions such that the registers were about twenty inches below the ceiling. Because R.G. 1.128 states "The ventilation system shall limit hydrogen concentration to less than two percent by volume at any location within the battery area", the staff inquired as to the effect of the lowered registers on producing non-uniform hydrogen concentrations. Of particular concern was the possibility for formation of hydrogen "pockets". In response, the licensee cited NUREG/CR-0304, "Mixing of Radiolytic Hydrogen Generated Within a Containment Compartment Following a LOCA" to demonstrate that even in the absence of forced ventilation there would be very little non-uniformity of concentration. We have reviewed this reference and agree with the licensee's conclusions. Accordingly, we conclude the design of the battery rooms in the NSEB conforms to the guidance in R.G. 1.128 with respect to maintaining hydrogen concentrations below two percent at all locations.

In the licensee's submittal of March 15, 1985, it was stated that the requirements of R.G. 1.128 were met except that hydrogen surveys would not be conducted. The licensee presented a justification of this position based on the low hydrogen concentrations that were calculated to occur. The staff advised the licensee, however, that the hydrogen surveys were only required following initial battery installation and served to validate the theoretical calculations of

hydrogen concentrations. Because of the importance of validating calculations to assure their accuracy, the staff asked the licensee to perform the post-installation surveys. By letter dated May 14, 1985 (RJR 85-220), the licensee agreed to this request.

Appendix R to 10 CFR 50/Regulatory Guide 1.75/IEEE 384-1981

The licensee states that with two exceptions, the design and installation of the modifications to the auxiliary electric system have been based on the requirements of Appendix R, Regulatory Guide 1.75 and IEEE 384. As a matter of clarification, however, the licensee also notes that the Auxiliary Building and Reactor Building were constructed before R.G. 1.75 was issued. As a result, the raceway systems in these original buildings, which now connect to the NSEB raceways, were designed to meet the original plant criteria for separation of redundant trains. The licensee adds that these raceways are now being upgraded to meet the new NRC fire protection requirements for Rancho Seco - including those of Appendix R to 10 CFR 50.

The licensee states the first exception to conformance with Appendix R occurs in Fire Areas 84.1 and 85.1, where cables from both electrical divisions are present. These fire areas are the second and third floor corridors of the NSEB; and the cables involved are those which control the essential HVAC system supply air dampers for the Switchgear Rooms and Electrical Equipment Rooms. A fire in this area, therefore, could misposition one or both of these dampers. If this were to occur, HVAC service to one or both trains of essential electric power in the NSEB could be disabled.

By letter dated May 16, 1985, however, the licensee reported that this was acceptable for Cycle 7 because, with the electrical loads to be used in this cycle, the equipment in the NSEB necessary for plant shutdown could remain functional with a loss of HVAC service. This is discussed further in the section titled "Environmental Effects on Equipment." In discussions with the licensee's representatives, the licensee also notes there is little risk of actually losing the HVAC service because of the very low installed fire loadings in these areas (estimated fire durations of 0.00 and 0.02 hours, respectively), the preparation of pre-fire plans for each area (which includes a list of the components that might be affected by a fire in the area), and the time available (a few hours) for correcting the condition before high temperatures would occur through heatup. We also note that, in the absence of fire damage, alarms are sent to the Control Room whenever high temperatures occur in the Switchgear Rooms. In the above letter, the licensee also committed to correct this condition prior to operation in Cycle 8.

Based on these considerations, we conclude that operation with this configuration during Cycle 7 does not present an undue risk to the

health and safety of the public. Accordingly, we find such operation in the proposed mode acceptable.

The second exception noted by the licensee is the absence of fire detection and suppression systems for the roof-mounted essential HVAC systems. The licensee justifies this omission on the basis of low fire loading in the area, wide separation of the redundant essential HVAC units, the absence of intervening combustibles and the natural dissipation of heat buildup into the surrounding open air. Based on this reasoning, the licensee has requested an exemption from the provisions of Appendix R which would otherwise require such a system. This exemption, however, is the subject of a separate licensing action. Based on the staff's review of the fire protection features of the NSEB, the physical arrangement of the equipment, and the materials present, we conclude there is a very low probability of a fire involving both trains of the roof-mounted essential HVAC. Accordingly, we further conclude operation of the facility pending resolution of the request for exemption, would not result in an undue risk to the health and safety of the public. We therefore find such interim operation acceptable.

On the basis of the licensee's description of the NSEB, the design and separation criteria specified by the licensee for this structure, and inspection of the facility, we conclude that except as noted above, the facility meets the requirements of Appendix R.

Branch Technical Position PSB-1 - Adequacy of Station Electric Distribution System Voltages

As a result of the proposed modifications to the facility electrical system, the licensee has performed a voltage analysis to determine if any changes in the protective undervoltage or overvoltage setpoints or Technical Specifications were required to support the additional loads. As a result of this analysis it was determined that an additional voltage drop would occur in the startup transformers such that corrective action was needed. To correct the condition so that all electrical equipment would have voltages as described in the licensee's response to the letter from William Gammill to Power Reactor Licensees dated August 8, 1979, the licensee determined it was necessary to increase the presently specified minimum switchyard voltage from 214 kilovolts to 215 kilovolts. During a visit to the facility, the staff examined these calculations and concluded the calculations appeared to have been performed properly. With this increase in the minimum switchyard voltage, the licensee has determined that no other changes are required in the existing settings for the undervoltage and overvoltage protective relays. Because the switchyard voltage is a limiting condition for operation addressed by Technical Specifications 3.7.1.J and 3.7.2.H, the licensee has also proposed to increase the limiting values in these specifications by one kilovolt. Based on the foregoing, we conclude the licensee has satisfactorily addressed the requirements of PSB-1.

Control Room Habitability

The original design of the facility provided a single HVAC system for the Control Room. This system was powered from electrical train "B" (Bus 3B and MCC S2B1) and was automatically loaded onto the essential bus following generation of a Safety Features Actuation Signal (SFAS). Because of upgrading the Control Room HVAC system, including addition of an HVAC system for the Technical Support Center (TSC), Bus 3B and MCC S2B1 could no longer accommodate the new electrical load. As a result, it was necessary for these loads to be moved to new bus 3B2. In addition, as part of the upgrading, a redundant HVAC system for the Control Room and TSC was also provided and was designed to be powered by electrical train "A". This system will be connected to new bus 3A2.

As discussed in paragraph B, above, during Cycle 7 new buses 3A2 and 3B2 will be energized via transformers X43A2 and X43B2A while offsite power is available, and will be energized via the cable interties from buses 3A and 3B respectively if there is a loss of offsite power. In the licensee's submittal of November 15, 1984, the licensee proposed that in the event of a LOOP, buses 3A2 and 3B2 would be energized by manual closing of the breakers associated with the cable interties. The staff noted, however, that although an upgraded system was being provided, this represented a reduction in the level of safety from the present installation because it was a change from automatic to manual initiation of the Control Room HVAC system. This reduction in the level of safety was brought to the attention of the licensee. As a result, the licensee modified the electrical design for Cycle 7 to provide automatic connection of new bus 3B2 (and thus the train "B" Control Room HVAC system) via the cable intertie to bus 3B, and automatic initiation of the train "B" Control Room/TSC HVAC system. According to the licensee, and we agree, this arrangement provides substantially the same level of safety as provided by the unmodified system.

Regarding train "A", the licensee has not implemented a similar modification for Cycle 7. This is because the capacity of the existing train "A" diesel generator is fully utilized by other planned initialloads. As previously mentioned, however, postulated accidents will most likely permit removal of certain loads after initial operation and subsequent manual loading of the train "A" Control Room/TSC HVAC system if needed.

Because the proposed mode of operation during Cycle 7 will provide substantially the same level of safety with respoect to Control Room habitability as is presently provided, we conclude this aspcet of the proposed modifications is acceptable.

Equipment Electrical Capacity/Rating

Diesel Generators. Based on the planned loading during Cycle 7,

the licensee concludes diesel generator GEA will have no useful spare capacity. Generator GEB, however, is estimated to have a spare capacity of about 253 kw. This spare capacity remains after the Control Room/TSC HVAC and the train "B" NSEB HVAC loads have been energized. The licensee notes that if it became necessary to power auxiliary feedwater pump P-318 from the "B" train, the Control Room/TSC HVAC, the NSEB HVAC and the Class 2 battery charger H4BN1 electrical loads would have to be removed from the train. The staff notes this should be necessary, however, only if there was a LOOP combined with concurrent inability of both the train "A" and steam turbine driven train "B" auxiliary feedwater pumps to operate. Even under these circumstances, if the problem lies with the train "A" auxiliary feedwater pump and not the train "A" diesel generator, it would still be possible to energize the Control Room/TSC HVAC system from the train "A" diesel.

Based on: (1) the fact the present Control Room HVAC system is not redundant, (2) the combination of circumstances that would be necessary to prevent operation of the Control Room/TSC HVAC system in the proposed configuration, and (3) the limited time the facility will be operating in the Cycle 7 configuration, we conclude operation in this mode does not reduce the present level of safety and is therefore acceptable.

Cable Interties. The licensee states the train "B" cable intertie is rated for 630 amperes continuous operation at 90°C. The licensee also cites calculations demonstrating an emergency rating of 890 amperes (at 130°C) for 100 hours in any twelve months up to a total of 500 hours. According to the licensee, the worst case loading on this intertie during Cycle 7 would be 865 amperes - or less than the emergency rating. This worst case condition consists of the normal electrical loads served by bus 3B2 (primarily battery chargers), plus the Control Room/TSC and NSEB HVAC systems, the essential pressurizer heaters and the Post-Accident Sampling System (PASS). The licensee states this estimate is conservative because part of the increased amperage would operate the NSEB HVAC system which will decrease the temperature in the NSEB and thus reduce the temperature to which the cable would be exposed (an ambient temperature of 115°F was assumed). In addition, all listed loads were assumed operating simultaneously at their full rating. The licensee states that the circuit breakers will have trip settings such that this emergency rating is lower than the breaker set points minus their tolerances.

The train "A" cable intertie is rated for 533 amperes continuous operation at 90°C or 751 amperes for 130°C emergency operation. Full loading (similar to the train "B" loading listed above) requires only 699 amperes for this train - which again is less than the emergency rating for this cable tie. In addition, the licensee states the actual maximum load during Cycle 7 will be less than this because of the limited capacity of transformer X43A1 (see below).

We have reviewed the industry standard cited by the licensee, NEMA Pub. No. WC 7-1971 (R1976), "Cross-linked-thermosetting-polyethylene-insulated Wire and Cable for the Transmission and Distribution of Electric Energy", the licensee's calculations related to emergency ratings and the other information submitted by the licensee. Based on this review, we conclude that in the event of a LOOP and receipt of Safety Features Actuation Signal (SFAS), operation in the proposed mode would require operation of the cable interties at load levels in excess of their normal ratings, but within the emergency ratings specified by the industry standard cited above. We also note there is a low probability of occurrence of a LOOP combined with an SFAS during the limited period (Cycle 7) for which this configuration is being proposed. In addition, we note that by providing a second (train "A") HVAC system for the Control Room/TSC, the proposed configuration affords the licensee probable additional means for maintaining Control Room habitability (as previously noted, the present system is non-redundant).

Based on the foregoing, we conclude the safety benefits gained by providing additional capability to maintain Control Room/TSC habitability and by timely implementation of additional NUREG-0737 requirements (such as PASS), outweigh any adverse effects which might result from operating the cable interties in excess of their normal current ratings but within their emergency ratings. Accordingly, we conclude operation in this mode during Cycle 7 is acceptable.

Station Service Transformers

As shown in Figure 3, in the event of a loss of offsite power, all loads on buses 3A/3A2 and 3B/3B2 will be supplied via transformers X43A1 and X43B2A respectively. The acceptability of this mode of operation is therefore dependent on the load carrying capacity of these transformers relative to safety-related loads.

Regarding transformer X43A1, the licensee states this transformer is oil-filled and has a nameplate rating of 1120 kva with a top oil temperature of 110°C. Because of this temperature limit, the licensee states this transformer cannot simultaneously accommodate both the Control Room/TSC and the NSEB train "A" HVAC in addition to the other safety-related loads. The transformer can, however, accommodate either one of these HVAC systems in addition to other safety-related loads. Under the worst of these conditions, the licensee estimates the electrical load would be 1212 kva. The licensee has calculated that under these conditions, this additional loading could be functionally accommodated by the transformer and that the decrease in transformer life would not be significant. We have reviewed these calculations and concur with the licensee's conclusions in this matter.

According to the licensee, the train "B" transformer, X43B2A, is a 1500 kva transformer with insulation for a 150°C temperature rise. The transformer, however, is currently rated 1120 kva at an 80°C temperature rise. The licensee states this was done to provide a qualified life in excess of 40 years. In the event it was necessary to operate this transformer with the worst case emergency loading proposed for Cycle 7 (1473 kva, 117°C temperature rise), the licensee estimates that operation at this load would increase the rate of aging of the transformer by a factor of about 36. Based on the estimated life for this transformer at its present rating (940 years), the licensee concludes the reduction in transformer life caused by short term operation at this higher load level is acceptable.

Based on the foregoing, we agree that operation in the postulated accident conditions might require short term operation of transformers X43A1 and X43B2A at load levels somewhat greater than their present nominal ratings. We also note this would result in some reduction in the estimated service life of these transformers. Nonetheless, we conclude there would be no reduction in the capability of the transformers to perform properly under postulated accident conditions. In addition, we conclude that even if an accident were to occur, the period of operation above normal ratings would be relatively short in duration so that the effect on estimated service life would not be significant. Accordingly, we conclude that with respect to transformer ratings, operation in the proposed mode during Cycle 7 is acceptable.

Environmental Effects on Equipment

The licensee's submittal of March 21, 1985, states the normal temperature specified for equipment located in the NSEB is 50-80°F and the abnormal specification is 102°F - based on 10 events of 8 hours duration each. The licensee states these specifications will not be exceeded if either the normal or essential HVAC systems operate. We have noted previously that in the event of a loss of offsite power, both the Control Room/TSC and the NSEB essential HVAC systems could be powered by the train "B" electrical system, and that the train "A" electrical system could operate either the Control Room/TSC or the NSEB essential HVAC system. It is also noted, however, that separate essential HVAC systems are provided for the NSEB - one for train "A" and one for train "B". Thus, proper environmental control of both the "A" and "B" sides of the NSEB requires one HVAC system for each side.

However, as discussed above, with a LOOP and receipt of a Safety Features Actuation Signal, there is ample capacity to power the Control Room/TSC (via train "B") and probably ample capacity to power both sides of the NSEB (via trains "A" and "B"). If, of course, one electrical train failed, then at least the Control Room/TSC essential HVAC system could be maintained in operation. In

addition, if it were the "A" train that failed, both the Control Room/TSC and the NSEB train "B" HVAC systems could be maintained in operation. On the other hand, if the "B" train were to fail, any available capacity in train "A" would be used to energize the Control Room/TSC essential HVAC system, and the NSEB HVAC systems could be without power.

The licensee has considered such an occurrence and the consequent effects on the equipment in the Control Room. The licensee states that when the outside air temperature exceeds 95°F, the temperature of the air in the switchgear rooms can exceed 102°F. Thus considering the maximum recorded temperature of 115°F outside air temperature, the temperature in these rooms theoretically could reach 122°F. This, of course, is conservative in that it assumes an extended period of a constant temperature of 115°F (instead of a peak) and does not take into the account the time required for heatup. Even so, the licensee has evaluated the effect of reaching a temperature of 122°F in these rooms and concludes that all safety-related equipment would remain capable of performing required safety functions (letter dated May 14, 1985, RJR 85-220).

Since the licensee proposes that the essential HVAC systems for each side of the NSEB be manually loaded onto the respective electrical buses, the staff inquired as to the signal that would alert the operators to the need for starting these systems. The licensee responded that this need would be signaled to the Control Room by means of alarms initiated by high temperature conditions in the NSEB. Further discussion, however, revealed these alarms had not yet been implemented. After discussions with the staff, the licensee committed, by letter dated May 14, 1985 (RJR 85-220), to implement these alarms prior to power operation in Cycle 7. Because of the limited fission product inventory and stored decay heat energy present prior to operation at power and because there are lower thermal and electrical loads involved in dealing with accidents which occur at these levels, we conclude the proposed schedule for implementation of these alarms is acceptable.

We have reviewed the information submitted by the licensee. Based on this review and the considerations set forth above, we conclude there is reasonable assurance that with respect to environmental effects upon equipment, operation in the proposed mode during Cycle 7 will not constitute an undue hazard to the health and safety of the public, and is, therefore, acceptable.

E. <u>ACCEPTABILITY OF THE FIRE PROTECTION MEASURES FOR THE NSEB</u>

By letters dated April 12 and May 14, 1985 (RJR 85-233), the licensee submitted preliminary and final copies of the Fire Hazard Analysis Report for the NSEB. This report is a portion of the overall re-analysis of fire hazards being performed for the Rancho

Seco facility. By letters dated November 15, 1984 and April 16, 1985, the licensee submitted information concerning the conformance of the NSEB with regulatory fire protection guidance. Specifically, these submittals addressed (for the NSEB only) conformance with 10 CFR 50.48; 10 CFR 50, Appendix A, Criteria 3 and 5; 10 CFR 50, Appendix R; Regulatory Guide 1.78; NUREG-0800, Standard Review Plan (SRP) Section 9.5.1 and the following sections of NRC Staff Branch Technical Position CMEB 9.5-1:

Section 5. General Plant Guidelines

Section 6. Fire Detection and Suppression

Section 7. Guidelines for Specific Plant Areas

Section II.D of this evaluation has already considered the conformance of the NSEB to the requirements of 10 CFR 50, Appendix R. That paragraph concludes that except for questions concerning overall plant conformance with Appendix R, certain cable re-routing to be performed for Fire Areas 84.1 and 85.1, and the resolution of an exemption request concerning fire detection and suppression systems for roof-mounted essential HVAC equipment, the NSEB meets the requirements of Appendix R.

Regarding 10 CFR 50, Appendix A, Criterion 3, the licensee states this criterion is satisfied because the structure has been designed to have appropriately rated fire walls, and because the fire protection system has adequate capacity and has been designed to minimize the effect of inadvertent actuation. Based on our review of the design of the NSEB and its fire detection and suppression systems, we conclude that, with the exceptions previously noted, the facility has been designed to minimize the effects of fires on safety-related equipment, and thus conforms to the requirements of General Design Criterion 3. As noted, the licensee has committed to correct one item; and the other item is the subject of a request for an exemption. Based on conformance with regulatory guidance in the other areas of the building design, we conclude use of the facility pending resolution of the exemption request is acceptable.

The licensee states General Design Criterion 5 does not apply to this facility because Rancho Seco is a single unit plant. Because Criterion 5 addresses the sharing of systems and structures between multiple units at a site and because Rancho Seco is a single unit site, we agree that Criterion 5 is not applicable to Rancho Seco.

Regarding Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room", although Standard Review Plan (SRP) Section 9.5.1 references this guidance, the licensee states this Guide is not applicable in the present instance because the NSEB does not contain a Control Room. The design of the facility supports the licensee's statement. Therefore we conclude Regulatory Guide 1.78 is not applicable to the NSEB.

Fire Hazards Analysis

The licensee's Fire Hazard Analysis examines each of the Fire Areas in the NSEB. For each Fire Area, the licensee describes the maximum fire severity, the equipment located in the fire area, the fire detection/suppression features, the type of construction used in the boundaries of the fire area, the consequences of inadvertent operation or rupture of the fire suppression system, the ability of the plant to achieve hot and cold shutdown following a fire in each area, and electrical faults that could be caused by a fire in the area. This analysis is then used as the basis for the physical separation and fire protection design of the facility. We have reviewed this analysis, and except for the subject of emergency lighting, conclude the scope and the depth of the analysis was acceptable. When the subject of conformance with 10 CFR 50, Appendix R, Section III.J requirements was discussed with the licensee's representative, the licensee responded by letter dated May 16, 1985 stating that, although not addressed in the Fire Hazards Analysis, inspection had been conducted and the NSEB did conform to this regulatory requirement.

Branch Technical Position CMEB 9.5-1

Certain of the sections in this Branch Technical Position (BTP) are applicable to the entire facility and not just to the NSEB. Because this review is limited to the NSEB, we have limited our review to those sections applicable to an individual structure. These sections are Section 5, General Plant Guidelines; Section 6, Fire Detection and Suppression and Section 7, Guidelines for Specific Plant Areas. The licensee's evaluation of the NSEB design against the requirements of Sections 6 and 7 were contained in the licensee's submittal of November 15, 1984. At the staff's request the licensee also submitted by letter dated April 16, 1985, an assessment of NSEB compliance with Section 5 of this BTP. Each of these sections is discussed below.

BTP CMEB 9.5-1, Section 5. We have reviewed the licensee's assessment of conformance with this section of the BTP. Except as noted below, we find the design conforms with the guidance contained in Section 5. The exceptions are as follows:

> Roof-mounted HVAC Systems. Fire detection and suppression systems are not provided for this roof-mounted essential HVAC equipment. The licensee notes these units are installed on the open roof area of the NSEB and the equipment units of trains "A" and "B" are separated by 45 feet. Based on these considerations, the licensee has requested an exemption from the requirement for providing fire detection and suppression systems for this open area. As indicated earlier, this exemption request is the subject of a separate review. For the reasons previously stated, we conclude there is no undue risk to safety by allowing normal plant operation until this matter is resolved.

Line-type thermal detectors. Line-type thermal detectors have not been installed in the cable trays as specified by the BTP, and by letter dated May 14, 1985 (RJR 85-238), the licensee withdrew a previous commitment to install such detectors. The licensee justifies this on the basis of the separation of the "A" and "B" trains by three hour rated fire barriers, and the use of ionization detectors for area smoke detection. We note that operating experience indicates a continuing need for addition of cables to cable trays, and because the line-type thermal detectors should be placed on top of all other cables in the trays, these operations can cause damage to the line-type detectors and/or reduce their effectiveness. Because alternative detectors of proven performance (ionization detectors) are available for fire detection, we conclude there is no significant risk to safety by allowing substitution of ionization detectors for the line-type thermal detectors.

Conduits less than 4-inches in diameter. This section of the BTP permits sealing conduits under 4-inches in diameter at the ends, rather than at the fire barrier, when the conduits extend more than five feet from the barrier. The licensee states that in some instances these conduits have been sealed at the ends when they did not extend more than five feet from the fire barrier. Because the purpose of the seals is to prevent the passage of smoke and hot gases, we conclude the most important factor is that the seals have been installed. Further, when the seals have been installed at both ends of the conduits, as the licensee states is the case, we conclude the length of the conduits is not significant. Accordingly, we find this deviation acceptable.

Outdoor oil-filled transformers. The licensee notes there is an outdoor oil-filled transformer less than 50 feet from the NSEB. By straight-line distance, the transformer is 36 feet from the nearest wall of the NSEB. In addition, there is an opening in this wall at an elevation of 15 feet. There is, however, an intervening concrete structure that shields the opening in the wall from a direct oil spray from the transformer. The distance from the transformer to this opening (measured along straight lines around the intervening structure) is 41 feet. The licensee states that although this is less than the specified 50 feet, the opening is an exhaust opening and the wall is reinforced concrete approximately 24-inches thick.

Because the opening in the wall is shielded from a direct spray of oil from the transformer, because it is an exhaust opening and is 41 feet from the transformer and because the wall of the NSEB is thick concrete, we conclude this deviation from the BTP does not constitute a significant fire hazard to safety-related equipment and is, therefore, acceptable.

The licensee has noted several items for clarification. These include the fact that combustible flexible duct couplings were used in the out-of-doors section of the normal (non-safety related) HVAC system, and the fact that certain utility doors (not serving areas containing safety-related equipment) were not electrically supervised. After reviewing the clarifications given for Section 5, we conclude they do not represent a deviation from the requirements of the BTP and are acceptable.

BTP CMEB 9.5-1, Section 6. This section addresses the staff's requirements for fire detection and suppression systems. Section 6 also references various National Fire Protection Association (NFPA) standards as acceptable guides for implementing these requirements. We have reviewed the licensee's assessment of conformance with this section and note the following:

In contrast with the requirements of Section 6, the fire detection systems are not Class A systems as defined in NFPA 72D. We note, however, that Class A systems were defined in the 1975 edition of NFPA 72D, but are no longer defined in current editions of this standard. What was originally intended by a Class A system was one which could remain operable in the presence of a single failure. The present design provides supervised circuits; and those systems having automatic actuation utilize cross-zoned ionization and thermal detectors - where actuation of either detector will cause an alarm in the Control Room. Thus, even with failure of one detection system, an alarm would be received and the suppression system could be manually initiated or manual suppression could be utilized as appropriate. Based on these capabilities, we conclude this is equivalent to the previously defined Class A system and is therefore acceptable.

The licensee states the piping for standpipes and fire hose connections is purchased to meet the requirements of ANSI B31.1, "Power Piping"; the piping supports are Seismic Category I; and the piping is analyzed for Safe Shutdown Earthquake (SSE) loading, but is not Seismic Category I because it is galvanized pipe with screwed malleable iron fittings. The licensee justifies this on the basis that the existing fire water supply is not Seismic Category I, but the fire suppression system piping is seismically supported to preclude damage to Class I equipment. Inasmuch as the piping is designed to conform to ANSI B31.1 and is seismically supported, we conclude the system conforms to the requirements of the BTP and is therefore acceptable.

The BTP specifies that provisions for locally disarming automatic carbon dioxide systems should be key locked and under strict administrative control. The licensee, however, has not

provided for key locking this function. The basis for this decision is the licensee's desire to retain the supervised and administratively controlled system presently used elsewhere in the plant where rooms are equipped with automatic carbon dioxide fire protection systems. With this system, any local disabling of the system is reported to and annunciated in the Control Room. The licensee states that adoption of a different system for use in the NSEB would not be appropriate. The licensee thus proposes to extend the present system to the NSEB. The only difference introduced by implementing this procedure for the NSEB is that disabling the suppression system will be annunciated on the Control Room computer rather than the fire protection annunciator panel. This is necessary because there is insufficient room on the existing panel for all of the new fire protection signals that are being added. We believe simplicity of procedures serves the interests of safety, and therefore conclude use of one procedure throughout the facility is desirable. We also believe use of an administratively controlled and supervised system (i.e., with annunciation in the Control Room), such as used by the licensee, is approximately equivalent in level of safety to use of a key lock system. Accordingly, we conclude this deviation from the BTP provision is acceptable.

We have also reviewed the balance of the licensee's assessment of conformance of the NSEB to the guidance in Section 6 of the BTP. Based on this review and the foregoing discussion, we conclude the Fire Detection and Suppression systems for the NSEB acceptably conform to the requirements of this BTP.

BTP CMEB 9.5-1, Section 7. This section of the BTP addresses the requirements for various plant areas. The licensee's assessment of the NSEB design against the requirements of this section reveals no deviations from guidance except regarding the installation of line-type thermal detectors.

Initially the licensee proposed to install line-type thermal detectors in the cable trays in Fire Areas 81 and 82 (train "A" and "B" cable tunnels). These detectors were to be used in combination with ionization detectors to provide automatic actuation of the water spray suppression systems in these areas. The licensee did, however, propose to defer installation of the line-type thermal detectors until 1988, when installation of cables in the NSEB would be complete. This, of course, would have delayed achievement of automatic initiation of fire suppression systems in these areas until the thermal detectors were installed.

As previously noted, however, the licensee has withdrawn the earlier commitment to install line-type thermal detectors in the NSEB. When asked the effect of this change on plans for the automatic suppression systems for Fire Areas 81 and 82, the

licensee, by letter dated May 16, 1985, stated that the overall plans were unaffected: other detectors would be utilized to provide the cross-zoned detection and automatic suppression systems planned for these areas. In addition, because line-type thermal detectors are not being used, it is feasible to implement automatic suppression for these areas prior to installation of all cables in the NSEB. Therefore, the licensee has also committed to provide automatic suppression for these areas prior to operation in Cycle 8, rather than in 1988. Based on an 18 month operating cycle, this should result in implementation of the automatic systems about one year sooner.

Because there are several ionization detectors presently in these areas which will provide Control Room alarms in the event of a fire in either of these areas - thereby permitting manual initiation of the suppression systems; because the licensee has committed to provide a system which conforms to regulatory guidance prior to operation in Cycle 8; and because this change will provide automatic suppression to these areas at an earlier date than previously proposed, we conclude this configuration provides a satisfactory interim level of fire protection for these areas and therefore, is acceptable for operation in Cycle 7.

Accordingly, except for this matter, which is to be resolved prior to operation in Cycle 8, we conclude the design of the NSEB acceptably conforms to the guidance contained in this section.

The staff concludes that except for the items discussed below, the fire protection design criteria for the NSEB are acceptable and meet the requirements of 10 CFR Part 50, Section 50.48 and General Design Criterion 3. This conclusion is based on meeting the guidelines of Branch Technical Position CMEB 9.5-1, Sections 5, 6 and 7, as well as applicable industry standards. In meeting these guidelines, the licensee has provided an acceptable basis for minimizing the probability and effects of fires and explosions and has provided fire detection and suppression systems of appropriate capacity and capability. Regarding the absence of a fire detection and suppression system for the roof-mounted essential HVAC equipment, we have previously concluded the risk associated with temporary operation without such equipment is sufficiently small that there is reasonable assurance the facility can operate safely until this matter is resolved. Regarding the absence of automatic fire suppression for Fire Areas 81 and 82, we conclude that because of the alternate means currently installed and available for detecting and suppressing fires in these areas, operation in Cycle 7 without automatic suppression for these areas is acceptable.

F. ACCEPTABILITY OF PROPOSED TECHNICAL SPECIFICATIONS

The licensee has proposed a number of revisions to the present facility Technical Specifications to reflect the modifications made to the electrical distribution and fire protection systems and the mode of operation for Cycle 7. These revisions include additional limiting conditions for operations as needed to reflect the new systems and components added by the licensee in response to NUREG-0737 requirements, and additional surveillance requirements for this new equipment and/or mode of operation. The changes proposed for each section of the Technical Specifications are discussed below:

Specification 3.7 - Auxiliary Electrical Systems. The changes proposed for this section are as follows:

- Addition of a requirement that at least one battery charger be operable for each of the new Class 1 batteries (A2 and B2) being placed in service at this time.
- Addition of a requirement that the inverters connected to the new Class 1 batteries be operable.
- An increase in the minimum required switchyard voltage from 214 KV to 215 KV (to accommodate an increased voltage drop through the startup transformers).
- Addition of a requirement that the interconnections between the existing 480 volt switchgear (3A and 3B) and the added 480 volt switchgear (3A2 and 3B2, respectively) be operable.
- Revision of specification 3.7.2.G to clarify that a Nuclear Service Bus (which may be removed from service for up to 24 hours) consists of buses 4A and 4A2, or 4B and 4B2 - where 4A2 and 4B2 are the new 4160 volt buses.
- Revision of specification 3.7.2.H to increase all minimum voltage levels by one kilovolt.
- Revision of the bases for the above specifications to reflect the indicated changes.

Based on the plant modifications proposed for implementation for Cycle 7, the staff finds these proposed revisions appropriate, complete and consistent with regulatory guidance. The staff has also reviewed the calculations performed by the licensee to determine the additional switchyard voltage required to retain present voltage level protective setpoints for protection against degraded electrical grid conditions for the load conditions as they will exist during Cycle 7. No deficiencies in the assumptions or method of performing this calculation were identified. Based on the

foregoing, we conclude the changes proposed for Technical Specification 3.7 are acceptable.

Specification 3.14 - Fire Suppression. The charges to this specification proposed by the licensee consist of adding the fire detection and suppression equipment provided for safety-related areas of the NSEB to the lists of those fire protection components or systems required to be operable. The specific changes include:

° Addition of operability requirements for fire detectors located in safety-related areas of the NSEB. A minimum of one smoke detector is required to be operable in each of the listed areas.

° Addition of operability requirements for the spray/sprinkler systems located in the NSEB cable tunnels and mechanical equipment rooms.

° Addition of operability requirements for the Carbon Dioxide extinguishing systems located in the NSEB switchgear and electrical equipment rooms.

° Addition of the fire hose stations located on the first and second floors of the NSEB to the list of hose stations required to be operable.

Based on our review of the changes proposed by the licensee, we conclude they are consistent with regulatory guidance and the modifications being implemented for Cycle 7 and are basically acceptable. Our review, however, revealed there were certain additional items not proposed by the licensee that should have been proposed. Discussions with the licensee indicated the licensee's audit also disclosed additional items that should have been proposed. By letter dated May 16, 1985, the licensee identified these items and committed to submit a request for amendment of the facility Technical Specifications to include these items. In this letter, the licensee also committed to operate in a manner equivalent to that which would be required if these items were included in the Technical Specifications. Based on these additional commitments, we conclude the licensee's present proposal for this section is acceptable.

Specification 3.27 - Nuclear Service Electrical Building Emergency Heating, Ventilation and Air Conditioning. This is a new specification proposed by the licensee to establish operability requirements for the essential HVAC systems for the NSEB and establish allowable periods during which this equipment can be out of service. Specifically, the licensee proposes to allow the HVAC for one train to be out of service for up to seven days and the HVAC for both trains to be out of service for up to 3.5 days.

It is the staff's position that a system is only operable if all of the auxiliaries necessary for its operation are also operable. A diesel generator, for example, is not fully operable if its cooling, lubrication, fuel, starting and room cooling systems are not also operable. By adopting this position, it is not necessary to impose operability requirements for every auxiliary system - since the requirements are implied by the requirements imposed on the principal systems. In the present case, the licensee is proposing a specification for a system which is needed to assure the operability of Class 1E electrical buses. As proposed by the licensee, however, it would allow the essential HVAC systems for both electrical trains to be out of service for up to 3.5 days. This is clearly inconsistent with present specification 3.7.2 which makes no provision for continued plant operation when both trains of Class 1E power are out of service. Accordingly, we conclude the licensee's proposal in this area is not acceptable and is not approved.

As indicated above, however, we believe the operability requirements for the essential HVAC systems are implicit in the operability requirements for the systems they serve. Accordingly, in the absence of justification for some less restrictive requirement, we conclude the essential HVAC systems for the NSEB must meet the same operability requirements as the buses served via the NSEB. On this basis, no additional operability requirements are needed and none are issued.

Specification 4.6 - Emergency Power System Periodic Testing. The licensee proposes to revise this specification to include operational testing of the cable interties between buses 3A - 3A2, and 3B - 3B2, and the energizing of the Control Room/TSC essential HVAC systems. Specifically, the proposed revision would require manual closing of the train "A" intertie and manual starting of the associated Control Room/TSC essential HVAC system; and automatic closing of the train "B" intertie and automatic energizing of the train "B" Control Room/TSC essential HVAC system. The licensee has also proposed appropriate corresponding changes to the basis for the specification. We conclude the changes proposed by the licensee are consistent with the proposed mode of operation in Cycle 7 and are appropriate and sufficient. Accordingly, we find the proposed revision acceptable.

Specification 4.30 - Nuclear Service Electrical Building Emergency Heating, Ventilation and Air Conditioning. The licensee has proposed that the essential HVAC systems for the NSEB be tested each 31 days to verify the operability of the systems. This test will consist of measurement of the flow of the air handling unit to verify the flow meets or exceeds the design value (24,500 cfm ± 10%) and verifying that the condensing unit is operational.

Since these units are required to assure the operability of the

essential HVAC systems for the NSEB, we agree that surveillance specifications should be provided. We also find the proposed specification incorporates an appropriate interval for testing and appropriate measures for verifying operability. Accordingly, we find this proposed addition to the facility Technical Specifications acceptable.

Specification 6.9.5 - Special Reports. The licensee proposes to revise item E of this specification, "Status of Inoperable Fire Protection Equipment," to add a reference to sections in the Fire Protection Technical Specifications requiring submission of special reports. This is an editorial change which is acceptable in principle. We note, however, the list of references is not complete in that the licensee failed to include sections 3.14.1.2, 3.14.2.2 and 3.14.6.2. Therefore, rather than create possible ambiguity regarding which sections of specification 3.14 require special reports (by incorporating an incomplete list of references), we are denying the present request. The licensee can, of course, submit a revised proposal which, if found to be complete, can be found acceptable.

III. ENVIRONMENTAL CONSIDERATION

This amendment involves changes in the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. We have determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

IV. CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to common defense and security or to the health and safety of the public.

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