

APR 29 1981

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MEMORANDUM FOR: Carlyle Michelson, Director
Office for Analysis and Evaluation
of Operational Data

THRU: Matthew Chiramal
Office for Analysis and Evaluation
of Operational Data

FROM: Frank Ashe
Office for Analysis and Evaluation
of Operational Data

SUBJECT: REQUIREMENTS OF THE PREFERRED OR OFFSITE POWER SYSTEM

Reference: Memorandum from J. Elin, Reactor Inspector to Carlyle Michelson,
Director, AEOD, dated January 15, 1981, Requirements of the
Preferred or Offsite Power System

The above reference memorandum to you delineates what appears to be differences between an unpublished document containing NRR staff interpretation of design criteria for the preferred or offsite power system and the wording contained in published NRC descriptions of the required preferred power system, namely, the Standard Review Plan (NUREG-75/087).

The Plant Systems Unit has completed its followup activities regarding the referenced memorandum and our findings and recommendations are provided in the attached enclosure.

F.A.
Frank Ashe
Office for Analysis and Evaluation
of Operational Data

Enclosure:
As stated
cc w/enclosure:
WLanning, AEOD

Response to John Elin's Memorandum to Carlyle Michelson
Dated January 15, 1981, Requirements of the Preferred or Offsite
Power System

- References:
- (1) Memorandum from J. Elin, Reactor Inspector, to Carlyle Michelson, Director, AEOD, dated January 15, 1981, Requirements of the Preferred or Offsite Power System
 - (2) Memorandum from Faust Rosa, Chief, Power Systems Branch, to Carlyle Michelson, Director, AEOD, dated December 15, 1980, AEOD Report on the Loss of Offsite Power Event at Arkansas Nuclear One, April 7, 1980.
 - (3) Memorandum from J. O. Elin, Reactor Inspector, to J. L. Crews, Chief, Reactor Operations and Nuclear Support Branch, dated April 29, 1980, Changes to the Preferred Power Supply at San Onofre Unit 1, Docket No. 50-206

Background

Reference 1 delineates apparent differences between the interpretation of design criteria for the preferred or offsite power system as expressed in Enclosure 1 of Reference 2 and the wording contained in the published NRC Standard Review Plan (NUREG-75/087) which provides descriptive information of the preferred power system and how the design review for this system is to be conducted. In a broader context, Reference 1 addresses three previous concerns which are identified in Reference 3 and specifically relate to the preferred power system associated with the San Onofre Nuclear Generating Station. These concerns are:

1. The use of a common switchyard structure to provide support for both the immediate and delayed access circuits;
2. A Technical Specification requirement relating to the minimum number of operable transmission lines associated with the two high voltage transmission routes; and
3. The use of a single dc control power source for the switchyard breakers associated with Unit 1.

The following section provides our findings with regard to each of these items respectively.

Findings

1. With regard to the use of a common switchyard structure to provide support for both the immediate and delayed access circuits, GDC 17 allows for a switchyard common to both circuits. GDC 17 requires two physically independent circuits from the transmission network to the onsite electrical distribution system, and also allows a switchyard common to both circuits. The design implementation and staff's interpretation of these requirements are to have physically independent and physically separate transmission lines from the switchyard to the onsite distribution system and from the switchyard to the transmission network. In the switchyard, common structures, such as towers and buses; and common control and motive power, such as dc control power and compressed air systems, are found acceptable.

While it would be prudent to use different structures which are physically separated to provide support for these circuits, we are presently unaware of any operational data, completed related probabilistic studies, and/or operational occurrences which would provide a bases to preclude a design similar to that associated with the San Onofre Unit Number 1 station. However, we agree that the applicable paragraphs of Section 8.2 of the Standard Review Plan which relates to this item is not clear. The information on this item which is provided in Item C of Enclosure 1 of Reference 2 is quite explicit. Accordingly, these paragraphs should be modified in the next published revision of the Standard Review Plan to provide clear information on this issue.

2. The proposed Technical Specification would have specified the operability of any two out of the seven circuits capable of supplying the associated switchyard as sufficient to meet the requirement for a minimum of two offsite power circuits. This specification has been modified to assure that multiple circuits on a single set of transmission towers are afforded sufficient independence between them to satisfy the physical independence requirement. This has been assured by specifying that the reactor shall not be made critical or maintained critical unless one transmission line from each of the two physically independent high voltage transmission routes (i.e., any one of four Southern California Edison Company lines and any one of three San Diego Gas and Electric Company lines) are operable. This is identical to Mr. Elin's proposed Technical Specification (regarding this item) as stated in Reference 3 and has been documented by the Office of Nuclear Reactor Regulation in a letter (with enclosure) from Dennis M. Crutchfield to Mr. R. Dietch dated February 6, 1981. This letter and attached enclosure states this modification of the associated proposed change No. 91 of the Technical Specifications. We conclude that this issue is resolved.
3. For the remaining concern, regarding the use of a single dc power source which provides control power for the switchyard breakers that are associated with Unit 1, it is our understanding that the Unit 1 control room design does not provide any positive means to indicate to control room personnel the status of this single dc source. Further, it is not clear from a related procedure what specific actions are to be performed by the Units 2 and 3 control room personnel if this single dc source is lost (Apparently, a related procedure exists in the Unit 2 and 3 control room. The dc power source which provides control power for the Unit 1 switchyard breakers is also associated with Unit 2.)

Finally, relating to this area, it appears that no analysis has been completed and documented in accordance with Section 8.2 III (2d) of the Standard Review Plan. This section requires that designs that do not provide separate control circuits (including circuit power supplies) must be justified by an analysis which shows the period of time that the station can remain in a safe condition assuming no ac power is available is compatible to the required time to re-establish ac power from the offsite grid to the safety-related distribution buses.

Recommendations Based on Findings

Based on followup activities related to Reference 1 above and conducted by the Office for Analysis and Evaluation of Operational Data the following recommendations are provided for consideration by the Office of Nuclear Reactor Regulation.

1. The applicable paragraphs of Section 8.2 of the next published revision of the Standard Review Plan should be modified to provide clarifying information with regard to a design which uses a common switchyard structure for support of both the immediate and delayed access circuits. This clarification should be consistent with the information provided in Item c of Enclosure 1 of Reference 2 and should include specific acceptance criteria for such a structure.
2. Positive means should be provided to Unit 1 control room personnel to indicate the status of the single dc power source provided for control power of the associated Unit 1 switchyard breakers. These means should be augmented with clear procedures which specify the appropriate required actions by control room personnel.
3. As an ancillary item which relates to Units 2 and 3, an analysis should be completed, as indicated in Section 8.2 III(2d) of the Standard Review Plan. The analysis should assume the loss of the single dc power source which provides control power for each unit's associated switchyard circuit breakers. The results of this analysis should also be documented.