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the southern electric system

October 28, 1981

Director, Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. S. A. Varga

Gentlemen:

Re: Joseph M. Farley Nuclear Plant - Units 1 and 2
Diesel Generator Technical Specification Change

Based on previous repair and surveillance testing of the diesel generators at Farley Nuclear Plant (FNP), the Technical Specifications in Section 3/4.8.1.1 have been found to be excessively restrictive. These restrictions primarily involve testing that the diesel generator manufacturer believes could be detrimental to the engine and insufficient time to perform maintenance on the engines. The enclosed request (Attachment 1) for a permanent change addresses the problems currently known in the FNP Technical Specification. The revised Technical Specification in the opinion of Alabama Power Company and Colt Industries (manufacturer of the FNP diesels) provides for improved assurance of diesel generator reliability. The proposed significant changes to the Technical Specification are:

1. The outage of a single diesel generator has been extended from three days to 18 days.

2. The diesel generator start time has been extended from 10 seconds to 12 seconds.

3. The diesel generator test frequency basis has been changed from the number of failures to the confidence of diesel reliability based on results of short term and long term tests.

The extension of an outage for a single diesel generator from three days to 18 days is based on providing sufficient time to trouble-shoot and determine the root cause of a diesel generator problem, to complete repairs, to requalify a diesel performing the manufacturer's recommended run-in test and simultaneously perform all necessary preventative maintenance on the diesels. Based on previous experience,

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18 days is sufficient for surveillance testing and performance of required maintenance. The outage of one diesel generator for a period of up to 18 days, with FNP Unit 1 and Unit 2 operating, results in the loss or partial loss of only one of the redundant trains of emergency loads in one unit only. The other Unit will have both redundant trains fully operational. Additionally, the five available off-site power sources, in combination with the FNP switchyard design, provides high reliability for off-site A.C. power sources such that diesel generator operation would only be needed in the most unlikely situations. Furthermore, the probability of a design basis accident occurring during the 18-day period is not significantly increased from the current 3-day period.

The change from 10 seconds to 12 seconds for the diesel generators starting and reaching rated speed and voltage is based on analyses of LOCA and non-LOCA accident cases. These analyses verified that the change in diesel generator start time would not affect any of the Engineered Safety Features response times listed in Technical Specification Table 3.3-5. Therefore, the change to 12 seconds has no impact on the accident analyses for FNP.

Current testing frequency is determined solely by the total number of diesel failures for all diesels. Basing the test frequency of each diesel on its demonstrated reliability allows the failure of one diesel to be disassociated from the other diesels. This approach to test frequency eliminates unnecessary testing which has contributed to diesel generator problems in the past.

In conclusion, all of the proposed changes to Technical Specification 3/4.8.1.1 have been made with the goal of assuring that the diesel generators are highly reliable by providing for appropriate testing and sufficient time for maintenance. Alabama Power Company's Plant Operations Review Committee has reviewed this proposed change to the Technical Specifications and has determined that the change does not involve an unreviewed safety question as shown in the safety evaluation with detailed bases included as Attachment 2. The Nuclear Operations Review Board is scheduled to review this change by November 12, 1981.

The class of each item in this proposed amendment is designated as Class III for Unit 1 and Class 1 for Unit 2 according to 10CFR170.22 requirements. Enclosed is a check for $4,400.00 to cover the total amount of the fees required.

In accordance with 10CFR50.30(c)(1)(i), three signed originals and thirty-seven (37) additional copies of these proposed changes are enclosed.

If you have any questions, please advise.

Yours very truly,

/s/ B. M. Dowdy

F. L. Clayton, Jr.

FLCJr/RLG:de

Enclosures

cc: Mr. R. A. Thomas (w/enclosure)
Mr. G. F. Trowbridge (w/enclosure)
Mr. J. P. O'Reilly (w/enclosure)
Mr. E. A. Reeves (w/enclosure)
Mr. W. H. Bradford (w/enclosure)

SWORN TO AND SUBSCRIBED BEFORE ME THIS 28th DAY OF October, 1981.

Gary L. Rasco
Notary Public

My commission expires:
2-15-82

Attachment 1

Safety Evaluation for Proposed Changes
to the FNP-1 and 2 Technical Specification
Section 3/4.8.1.1 A.C. Sources - Operating

I. BACKGROUND

During previous repair and surveillance testing of the diesel generators at Farley Nuclear Plant (FNP), the Technical Specifications were found to be excessively restrictive in that Section 3/4.8.1.1 required testing that the diesel generator manufacturer believes could be detrimental to the engines. Because of these problems, several emergency Technical Specification change requests have been initiated by Alabama Power Company and approved by the NRC. These emergency changes were on a one-time basis for a limited duration of time, primarily for an extension of the three-day LCO to 17 days. The enclosed request is for a permanent change that addresses the problems currently existing in the Farley Technical Specifications. The revised Technical Specification will provide assurance of diesel generator reliability while eliminating the unneccessarily restrictive testing that may have contributed to problems in the past.

II. REFERENCE

Technical Specifications 3/4.8.1.1

III. BASES

i. Introduction

The onsite emergency A.C. power supply for Units 1 and 2 consists of five diesel generators which supply standby power for 4160V emergency buses, F, G, H, J, K, and L of each unit. These buses provide power to the emergency loads.

The emergency loads of each unit are divided in two balanced, redundant load groups so that failure of a single redundant group does not prevent the safe shutdown of the reactor. The redundant load groups are designated as Train A and Train B.

Train A for both Unit 1 and Unit 2 is supplied by diesel generators 1-2A and 1C, and Train A supplies the 4160V emergency buses F, H, and K.

Train B for Unit 1 is supplied by diesel generators 1B and 2C, while Unit 2 Train B is supplied by diesel generators 2B and 2C. Train B for both Unit 1 and Unit 2 supplies the 4160V emergency buses G, J, and L.

The capacity of the diesel generators ensures that sufficient and redundant power will be available to provide for the functioning of required emergency loads during the worst case loading conditions. The arrangement is shown in Figure No. 1, FSAR Figure 8.3-3.

ii. Discussion of the Impact of the Proposed Technical Specification Changes

The impact of the various proposed Technical Specification changes are discussed and explained in the following paragraphs. The safety evaluation of each proposed significant change is also presented. There are no design changes involved in any of these proposed Technical Specification changes. The accident cases are identical to those analyzed in FSAR Chapter 8.

A. Outage of a Single Diesel Generator Extended from 3 Days to 18 Days.

The outage of a single diesel generator for a period of up to 18 days (for diesel generator repair and performance of manufacturs recommended run-in test) with Unit 1 and Unit 2 operating results in the loss or partial loss of only one of the redundant Trains of emergency loads in one unit only. There are seven accident cases which are listed and discussed below, in relation to the outage of a single diesel generator. Each of these accident cases are listed and discussed below:

1. Loss of Off-Site Power - Units 1 and 2 (See Figure No. 2, FSAR Table 8.3-2, Sheet 1)

A. Diesel Generator 1-2A Inoperable

1. D.G. 1B will automatically energize Unit 1 Train B buses 1G and 1L and the required Unit 1 Train B LOSP loads will be automatically sequenced on.

2. D.G. 1C will automatically energize Unit 2 Train A buses 2F, 2K, and 2H and the required Unit 2 Train A LOSP loads and River Water Pump 6 will be automatically sequenced on.

3. D.G. 2B will automatically energize Unit 2 Train B buses 2G and 2L and the required Unit 2 Train B LOSP loads will be automatically sequenced on.

4. D.G. 2C will automatically energize Units 1 and 2 Train B buses 1J and 2J and River Water Pumps 4, 5 and River Water Pumps 1, 2 and 3 will be automatically sequenced on.

5. Unit 1 Train A buses 1F, 1K and 1H will not be energized automatically; however, if it becomes necessary, D.G. 1C could be aligned to supply the required Train A LOSP loads on Unit 1 buses 1F and 1K through operator action. Also, if it becomes necessary D.G. 2C could be aligned to supply the required Train B LOSP loads on either Unit 1 buses 1G and 1L or Unit 2 buses 2G and 2L through operator action.

B. Diesel Generator 1B Inoperable

1. D.G. 1-2A will automatically energize Unit 1 Train A buses 1F, 1K, and 1H and the required Unit 1 Train A LOSP loads and River Water Pumps 8, 9 and 10 will be automatically sequenced on.

2. D.G. 1C (same as 1.A.2)

3. D.G. 2B (same as 1.A.3)

4. D.G. 2C (same as 1.A.4)

5. Unit 1 Train B buses 1G and 1L will not be energized automatically; however, if it becomes necessary, D.G. 2C could be aligned to supply the required Train B LOSP loads on either Unit 1 buses 1G and 1L or Unit 2 buses 2G and 2L through operator action. Also, if it becomes necessary D.G. 1C could be aligned to supply the required Train A LOSP loads on Unit 1 buses 1F and 1K through operator action.

C. Diesel Generator 2B Inoperable

1. D.G. 1-2A (same as 1.B.1)

2. D.G. 1B (same as 1.A.1)

3. D.G. 1C (same as 1.A.2)

4. D.G. 2C (same as 1.A.4)

5. Unit 2 Train B buses 2G and 2L will not be energized automatically; however, if it becomes necessary D.G. 2C could be aligned to supply the required Train B LOSP loads on either Unit 1 buses 1G and 1L or Unit 2 buses 2G and 2L through operator action. Also, if it becomes necessary D.G. 1-2A could be aligned to supply the required Train A LOSP loads on Unit 2 buses 2F, 2K, and 2H and River Water Pumps 6 and 7 through operator action.

D. Diesel Generator 1C Inoperable

1. D.G. 1-2A (same as 1.B.1)

2. D.G. 1B (same as 1.A.1)

3. D.G. 2B (same as 1.A.3)

4. D.G. 2C (same as 1.A.4)

5. Unit 2 Train A buses 2F, 2K, and 2H will not be energized automatically; however, if it becomes necessary, D.G. 1-2A could be aligned to supply the required Train A LOSP loads on Unit 2 buses 2F 2K, and 2H and River Water Pumps 6 and 7 through operator action. Also, if it becomes necessary, D.G. 2C could be aligned to supply the required Train B LOSP loads on either Unit 1 buses 1G and 1L or Unit 2 buses 2G and 2L through operator action.

E. Diesel Generator 2C Inoperable

1. D.G. 1-2A (same as 1.B.1)

2. D.G. 1B (same as 1.A.1 plus Unit 1 Train B bus 1J will be loaded automatically)

3. D.G. 2B (same as 1.A.3 plus Unit 2 Train B bus 2J will be loaded automatically)

4. D.G. 1C (same as 1.A.2)

5. All Unit 1 and Unit 2 buses will be energized automatically.

2. Loss of Off-Site Power - Unit 1* (See Figure No. 3, FSAR Table 8.3-2, Sheet 4) -*Note: Diesel Generator 2B is not required since it is a Unit 2 diesel only. D.G. 1C is not required for this scenario; however, it may be used if necessary.

A. Diesel Generator 1-2A Inoperable

1. D.G. 1B (same as 1.A.1)

2. D.G. 2C will automatically energize Unit 1 Train B bus 1J and River Water Pumps 4 and 5 will be automatically sequenced on.

3. Unit 1 Train A buses 1F, 1K, and 1H will not be energized automatically; however, if it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply the required Train A LOSP loads on Unit 1 buses 1F and 1K through operator action. Also, if it becomes necessary, D. G. 2C could be aligned

to supply the required Train B LOSP loads on Unit 1 buses 1G and 1L through operator action.

B. Diesel Generator 1B Inoperable

1. D.G. 1-2A (same as 1.B.1)

2. D.G. 2C (same as 2.A.2)

3. Unit 1 Train B buses 1G and 1L will not be energized automatically; however, if it becomes necessary, D.G. 2C could be aligned to supply the required Train B LOSP loads on Unit 1 buses 1G and 1L through operator action. Also, if it becomes necessary, D.G. 1C (which will be running, but not connected automatically to any bus in this accident case) could be aligned to supply the required Train A LOSP loads on Unit 1 buses 1F and 1K through operator action.

C. Diesel Generator 2C Inoperable

1. D.G. 1-2A (same as 1.B.1)

2. D.G. 1B (same as 1.E.2)

3. All Unit 1 Train A and B buses will be energized automatically; however, if it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply the required Train A LOSP loads on Unit 1 buses 1F and 1K through operator action.

3. Loss of Off-Site Power - Unit 2 *(See Figure No. 4, FSAR Table 8.3-2, Sheet 4) - *Note: D.G. 1B is not required since it is a Unit 1 diesel only. D.G. 1C is not required for this scenario; however, it may be used if necessary.

A. Diesel Generator 1-2A Inoperable

1. D.G. 2B (same as 1.A.3)

2. D.G. 2C will automatically energize Unit 2 Train B bus 2J and River Water Pumps 1, 2 and 3 will be automatically sequenced on.

3. Unit 2 Train A buses 2F, 2K, and 2H will not be energized automatically; however, if it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply the required Train A LOSP loads on Unit 2 buses 2F and 2K through operator action. Also, if it becomes necessary, D.G. 2C could be aligned to supply the required Train B LOSP loads on Unit 2 buses 2G and 2L through operator action.

B. Diesel Generator 2B Inoperable

1. D.G. 1-2A will automatically energize Unit 2 Train A buses 2F, 2K, and 2H and the required Unit 2 Train A LOSP loads and River Water Pumps 6 and 7 will be automatically sequenced on.

2. D.G. 2C (same as 3.A.2)

3. Unit 2 Train B buses 2G and 2L will not be energized automatically; however, if it becomes necessary, D.G. 2C could be aligned to supply the required Train B LOSP loads on Unit 2 buses 2G and 2L through operator action. Also, if it becomes necessary D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply the required Train A LOSP loads on Unit 2 buses 2F and 2K through operator action.

C. Diesel Generator 2C Inoperable

1. D.G. 1-2A (same as 3.B.1)

2. D.G. 2B (same as 1.E.3)

3. All Unit 2 Train A and B buses will be energized automatically however, if it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply the required Train A LOSP loads on Unit 2 buses 2F and 2K through operator action.

4. Loss of Off-Site Power - Units 1 and 2 Concurrent with a Loss of Coolant Accident on Unit 1 (See Figure No. 5, FSAR Table 8.3-2, Sheet 2)

A. Diesel Generator 1-2A Inoperable

1. D.G. 1B will automatically energize Unit 1 Train B buses 1G and 1L and the required Unit 1 Train B LOCA loads will be automatically sequenced on.

2. D.G. 1C (same as 1.A.2)

3. D.G. 2B (same as 1.A.3)

4. D.G. 2C (same as 1.A.4)

5. Unit 1 Train A buses 1F and 1K will not be energized automatically; however, if it becomes necessary, D.G. 1C could be aligned to supply minimum Train A LOCA loads on Unit 1 buses 1F and 1K through operator action. Also, if it becomes necessary, D.G. 2C could be aligned to supply either minimum Train B LOCA loads on Unit 1 buses 1G and 1L or the required Train B LOSP loads on Unit 2 buses 2G and 2L through operator action.

B. Diesel Generator 1B Inoperable

1. D.G. 1-2A will automatically energize Unit 1 Train A buses 1F and 1K and the required Unit 1 Train A LOCA loads will be automatically sequenced on.

2. D.G. 1C (same as 1.A.2)

3. D.G. 2B (same as 1.A.3)

4. D.G. 2C (same as 1.A.4)

5. Unit 1 Train B buses 1G and 1L will not be energized automatically; however, if it becomes necessary, D.G. 2C could be aligned to supply either minimum Train B LOCA loads on Unit 1 buses 1G and 1L or the required Train B LOSP loads on Unit 2 buses 2G and 2L through operator action. Also, if it becomes necessary, D.G. 1C could be aligned to supply minimum Train A LOCA loads on Unit 1 buses 1F and 1K through operator action.

C. Diesel Generator 2B Inoperable

1. D.G. 1-2A (same as 4.B.1)

2. D.G. 1B (same as 4.A.1)

3. D.G. 1C (same as 1.A.2)

4. D.G. 2C (same as 1.A.4)

5. Unit 2 Train B buses 2G and 2L will not be energized automatically; however, if it becomes necessary, D.G. 2C could be aligned to supply either the required Train B LOSP loads on Unit 2 buses 2G and 2L or minimum Train B LOCA loads on Unit 1 buses 1G and 1L through operator action.

D. Diesel Generator 1C Inoperable

1. D.G. 1-2A (same as 4.B.1)

2. D.G. 1B (same as 4.A.1)

3. D.G. 2B (same as 1.A.3)

4. D.G. 2C (same as 1.A.4)

5. Unit 2 Train A buses 2F, 2K, and 2H will not be energized automatically; however, if it becomes necessary D.G. 2C could be aligned to supply either the required Train B LOSP loads on Unit 2 buses 2G and 2L or minimum Train B LOCA loads on Unit 1 buses 1G and 1L through operator action.

E. Diesel Generator 2C Inoperable

1. D.G. 1-2A (same as 4.B.1)

2. D.G. 1B (same as 4.A.1)

3. D.G. 2B (same as 1.E.3)

4. D.G. 1C (same as 1.A.2)

5. Unit 1 Train B bus 1J will not be energized automatically and it is not required.

5. Loss of Off-Site Power - Units 1 and 2 Concurrent with a Loss of Coolant Accident on Unit 2 (See Figure 6, FSAR Table 8.3-2, Sheet 3)

A. Diesel Generator - 1-2A Inoperable

1. D.G. 1B (same as 1.A.1)

2. D.G. 1C will automatically energize Unit 1 Train A buses 1F, 1K and 1H and the required Unit 1 Train A LOSP loads will be automatically sequenced on.

3. D.G. 2B will automatically energize Unit 2 Train B buses 2G and 2L and the required Unit 2 Train B LOCA loads will be automatically sequenced on.

4. D.G. 2C (same as 1.A.4)

5. Unit 2 Train A buses 2F and 2K will not be energized automatically; however, if it becomes necessary, D.G. 1C could be aligned to supply minimum Train A LOCA loads on Unit 2 buses 2F and 2K through operator action. Also, if it becomes necessary, D.G. 2C could be aligned to supply either minimum Train B LOCA loads on Unit 2 buses 2G and 2L or the required Train B LOSP loads on Unit 1 buses 1G and 1L through operator action.

B. Diesel Generator 1B Inoperable

1. D.G. 1-2A will automatically energize Unit 2 Train A buses 2F and 2K and the required Unit 2 Train A LOCA loads will be automatically sequenced on.

2. D.G. 1C (same as 5.A.2)

3. D.G. 2B (same as 5.A.3)

4. D.G. 2C (same as 1.A.4)

5. Unit 1 Train B buses 1G and 1L will not be energized automatically; however, if it becomes necessary, D.G. 2C could be aligned to supply either the required Train B LOSP loads on Unit 1 buses 1G and 1L or minimum Train B LOCA loads on Unit 2 buses 2G and 2L through operator action.

C. Diesel Generator 2B Inoperable

1. D.G. 1-2A (same as 5.B.1)

2. D.G. 1B (same as 1.A.1)

3. D.G. 1C (same as 5.A.2)

4. D.G. 2C (same as 1.A.4)

5. Unit 2 Train B buses 2G and 2L will not be energized automatically; however, if it becomes necessary, D.G. 2C could be aligned to supply either minimum Train B LOCA loads on Unit 2 buses 2G and 2L or the required Train B LOSP loads on Unit 1 buses 1G and 1L through operator action. Also, if it becomes necessary D.G. 1C could be aligned to supply minimum Train A LOCA loads on Unit 2 buses 2F and 2K through operator action.

D. Diesel Generator 1C Inoperable

1. D-G. 1-2A (same as 5.B.1)

2. D.G. 1B (same as 1.A.1)

3. D.G. 2B (same as 5.A.3)

4. D.G. 2C (same as 1.A.4)

5. Unit 1 Train A buses 1F, 1K, and 1H will not be energized automatically; however, if it becomes necessary, D.G. 2C could be aligned to supply either the required Train B LOSP loads on Unit 1 buses 1G and 1L or minimum Train B LOCA loads on Unit 2 buses 2G and 2L through operator action.

E. Diesel Generator 2C Inoperable

1. D.G. 1-2A (same as 5.B.1)

2. D.G. 1B (same as 1.E.2)

3. D.G. 2B (same as 5.A.3)

4. D.G. 1C (same as 5.A.2)

5. Unit 2 Train B bus 2J will not be energized automatically and is not required.

6. Loss of Off-Site Power and a Loss of Coolant Accident on Unit 1 *(See Figure 7, FSAR, Table 8.3-2, Sheet 5)
*Note: D.G. 2B is not required since it is a Unit 2 diesel only. D.G. 1C is not required for this scenario; however, it may be used if necessary.

A. Diesel Generator 1-2A Inoperable

1. D.G. 1B (same as 4.A.1)

2. D.G. 2C (same as 2.A.2)

3. Unit 1 Train A buses 1F, and 1K will not be energized automatically; however, if it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply minimum Train A LOCA loads on Unit 1 buses 1F and 1K through operator action. Also, if it becomes necessary, D.G. 2C could be aligned to supply minimum Train B LOCA loads on Unit 1 buses 1G and 1L through operator action.

B. Diesel Generator 1B Inoperable

1. D.G. 1-2A (same as 4.B.1)

2. D.G. 2C (same as 2.A.2)

3. Unit 1 Train B buses 1G and 1L will not be energized automatically; however, if it becomes necessary, D.G. 2C could be aligned to supply minimum Train B LOCA loads on Unit 1 buses 1G and 1L through operator action. Also, if it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply minimum Train A LOCA loads on Unit 1 buses 1F and 1K through operator action.

C. Diesel Generator 2C Inoperable

1. D.G. 1-2A (same as 4.B.1)

2. D.G. 1B (same as 4.A.1)

3. Unit 1 Train B bus 1J will not be energized automatically and it is not required. If it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply minimum Train A LOCA loads on Unit 1 buses 1F and 1K through operator action.

7. Loss of Off-Site Power and a Loss of Coolant Accident on Unit 2. *(See Figure 8, FSAR Table 8.3-2, Sheet 5)
*Note: D.G. 1B is not required since it is a Unit 1 diesel only. D.G. 1C is not required for this scenario; however, it may be used if necessary.

A. Diesel Generator 1-2A Inoperable

1. D.G. 2B (same as 5.A.3)

2. D.G. 2C (same as 3.A.2).

3. Unit 2 Train A buses 2F and 2K will not be energized automatically; however, if it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply minimum Train A LOCA loads on Unit 2 buses 2F and 2K through operator action. Also, if it becomes necessary, D.G. 2C could be aligned to supply minimum Train B LOCA loads on Unit 2 buses 2G and 2L through operator action.

B. Diesel Generator 2B Inoperable

1. D.G. 1-2A (same as 5.B.1)

2. D.G. 2C (same as 3.A.2)

3. Unit 2 Train B buses 2G and 2L will not be energized automatically; however, if it becomes necessary D.G. 2C could be aligned to supply minimum Train B LOCA loads on Unit 2 buses 2G and 2L through operator action. Also, if it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply minimum Train A LOCA loads on Unit 2 buses 2 buses 2F and 2K through operator action.

C. Diesel Generator 2C Inoperable

1. D.G. 1-2A (same as 5.B.1)

2. D.G. 2B (same as 5.A.3)

3. Unit 2 Train B bus 2J will not be energized automatically and it is not required. If it becomes necessary, D.G. 1C (which will be running but not connected automatically to any bus in this accident case) could be aligned to supply minimum Train A LOCA loads on Unit 2 buses 2F and 2K through operation action.

Based on a review of the accident cases above, when one diesel generator is out of service for up to 18 days, the Unit affected by the D.G. outage will always have at least one complete train of emergency buses available to bring the Unit to a safe shutdown condition, while the other Unit will have both trains of the emergency buses available. The redundant train of emergency equipment, which is affected by the out of service diesel, can be energized by alignment of diesel generators and connecting of buses. Adequate guidance to do this alignment is given in EOP-7, "Loss of Off-Site Power." Furthermore, the Service Water System can be placed on recirculation to the pond and eliminate the River Water Pumps from the diesel loads such that additional emergency equipment can be loaded from the operating diesel. The probability of the loss of the seismic dam during the 18 day period is miniscule.

The probability of Loss of Off-Site Power or a Loss of Off-Site Power concurrent with a Loss of Coolant Accident during the 18 day period is not significantly increased from the current 3 day period.

The diesel generator system is the standby onsite power supply for the 4160V emergency distribution system (Figure 1, FSAR Figure 8.3-3). The power source for the distribution system is normally supplied by the offsite AC sources feeding the high voltage switchyard. The high voltage switchyard supplies these emergency buses via the startup transformers. The emergency power system has been designed and constructed with an emphasis on high reliability. This reliability is achieved through the use of the redundancy of equipment and power sources (Figure 9) that can be summarized as follows:

1. Two physically separate and electrically independent trains of safeguards equipment for each unit, either one sufficient for safe shutdown.

2. Each train of safeguards equipment on each unit is supplied by a separate startup transformer. Also, each startup transformer serves as both normal and emergency power for its safeguards bus, so no switching is necessary following a plant trip.

3. Capability to power both trains of safeguards equipment from one startup transformer.

4.* A fully processed on-site spare startup transformer which can be used to replace any one failed startup transformer.

5.* A spare overhead startup transformer feeder which can be used to power any one of the four transformers in the event of failed transformer oil pipe feeder cable.

6.* Two 230KV circuit breakers supplying each startup transformer.

7. Two 230KV switchyard buses, each capable of supplying each transformer through separate breakers by utilization of the breaker-and-half-scheme.

8. Five available sources of power for the 230KV switchyard; Farley Unit 1 generator, three lines from the 230KV grid, and a tie to the 500KV grid through a 500/230KV autobank. In addition the 500KV switchyard is tied to the grid through two lines and is tied to the Farley Unit 2 generator.

*In process of being installed at Farley Nuclear Plant.

All safeguards loads (those required for safe shutdown) are powered from 4160V bus F (A-train safeguards) and 4160V bus G (B-train safeguards) during all modes of normal plant operation. Either train of safeguards equipment is sufficient for achieving safe shutdown should the other train fail. Also, no single failure will cause a loss of both trains of power. Bus F is normally fed from start-up transformer A, and bus G is normally fed from start-up transformer B. Since the normal and preferred power supplies to the safeguards buses are the same, no transfer to a preferred source is required to be made following a plant trip or plant emergency. The result is high reliability of the emergency power source for the safeguards equipment. In the event of a loss of one start-up transformer, power to the safeguards bus normally fed from that transformer can be restored through the remaining transformer. Each start-up transformer is of a sufficient KVA capacity to supply the load requirements of both trains of emergency power in one Unit.

In order to improve the reliability of the Starting Station Service power supply at FNP, Alabama Power Company is presently installing 1) a spare start-up transformer; 2) a spare start-up transformer feeder; and 3) a new 230KV breaker, bus connections, and extension of the 2B oil pipe cable to provide separate terminal positions for the startup transformers 1B and 2B. These are shown on the attached sketch (Figure 9). Should a start-up transformer fail, the failed transformer could be disconnected, removed, and the spare transformer set in its place. The spare transformer will be fully processed and ready to install at any time. It has been determined that removal of the failed transformer, installation, hookup, and testing of the spare transformer, and restoration of power through the new transformer could all be accomplished within several days. The spare feeder consists of an 230KV overhead bus which can be utilized to supply any one of the four start-up transformers (1A, 1B, 2A, or 2B) in the event of a failure of the underground oil pipe cable normally feeding the transformer. Connection of the transformer with the failed cable to the spare overhead feeder would be accomplished through the use of a disconnect switch in the 230KV switchyard and cable jumpers on the transformer end. The arrangement of the spare overhead bus is such that each transformer will be energized through its normal 230KV source breakers, and, therefore, no protective circuits will be affected by the changeover. The changeover could be accomplished within one day. This modification is scheduled for completion in early 1982. At no time at the Farley Nuclear Plant have all 5 offsite lines been out of service.

In conclusion, Alabama Power Company believes that the extension of the time for removal from service of a diesel can be extended from 3 days to 18 days based on the following:

1. The onsite diesel generator arrangement provides at least one full train of emergency buses in the unit affected by a single diesel generator outage.

2. The minimum safeguard loads in the inoperable train, due to one diesel out of service, can be energized by operation action.

3. The probability of a design basis accident occuring during this extended period is not significantly increased.

4. The offsite AC power sources, which normally energize the emergency buses, are of the highest possible reliability, precluding need for diesel operation in all but the most unlikely situations.

5. 18 days provides sufficient time to troubleshoot and determine the root cause of diesel generator problems and for completion of necessary repairs and perform manufacturer recommended run-in which will verify successful repair of the diesel generator.

B. Diesel Generator Start Time Extended from 10 Seconds to 12 Seconds

The basis for the diesel generators starting and reaching rated RPM and voltage in a specified time is the Engineered Safety Features Response Time (Technical Specification Table 3.3-5). Currently, the diesel generators start time is required by Technical Specifications to be less than or equal to 10 seconds. However, based on a review of the assumptions used in determining the Engineered Safety Features (ESF) Response Time, it has been determined that a diesel generator start time of 12 seconds will not extend any of the ESF response times beyond limits used in safety analyses. For the non-LOCA limiting transient, steamline break with no off-site power, SI pumps are assumed to start 12 seconds after the diesels received a start signal and thereafter ramp to full flow over the next 12 seconds. For the LOCA analysis, it is assumed that there is no flow for a 25 second period starting when the monitored parameter is at the SI initiation setpoint. Thereafter full flow is assumed. Extending the diesel generator start time to 12 seconds will not invalidate either of the safety analyses. Westinghouse Corporation has confirmed the above accident analyses impact.

C. Diesel Generator Test Frequency Based on the Number of Consecutive Successful Starts Vice Number of Failures

Current diesel generator testing requirements are based on cumulative failures (per diesel generator type). These bases do not reflect individual diesel generator reliability and cause increased testing where more than one diesel generator of a type is installed.

Although the root cause for a valid failure may have been corrected, the failure is retained in the data base until an additional 100 valid tests are accumulated and affects test frequency requirements. In addition, if an AC source is declared inoperable for any reason, the diesel generators must be tested within one hour and at least once per 8 hours thereafter, although previous testing may have demonstrated the diesel generators to be 100% reliable. Such frequent testing has been determined by Colt Industries to be detrimental to the diesel and does not allow sufficient time to determine and repair the root cause of diesel failure. Such condition increases the probability of returning to service a diesel which may not have been completely repaired.

Because no possibility of common mode failure exists at Farley Nuclear Plant, Table 4.8-1 of Technical Specification Section 3/4.8.1.1 has been changed to base diesel generator test requirements on the demonstrated reliability of each diesel individually. With an inoperable AC source, no increase in diesel generator test frequency is required provided that each diesel has demonstrated a historical reliability of 95%. For the longest test frequency (14 days) in Table 4.8-1, both the long term (the last 100 tests) and the short term (the last 20 tests) historical record demonstrate a diesel generator reliability of at least 95%. When the short term historical reliability decreases to 90% (18 of the 20 test) but the long term historical reliability remains at least 95% the test frequency is increased to at least once per 7 days for the affected diesel. When either the short term reliability falls below 90% or the long term falls below 95% (but greater than or equal to 90%) the testing frequency is increased to once per 7 days and Alabama Power Company will undertake a diesel generator Reliability Improvement Program for the affected diesel. It should be noted that, subsequent to each diesel failure, Alabama Power Company will determine the cause of the failure and fully repair the diesel. If a diesel fails a test run and is subsequently repaired (with a total of 18 days which provides adequate time for troubleshooting and complete repair and manufacturer's recommended run-in), Alabama Power Company's position is that there is at least a 95% probability that no defect exists in the repaired diesel which would cause the diesel to fail during an emergency situation. The repair accomplished during the 18 day period fully restores the diesel to an acceptable configuration for long-term operation.

In the event the above measures are unsuccessful and the diesel generator reliability declines to either 75% in the short term or 89% in the long term, then Alabama Power Company will undertake to requalify the affected diesel to an interim basis within 45 days and to fully requalify the diesel within an additional seven weeks. The interim requalification typically consists of, but is not constrained to:

a) troubleshooting and repair - 14 days

b) manufacturer's recommended run-in - 4 days

c) diesel cool down prior to testing - 1 day

d) 3 consecutive successful tests performed on a once per 24 hour basis.

e) 3 additional consecutive tests performed on a once per 3 days basis

f) 1 additional consecutive test performed 7 days after the last 3 day test.

The minimum time period required for the above is 38 days, an additional 7 days is allocated to allow for resolution of any problems discovered during run-in or the initial 3 tests. The test frequency described above is deliberately selected to allow discovery of problems which may not be apparent if the diesel is tested on a strict daily or once per 3 day basis. Successful completion of the seven consecutive tests would provide greater than a 50% confidence level that the diesel is at least 90% reliable.

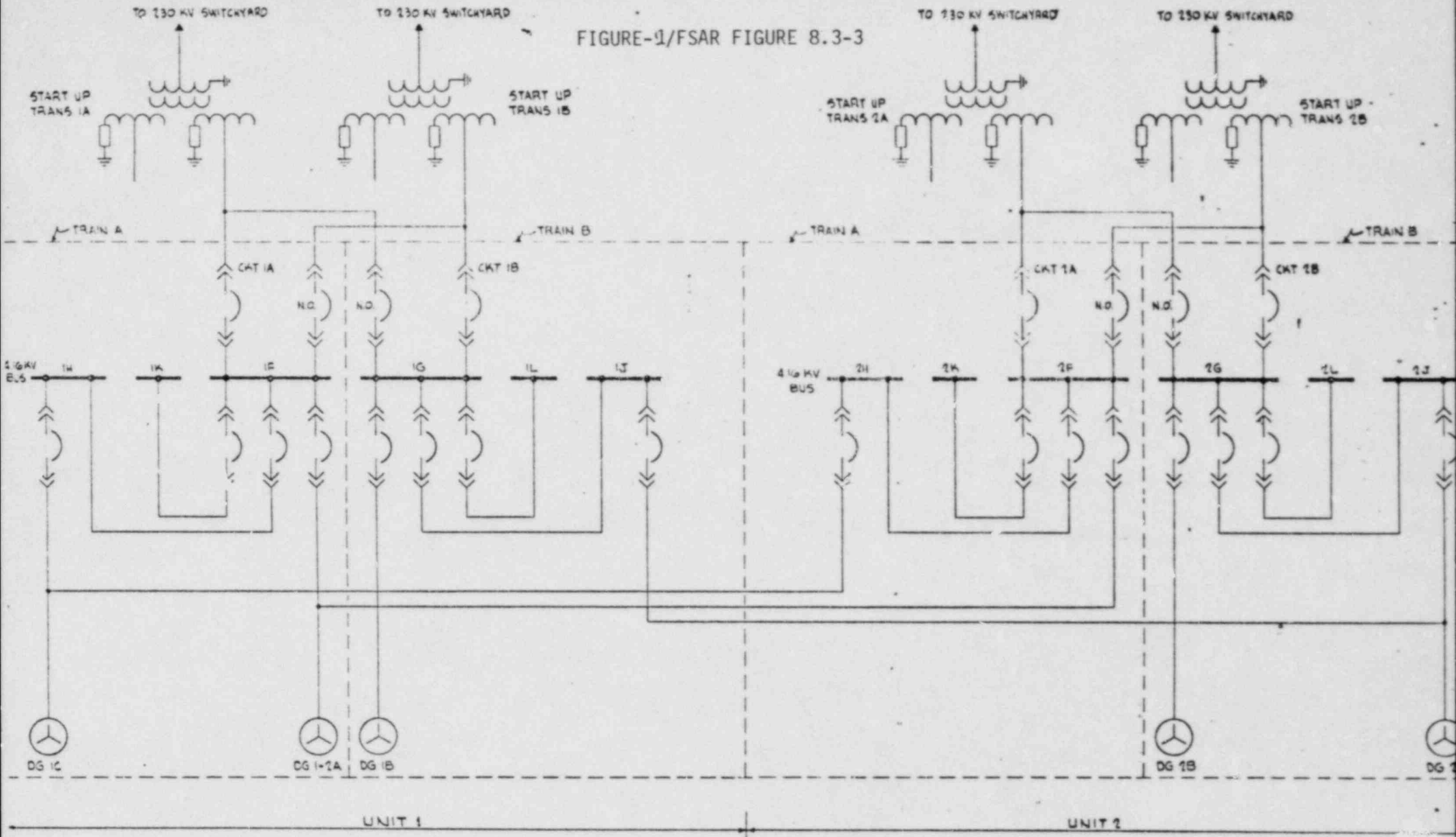
Full requalification would occur subsequent to the completion of an additional 7 consecutive successful tests (on a once per week basis). The total of 14 consecutive successful tests would provide greater than a 50% confidence level that the diesel is at least 95% reliable. The test frequency of once per week is the maximum recommended by the manufacturer for this number of tests.

The test frequency program specified in Table 4.8-1 thus provides a high degree of certainty that the reliability of the diesels will be at least 95% and that this will be substantiated by both the short and long term historical record.

IV. CONCLUSION

The proposed change to Technical Specification 3/4.8.1.1 does not involve an unreviewed safety question as defined by 10CFR50.59. This Technical Specification change will not significantly affect the safe operation of Farley Nuclear Plant Units 1 and 2.

FIGURE-1/FSAR FIGURE 8.3-3



ALABAMA POWER COMP
JOSEPH M. FARLEY NUCLE
FINAL SAFETY ANALYSIS

SCHEMATIC ARRANGEMENT DIES
AND 4160-V EMERGENCY BUSES.

FIGURE-2/FSAR TABLE 8.3-2 sheet 1

DIESEL GENERATORS ESTIMATE OF LOADING REQUIREMENTS

UNIT(S) IN OPERATION	POSTULATED EVENT	SCHEMATIC ARRANGEMENT DIESEL GENERATORS & 4KV EMERGENCY BUSES	DIESEL GEN LOADS	
			GEN #	KW LOAD
UNIT #1 AND UNIT #2	LOSS ON BOTH UNITS	TRAIN "A" / TRAIN "B"	1-2A	4348
			1C	3092
			1B	2977
			2B	2919
			2C	2563

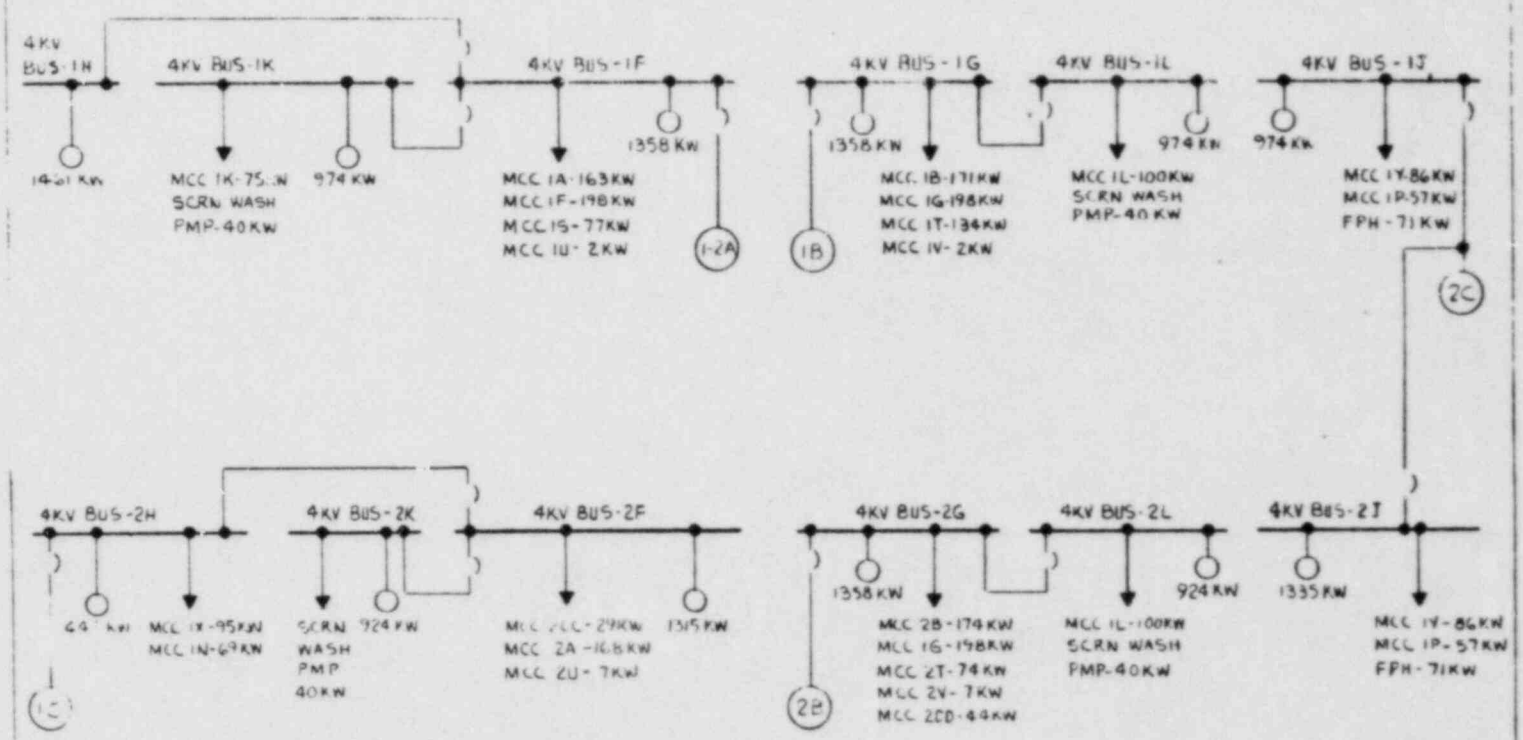


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FIGURE-3/FSAR TABLE 8.3-2 sheet 4

DIESEL GENERATORS ESTIMATE OF LOADING REQUIREMENTS

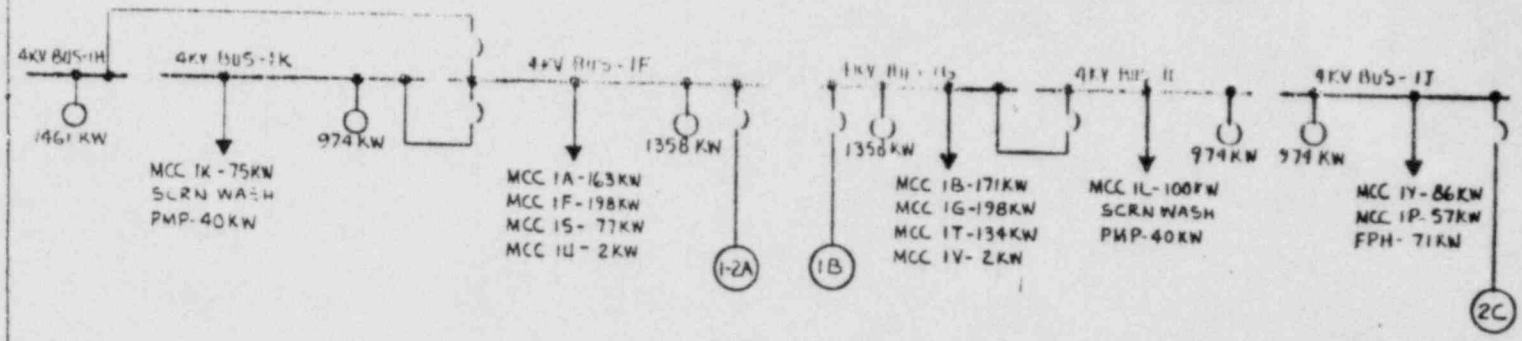
UNIT (S) IN OPERATION	POSTULATED EVENT	SCHEMATIC ARRANGEMENT DIESEL GENERATORS & 4KV EMERGENCY BUSES	DIESEL GEN LOADS	
			GEN#	KW LOAD
1 UNIT #1 AND UNIT #2	4. LOSP ON UNIT #1		1-2A	4348
			1B	2977
			2C	1188

FIGURE-4/FSAR TABLE 8.3-2 sheet 4

DIESEL GENERATORS ESTIMATE OF LOADING REQUIREMENTS

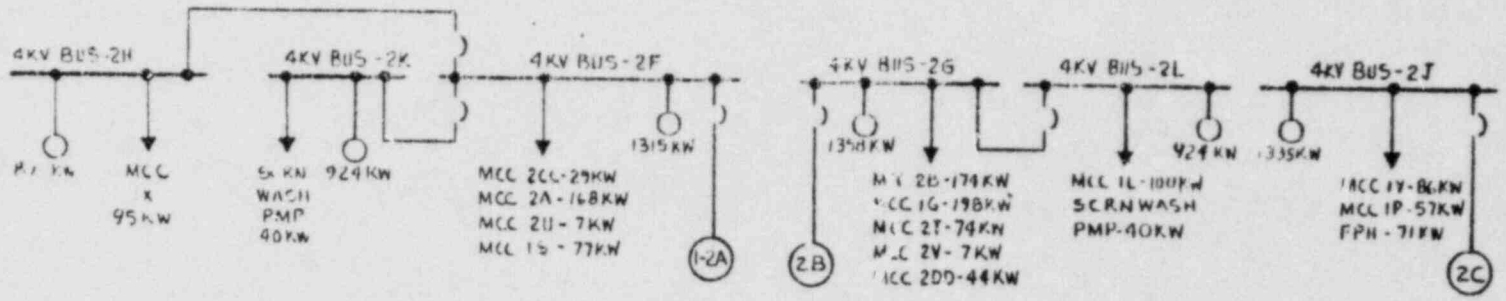
UNIT (S) IN OPERATION	POSTULATED EVENT	SCHEMATIC ARRANGEMENT DIESEL GENERATORS & 4KV EMERGENCY BUSES	DIESEL GEN LOADS	
			GEN*	KW LOAD
1 UNIT *1 AND UNIT *2	5. LOSP ON UNIT *2		1-2A	3545
			2B	2919
			2C	1549

FIGURE-5/FSAR TABLE 8.3-2 sheet 2

DIESEL GENERATORS ESTIMATE OF LOADING ARRANGEMENTS

UNIT (S) IN OPERATION	POSTULATED EVENT	SCHEMATIC ARRANGEMENT DIESEL GENERATORS & 4KV EMERGENCY BUSES	DIESEL GEN. LOADS	
			GEN*	KW LOAD
UNIT #1 AND UNIT #2	2 LOSP ON BOTH UNITS & LOCATION UNIT #1	TRAIN "A" / TRAIN "B"	1-2A	3885
			1C	3092
			1B	3974
			2B	2936
			2C	2523

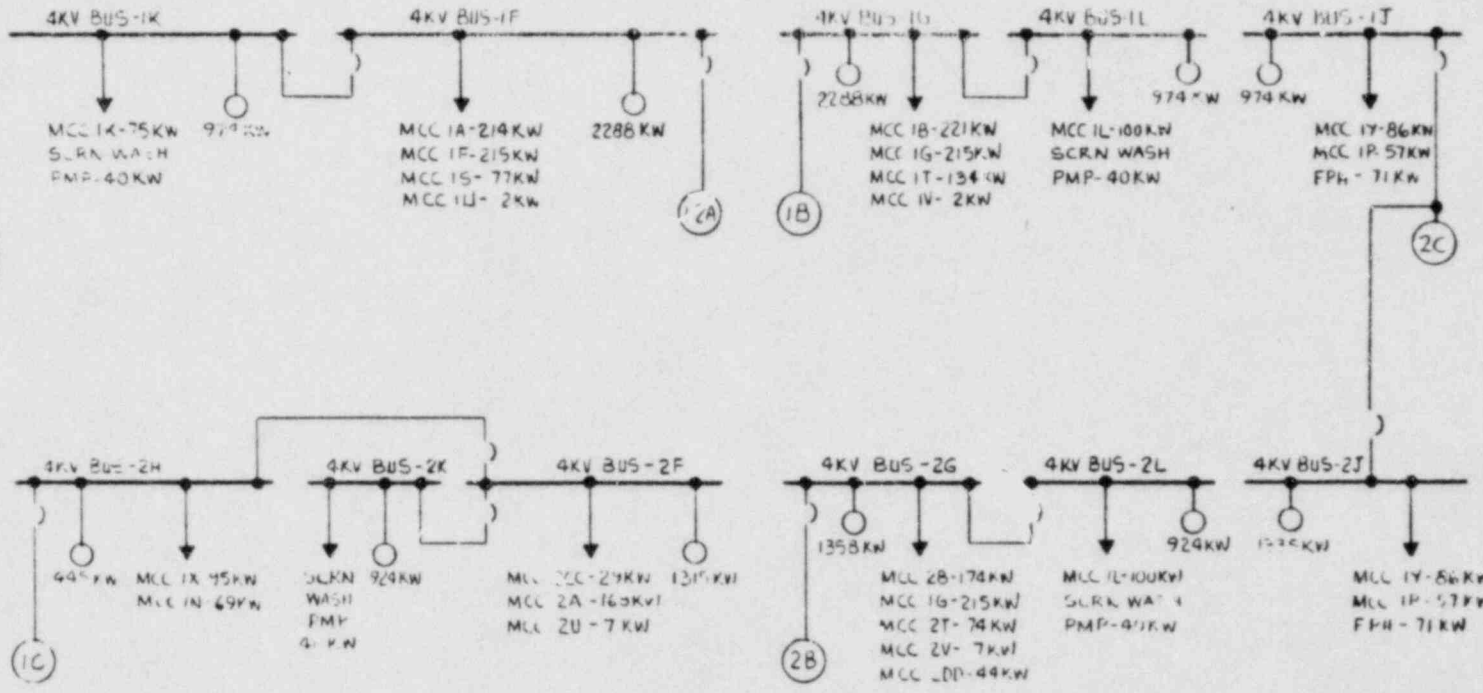


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FIGURE-6/FSAR TABLE 8.3-2 sheet 3

DIESEL GENERATORS ESTIMATE OF LOADING REQUIREMENTS

UNIT(S) IN OPERATION	POSTULATED EVENT	SCHEMATIC ARRANGEMENT DIESEL GENERATORS & 4KV EMERGENCY BUSES	DIESEL GEN LOADS	
			GEN*	KW LOAD
UNIT 1 AND UNIT 2	3 LOOP ON BOTH UNITS & LOCA ON UNIT 2		1-2A	3572
			1C	2896
			1B	2994
			2B	3897
			2C	2523

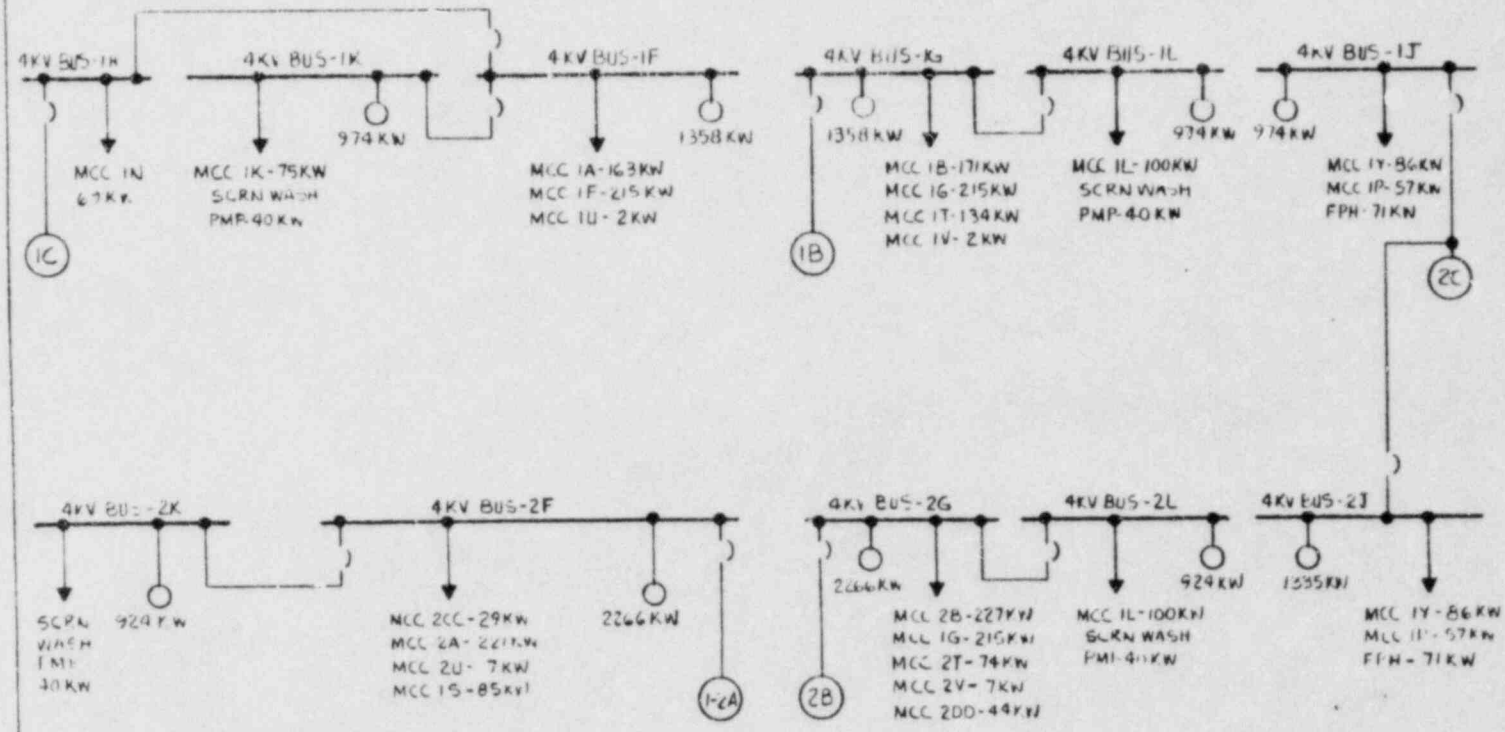

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FIGURE-7/FSAR TABLE 8.3-2 sheet 5

DIESEL GENERATORS ESTIMATE OF LOADING REQUIREMENTS

UNIT (S) IN OPERATION	POSTULATED EVENT	SCHEMATIC ARRANGEMENT DIESEL GENERATORS & 4KV EMERGENCY BUSES	DIESEL GEN LOADS	
		TRAIN "A" TRAIN "B"	GEN#	KW LOAD
1 UNIT "1 AND UNIT "2	a LOSP & LOCA ON UNIT "1		1-2A	3885
			1B	3974
			2C	1188

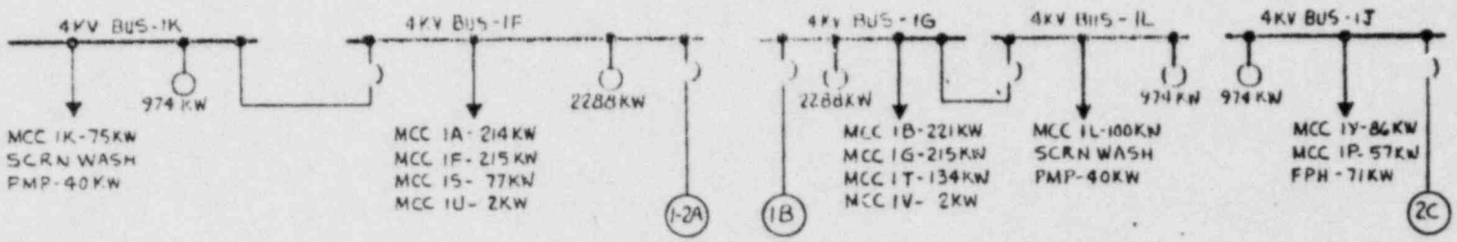


FIGURE-8/FSAR TABLE 8.3-2 sheet 5

DIESEL GENERATORS ESTIMATE OF LOADING REQUIREMENTS

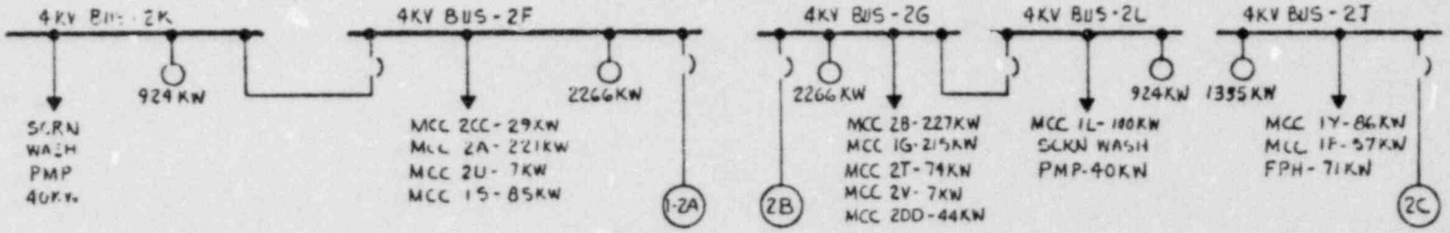
UNIT (S) IN OPERATION	POSTULATED EVENT	SCHEMATIC ARRANGEMENT DIESEL GENERATORS & 4KV EMERGENCY BUSES	DIESEL GEN LOADS	
		TRAIN "A" TRAIN "B"	GEN#	KW LOAD
1 UNIT "1" AND UNIT "2	2 LOSP & LOCA ON UNIT "2		1-2A	3572
			2B	3897
			2C	1549

FIGURE 9 - OFF-SITE POWER SOURCES

FARLEY NUCLEAR PLANT