Enclosure
PG&E Letter DCL-98-079

# Licensing Basis Impact Evaluation for Design Change Package E-049424 - Emergency Diesel Generator Load Sequencing Requirements

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| REFERENCE DOCUMENT No. | 1. FSAR<br>2. DCM S-21, Rev.7 | Doc. Rev. No. | 11 |

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| Reference Document Title | 1. FSAR Section 8.3 ONSITE POWER SYSTEM<br>2. Diesel Engine System |

Sponsoring Organization: DES/NTS  Sponsor: Anil K. Kar (Print)

As a result of the LBIE Screen (Form 69-10431), indicate which sections of this LBIE have been completed and are attached. Refer to TS3.ID2 to complete each evaluation.

- ☒ SECTION 1 — 10 CFR 50.59 Safety Evaluation (including 10 CFR 50.54(a)(3) and OL Condition 2.C.(5)b./2.C.(4)b. Evaluations)
- ☐ SECTION 2 — Environmental Protection Evaluation
- ☐ SECTION 3 — Emergency Plan Evaluation - 10 CFR 50.54(q)
- ☐ SECTION 4 — Security Plans' Evaluation - 10 CFR 50.54(p)

Explain why this LBIE is being performed (i.e., Why were Screen questions answered "Yes"?)

This LBIE safety evaluation addresses changes to FSAR Section 8.3.1.1.13, "Diesel generator Units," and DCM S-21, Revision 7, to clarify transient voltage and frequency decrease and recovery times during load sequencing. The change:

- Applies the criteria of Regulatory Guide (RG) 1.9, Revision 2 (December 1979), Regulatory Position C4 as it pertains to voltage and frequency dip and recovery during load sequencing.
- Documents previously established commitments to demonstrate EDG performance during load sequencing with worst case sequence timing intervals.
- Recognizes that the KWS relays are not credited for performing a safety function.

In summary, DCPP:

- Meets the frequency and voltage decrease requirements of RG 1.9, Revision 0, as demonstrated by analysis in Calculation 215-DC, Revision 2 for nominal load block time intervals.
- Meets the frequency and voltage recovery requirements of RG 1.9, Revision 2, as demonstrated by analysis in Calculation 215-DC, Revision 2 for nominal load block time intervals.
- Meets commitments to the NRC, made in DCL 85-132, for demonstrating that the objectives of RG 1.9 are met for worst case load block time intervals, as demonstrated by analysis in Calculation 215-DC, Revision 2 and pre-operational testing.

Background

During initial licensing, DCPP committed to comply with Safety Guide 9 (SG 9), March 1971 (RG 1.9, Revision 0), "Selection of Diesel Generator Set Capacity for Standby Power Supplies." SG 9 Regulatory Position C4 required:

> That each EDG "...be capable of starting and accelerating to rated speed, in the required sequence, all the needed engineered safety features and emergency shutdown load. At no time during the load sequence should the frequency and voltage decrease to less than 95 percent of nominal and 75 percent of nominal, respectively.... Voltage should be restored to within 10 percent of nominal and frequency should be restored to within 2 percent of nominal in less than 40 percent of each load sequence time interval."

These requirements are currently captured in DCM S-21, Section 4.3.1 items i, j, k, m, and n.

The FSAR, Revision 0, included ALCO shop test results of the capability of the EDGs to meet this position. These test data are described in FSAR Update, Revision 11, Table 8.3-8. It should be noted that the original shop testing was performed assuming a load sequence interval of 5 second. The actual nominal load sequence interval, as provided in TS Table 4.8-2a is 4 seconds. It should also be noted that the ALCO test data for several EDGs did not demonstrate compliance with the requirements for frequency recovery in accordance with SG 9. Only two of the five EDGs tested had a frequency recovery time less than the 1.6 seconds required by SG 9. The shop test data will continue to be included in the FSARU with a note stating that it is historical data and that the interval used was 5 seconds. The NRC recognized compliance with SG 9 in the original SER, March 1974.

In late 1980, an issue was identified regarding the potential for the containment spray pumps simultaneously starting with other ESF equipment. This was due to the high-high containment pressure (P signal) start of the containment spray pump independent of the safety injection (S signal) start of the other ESF loads resulting in the potential of a simultaneous start of the containment spray pump with another ESF load. This was resolved by changing the design to require coincidence logic of the P signal with the last load block timer to start the containment spray pump. This issue, described in NCR DC0-80-EN-005, was reported to the NRC on January 19, 1981, under the requirements of 10 CFR 50.55(e).

Testing was performed in July, 1981, (Test Procedure 21.1, RLOC -2716-1556 ). This testing provided nominal load block sequencing except for the last load block. The last load block had an interval of 1.3 seconds between the AFW and CS pumps. The 1.3 seconds is consistent with a worst case timing sequence between these two loads (TS Table 4.8-2a). These tests demonstrated that frequency dropped below the 57 Hz

minimum momentarily for the last load block. In the most severe case, frequency dropped to 56.3 Hz.

It was discovered in 1993 that the frequency recovery time data were misread (discussed below). Although the test results concluded that recovery was within 1 second in all cases, actual frequency recovery was typically between 2.2 and 2.3 seconds. This would not demonstrate compliance with SG 9 requirements.

PG&E submitted a letter to the NRC on July 31, 1981 (RLOC 0313-0748). The letter stated the following:

> "Our Final Safety Analysis Report commits us to meet the intent of Regulatory Guide 1.9 (Selection of Diesel-Generator Set Capacity for Standby Power Supplies). A series of diesel loading tests were devised and performed in order to demonstrate our ability to meet that commitment....It is our conclusion that these tests repeatedly demonstrated that containment spray pump starts coincident with starting other engineered safety feature equipment can be accommodated by emergency diesel generators without creating an unacceptable prolonged underfrequency or undervoltage condition. The tests demonstrated that the system meets Final Safety Analysis Report requirements, including the intent of Regulatory Guide 1.9."

The NRC responded to this letter on September 14, 1981 (RLOC 00161-1713). The NRC response stated:

> "We have reviewed your submittal dated July 31, 1981 in regard to diesel generator load tests and find that the tests demonstrate compliance with the guidelines delineated in Regulatory Guide 1.9 except for one minor frequency variation. The frequency variation was slightly below the 95% frequency lower recommended limit for less than one second; the Diesel Generator showed strong recovery capability demonstrated by return to within the frequency limit within less than 0.035 seconds: this meets the objective of Regulatory Guide 1.9, and is, therefore, acceptable."

Although the tests results were not provided in the July 31 letter to the NRC, it is apparent from their response that they had been apprised of the details of the tests. It should also be noted that the return within the frequency limit stated as 0.035 seconds is not demonstrated by the oscillographs. This appears to have been a typographical error, with a more accurate recovery of 0.35 seconds applying to the time from the maximum dip below 57 Hz to a recovery to 57 Hz.

It appears that in March 1985, there was additional discussion with the NRC concerning the capabilities of the EDGs to start and load (reference NRA correspondence documenting March 14 meeting with NRC). On March 29, 1985, DCL-85-132 was submitted to the NRC, concluding that testing demonstrated that the intent of SG 9 was met. The enclosure to this letter provides a summary of Diesel Generator Capabilities and provides a summary of the test results of both the manufacturer's testing and the

testing in July, 1981. The test result summaries had the same errors as previously communicated in the original FSAR Table 8.3-8 and the July 31, 1981 letter. Specifically, the enclosure stated that the frequency recovery times for a shop test with the starting of an 800 hp motor on an unloaded diesel generator was within 1.3 seconds (this was only true on one diesel tested) and that the frequency recovery time to 100% value when starting CS pump 1.3 seconds after an AFW pump was less than one second.

There does not appear to be a specific response from the NRC on this letter. The Units 1 and 2 combined TS, referenced in DCL 85-132, were issued later in 1985. This letter does establish the basis for the perceived commitment a worst case starting interval should be assumed.

In Mid-1992, engineering received information from the manufacturer of the KWS relays that the relays, nominally set to actuate when a load of 10% of the rated capacity of the EDG is started, could not be relied upon to actuate unless load approached 25 to 30% of the EDG rated capacity. The KWS (kilo-watt sensing) relays were designed to provide a turbo air assist when large loads are added to the EDGs. In November 1992, engineering collected test frequency and voltage data on Unit 1 EDGs during the performance of STP M-15. They found that frequency recovery exceeded 1.6 seconds during the last load blocks. Although NCR DC0-92-EN-N031 was initiated, the condition was ultimately determined to not be non-conforming. The conclusion was that deviation from the 40% recovery time was acceptable in the last load block.

In July, 1993, engineering determined that the testing referred to in the July 31, 1981 and March 29, 1985, letters to the NRC did not accurately determine recovery times. It was determined that instead of assessing recovery time from the time the breaker closes to the time frequency recovers to 2% of nominal (58.8 Hz), the recovery times had been taken from the point of lowest frequency to recovery to 58.8 Hz. In addition, it was recognized that only two of five shop tests demonstrated a recovery time lower than the 1.6 second SG 9 requirement. This was documented in AR A0312930.

AR A0312930 documents a discussion on August 2, 1993, between NPG licensing and the NRR Project Manager. It is apparent from the discussion in the AR that the NRR PM involved the NRR electrical branch. The NRR PM suggested that PG&E ought to process this issue in accordance with 10 CFR 50.59 and submit the 50.59 results in the regular 50.59 submittal to the NRC.

Subsequently, engineering performed computer analysis, using a model developed by EPRI and accepted by the NRC for use at other facilities to resolve NRC EDSFI inspection findings on EDG loading capability. Validation of the modeling required benchmarking performance for each EDG. The benchmarking was delayed to accommodate outage scheduling and was not competed until 2R7.

The results of the computer analysis, documented in Calculation 215-DC, R1, demonstrated compliance with RG 1.9 as discussed below. This evaluation also changed the commitment for frequency and voltage recovery from SG 9 to RG 1.9, Revision 2. A LBIE safety evaluation was reviewed and approved by the PSRC on May 2, 1997.

In September and October, 1997, an NRC AE Team inspection was performed at DCPP. The team reviewed the results of Calculation 215-DC and questioned the conclusions supporting compliance with RG 1.9. Specifically, they questioned how compliance with the frequency drop could be demonstrated with frequency drops below 57 Hz in the first load block. In addition, they questioned compliance with the frequency recovery times in the first load block. A white paper was drafted to address these concerns, citing a combination of both the simulation and testing as the basis for considering compliance with RG 1.9, Revision 2 with respect to frequency and voltage recovery, and SG 9 in all other respects.

During the assessment to address the AE team inspections concerns, weaknesses were identified in the LBIE prepared and approved in May 1997. In addition, a commitment was made to the NRC to revise the calculation and DCM to clarify compliance with RG 1.9 and to clarify the docket regarding the DCL 85-132.

Summary of Design Criteria and Compliance for load sequencing:

The following are applicable criteria from DCM S-21 prior to this change (with the exception of 4.3.1 p., a new criteria) with a discussion of how each criterion is changed and how compliance is demonstrated.

4.3.1 j) *"Each diesel-generator set is designed so that at no time during the load sequence will the frequency decrease to less than 95 percent of nominal frequency."*

This being clarified to state that it applies to the nominal load block interval without consideration of any timer tolerances and drifts. This change is considered a clarification and not a change in commitment. Both Revision 0 and Revision 2 of RG 1.9 do not require that testing be performed assuming worst case timer tolerances. DCM S-21 criterion 4.3.1 p. has been created to address an implied commitment to the NRC that load sequencing assuming worst case timer tolerances be demonstrated.

Compliance to Criterion 4.3.1 j) is demonstrated through the simulation contained in Calculation 215-DC, Rev 2. This simulation shows that for nominal time intervals, frequency does not drop below 57 Hz. The results of the simulation are supported by STP M-15 test data collected during 1R7 and 2R7 outages..
During the STP M-15 test, KWS relay was blocked.

4.3.1.h) *"Each diesel-generator set is designed so that at no time during the load sequence will the voltage decrease to less than 75 percent of nominal voltage."*

As with the 4.3.1.j), this criteria is being clarified to state that it applies to the nominal load block interval without consideration of any timer tolerances and drifts. This change is considered a clarification and not a change in commitment.

Compliance to Criteria 4.3.1 h) is demonstrated by both 1981 testing, STP M-15 tests during 1R7 and 2R7 and by Calculation 215-DC, Rev 2.

4.3.1 n) *"The diesel-generator sets are designed to ensure that nominal frequency is restored within 40 percent of each load sequence time interval."*

This criteria is being revised to allow 60 percent of each load sequence and allow a greater percentage of the time interval if justified by analysis. This is consistent with RG 1.9 Revision 2, Regulatory Position 4.

The results of testing and calculations performed at DCPP consistently demonstrate that the 40% interval frequency recovery requirements of SG 9 are not met for all EDGs. In three separate instances it appears that the results were unintentionally represented to the NRC to indicate that the SG 9 frequency recovery requirements could be met. The testing performed during preoperational phase was also performed with the KWS relays inservice. The relays may have actuated for larger loads between 600 hp and 1000 hp, improving frequency response. The KWS relays can not, however, be relied upon to actuate. Based on factory test typical improvement will be in the order of a few tenths of a second for 600 hp motors if the relay actuates.

The NRC established in their September, 14, 1981 letter that the testing performed demonstrated that the objectives of SG 9 were met. The intent of the recovery requirement is to assure that EDGs capably start and accelerate loads without impacting the capability of the EDG to continue operations at rated frequency and voltage, accept additional loads, or the ability of the load to perform its function. Generically, the NRC recognized that the frequency and voltage recovery requirements of SG 9 were too stringent for most licensees to demonstrate compliance and issued Revision 2 with relaxed recovery requirements.

Testing and analysis have consistently demonstrated that the DCPP EDGs have met the objectives of RG 1.9 revisions 0 and 2, in that regardless of test assumptions, the EDGs capably start and accelerate loads without impacting the subsequent performance of the EDG or the load. Changing commitment from 40% to 60% frequency recovery does not reduce any margin of safety. The method of demonstrating compliance to RG 1.9

Revision 2 is more thorough than the methods during plant licensing. Original testing was limited in its capabilities of modeling expected post-LOCA equipment loads and at modeling timer drift. The calculation, which was benchmarked against plant data, was able to model variations in sequence timers and model expected post-LOCA loading of ESF equipment.

In addition to relaxing the voltage and frequency recovery requirements, Revision 2 recommended other requirements and compliance with IEEE 387-1977. DCPP has not adopted these other requirements of RG 1.9 Revision 2. However, these requirements were reviewed to determine if the relaxation provided on frequency was offset by more stringent requirements revisions to RG 1.9. This review determined that there are no additional requirements provided in the revision that would directly compensate for relaxed voltage and frequency recovery times.

In addition, it is apparent from past interaction with the NRC that compliance with RG 1.9 revision 2 for frequency recovery is an acceptable position. The 1991 EDSFI (NRC Inspection Report 50-275,323/91-07) reviewed load sequencing against the frequency recovery times of Revision 2 and found them to be acceptable. The 1993 communications with the NRC PM indicate that it would be acceptable to document this change in accordance with 10 CFR 50.59. The 1997 AE Team Inspection appeared to indicate that compliance with the frequency recovery times of Revision 2 was acceptable.

<u>4.3.1 m)</u> *"The diesel-generator sets are designed to ensure that nominal voltage is restored within 40 percent of each load sequence time interval."*

This criterion is being revised to allow 60 percent of each load sequence and allow a greater percentage of the time interval if justified by analysis. This is consistent with RG 1.9 Revision 2, Regulatory Position 4.

Testing and analysis has consistently demonstrated compliance with both the 40 and 60 percent load sequence time interval, regardless of the condition of the KWS relay. This criterion is revised to be consistent with 4.3.1.n).

<u>4.3.1 p)</u> *"Each diesel-generator set is designed to start and accelerate the loads in the required sequence considering worst case timer tolerances for the two consecutive largest loads. The worst case loading sequence considering timer tolerances would be starting of two large motors within 1.3 seconds. During this load interval, voltage and frequency may dip below 75 percent and 95 percent respectively. This would be acceptable as long as the voltage and frequency, at the end of the loading interval, recover and the diesel generator attains its final steady state nominal voltage and frequency values. This should be demonstrated by either test, analysis, or a combination of both."*

This criterion is added with this revision to the DCM. Neither RG 1.9, Revision 0 or 2, explicitly require the consideration of timer tolerances in testing. Revision 2 only requires the consideration of timer tolerances if during the nominal sequence recovery exceeds the 60 percent. This new DCM criterion is derived from the March 29, 1985 letter to the NRC, in which DCPP appears to commit to demonstrating that the EDGs can start and accelerate sequential loads assuming allowed timer tolerances. While no specific acceptance criteria was provided, the September 14, 1981 NRC letter and the March 29, 1985 PG&E letter indicate that this criterion is met if the objective or intent of RG 1.9 is met.

The addition of this criterion to the DCM establishes a more stringent requirement than currently specified by the DCM and FSARU section 8.3.1.1.13.

This criterion is demonstrated as met by Calculation 215-DC, Revision 2. The results of the analysis show that assuming worst case timer drift, frequency may drop below 57 Hz and recovery may exceed 60% of the time interval. The calculation further shows that this has no impact on the EDG or its ESF loads from performing their design function. Original testing performed in 1981 also demonstrates compliance with this criteria. However, results of the testing can not be credited since the KWS relay may have added in frequency recovery.

KWS Relay:

As discussed above, this change removes credit for the KWS relays in demonstrating compliance with the requirements of SG 9 and RG 1.9 Revision 2. At this time the KWS relays will remain in service and will continue to function as they have historically. The function performed by the KWS relay is not described in the FSAR. However, as discussed above, the KWS may have aided frequency recovery times during qualification testing. KWS relay actuation or lack of actuaion has no impact on the voltage dip and voltage recovery time. Calculation 215-DC, Rev. 2 provides analysis which demonstrates acceptable performance without crediting the KWS relay.

| | | | Yes | No |
|---|---|---|---|---|
| RECOMMEND APPROVAL | | | ☒ | ☐ |
| PSRC REVIEW: MEETING NO: | 98-024 | DATE: | 3/13/98 | |
| APPROVED (PLANT MANAGER) | A. P. [illegible] | DATE: | 3/13/98 | |

SECTION 1. 10 CFR 50.59 SAFETY EVALUATION

For the issue under consideration, provide an explanation justifying each of the Yes/No answers. The detail provided shall be commensurate with the nuclear safety significance of the proposed activity or CTE.

| | Yes | No |
|---|---|---|
| 1. May the probability of occurrence of an accident previously evaluated in the SAR be increased? | ☐ | ☒ |

Justification:

This change does not, in any way, affect overall system performance in a manner which could lead to an accident. The EDGs are involved in accident mitigation and do not initiate accidents. Therefore, the probability of occurrence of an accident previously evaluated will not be increased.

| | | |
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| 2. May the consequences of an accident previously evaluated in the SAR be increased? | ☐ | ☒ |

Justification:
This change does not affect the performance of the EDGs or the performance of equipment supported by the EDGs. As provided in the preceding description of this change, both pre-operational tests and the analysis provided in Calc. 215-DC, Rev. 2, establish compliance with appropriate regulatory commitments. This assures that the EDGs have met the objectives of Regulatory Guide 1.9 in that the EDGs start and accelerate loads without impacting (1) the capability of the EDGs to continue operations at rated frequency and voltage, (2) the capability of the EDGs to accept additional loads, or (3) the ability of the loads to perform their intended functions. Therefore, all safety equipment supplied power by the EDGs will operate as designed and the radiological consequences of an accident previously evaluated will not be increased.

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| 3. May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased? | ☐ | ☒ |

Justification:

The malfunction of the EDGs and ESF equipment supported by the EDGs has been previously evaluated in the SAR. This change does not have an impact on the probability of occurrence of a malfunction of this equipment. Calculation 215-DC, Revision 2, demonstrates that the EDGs start and accelerate loads without impacting (1) the capability of the EDGs to continue operations at rated frequency and voltage, (2) the capability of the EDGs to accept additional loads, or (3) the ability of the loads to perform their intended functions. Additionally, the physical configuration of the EDGs is not impacted by this change. Therefore, both pre-operational and routine testing demonstrate the capability of the EDGs to perform their intended function.

This change recognizes that the KWS relays have never performed as originally intended and can not be relied upon to perform a function to assist the EDG response to transients. The function of the KWS relays is not described in the SAR. However, pre-operational testing results may have been influenced by

the KWS relays. Specifically, testing has demonstrated that the KWS relay has a minor impact on the frequency recovery times following the addition of the largest ESF loads. The analysis provided in Calculation 215-DC, Revision 2 assures that the EDG will capably accelerate loads regardless of whether the KWS relay actuates. At this time, the KWS relay will continue to be treated as a quality component, assuring that it continues to perform as expected.

Based on the above, the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR is not increased.

4. May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased? ☐ ☒

Justification:

This change does not affect the performance of the EDGs or the performance of equipment supported by the EDGs. As provided in the description of this change, both pre-operational tests and the analysis provided in Calc. 215-DC, Rev. 2 establish compliance with appropriate regulatory commitments. This assures that the EDGs have met the objectives of Regulatory Guide 1.9, Revisions 0 and 2, Regulatory Position 4, in that the EDGs start and accelerate loads without impacting (1) the capability of the EDGs to continue operations at rated frequency and voltage, (2) the capability of the EDGs to accept additional loads, or (3) the ability of the loads to perform their intended functions. Therefore, all safety equipment supplied power by the EDGs will operate as designed and the radiological consequences of a malfunction previously evaluated will not be increased.

5. May the possibility of an accident of a different type than any previously evaluated in the SAR be created? ☐ ☒

Justification:
This change does not, in any way, affect overall system performance in a manner which could lead to an accident. The EDGs are involved in accident mitigation and do not initiate accidents. Therefore this change does not create the possibility of an accident of a different type than already evaluated.

6. May the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? ☐ ☒

Justification:
Calculation 215-DC, Revision 2 demonstrates that the EDGs start and accelerate loads without impacting (1) the capability of the EDGs to continue operations at rated frequency and voltage, (2) the capability of the EDGs to accept additional loads, or (3) the ability of the loads to perform their intended functions. Additionally, the physical configuration of the EDGs is not impacted by this change. Therefore, both pre-operational and routine testing demonstrate the capability of the EDGs to perform their intended function.

This change recognizes that the KWS relays may not have performed as originally intended and can not be relied upon to perform a function to assist the EDG response to transients. The function of the KWS relays is not described in the SAR. However, pre-operational testing results may have been influenced by the KWS relays. Specifically, testing has demonstrated that the KWS relay has a minor impact on the frequency recovery times following the addition of the largest ESF loads. The analysis provided in

Calculation 215-DC, Revision 2 assures that the EDG will capably accelerate loads regardless of whether the KWS relay actuates. At this time, the KWS relay will continue to be treated as a quality component, assuring that it continues to perform as expected.

Therefore, this change does not impact the EDGs or its associated loads in a manner which could lead to a malfunction of a different type than previously evaluated.

7. Is there a reduction in the margin of safety as defined in the basis for any Technical Specification? ☐ ☒

Justification:

The description of this change provides a background of the regulatory history of compliance with RG 1.9, Revisions 0 and 2. RG 1.9 provides a basis, acceptable to the NRC, for the selection of diesel generator sets of sufficient capacity and margin to implement GDC 17. As stated in the NRC's September 14, 1981 letter to PG&E, the basis for acceptance of DCPP compliance with RG 1.9 is that testing demonstrated that the objectives of RG 1.9 were met.

The change to clarify the requirements for frequency and voltage dip during load sequencing has no impact on a margin of safety. The revised criteria are consistent with the original licensing basis. This is also true for the addition of a criteria to the DCM to capture an original licensing commitment to perform testing which demonstrates worst case load sequencing. Compliance with these criteria is demonstrated by the pre-operational testing and Calculation 215-DC, Revision 2.

The change to the frequency and voltage recovery criteria from RG 1.9, Revision 0, Regulatory Position C4 criteria of 40 percent of the load-sequence time interval to RG 1.9, Revision 2, C4 criteria of 60 percent of the time interval, does not impact on a margin of safety. It is clear from the review of regulatory history that establishing frequency and voltage recovery within 60 percent of the time interval acceptably demonstrates that the EDGs capably start and accelerate loads. Compliance with this criteria has been acceptable to the NRC during the 1991 EDSFI inspection, in 1993 discussions with the NRR Project Manager, and to the 1997 AE Team Inspection.

DCPP has not adopted other requirements of RG 1.9 Revision 2. However, these requirements were reviewed to determine if the relaxation on frequency and voltage recovery requirements were offset by requirements more stringent than RG 1.9, Revision 0. This review determined that there are no additional requirements provided in the revision which would directly compensate for relaxed recovery times. This is consistent with the understanding that the relaxation in recovery times originated from the NRC's recognition that the recovery times required by RG 1.9 Revision 0 were too restrictive for most applications. Therefore, compliance with RG 1.9, Revision 2 criteria for voltage and frequency recovery clearly meets the objective of RG 1.9, Revision 0 and this change does not impact a margin of safety.

This change recognizes that the KWS relays may not have performed as originally intended and can not be relied upon to perform a function to assist the EDG response to transients. The KWS relay function is not described in the TS, TS bases, or the SAR. Although the KWS relay may have impacted pre-operational testing for the addition of the largest loads, the analysis in Calculation 215-DC, Revision 2 and the testing which supported this analysis clearly demonstrates that regulatory commitments can be met regardless of the performance of the KWS relay.

Based on the above, this change does not involve a reduction in the margin of safety as defined in the basis for any TS.

8. Is there a change to the Fire Protection Program (FPP) (FSAR Update, Section 9.5, including tables, figures and appendices)? ☐† ☒

9. Is there a change to the Quality Assurance (QA) Program (FSAR Update, Chapter 17)? ☐† ☒

†Complete and attach the next form sheet to this 10 CFR 50.59 Safety Evaluation.

Based upon the above criteria and justification, I have determined that an unreviewed safety question is * ☒ is not ☐ involved. A change to the DCPP Technical Specifications is* ☐ is not ☐ involved. Further, any resulting changes to the FPP or QA Program are documented as being within the licensing basis.

Anil K. Kar Anil K. Kar 3/12/98
Preparer Signature Date

REVIEWED: Based upon my independent technical review, I concur with the above conclusion.

Max K. Hentschel M. K. Hentschel 3/12/98
Independent Technical Reviewer Signature Date

*If an unreviewed safety question, change to DCPP Technical Specifications or other license amendment is involved, NRC approval is required prior to implementing the activity or CTE.