



**INDIANA
MICHIGAN
POWER***

A unit of American Electric Power

Indiana Michigan Power
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106
AEP.com

April 7, 2005

AEP:NRC:5811-01
10 CFR 50.90

Docket Nos: 50-315
50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

SUBJECT: Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
Response to Request For Additional Information Regarding License Amendment
Request to Extend the Allowed Outage Times for Emergency Diesel Generators,
69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service
Water (TAC Nos. MC4525 and MC4526)

REFERENCES:

- 1) Letter from J. N. Jensen, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC) Document Control Desk, "Donald C. Cook Nuclear Plant Units 1 and 2 - Docket Nos. 50-315 and 50-316 - Extension of Allowed Outage Times for Emergency Diesel Generators, 69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service Water," AEP:NRC:4811, dated September 21, 2004 (ML042780478).
- 2) Letter from C. F. Lyon, NRC, to M. K. Nazar, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Request for Additional Information Regarding License Amendment Request to Extend Allowed Outage Times (TAC Nos. MC4525 and MC4526)," dated January 18, 2005 (ML043650279).
- 3) Letter from C. F. Lyon, NRC, to M. K. Nazar, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Request for Additional Information Regarding License Amendment Request to Extend Allowed Outage Times (TAC Nos. MC4525 and MC4526)," dated February 25, 2005 (ML050490440).

A001

- 4) Letter from J. N. Jensen, I&M, to NRC Document Control Desk, "Partial Response to Request For Additional Information Regarding License Amendment Request to Extend the Allowed Outage Times for Emergency Diesel Generators, 69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service Water (TAC NOS. MC4525 and MC4526)," AEP:NRC:5811, dated March 18, 2005.

Dear Sir or Madam:

By Reference 1, Indiana Michigan Power Company (I&M) proposed to amend Facility Operating Licenses DPR-58 and DPR-74 for Donald C. Cook Nuclear Plant (CNP), Units 1 and 2. I&M proposed revising the Technical Specifications (TS) to permit extending allowed outage times (AOTs) from 72 hours to 14 days for an inoperable emergency diesel generator, an inoperable component cooling water (CCW) system loop, an inoperable essential service water (ESW) system loop, or an inoperable alternate offsite power circuit (69 kilovolt circuit). The amendment request transmitted by Reference 1 included copies of the CNP Current Technical Specifications (CTS) and the current draft CNP Improved Technical Specifications (ITS) pages that were affected by the proposed amendment. References 2 and 3 transmitted Nuclear Regulatory Commission (NRC) Requests for Additional Information regarding the proposed amendment. A partial response to the Reference 2 Request for Additional Information (RAI) was transmitted by Reference 4. This letter provides the response to the NRC RAI transmitted by Reference 3.

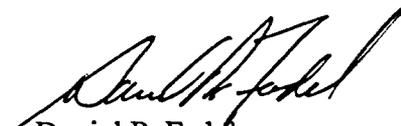
Enclosure 1 to this letter provides an affirmation pertaining to the statements made in this correspondence. Enclosure 2 provides the response to the NRC RAI transmitted by Reference 3. The enclosed response to Reference 3 affects the proposed changes to CTS and ITS requirements for the 69 kilovolt circuit AOT transmitted by the original amendment request (Reference 1). The partial response to Reference 2 transmitted by Reference 4 affects the proposed changes to the CTS and ITS requirements for the CCW and ESW AOTs transmitted by Reference 1. Attachments 1A through 4B to this letter provide a complete set of new CTS and ITS pages, replacing those transmitted by Reference 1. Attachments 1A and 1B provide new marked-up CTS pages for Unit 1 and Unit 2, respectively. Attachments 2A and 2B provide new CTS pages with the proposed changes incorporated. Attachments 3A and 3B provide new marked-up ITS pages for Unit 1 and Unit 2, respectively. Attachments 4A and 4B provide new ITS pages with the proposed changes incorporated. The Bases changes shown in Attachments 1A through 4B are provided for information only. Following NRC approval of the proposed TS changes, the TS Bases will be revised to incorporate these changes in accordance with the CNP TS Bases Control Program. Attachment 5 contains a list of regulatory commitments made in this submittal.

Enclosure 2 to the original amendment request transmitted by Reference 1 included an evaluation of significant hazard considerations performed in accordance with 10 CFR 50.92 and an environmental assessment performed in accordance with 10 CFR 51.22. The information in this letter provides supporting information for the amendment request submitted by Reference 1. The new CTS and ITS pages reflect a reduction in scope of the requested amendment in that the request for extended CCW

and ESW AOTs has been withdrawn, and the request for an extended 69 kilovolt circuit AOT has been limited to a one-time usage. Additionally, the new ITS pages contain structure changes that enhance their clarity but do not affect the requirements. The information provided in this letter, the reduction in scope, and the new TS pages do not alter the validity of the original evaluation of significant hazard considerations for the remaining proposed changes. The environmental assessment provided in Enclosure 2 to Reference 1 also remains valid.

Should you have any questions, please contact Mr. John A. Zwolinski, Safety Assurance Director, at (269) 466-2428.

Sincerely,



Daniel P. Fadel
Engineering Vice President

JRW/jen

Enclosures:

1. Affirmation.
2. Response to Request for Additional Information Regarding License Amendment Request to Extend Allowed Outage Times.

Attachments:

- 1A. Donald C. Cook Nuclear Plant Unit 1 Current Technical Specification Pages Marked To Show Changes.
- 1B. Donald C. Cook Nuclear Plant Unit 2 Current Technical Specification Pages Marked To Show Changes.
- 2A. Donald C. Cook Nuclear Plant Unit 1 Current Technical Specification Pages With the Proposed Changes Incorporated.
- 2B. Donald C. Cook Nuclear Plant Unit 2 Current Technical Specification Pages With the Proposed Changes Incorporated.
- 3A. Donald C. Cook Nuclear Plant Unit 1 Improved Technical Specification Pages Marked To Show Changes.
- 3B. Donald C. Cook Nuclear Plant Unit 2 Improved Technical Specification Pages Marked To Show Changes.
- 4A. Donald C. Cook Nuclear Plant Unit 1 Improved Technical Specification Pages With the Proposed Changes Incorporated.

- 4B. Donald C. Cook Nuclear Plant Unit 2 Improved Technical Specification Pages With the Proposed Changes Incorporated.
5. Regulatory Commitments.
- c: J. L. Caldwell, NRC Region III
K. D. Curry, AEP Ft. Wayne, w/o attachments
J. T. King, MPSC
C. F. Lyon, NRC Washington, DC
MDEQ – WHMD/HWRPS
NRC Resident Inspector

Enclosure 1 to AEP:NRC:5811-01

AFFIRMATION

I, Daniel P. Fadel, being duly sworn, state that I am Engineering Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

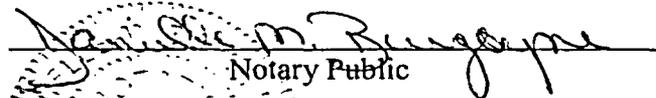
Indiana Michigan Power Company



Daniel P. Fadel
Engineering Vice President

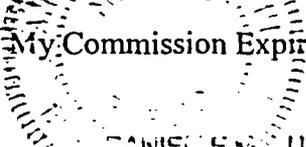
SWORN TO AND SUBSCRIBED BEFORE ME

THIS 7 DAY OF April, 2005



Notary Public

My Commission Expires Apr. 4, 2008



DANIELLE M. BURGUYNE
Notary Public, State of Michigan
County of Genesee
My Commission Expires April 4, 2008
Acting in the County of Barrien

ENCLOSURE 2 TO AEP:NRC:5811-01

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST TO EXTEND ALLOWED OUTAGE TIMES

References for this enclosure are identified on Pages 11, 12, and 13.

By Reference 1, Indiana Michigan Power Company (I&M) proposed to amend Facility Operating Licenses DPR-58 and DPR-74 for Donald C. Cook Nuclear Plant (CNP), Units 1 and 2. I&M proposed revising the Technical Specifications (TS) to permit extending allowed outage times (AOTs) from 72 hours to 14 days for an inoperable emergency diesel generator (EDG), an inoperable component cooling water (CCW) system loop, an inoperable essential service water (ESW) system loop, or an inoperable alternate offsite power circuit (69 kilovolt circuit). The amendment request transmitted by Reference 1 included copies of the CNP Current Technical Specifications (CTS) and the current draft CNP Improved Technical Specifications (ITS) pages that were affected by the proposed amendment. References 2 and 3 transmitted Nuclear Regulatory Commission (NRC) Requests for Additional Information (RAI) regarding the proposed amendment. A partial response to the Reference 2 RAI was transmitted by Reference 4. This enclosure provides the response to the NRC RAI transmitted by Reference 3.

NRC Question 1

Please discuss the communication protocol that has been established between the control room operator at CNP and the transmission system operator. Is the transmission system operator notified in advance that the EDG is going to be taken out of service for an extended period of time?

I&M Response to NRC Question 1

Prior to entering an extended EDG AOT, CNP personnel will hold discussions with the system load dispatcher to 1) ensure no significant grid perturbations are expected during the extended AOT, and 2) request that the system load dispatcher inform CNP if conditions change during an extended AOT such that significant grid perturbations do occur or become expected. This action has been included in the list of regulatory commitments provided in Attachment 5 to this letter.

Additionally, transmission network voltages are monitored during normal operation and adjusted as necessary by the transmission organization using the Cook Plant Online Load Flow (CKOLF) program. The CKOLF program determines expected voltages at the CNP preferred offsite power switchyards assuming a trip of a CNP unit. Readouts from this program are available to operators in the control room. Interface agreements with the transmission organization would result in notification of the CNP control room operators if the CKOLF program predicts that an unacceptable voltage would occur following a unit trip. Upon receipt of such a notification, the offsite circuit would be declared inoperable, applicable TS Actions would be initiated, and the transmission organization would take actions to restore adequate voltages.

NRC Question 2

Please explain why your compensatory measures listed on page 16 of Attachment 1 are adequate. Do you intend to make them regulatory commitments? Please address the regulatory commitments listed below, which have been typically provided for past EDG AOT extension requests.

I&M Response to NRC Question 2

I&M considers that the compensatory measures listed on Page 16 of Enclosure 2 to Reference 1, supplemented as described below, provide adequate defense-in-depth by assuring the availability of redundant and diverse methods of providing power to important components during the extended 69 kilovolt circuit or EDG AOT. These measures also provide assurance, to the maximum extent practical, that challenges to these redundant and diverse methods are minimized during the extended AOTs. These compensatory measures are consistent with compensatory measures established at other plants that have obtained NRC approval of similar amendments based on installation of additional non-safety related diesel generators to supplement existing power supplies. The compensatory measures identified in NRC Question 2 as typical of EDG AOT extension requests from other licensees are restated below, followed by I&M's response.

- A. *The local area weather conditions will be evaluated prior to entering the extended EDG AOT for voluntary planned maintenance. An extended EDG AOT will not be entered for voluntary planned maintenance purposes if weather forecasts for the local area are predicting severe weather conditions that could affect the switchyard or offsite power supply during the AOT.*

Response: These actions are similar to actions identified in the list of compensatory measures provided on Page 16 of Enclosure 2 to the original amendment request transmitted by Reference 1. Those actions have been included in the list of regulatory commitments provided in Attachment 5 to this letter.

- B. *The condition of the switchyard, offsite power supply, and the grid will be evaluated prior to entering the extended AOT for elective maintenance. An extended EDG AOT will not be entered to perform elective maintenance when grid stress conditions are high such as during extreme summer temperatures and/or high demand.*

Response: These actions have been included in the list of regulatory commitments provided in Attachment 5 to this letter.

- C. *No discretionary switchyard maintenance will be allowed. In addition, no discretionary maintenance will be allowed on the main, auxiliary, or startup transformers associated with the unit.*

Response: These actions are similar to actions identified in the list of compensatory measures provided on Page 16 of Enclosure 2 to the original amendment request transmitted by Reference 1. Those actions have been modified to include site specific terminology and have been included in the list of regulatory commitments provided in Attachment 5 to this letter.

- D. *No maintenance or testing that affects the reliability of the train associated with the OPERABLE EDG will be scheduled during the extended AOT. If any testing and maintenance activities must be performed while the extended AOT is in effect, a 10 CFR 50.65(a)(4) evaluation will be performed.*

Response: These actions are similar to actions identified in the list of compensatory measures provided on Page 16 of Enclosure 2 to the original amendment request transmitted by Reference 1. Those actions have been included in the list of regulatory commitments provided in Attachment 5 to this letter. The compensatory measures identified in Reference 1 that are applicable to CCW and ESW AOT extensions have not been included in Attachment 5 since those proposed AOT extensions were withdrawn by Reference 4.

- E. *After entering the extended AOT, the Supplemental Diesel Generator (SDG) will be verified available every 8 hours and treated as protected equipment.*

The staff notes that you propose to verify availability every 72 hours. Please justify why a 72 hour verification is appropriate for CNP and why the SDG will not be treated as protected equipment.

Response:

As shown in Attachments 1A through 4B to this letter, the Bases changes associated with the proposed amendment have been modified to require that SDG availability be verified every 12 hours, when they are credited as available for extending an EDG AOT. At CNP, the operating shifts are 12 hours in duration. This is reflected in the CTS Table 1.2 definitions of surveillance frequency notation. Therefore, the Bases changes will require shiftly verification of SDG availability.

In Reference 1, I&M identified several precedent licensing actions for extending EDG AOTs based on the availability of additional power supplies. Those precedent licensing actions relied on a range of frequencies (e.g., 8 hours – 72 hours) for verifying the availability of the additional power supplies during the extended AOT. The majority of those precedent licensing actions that rely on supplemental non-safety related diesel generators to support extended EDG AOTs were based on verifying the availability of those supplemental diesel generators on a 72 hour frequency during the extended AOT. Therefore, the frequency of once per 12 hours specified in the CNP Bases change is conservative with respect to a majority of the precedent licensing actions.

Additionally, requiring SDG availability verification every 8 hours would result in some operating crews performing the verification twice per shift. I&M considers that the additional operator burden resulting from twice-per-shift verification would not provide a compensating increase in the level of assurance that the SDGs remained available. As committed in Reference 4, the SDGs will be designated as guarded (i.e., protected) equipment when they are credited as available for extending an EDG AOT. This designation provides protection against activities that could affect SDG availability. An action to designate the SDGs as guarded (i.e., protected) equipment during an extended AOT has been included in the list of regulatory commitments provided in Attachment 5 to this letter. I&M considers that the designation as guarded equipment, in conjunction with availability verification every 12 hours, will provide ample assurance that the SDGs will remain available throughout an extended EDG AOT, regardless of whether the shifts are 8 or 12 hours in duration.

- F. *The turbine driven emergency feed water pump will not be taken out of service for planned maintenance activities and will be treated as protected equipment.*

Response: This action was not included in the list of compensatory measures identified in the original amendment request transmitted by Reference 1 because removal of the turbine driven auxiliary feed water pump (TDAFWP) from service for planned or unplanned maintenance during an extended AOT would be assessed by the CNP Configuration Risk Management Program described in Section 4.2.3 of Enclosure 2 to Reference 1. However, for added assurance, an action to designate the TDAFWP as guarded (i.e., protected) equipment during an extended AOT has been included in the list of regulatory commitments provided in Attachment 5 to this letter.

- G. *Should a severe weather warning be issued for the local area that could affect the switchyard or offsite power supply during the AOT, an operator will be available locally at the SDG should local operation of the SDG be required as a result of on-site weather-related damage.*

Response: As described on Pages 12 and 13 of Enclosure 2 to the original amendment request transmitted by Reference 1, the SDG components will be protected against the effects of likely weather-related events that could challenge a loss of offsite power. As also described, the SDGs will start automatically and will be loaded remotely from the control room. The control room will also have remote start and stop capability. These design provisions should preclude the need to dispatch an operator to the SDG. Considering these design provisions, weather conditions severe enough to impair SDG operations may render the area unsafe for an operator and/or may result in a more urgent need for the operator elsewhere in the plant. The list of compensatory measures identified in Reference 1 and added to Attachment 5 of this letter includes monitoring weather conditions and taking appropriate actions if severe weather is expected. I&M considers that the decision to dispatch an operator to the SDG in response to severe

weather is best made by shift management personnel based on the existing conditions and the potential personnel safety hazard. Accordingly, the compensatory measure identified in Item G above is not included in the compensatory measure commitments for CNP.

NRC Question 3

Your submittal states on page 12, 3rd bullet, "the SDG will have the capacity to power at least one train of vital equipment needed to ensure that safe shutdown following an SBO can be maintained." Please compare the load and power requirements of the SDG to the EDG. In addition, specify the time it will take to manually connect the SDG to the safety bus.

I&M Response to NRC Question 3

The combined capacity of both SDGs will be 4500 kilowatts and 5626 kilovolt-amps. The design SDG loads (i.e., one train of vital equipment needed for safe shutdown following an SBO) total 2390 kilowatts and 2755 kilovolt-amps.

The capacity of each EDG is 3500 kilowatts and 4375 kilovolt-amps. The maximum design load at nominal frequency for any of the four EDGs is 3470 kilowatts and 3942 kilovolt-amps.

Procedures for operation of the SDGs have not been finalized. Performance of operator actions needed to manually connect the SDGs to the safety bus following a loss of all alternating current power has been informally timed at approximately 10 minutes.

NRC Question 4

Discuss your reliability and unavailability goals established for the SDGs. In addition, discuss how often SDGs will be tested to maintain the established reliability goals. Would these goals be monitored under the maintenance rule? Please describe and justify your proposed testing and testing frequency.

I&M Response to NRC Question 4

As documented in Reference 4, the SDGs will be included in the CNP Maintenance Rule Program prior to crediting the SDGs as available for extending an EDG AOT. The program is based on NUMARC 93-01 (Reference 5), as endorsed by Regulatory Guide 1.160 (Reference 6). The CNP Maintenance Rule Program establishes performance criteria, including reliability and unavailability criteria, for component functions included in the program. The performance criteria are based on expected maintenance activities, generic industry and vendor inputs, engineering analysis, and Probabilistic Risk Assessment inputs. Reliability and unavailability goals for the SDGs will be established in accordance with this program.

The SDGs will be load tested every quarter, and automatic features (startup, synchronization, breaker and disconnect alignment) will be tested every 18 months. This testing will be

controlled by the current Administrative Technical Requirements (ATR) manual, or by the Technical Requirements Manual which will replace the ATR manual as part of ITS implementation.

In determining the appropriate frequency for SDG load testing, I&M has utilized existing guidance for a station blackout alternate alternating current (AAC) power source, even though the CNP SDGs are not credited for fulfilling 10 CFR 50.63 requirements. Quarterly testing is consistent with the guidance in NUMARC 87-00 (Reference 7) Appendix B, Item B.10, which would require AAC testing at least every three months. Item B-10 also specifies load testing of AACs every refueling outage. Quarterly load testing of the SDGs will exceed that frequency. Regulatory Guide 1.155 (Reference 8) paragraph 3.3.5.5 states only that an AAC power system should be tested periodically. I&M has also considered precedent licensing actions as identified in Reference 1. Of those precedent licensing actions, the Arkansas Nuclear One (ANO) Unit 2 amendment (Reference 9) is most similar to the proposed CNP amendment request. The ANO amendment and the proposed CNP amendment are both supported by plant modifications to permanently install supplemental alternating current power supplies consisting of non-safety related diesel generators. As stated on Page 4 of Attachment 1 to the ANO amendment request (Reference 10), full load testing of the supplemental ANO diesel generator is performed quarterly.

I&M also utilized existing guidance for AAC power source testing in determining the frequency of testing of SDG automatic features. NUMARC 87-00 (Reference 7) Appendix B, Item B.10, specifies that a timed start test be performed on an AAC power source every refueling outage. This frequency is consistent with the planned frequency for testing the SDG automatic features. Testing the SDG automatic features every 18 months is also consistent with the ANO Unit 2 amendment. As stated on Page 4 of Attachment 1 to the ANO amendment request (Reference 10), timed testing of the supplemental ANO diesel generator is performed every 18 months. The 18-month frequency will also allow the testing of SDG automatic features to be performed during scheduled unit shutdowns. This is the preferable condition for testing the SDG automatic feature that isolates the 69/4 kilovolt transformer from plant electrical distribution systems, thereby rendering the alternate power circuit inoperable. After sufficient SDG performance data has been obtained, the frequency of testing SDG automatic features may be extended to 24 months using the guidance in Generic Letter 91-04 (Reference 11).

NRC Question 5

Please discuss why a permanent change to the CNP TS is required to perform one-time maintenance activities on the alternate offsite circuit. Also, provide justification for extending the AOT to 14 days with respect to Regulatory Guide 1.93.

I&M Response to NRC Question 5

As described on Page 11 of Enclosure 2 to Reference 1, I&M had planned to use the extended 69 kilovolt circuit AOT to implement modifications to maintain or improve reliability of the

alternate offsite power supply, in addition to needing the extended AOT to complete the one-time connection of the SDGs to the existing plant electrical system. However, to expedite review of the EDG AOT extension, I&M has elected to reduce the scope of the 69 kilovolt circuit AOT extension from a permanent allowance to a one-time allowance. The one-time allowance will be used to complete connection of the SDGs to the existing plant electrical system and to perform upgrades to the alternate offsite power supply circuit.

Accordingly, the proposed changes to CTS 3.8.1.1 and ITS 3.8.1, and the changes to the associated Bases, have been revised to remove the permanent 69 kilovolt circuit AOT extension allowance. Revised CTS and ITS pages are provided in Attachments 1A through 4B to this letter. In lieu of a permanent 69 kilovolt circuit AOT extension allowance in CTS and ITS, I&M proposes that the following license conditions be added to Section 2.C of the CNP Unit 1 and Unit 2 operating licenses.

If the ITS have not been implemented:

The 72 hour allowed outage time of Technical Specifications 3.8.1.1 Action "a" may be extended to 14 days one time for the 69 kilovolt (alternate) independent offsite power circuit when it is made inoperable to complete connection of the Supplemental Diesel Generators to the existing plant electrical system and to perform upgrades to the alternate offsite power supply circuit.

If the ITS have been implemented:

The 72 hour Completion Time of Technical Specifications 3.8.1 Required Action A.3 may be extended to 14 days one time for the 69 kilovolt (alternate) qualified offsite circuit when it is made inoperable to complete connection of the Supplemental Diesel Generators to the existing plant electrical system and to perform upgrades to the alternate offsite power supply circuit.

The regulatory position stated in Regulatory Guide 1.93 is guidance for establishing permanent TS AOTs for electric power supplies. Accordingly, I&M considers that the regulatory position stated in Regulatory Guide 1.93 would not apply to a one-time license condition allowance. I&M may request additional one-time 69 kilovolt circuit AOT extensions in the future so as to complete system upgrades such as those described on Page 11 of Enclosure 2 to Reference 1.

NRC Question 6

It is the staff's understanding that the 69kV power source is designated as one of the offsite power sources. However, the staff notes after reviewing the updated final safety analysis report that transformer TR12EP-1, which is powered from 69kV source, is sized only to power one train of the engineered safeguards equipment in one unit while supplying one train of shutdown equipment in the other unit. It is not clear to the staff how this source satisfies the requirements

of GDC-17 with regard to capacity. Please provide the design-basis for your 345kV and 69kV systems.

I&M Response to NRC Question 6

As described in Section 1.4 of the CNP Updated Final Safety Analysis Report (UFSAR), CNP was designed and licensed to plant specific design criteria (PSDC) rather than the General Design Criteria (GDC) in Appendix A to 10 CFR 50. The GDC in 10 CFR 50 Appendix A differ both in numbering and content from the PSDC adopted for CNP. There is no concise PSDC statement corresponding to GDC 17, "Electric Power Systems."

As shown in figure 8.1-2A of the CNP UFSAR, 345/34.5 kilovolt transformer TR5 and/or 765/345/34.5 kilovolt transformer TR4 supply reserve auxiliary transformers (RATs) TR101AB, TR101CD, TR201AB, and TR201CD. Each RAT has the capacity to supply a train of safeguards equipment. The design basis for the alternate offsite power circuit (69 kilovolt circuit), is as described in Chapter 8 of the CNP UFSAR and restated above in NRC Question 6. This design was recognized in I&M's analysis of the adequacy of station electrical system voltages transmitted to the NRC by Reference 12, and was acknowledged by the NRC as documented in Reference 13. In subsequent correspondence (Reference 14), I&M also stated that acceptable system voltages could be maintained with transformer TR12EP-1 supplying both safety trains in one unit under accident conditions and one safety train in the opposite unit under shutdown conditions. However, this loading would exceed the transformer rated capacity, resulting in a small decrease in transformer life (approximately 3 percent in 24 hours). Therefore, the UFSAR appropriately identifies a design basis that is consistent with the transformer TR12EP-1 rated capacity. In Reference 15, the NRC acknowledged that transformer TR12EP-1 did not have the capacity to supply both safety trains on both units concurrently while maintaining acceptable system voltages.

NRC Question 7

It is stated that the SDGs will be available prior to removing the EDG from service for the extended preplanned maintenance work or prior to exceeding the 72 hours AOT for the extended unplanned corrective maintenance work. Does this mean that the SDG will be tested to assure its operability before an EDG is declared inoperable? Please clarify.

I&M Response to NRC Question 7

As shown in Attachments 1A through 4B to this letter, the Bases changes associated with the proposed amendment state that SDG availability is assured by 1) verifying the SDG equipment is mechanically and electrically ready for automatic operation; 2) verifying 24-hour onsite fuel supply is available for each SDG; and 3) ensuring the SDGs are aligned to automatically supply power to 69 kilovolt Substation 4.16-kV Bus 1. This verification does not require that the SDGs be tested immediately prior to crediting them as available. The SDGs will be permanently installed plant equipment, subject to the periodic testing described in the response to NRC

Question 4, performance monitoring in accordance with 10 CFR 50.65, preventive maintenance programs, and the verification described in the Bases changes. These measures will provide the necessary assurance of SDG availability prior to crediting them as available in support of an extended EDG AOT. This is consistent with the EDG operability requirements in existing CTS 3.8.1 Actions b and e, and draft ITS 3.8.1 Required Actions B.1 through B.4. These specifications require that an EDG be operable if the other train EDG is made or found inoperable. Otherwise, the unit must be shut down within 8 hours. However, these specifications do not require that the remaining operable EDG be tested, provided that the remaining operable EDG is determined to not be inoperable due to common cause failure.

The provisions in the CNP Bases changes for verifying SDG availability are also consistent with the precedent licensing action identified in Reference 1 for ANO 2. The ANO 2 licensee submittals and the approved amendment do not commit or require testing of the supplemental non-safety related diesel generator immediately prior to an extended EDG AOT. There were two other plants identified in Reference 1 that were granted amendments allowing extended EDG AOTs supported by supplemental non-safety related diesel generators. These plants, Crystal River 3 and Waterford 3, are authorized to use temporary non-safety related diesel generators to support the extended AOTs. Therefore, it is appropriate that these plants test the temporary non-safety related diesel generators prior to crediting them as available, since there may be no prior demonstration of reliability. Since the CNP SDGs will be permanently installed and subject to the above described periodic testing, performance monitoring, preventive maintenance, and availability verification, I&M does not consider that testing immediately prior to an extended EDG AOT is necessary to provide assurance of availability.

NRC Question 8

It is stated that the EDGs are demonstrating adequate reliability. Please provide the current reliability and unavailability of the EDGs at CNP. Also, evaluate how these actual values relate to the target values committed to for station blackout conditions.

I&M Response to NRC Question 8

The EDG reliability trigger value is 2 maintenance preventable functional failures (MPFFs) per 25 demands. The current actual values are as follows:

EDG	Unit 1 AB	Unit 1 CD	Unit 2 AB	Unit 2 CD
MPFF per 25 Demands	0	1	1	0

The target EDG reliability for station blackout conditions is 0.975, as documented in Section 8.7.1 of the CNP UFSAR. The current EDG unavailability target is less than 432 hours per 24 months. This corresponds to an availability of approximately 97.5 percent. The current actual unavailabilities are as follows:

EDG	Unit 1 AB	Unit 1 CD	Unit 2 AB	Unit 2 CD
Unavailable Hours per 24 Months	81.97	160.18	181.07	99.37

NRC Question 9

The staff notes that there appears to be inconsistency between the proposed changes to the current TS and the revised current draft Improved Technical Specification (ITS) with regard to (1) the availability of the SDGs and one of the offsite power sources during the extended AOT of the essential service water system, and (2) the availability of the SDGs as a condition for taking the EDG out of service for the extended AOT. Please explain how the proposed changes to current TS and your draft ITS are consistent, or propose appropriate changes to make them consistent.

I&M Response to NRC Question 9

I&M considers the proposed ITS changes submitted by Reference 1 to be consistent with the proposed CTS changes. However, to enhance clarity, the structure of the proposed ITS has been revised to be similar to the ITS changes approved by the NRC for Calvert Cliffs in Reference 16. The revised ITS pages are provided in Attachments 3A through 4B.

NRC Question 10

The staff notes that the proposed change does not include TS requirements of verification that the required systems, subsystems, trains, components, and devices that depend on the remaining EDG during the extended EDG AOT. Please explain this apparent omission.

I&M Response to NRC Question 10

As described below, the existing CTS and draft ITS both contain requirements that ensure operability of required systems, subsystems, trains, components, and devices that depend on the remaining EDG during the extended EDG AOT. There was no omission of needed TS requirements.

CTS

Existing CTS 3.0.5 states in part (emphasis added):

When a system, subsystem, train, component or device is determined to be inoperable solely because its emergency power source is inoperable, or solely because its normal power source is inoperable, it may be considered OPERABLE for the purpose of satisfying the requirements of its applicable Limiting Condition for Operation, provided: (1) its corresponding normal or emergency power source is OPERABLE; and (2) all of its

redundant system(s), subsystem(s), train(s), component(s) and device(s) are OPERABLE, or likewise satisfy the requirements of this specification.

The existing Bases for CTS 3.0.5 state in part (emphasis added):

This specification delineates what additional conditions must be satisfied to permit operation to continue, consistent with the ACTION statements for power sources, when a normal or emergency power source is not OPERABLE. It specifically prohibits operation when one division is inoperable because its normal or emergency power source is inoperable and a system, subsystem, train, component or device in another division is inoperable for another reason.

The existing Bases for CTS 3.0.5 also provide examples showing how, when an EDG is inoperable, the specification functions to ensure operability of required systems, subsystems, trains, components, and devices that depend on the remaining EDG. Existing CTS 3.0.5 is unaffected by the proposed amendment.

ITS

If an EDG were inoperable, Required Action C.2 of TS 3.8.1 in the proposed ITS transmitted by the original amendment request (Reference 1) would require operators to:

Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.

Therefore, if a required system, subsystem, train, component, or device that depended on the remaining EDG were inoperable during an extended EDG AOT, both trains of the required features would be declared inoperable and the applicable Conditions and Required Actions would be followed. Required Action C.2 of TS 3.8.1 has been retained as Required Action B.3 in the revised ITS provided in Attachments 3A through 4B.

References

1. Letter from J. N. Jensen, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Units 1 and 2 - Docket Nos. 50-315 and 50-316 - Extension of Allowed Outage Times for Emergency Diesel Generators, 69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service Water," AEP:NRC:4811, dated September 21, 2004 (ML042780478).
2. Letter from C. F. Lyon, NRC, to M. K. Nazar, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Request for Additional Information Regarding License Amendment Request to Extend Allowed Outage Times (TAC Nos. MC4525 and MC4526)," dated January 18, 2005 (ML043650279).

3. Letter from C. F. Lyon, NRC, to M. K. Nazar, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Request for Additional Information Regarding License Amendment Request to Extend Allowed Outage Times (TAC Nos. MC4525 and MC4526)," dated February 25, 2005 (ML050490440).
4. Letter from J. N. Jensen, I&M, to NRC Document Control Desk, "Partial Response to Request For Additional Information Regarding License Amendment Request to Extend the Allowed Outage Times for Emergency Diesel Generators, 69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service Water (TAC Nos. MC4525 and MC4526)," AEP:NRC:5811, dated March 18, 2005.
5. Nuclear Management and Resources Council document NUMARC 93-01, "Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2, dated April 1996.
6. NRC Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2, dated March 1, 1997.
7. Nuclear Management and Resources Council document NUMARC 87-00, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors," Revision 1, dated August 1991.
8. NRC Regulatory Guide 1.155, "Station Blackout," dated August 1, 1988.
9. Letter from T. W. Alexion, NRC, to C. G. Anderson, Entergy, "Arkansas Nuclear One, Unit No. 2 – Issuance of Amendment re: Extension of Emergency Diesel Generator Allowable Outage Time (TAC No. MB6361)," dated August 8, 2003 (ML032240050).
10. Letter from C. G. Anderson, Entergy Operations, Inc., to NRC Document Control Desk, "Arkansas Nuclear One, Unit 2, Docket No. 50-368, License Amendment Request, Extension of Emergency Diesel Generator Allowable Outage Time," dated September 19, 2002 (ML022680507).
11. NRC Generic Letter 91-04, "Changes in Technical Specifications Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991.
12. Letter from J. E. Dolan, I&M, to H. R. Denton, NRC, AEP:NRC:00268, dated December 17, 1979.
13. Letter from J. E. Dolan, I&M, to H. R. Denton, NRC, AEP:NRC:00268B, dated May 28, 1980.
14. Letter from J. E. Dolan, I&M, to H. R. Denton, NRC, AEP:NRC:00268C, dated January 27, 1981.

15. Letter from S. A. Varga, NRC, to J. Dolan, I&M, dated June 1, 1981.
16. Letter from G. S. Vissing, NRC, to G. Vanderheyden, Calvert Cliffs Nuclear Power Plant, Inc, "Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 - Amendment re: Extension of Diesel Generator Required Action Time (TAC Nos. MC8976 and MC8977)," dated April 13, 2004 (ML040980651).

Attachment 1A to AEP:NRC:5811-01

DONALD C. COOK NUCLEAR PLANT UNIT 1
CURRENT TECHNICAL SPECIFICATION PAGES
MARKED TO SHOW CHANGES

For clarity, all previous revision bars have been removed from these pages.
Only pages containing new or deleted text have been provided.

3/4 8-1
B 3/4 8-1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Two separate and independent diesel generators, each with:
 1. A separate day fuel tank containing a minimum of 70 gallons of fuel,
 2. A separate fuel storage system* containing a minimum indicated volume of 46,000 gallons of fuel, and
 3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With an offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. offsite source by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least two offsite circuits and two diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated; restore diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, unless the following condition exists:

1. The requirement to restore the diesel generators to OPERABLE status within 72 hours may be extended to 14 days if both SDGs are verified available, and
2. If at any time during the above identified 14-day period, one or both SDGs become unavailable, either restore both SDGs to available status within 72 hours (not to exceed 14 days from the time the required diesel generator of LCO 3.8.1.1.b originally became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

At the number of failures for the inoperable diesel indicated in Table 4.8-1 perform the Additional Reliability Actions prescribed in Table 4.8-1.

*Tanks are separate between diesels but shared between Units 1 and 2.

3/4 BASES
3/4.8 ELECTRICAL POWER SYSTEMS

The OPERABILITY of the A.C. and D.C power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criteria 17 of Appendix "A" to 10 CFR 50 as delineated in the 1971 version of Safety Guide 6.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one of each of the onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source.

An independent onsite standby AC power source consisting of two supplemental diesel generators (SDGs) is provided to automatically supply power to 4.16kV bus 1, which is normally supplied by the 69 kV alternate qualified offsite circuit and can be manually aligned to directly supply the 4.16 kV emergency buses. The SDGs are used to support extended Allowed Outage Times (AOTs) in the event of an inoperable emergency diesel generator (EDG). When one EDG is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the AOT can be extended from 72 hours to 14 days if both SDGs are verified available for backup operation. The SDGs will be available prior to removing the EDG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour AOT for the extended unplanned corrective maintenance work. The SDGs shall not be used to extend the AOT for more than one inoperable EDG (of the four total EDGs for both units) at a time. SDG mechanical and electrical reliability is demonstrated by performance of periodic testing and inspections during normal operations. Verification of SDG availability requires: 1) verifying that the SDG equipment is mechanically and electrically ready for automatic operation; 2) verifying that the onsite diesel fuel oil supply is sufficient to allow both SDGs to be operated continuously at design load for 24 hours; and 3) verifying that the SDGs are aligned to automatically supply power to the 4.16kV bus 1, which can be manually aligned to directly supply the 4.16kV emergency buses. This verification will be repeated for both SDGs at least once every 12 hours. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the EDG AOT reverts back to 72-hours. The 72 hours begins with the discovery of unavailability of one or both SDGs, not to exceed a total of 14 days from the time the EDG became inoperable. A Configuration Risk Management Program (CRMP) shall also be implemented prior to the AOT exceeding 72 hours to assess risk of any activities to be performed affecting Unit 1 operation during the extended period beyond 72 hours that the required EDG is inoperable. In addition, planned maintenance or inspections using the 14 day AOT shall be limited to once per operating cycle per train.

Surveillance requirement 4.8.1.1.a ensures proper circuit continuity for the offsite A.C. power sources and the associated distribution system by verifying correct breaker alignment and indicated power availability. The 7-day frequency is adequate since information is available to the control room to alert operators, and the offsite transmission network has been analyzed to ensure adequacy with minimum predicted low voltage occurrences.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during Modes 5 and 6, and during movement of irradiated fuel ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status.

If the minimum specified A.C. and D.C. distribution systems and components are not OPERABLE, sufficiently conservative ACTIONS are specified (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions). Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These ACTIONS minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required A.C. and

Attachment 1B to AEP:NRC: 5811-01

DONALD C. COOK NUCLEAR PLANT UNIT 2
CURRENT TECHNICAL SPECIFICATION PAGES
MARKED TO SHOW CHANGES

For clarity, all previous revision bars have been removed from these pages.
Only pages containing new or deleted text have been provided.

3/4 8-1
B 3/4 8-1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Two separate and independent diesel generators, each with:
 1. A separate day fuel tank containing a minimum of 70 gallons of fuel,
 2. A separate fuel storage system* containing a minimum indicated volume of 46,000 gallons of fuel, and
 3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With an offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. offsite source by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least two offsite circuits and two diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- a. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated; restore diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, unless the following condition exists:
 1. The requirement to restore the diesel generators to OPERABLE status within 72 hours may be extended to 14 days if both SDGs are verified available, and
 2. If at any time during the above identified 14-day period, one or both SDGs become unavailable, either restore both SDGs to available status within 72 hours (not to exceed 14 days from the time the required diesel generator of LCO 3.8.1.1.b originally became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

At the number of failures for the inoperable diesel indicated in Table 4.8-1 perform the Additional Reliability Actions prescribed in Table 4.8-1.

*Tanks are separate between diesels but shared between Units 1 and 2.

The OPERABILITY of the A.C. and D.C power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criteria 17 of Appendix "A" to 10 CFR 50 as delineated in the 1971 version of Safety Guide 6.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one of each of the onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source.

An independent onsite standby AC power source consisting of two supplemental diesel generators (SDGs) is provided to automatically supply power to 4.16kV bus 1, which is normally supplied by the 69 kV alternate qualified offsite circuit and can be manually aligned to directly supply the 4.16 kV emergency buses. The SDGs are used to support extended Allowed Outage Times (AOTs) in the event of an inoperable emergency diesel generator (EDG). When one EDG is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the AOT can be extended from 72 hours to 14 days if both SDGs are verified available for backup operation. The SDGs will be available prior to removing the EDG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour AOT for the extended unplanned corrective maintenance work. The SDGs shall not be used to extend the AOT for more than one inoperable EDG (of the four total EDGs for both units) at a time. SDG mechanical and electrical reliability is demonstrated by performance of periodic testing and inspections during normal operations. Verification of SDG availability requires: 1) verifying that the SDG equipment is mechanically and electrically ready for automatic operation; 2) verifying that the onsite diesel fuel oil supply is sufficient to allow both SDGs to be operated continuously at design load for 24 hours; and 3) verifying that the SDGs are aligned to automatically supply power to the 4.16kV bus 1, which can be manually aligned to directly supply the 4.16kV emergency buses. This verification will be repeated for both SDGs at least once every 12 hours. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the EDG AOT reverts back to 72-hours. The 72 hours begins with the discovery of unavailability of one or both SDGs, not to exceed a total of 14 days from the time the EDG became inoperable. A Configuration Risk Management Program (CRMP) shall also be implemented prior to the AOT exceeding 72 hours to assess risk of any activities to be performed affecting Unit 2 operation during the extended period beyond 72 hours that the required EDG is inoperable. In addition, planned maintenance or inspections using the 14 day AOT shall be limited to once per operating cycle per train.

Surveillance requirement 4.8.1.1.a ensures proper circuit continuity for the offsite A.C. power sources and the associated distribution system by verifying correct breaker alignment and indicated power availability. The 7-day frequency is adequate since information is available to the control room to alert operators, and the offsite transmission network has been analyzed to ensure adequacy with minimum predicted low voltage occurrences.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during Modes 5 and 6 ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status.

If the minimum specified A.C. and D.C. distribution systems and components are not OPERABLE, sufficiently conservative ACTIONS are specified (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions). Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These ACTIONS minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required A.C. and

Attachment 2A to AEP:NRC: 5811-01

DONALD C. COOK NUCLEAR PLANT UNIT 1
CURRENT TECHNICAL SPECIFICATION PAGES WITH THE PROPOSED
CHANGES INCORPORATED

All affected Technical Specification pages have been provided
Only Bases pages containing new or deleted text have been provided.

3/4 8-1
B 3/4 8-1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Two separate and independent diesel generators, each with:
 - 1. A separate day fuel tank containing a minimum of 70 gallons of fuel,
 - 2. A separate fuel storage system* containing a minimum indicated volume of 46,000 gallons of fuel, and
 - 3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With an offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. offsite source by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least two offsite circuits and two diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- a. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated; restore diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, unless the following condition exists:
 - 1. The requirement to restore the diesel generators to OPERABLE status within 72 hours may be extended to 14 days if both SDGs are verified available, and
 - 2. If at any time during the above identified 14-day period, one or both SDGs become unavailable, either restore both SDGs to available status within 72 hours (not to exceed 14 days from the time the required diesel generator of LCO 3.8.1.1.b originally became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

At the number of failures for the inoperable diesel indicated in Table 4.8-1 perform the Additional Reliability Actions prescribed in Table 4.8-1.

*Tanks are separate between diesels but shared between Units 1 and 2.

The OPERABILITY of the A.C. and D.C power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criteria 17 of Appendix "A" to 10 CFR 50 as delineated in the 1971 version of Safety Guide 6.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one of each of the onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source.

An independent onsite standby AC power source consisting of two supplemental diesel generators (SDGs) is provided to automatically supply power to 4.16kV bus 1, which is normally supplied by the 69 kV alternate qualified offsite circuit and can be manually aligned to directly supply the 4.16 kV emergency buses. The SDGs are used to support extended Allowed Outage Times (AOTs) in the event of an inoperable emergency diesel generator (EDG). When one EDG is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the AOT can be extended from 72 hours to 14 days if both SDGs are verified available for backup operation. The SDGs will be available prior to removing the EDG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour AOT for the extended unplanned corrective maintenance work. The SDGs shall not be used to extend the AOT for more than one inoperable EDG (of the four total EDGs for both units) at a time. SDG mechanical and electrical reliability is demonstrated by performance of periodic testing and inspections during normal operations. Verification of SDG availability requires: 1) verifying that the SDG equipment is mechanically and electrically ready for automatic operation; 2) verifying that the onsite diesel fuel oil supply is sufficient to allow both SDGs to be operated continuously at design load for 24 hours; and 3) verifying that the SDGs are aligned to automatically supply power to the 4.16kV bus 1, which can be manually aligned to directly supply the 4.16kV emergency buses. This verification will be repeated for both SDGs at least once every 12 hours. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the EDG AOT reverts back to 72-hours. The 72 hours begins with the discovery of unavailability of one or both SDGs, not to exceed a total of 14 days from the time the EDG became inoperable. A Configuration Risk Management Program (CRMP) shall also be implemented prior to the AOT exceeding 72 hours to assess risk of any activities to be performed affecting Unit 1 operation during the extended period beyond 72 hours that the required EDG is inoperable. In addition, planned maintenance or inspections using the 14 day AOT shall be limited to once per operating cycle per train.

Surveillance requirement 4.8.1.1.1.a ensures proper circuit continuity for the offsite A.C. power sources and the associated distribution system by verifying correct breaker alignment and indicated power availability. The 7-day frequency is adequate since information is available to the control room to alert operators, and the offsite transmission network has been analyzed to ensure adequacy with minimum predicted low voltage occurrences.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during Modes 5 and 6, and during movement of irradiated fuel ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status.

If the minimum specified A.C. and D.C. distribution systems and components are not OPERABLE, sufficiently conservative ACTIONS are specified (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions). Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These ACTIONS minimize the probability of the

Attachment 2B to AEP:NRC:5811-01

DONALD C. COOK NUCLEAR PLANT UNIT 2
CURRENT TECHNICAL SPECIFICATION PAGES WITH THE PROPOSED
CHANGES INCORPORATED

All affected Technical Specification pages have been provided
Only Bases pages containing new or deleted text have been provided.

3/4 8-1
B 3/4 8-1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Two separate and independent diesel generators, each with:
 - 1. A separate day fuel tank containing a minimum of 70 gallons of fuel,
 - 2. A separate fuel storage system* containing a minimum indicated volume of 46,000 gallons of fuel, and
 - 3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With an offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. offsite source by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least two offsite circuits and two diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated; restore diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, unless the following condition exists:
 - 1. The requirement to restore the diesel generators to OPERABLE status within 72 hours may be extended to 14 days if both SDGs are verified available, and
 - 2. If at any time during the above identified 14-day period, one or both SDGs become unavailable, either restore both SDGs to available status within 72 hours (not to exceed 14 days from the time the required diesel generator of LCO 3.8.1.1.b originally became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

At the number of failures for the inoperable diesel indicated in Table 4.8-1 perform the Additional Reliability Actions prescribed in Table 4.8-1.

*Tanks are separate between diesels but shared between Units 1 and 2.

3/4 BASES
3/4.8 ELECTRICAL POWER SYSTEMS

The OPERABILITY of the A.C. and D.C power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criteria 17 of Appendix "A" to 10 CFR 50 as delineated in the 1971 version of Safety Guide 6.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one of each of the onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source.

An independent onsite standby AC power source consisting of two supplemental diesel generators (SDGs) is provided to automatically supply power to 4.16kV bus 1, which is normally supplied by the 69 kV alternate qualified offsite circuit and can be manually aligned to directly supply the 4.16 kV emergency buses. The SDGs are used to support extended Allowed Outage Times (AOTs) in the event of an inoperable emergency diesel generator (EDG). When one EDG is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the AOT can be extended from 72 hours to 14 days if both SDGs are verified available for backup operation. The SDGs will be available prior to removing the EDG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour AOT for the extended unplanned corrective maintenance work. The SDGs shall not be used to extend the AOT for more than one inoperable EDG (of the four total EDGs for both units) at a time. SDG mechanical and electrical reliability is demonstrated by performance of periodic testing and inspections during normal operations. Verification of SDG availability requires: 1) verifying that the SDG equipment is mechanically and electrically ready for automatic operation; 2) verifying that the onsite diesel fuel oil supply is sufficient to allow both SDGs to be operated continuously at design load for 24 hours; and 3) verifying that the SDGs are aligned to automatically supply power to the 4.16kV bus 1, which can be manually aligned to directly supply the 4.16kV emergency buses. This verification will be repeated for both SDGs at least once every 12 hours. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the EDG AOT reverts back to 72-hours. The 72 hours begins with the discovery of unavailability of one or both SDGs, not to exceed a total of 14 days from the time the EDG became inoperable. A Configuration Risk Management Program (CRMP) shall also be implemented prior to the AOT exceeding 72 hours to assess risk of any activities to be performed affecting Unit 2 operation during the extended period beyond 72 hours that the required EDG is inoperable. In addition, planned maintenance or inspections using the 14 day AOT shall be limited to once per operating cycle per train.

Surveillance requirement 4.8.1.1.1.a ensures proper circuit continuity for the offsite A.C. power sources and the associated distribution system by verifying correct breaker alignment and indicated power availability. The 7-day frequency is adequate since information is available to the control room to alert operators, and the offsite transmission network has been analyzed to ensure adequacy with minimum predicted low voltage occurrences.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during Modes 5 and 6 ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status.

If the minimum specified A.C. and D.C. distribution systems and components are not OPERABLE, sufficiently conservative ACTIONS are specified (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions). Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These ACTIONS minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required A.C. and

Attachment 3A to AEP:NRC:5811-01

DONALD C. COOK NUCLEAR PLANT UNIT 1
IMPROVED TECHNICAL SPECIFICATION PAGES
MARKED TO SHOW CHANGES

Only pages containing new or deleted text or changes to section numbers have been provided.

3.8.1-3
3.8.1-4
3.8.1-5
B 3.8.1-3
B 3.8.1-6
B 3.8.1-8
B 3.8.1-9
B 3.8.1-10
B 3.8.1-11
B 3.8.1-12
B 3.8.1-13
B 3.8.1-14
B 3.8.1-15
B 3.8.1-35

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. One required DG inoperable.</p>	<p>B.1 Verify both supplemental diesel generators are available.</p>	<p>1 hour <u>AND</u> Once per 12 hours thereafter</p>
	<p><u>AND</u></p>	
	<p>B.12 -----NOTE----- Not applicable if a required Unit 2 DG is inoperable. -----</p>	
	<p>Perform SR 3.8.1.1 for the required offsite circuit(s).</p>	<p>1 hour <u>AND</u></p>
	<p><u>AND</u></p>	<p>Once per 8 hours thereafter</p>
	<p>B.23 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.</p>	<p>4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)</p>
	<p><u>AND</u></p>	
	<p>B.34.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.</p>	<p>24 hours</p>
	<p><u>OR</u></p>	
	<p>B.34.2 Perform SR 3.8.1.2 for OPERABLE DG(s).</p> <p><u>AND</u></p>	<p>24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>B.45 Restore required DG to OPERABLE status.</p>	<p>72 hours 14 days <u>AND</u> 6:17 days from discovery of failure to meet LCO 3.8.1.a or b</p>
<p>C. Required Action and associated Completion Time of Required Action B.1 not met.</p>	<p>C.1 Restore both supplemental diesel generators to available status. <u>OR</u> C.2 Restore required DG to OPERABLE status.</p>	<p>72 hours 72 hours</p>
<p>GD. Two required offsite circuits inoperable.</p>	<p>GD.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable. <u>AND</u> GD.2 Restore one required offsite circuit to OPERABLE status.</p>	<p>12 hours from discovery of Condition GD concurrent with inoperability of redundant required features 24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>DE. One required offsite circuit inoperable.</p> <p><u>AND</u></p> <p>One required DG inoperable.</p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition DE is entered with no AC power source to any train. -----</p> <p>DE.1 Restore required offsite circuit to OPERABLE status.</p> <p><u>OR</u></p> <p>DE.2 Restore required DG to OPERABLE status.</p>	<p>12 hours</p> <p>12 hours</p>
<p>EF. Two required DGs inoperable.</p>	<p>EF.1 Restore one required DG to OPERABLE status.</p>	<p>2 hours</p>
<p>FG. Required Action and associated Completion Time of Condition A, B, C, D, E or EF not met.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Required Action B.2, B.3, B.4.1, B.4.2, or B.5 not met.</p>	<p>FG.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>FG.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>
<p>GH. Three or more required AC sources inoperable.</p>	<p>GH.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

BASES

BACKGROUND (continued)

In the event of a loss of preferred power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a loss of coolant accident (LOCA).

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within approximately 1 minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service.

Ratings for Train A and Train B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 3500 kW with 10% overload permissible for up to 2 hours in any 24 hour period (however the continuous service rating is not exceeded in the post accident load profile). The ESF loads that are powered from the 4.16 kV emergency buses are listed in Reference 4.

Each DG has its own starting air system consisting of two redundant starting air trains. Each train has one start receiver that normally contains sufficient air for two EDG start sequences. One start sequence includes a 10 second continuous crank and the second start sequence includes an actual run of the DG. The energy used for the first start sequence is greater than that required for the DG run sequence. Also each DG has its own day tank and fuel oil transfer system. The fuel oil transfer system, which includes two transfer pumps, is capable of transferring fuel oil from the associated fuel oil storage tank to the day tank. Each transfer pump is capable of maintaining the level in the day tank when the associated DG is operating at full load.

An independent onsite standby AC power source consisting of two supplemental diesel generators (SDGs) is provided to automatically supply power to 4.16 kV bus 1, which is normally supplied by the 69 kV alternate qualified offsite circuit and can be manually aligned to directly supply the 4.16 kV emergency buses. The SDGs are used to support extended Completion Times in the event of an inoperable DG.

APPLICABLE
SAFETY
ANALYSES

The initial conditions of DBA and transient analyses in the UFSAR, Chapter 14 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

BASES

APPLICABILITY (continued)

provided the associated required equipment is inoperable. This exception is intended to allow declaring the Unit 2 supported equipment inoperable either in lieu of declaring the Unit 2 AC sources inoperable, or at any time subsequent to entering ACTIONS for an inoperable Unit 2 AC Source.

This exception is acceptable since, with the Unit 2 powered equipment inoperable and the associated ACTIONS entered, the Unit 2 AC sources provide no additional assurance of meeting the above criteria.

The AC power requirements for MODES 5 and 6 and other conditions in which AC sources are required are covered in LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

To ensure a highly reliable power source remains with one required offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit(s) on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition GD, for two offsite circuits inoperable, is entered. As Noted, this Required Action is not applicable if only a required Unit 2 offsite circuit is inoperable.

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required features failures consist of inoperable features associated with a train, redundant to the train that has no offsite power available.

BASES

ACTIONS (continued)

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to ~~72 hours~~ 14 days. This could lead to a total of ~~444 hours~~ 17 days, since initial failure to meet the LCO, to restore the offsite circuit. At this time, a DG could again become inoperable, the circuit restored OPERABLE, and an additional ~~72 hours~~ 14 days (for a total of ~~931 days~~) allowed prior to complete restoration of the LCO. The ~~617 day~~ Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and ~~617 day~~ Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that LCO 3.8.1.a or b was initially not met, instead of at the time Condition A was entered.

B.1

In order to extend the Completion Time for an inoperable DG from 72 hours to 14 days, the SDGs must be verified within 1 hour after the required DG is declared inoperable. The SDGs shall not be used to extend the Completion Time for more than one inoperable DG (of the four total DGs for both units) at a time. SDG mechanical and electrical reliability is demonstrated by performance of periodic testing and inspections during normal operations. Verification of SDG availability requires: 1) verifying that the SDG equipment is mechanically and electrically ready for automatic operation; 2) verifying that the onsite diesel fuel oil supply is sufficient to allow both SDGs to be operated continuously at design load for 24 hours; and 3) verifying that the SDGs are aligned to automatically supply power to the 4.16 kV bus 1, which can be manually aligned to directly supply the 4.16 kV emergency buses. This verification will be repeated for both SDGs at least once every 12 hours.

BASES

ACTIONS (continued)

B.42

To ensure a highly reliable power source remains with an inoperable DG, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered. As Noted, this Required Action is not applicable if a required Unit 2 DG is inoperable.

B.23

Required Action B.23 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has an inoperable DG.

The Completion Time for Required Action B.23 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

- a. An inoperable DG exists; and
- b. A redundant required feature on another train is inoperable.

If at any time during the existence of this Condition (one required DG inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering one required DG inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently is acceptable because it minimizes risk while

BASES

ACTIONS (continued)

allowing time for restoration before subjecting the unit to transients associated with shutdown.

In this condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and the Unit 2 Class 1E Electrical Power Distribution System when required to be OPERABLE. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.34.1 and B.34.2

Required Action B.34.1 provides an allowance to avoid unnecessary testing of OPERABLE DG(s). If it can be determined that the cause of an inoperable DG does not exist on the other required OPERABLE DG(s), SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on other DG(s), the other DG(s) would be declared inoperable upon discovery and Condition EF or GH of LCO 3.8.1 would be entered. Once the failure is repaired, the common cause failure no longer exists, and Required Action B.34.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG(s), performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of those DG(s).

In the event the inoperable DG is restored to OPERABLE status prior to completing either B.34.1 or B.34.2, the plant corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. 7), 24 hours is reasonable to confirm that the OPERABLE DG(s) is not affected by the same problem as the inoperable DG.

B.45

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition B for a period that should not exceed 72 hours. However, an evaluation performed in accordance with Regulatory Guide 1.177 (Ref. 13) has determined that operation may continue in Condition B for a period that should not exceed 14 days if both SDGs are available.

BASES

ACTIONS (continued)

Therefore, when one required DG is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the Completion Time can be extended from 72 hours to 14 days if both SDGs are verified available for backup operation in accordance with Required Action B.1:

In Condition B, the remaining required OPERABLE DG(s), and the offsite circuits, and the SDGs are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and Unit 2 Class 1E Electrical Power Distribution System when required to be OPERABLE. The ~~72-hour~~ 14 day Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. A Configuration Risk Management Program (CRMP) shall also be implemented prior to the Completion Time exceeding 72 hours to assess risk of any activities to be performed affecting Unit 1 operation during the extended period beyond 72 hours that the required DG is inoperable. In addition, planned maintenance or inspections using the 14 day Completion Time shall be limited to once per operating cycle per train:

The second Completion Time for Required Action B.45 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of ~~144 hours~~ 17 days, since initial failure to meet the LCO, to restore the DG. At this time, an offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of ~~920 days~~) allowed prior to complete restoration of the LCO. The ~~6~~ 17 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the ~~72-hour~~ 14 day and ~~6~~ 17 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action B.23, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition B was entered.

BASES

ACTIONS (continued)

C.1 and C.2

If one or both SDGs become unavailable with a required DG inoperable, then action is required to restore both SDGs to available status within 72 hours, or to restore the required DG to OPERABLE status within 72 hours in accordance with Regulatory Guide 1.93 (Ref. 6). In Condition C, the remaining required OPERABLE DG(s) and offsite circuits are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and Unit 2 Class 1E Electrical Power Distribution System when required to be OPERABLE. The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. The Completion Time of 72 hours begins with the discovery of unavailability of one or both SDGs. However, since the Completion Time of Condition B began at the time the DG was originally declared inoperable, the total time the DG may be inoperable prior to entering Condition G, which requires that the unit must be brought to a MODE in which the LCO does not apply, is limited to a total of 14 days by Required Action B.5.

GD.1 and GD.2

Required Action GD.1, which applies when two required offsite circuits are inoperable and with inoperability of redundant required features, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for taking this action is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train features are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required features failures consist of inoperable features associated with a train, redundant to the train that has no offsite power available.

The Completion Time for Required Action GD.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the Completion Time only begins on discovery that both:

BASES

ACTIONS (continued)

- a. All required offsite circuits are inoperable; and
- b. A redundant required feature is inoperable.

If at any time during the existence of Condition GD (two required offsite circuits inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition GD for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable that involve one or more DGs inoperable. However, two factors tend to decrease the severity of this level of degradation:

- a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure; and
- b. The time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

With two of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria.

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A.

BASES

ACTIONS (continued)

DE.1 and DE.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable, resulting in de-energization. Therefore, the Required Actions of Condition DE are modified by a Note to indicate that when Condition DE is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems - Operating," must be immediately entered. This allows Condition DE to provide requirements for the loss of one offsite circuit and one DG, without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train. Condition DE must be entered when the preferred offsite source and DG are inoperable and when the alternate source is not supplying the train.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition DE for a period that should not exceed 12 hours.

In Condition DE, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition CD (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

EF.1

With two required DGs inoperable, there is no more than two remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, sufficient standby AC sources may not be available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for the majority of ESF equipment for this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

BASES

ACTIONS (continued)

According to Reference 6, with both unit DGs inoperable, operation may continue for a period that should not exceed 2 hours. This Completion Time assumes complete loss of onsite (DG) AC capability to power minimum loads needed to respond to analyzed event.

FG.1 and FG.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

GH.1

Condition GH corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

SURVEILLANCE
REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with Plant Specific Design Criterion (PSDC) 39 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), Regulatory Guide 1.137 (Ref. 10), and IEEE Standard 387-1995 (Ref. 11) as addressed in the applicable SR discussion.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3910 V is 94% of the nominal 4160 V output voltage. This value ensures the ESF pumps have an adequate level of voltage so that they are assured of achieving adequate fluid flow to meet their safety and accident mitigation functions. The specified maximum steady state output voltage of 4400 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum steady

BASES

REFERENCES (continued)

6. Regulatory Guide 1.93, Rev. 0, December 1974.
 7. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
 8. UFSAR, Section 1.4.7.
 9. Regulatory Guide 1.108, Rev. 1, August 1977.
 10. Regulatory Guide 1.137, Rev. 1, October 1979.
 11. IEEE Standard 387-1995.
 12. ASME Operation and Maintenance Standards and Guides (OM Codes).
 13. Regulatory Guide 1.177, August 1978.
-

DONALD C. COOK NUCLEAR PLANT UNIT 2
IMPROVED TECHNICAL SPECIFICATION PAGES
MARKED TO SHOW CHANGES

Only pages containing new or deleted text or changes to section numbers have been provided.

3.8.1-3
3.8.1-4
3.8.1-5
B 3.8.1-3
B 3.8.1-6
B 3.8.1-8
B 3.8.1-9
B 3.8.1-10
B 3.8.1-11
B 3.8.1-12
B 3.8.1-13
B 3.8.1-14
B 3.8.1-15
B 3.8.1-35

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. One required DG inoperable.</p>	<p>B.1 Verify both supplemental diesel generators are available.</p>	<p>1 hour <u>AND</u> Once per 12 hours thereafter</p>
	<p><u>AND</u></p> <p>B.12 -----NOTE----- Not applicable if a required Unit 1 DG is inoperable. -----</p>	
	<p>Perform SR 3.8.1.1 for the required offsite circuit(s).</p>	<p>1 hour <u>AND</u> Once per 8 hours thereafter</p>
	<p><u>AND</u></p> <p>B.23 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.</p>	<p>4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)</p>
	<p><u>AND</u></p> <p>B.34.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.</p>	<p>24 hours</p>
	<p><u>OR</u></p> <p>B.34.2 Perform SR 3.8.1.2 for OPERABLE DG(s).</p> <p><u>AND</u></p>	<p>24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>B.45 Restore required DG to OPERABLE status.</p>	<p>72 hours 14 days <u>AND</u> 617 days from discovery of failure to meet LCO 3.8.1.a or b</p>
<p>C. Required Action and associated Completion Time of Required Action B.1 not met.</p>	<p>C.1 Restore both supplemental diesel generators to available status. <u>OR</u> C.2 Restore required DG to OPERABLE status.</p>	<p>72 hours 72 hours</p>
<p>GD. Two required offsite circuits inoperable.</p>	<p>GD.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable. <u>AND</u> GD.2 Restore one required offsite circuit to OPERABLE status.</p>	<p>12 hours from discovery of Condition GD concurrent with inoperability of redundant required features 24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>DE. One required offsite circuit inoperable.</p> <p><u>AND</u></p> <p>One required DG inoperable.</p>	<p>-----NOTE-----</p> <p>Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition DE is entered with no AC power source to any train.</p> <p>-----</p> <p>DE.1 Restore required offsite circuit to OPERABLE status.</p> <p><u>OR</u></p> <p>DE.2 Restore required DG to OPERABLE status.</p>	<p>12 hours</p> <p>12 hours</p>
<p>EF. Two required DGs inoperable.</p>	<p>EF.1 Restore one required DG to OPERABLE status.</p>	<p>2 hours</p>
<p>FG. Required Action and associated Completion Time of Condition A, B, C, D, E or EF not met.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Required Action B.2, B.3, B.4.1, B.4.2, or B.5 not met.</p>	<p>FG.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>FG.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>
<p>GH. Three or more required AC sources inoperable.</p>	<p>GH.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

BASES

BACKGROUND (continued)

In the event of a loss of preferred power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a loss of coolant accident (LOCA).

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within approximately 1 minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service.

Ratings for Train A and Train B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 3500 kW with 10% overload permissible for up to 2 hours in any 24 hour period (however the continuous service rating is not exceeded in the post accident load profile). The ESF loads that are powered from the 4.16 kV emergency buses are listed in Reference 4.

Each DG has its own starting air system consisting of two redundant starting air trains. Each train has one start receiver that normally contains sufficient air for two EDG start sequences. One start sequence includes a 10 second continuous crank and the second start sequence includes an actual run of the DG. The energy used for the first start sequence is greater than that required for the DG run sequence. Also each DG has its own day tank and fuel oil transfer system. The fuel oil transfer system, which includes two transfer pumps, is capable of transferring fuel oil from the associated fuel oil storage tank to the day tank. Each transfer pump is capable of maintaining the level in the day tank when the associated DG is operating at full load.

An independent onsite standby AC power source consisting of two supplemental diesel generators (SDGs) is provided to automatically supply power to 4.16 kV bus 1, which is normally supplied by the 69 kV alternate qualified offsite circuit and can be manually aligned to directly supply the 4.16 kV emergency buses. The SDGs are used to support extended Completion Times in the event of an inoperable DG.

APPLICABLE
SAFETY
ANALYSES

The initial conditions of DBA and transient analyses in the UFSAR, Chapter 14 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

BASES

APPLICABILITY (continued)

provided the associated required equipment is inoperable. This exception is intended to allow declaring the Unit 1 supported equipment inoperable either in lieu of declaring the Unit 1 AC sources inoperable, or at any time subsequent to entering ACTIONS for an inoperable Unit 1 AC Source.

This exception is acceptable since, with the Unit 1 powered equipment inoperable and the associated ACTIONS entered, the Unit 1 AC sources provide no additional assurance of meeting the above criteria.

The AC power requirements for MODES 5 and 6 and other conditions in which AC sources are required are covered in LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

To ensure a highly reliable power source remains with one required offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit(s) on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition \overline{GD} , for two offsite circuits inoperable, is entered. As Noted, this Required Action is not applicable if only a required Unit 1 offsite circuit is inoperable.

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required features failures consist of inoperable features associated with a train, redundant to the train that has no offsite power available.

BASES

ACTIONS (continued)

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to ~~72 hours~~ 14 days. This could lead to a total of ~~144 hours~~ 17 days, since initial failure to meet the LCO, to restore the offsite circuit. At this time, a DG could again become inoperable, the circuit restored OPERABLE, and an additional ~~72 hours~~ 14 days (for a total of ~~931~~ days) allowed prior to complete restoration of the LCO. The ~~617~~ day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and ~~617~~ day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that LCO 3.8.1.a or b was initially not met, instead of at the time Condition A was entered.

B:1

In order to extend the Completion Time for an inoperable DG from 72 hours to 14 days, the SDGs must be verified within 1 hour after the required DG is declared inoperable. The SDGs shall not be used to extend the Completion Time for more than one inoperable DG (of the four total DGs for both units) at a time. SDG mechanical and electrical reliability is demonstrated by performance of periodic testing and inspections during normal operations. Verification of SDG availability requires: 1) verifying that the SDG equipment is mechanically and electrically ready for automatic operation; 2) verifying that the onsite diesel fuel oil supply is sufficient to allow both SDGs to be operated continuously at design load for 24 hours; and 3) verifying that the SDGs are aligned to automatically supply power to the 4.16 kV bus 1, which can be manually aligned to directly supply the 4.16 kV emergency buses. This verification will be repeated for both SDGs at least once every 12 hours.

BASES

ACTIONS (continued)

B.12

To ensure a highly reliable power source remains with an inoperable DG, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered. As Noted, this Required Action is not applicable if a required Unit 1 DG is inoperable.

B.23

Required Action B.23 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has an inoperable DG.

The Completion Time for Required Action B.23 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

- a. An inoperable DG exists; and
- b. A redundant required feature on another train is inoperable.

If at any time during the existence of this Condition (one required DG inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering one required DG inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently is acceptable because it minimizes risk while

BASES

ACTIONS (continued)

allowing time for restoration before subjecting the unit to transients associated with shutdown.

In this condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and the Unit 1 Class 1E Electrical Power Distribution System when required to be OPERABLE. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.34.1 and B.34.2

Required Action B.34.1 provides an allowance to avoid unnecessary testing of OPERABLE DG(s). If it can be determined that the cause of an inoperable DG does not exist on the other required OPERABLE DG(s), SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on other DG(s), the other DG(s) would be declared inoperable upon discovery and Condition ~~EE~~ or ~~GH~~ of LCO 3.8.1 would be entered. Once the failure is repaired, the common cause failure no longer exists, and Required Action B.34.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG(s), performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of those DG(s).

In the event the inoperable DG is restored to OPERABLE status prior to completing either B.34.1 or B.34.2, the plant corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. 7), 24 hours is reasonable to confirm that the OPERABLE DG(s) is not affected by the same problem as the inoperable DG.

B.45

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition B for a period that should not exceed 72 hours. However, an evaluation performed in accordance with Regulatory Guide 1:177 (Ref. 13) has determined that operation may continue in Condition B for a period that should not exceed 14 days if both SDGs are available!

BASES

ACTIONS (continued)

Therefore, when one required DG is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the Completion Time can be extended from 72 hours to 14 days if both SDGs are verified available for backup operation in accordance with Required Action B.1.

In Condition B, the remaining required OPERABLE DG(s), and the offsite circuits, and the SDGs are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and Unit 1 Class 1E Electrical Power Distribution System when required to be OPERABLE. The 72-hour/14 day Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. A Configuration Risk Management Program (CRMP) shall also be implemented prior to the Completion Time exceeding 72 hours to assess risk of any activities to be performed affecting Unit 2 operation during the extended period beyond 72 hours that the required DG is inoperable. In addition, planned maintenance or inspections using the 14 day Completion Time shall be limited to once per operating cycle per train.

The second Completion Time for Required Action B.45 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of 144 hours/17 days, since initial failure to meet the LCO, to restore the DG. At this time, an offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of 216 days) allowed prior to complete restoration of the LCO. The 617 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour/14 day and 617 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action B.23, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition B was entered.

BASES

ACTIONS (continued)

C.1 and C.2

If one or both SDGs become unavailable with a required DG inoperable, then action is required to restore both SDGs to available status within 72 hours, or to restore the required DG to OPERABLE status within 72 hours in accordance with Regulatory Guide 1.93 (Ref. 6). In Condition C, the remaining required OPERABLE DG(s) and offsite circuits are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and Unit 1 Class 1E Electrical Power Distribution System when required to be OPERABLE. The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. The Completion Time of 72 hours begins with the discovery of unavailability of one or both SDGs. However, since the Completion Time of Condition B began at the time the DG was originally declared inoperable, the total time the DG may be inoperable prior to entering Condition G, which requires that the unit must be brought to a MODE in which the LCO does not apply, is limited to a total of 14 days by Required Action B.5.

GD.1 and GD.2

Required Action GD.1, which applies when two required offsite circuits are inoperable and with inoperability of redundant required features, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for taking this action is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train features are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required features failures consist of inoperable features associated with a train, redundant to the train that has no offsite power available.

The Completion Time for Required Action GD.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the Completion Time only begins on discovery that both:

BASES

ACTIONS (continued)

- a. All required offsite circuits are inoperable; and
- b. A redundant required feature is inoperable.

If at any time during the existence of Condition $G\bar{D}$ (two required offsite circuits inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition $G\bar{D}$ for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable that involve one or more DGs inoperable. However, two factors tend to decrease the severity of this level of degradation:

- a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure; and
- b. The time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

With two of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria.

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A.

BASES

ACTIONS (continued)

DE.1 and DE.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable, resulting in de-energization. Therefore, the Required Actions of Condition DE are modified by a Note to indicate that when Condition DE is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems - Operating," must be immediately entered. This allows Condition DE to provide requirements for the loss of one offsite circuit and one DG, without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train. Condition DE must be entered when the preferred offsite source and DG are inoperable and when the alternate source is not supplying the train.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition DE for a period that should not exceed 12 hours.

In Condition DE, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition CD (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

EF.1

With two required DGs inoperable, there is no more than two remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, sufficient standby AC sources may not be available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for the majority of ESF equipment for this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

BASES

ACTIONS (continued)

According to Reference 6, with both unit DGs inoperable, operation may continue for a period that should not exceed 2 hours. This Completion Time assumes complete loss of onsite (DG) AC capability to power minimum loads needed to respond to analyzed event.

FG.1 and FG.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

GH.1

Condition GH corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

**SURVEILLANCE
REQUIREMENTS**

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with Plant Specific Design Criterion (PSDC) 39 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), Regulatory Guide 1.137 (Ref. 10), and IEEE Standard 387-1995 (Ref. 11) as addressed in the applicable SR discussion.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3910 V is 94% of the nominal 4160 V output voltage. This value ensures the ESF pumps have an adequate level of voltage so that they are assured of achieving adequate fluid flow to meet their safety and accident mitigation functions. The specified maximum steady state output voltage of 4400 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum steady

BASES

REFERENCES (continued)

6. Regulatory Guide 1.93, Rev. 0, December 1974.
7. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
8. UFSAR, Section 1.4.7.
9. Regulatory Guide 1.108, Rev. 1, August 1977.
10. Regulatory Guide 1.137, Rev. 1, October 1979.
11. IEEE Standard 387-1995.
12. ASME Operation and Maintenance Standards and Guides (OM Codes).

~~13. Regulatory Guide 1.177, August 1978.~~

**DONALD C. COOK NUCLEAR PLANT UNIT 1
IMPROVED TECHNICAL SPECIFICATION PAGES WITH THE PROPOSED
CHANGES INCORPORATED**

**All affected Technical Specification pages have been provided
Only Bases pages containing new or deleted text or changes to section numbers have been
provided.**

3.8.1-3
3.8.1-4
3.8.1-5
3.8.1-6
3.8.1-7
3.8.1-8
3.8.1-9
3.8.1-10
3.8.1-11
3.8.1-12
3.8.1-13
3.8.1-14
3.8.1-15
3.8.1-16
3.8.1-17
3.8.1-18
B 3.8.1-3
B 3.8.1-6
B 3.8.1-8
B 3.8.1-9
B 3.8.1-10
B 3.8.1-11
B 3.8.1-12
B 3.8.1-13
B 3.8.1-14
B 3.8.1-15
B 3.8.1-35

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. One required DG inoperable.</p>	<p>B.1 Verify both supplemental diesel generators are available.</p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 12 hours thereafter</p>
	<p><u>AND</u></p>	
	<p>B.2 -----NOTE----- Not applicable if a required Unit 2 DG is inoperable. -----</p>	
	<p>Perform SR 3.8.1.1 for the required offsite circuit(s).</p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p>
	<p><u>AND</u></p>	
	<p>B.3 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.</p>	<p>4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)</p>
	<p><u>AND</u></p>	
	<p>B.4.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.</p> <p><u>OR</u></p> <p>B.4.2 Perform SR 3.8.1.2 for OPERABLE DG(s).</p> <p><u>AND</u></p>	<p>24 hours</p> <p>24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>B.5 Restore required DG to OPERABLE status.</p>	<p>14 days</p> <p><u>AND</u></p> <p>17 days from discovery of failure to meet LCO 3.8.1.a or b</p>
<p>C. Required Action and associated Completion Time of Required Action B.1 not met.</p>	<p>C.1 Restore both supplemental diesel generators to available status.</p> <p><u>OR</u></p> <p>C.2 Restore required DG to OPERABLE status.</p>	<p>72 hours</p> <p>72 hours</p>
<p>D. Two required offsite circuits inoperable.</p>	<p>D.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.</p> <p><u>AND</u></p> <p>D.2 Restore one required offsite circuit to OPERABLE status.</p>	<p>12 hours from discovery of Condition D concurrent with inoperability of redundant required features</p> <p>24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. One required offsite circuit inoperable.</p> <p><u>AND</u></p> <p>One required DG inoperable.</p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition E is entered with no AC power source to any train. -----</p> <p>E.1 Restore required offsite circuit to OPERABLE status.</p> <p><u>OR</u></p> <p>E.2 Restore required DG to OPERABLE status.</p>	<p>12 hours</p> <p>12 hours</p>
<p>F. Two required DGs inoperable.</p>	<p>F.1 Restore one required DG to OPERABLE status.</p>	<p>2 hours</p>
<p>G. Required Action and associated Completion Time of Condition A, C, D, E or F not met.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Required Action B.2, B.3, B.4.1, B.4.2, or B.5 not met.</p>	<p>G.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>G.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>
<p>H. Three or more required AC sources inoperable.</p>	<p>H.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. SR 3.8.1.1 through SR 3.8.1.22 are applicable only to the AC electrical power sources for Unit 1.
 2. SR 3.8.1.23 is applicable only to the Unit 2 required AC electrical power sources. The Surveillances referenced in SR 3.8.1.23 are the Unit 2 Surveillance Requirements.
-

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	7 days
SR 3.8.1.2	<p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 2. A modified DG start involving gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.8 must be met. <p>-----</p> <p>Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3910 V and ≤ 4400 V, and frequency ≥ 59.4 Hz and ≤ 61.2 Hz.</p>	31 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.3</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.8. <p>-----</p> <p>Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 3150 kW and ≤ 3500 kW.</p>	<p>31 days</p>
<p>SR 3.8.1.4</p> <p>Verify each day tank contains ≥ 101.4 gal of fuel oil.</p>	<p>31 days</p>
<p>SR 3.8.1.5</p> <p>Check for and remove accumulated water from each day tank.</p>	<p>31 days</p>
<p>SR 3.8.1.6</p> <p>Verify each required DG air start receiver pressure is ≥ 190 psig.</p>	<p>31 days</p>
<p>SR 3.8.1.7</p> <p>Verify each fuel oil transfer system operates to automatically transfer fuel oil from the storage tank to the day tank.</p>	<p>92 days</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.8</p> <p>-----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify each DG starts from standby condition and achieves:</p> <ul style="list-style-type: none"> a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 3910 V and ≤ 4400 V, and frequency ≥ 59.4 Hz and ≤ 61.2 Hz. 	<p>184 days</p>
<p>SR 3.8.1.9</p> <p>-----NOTE----- SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the electrical power distribution subsystem. -----</p> <p>Verify:</p> <ul style="list-style-type: none"> a. Automatic transfer from the auxiliary source to the preferred offsite circuit; and b. Manual alignment to the alternate offsite circuit. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.10</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.86. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. <p>-----</p> <p>Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:</p> <ol style="list-style-type: none"> a. Following load rejection, the frequency is ≤ 64.4 Hz; b. Within 2 seconds following load rejection, the voltage is ≥ 3910 V and ≤ 4400 V; and c. Within 2 seconds following load rejection, the frequency is ≥ 59.4 Hz and ≤ 61.2 Hz. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.11</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.86. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. <p>-----</p> <p>Verify each DG does not trip and voltage is maintained ≤ 5000 V during and following a load rejection of ≥ 3150 kW and ≤ 3500 kW.</p>	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.12</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. Energizes permanently connected loads in ≤ 10 seconds; 2. Energizes auto-connected shutdown loads through time delay relays, where applicable; 3. Maintains steady state voltage ≥ 3910 V and ≤ 4400 V; 4. Maintains steady state frequency ≥ 59.4 Hz and ≤ 61.2 Hz; and 5. Supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.13</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and:</p> <ol style="list-style-type: none"> a. In ≤ 10 seconds achieves voltage ≥ 3740 V and frequency ≥ 58.8 Hz; b. Achieves steady state voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 59.4 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are auto-connected through the time delay relays, where applicable, from the offsite power system. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.14 -----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ----- Verify each DG's automatic trips are bypassed on an actual or simulated loss of voltage signal on the emergency bus or an actual or simulated ESF actuation signal except:</p> <ul style="list-style-type: none"> a. Engine overspeed; and b. Generator differential current. 	<p>24 months</p>
<p>SR 3.8.1.15 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 3. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.86. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. <p>----- Verify each DG operates for ≥ 8 hours at a load ≥ 3150 kW and ≤ 3500 kW.</p>	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.16</p> <p>-----NOTES-----</p> <p>1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 3150 kW and ≤ 3500 kW.</p> <p> Momentary transients outside of load range do not invalidate this test.</p> <p>2. All DG starts may be preceded by an engine prelube period.</p> <p>-----</p> <p>Verify each DG starts and achieves:</p> <p>a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and</p> <p>b. Steady state voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 59.4 Hz and ≤ 61.2 Hz.</p>	<p>24 months</p>
<p>SR 3.8.1.17</p> <p>-----NOTE-----</p> <p>This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.</p> <p>-----</p> <p>Verify each DG:</p> <p>a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power;</p> <p>b. Transfers loads to offsite power source; and</p> <p>c. Returns to ready-to-load operation.</p>	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.18</p> <p>-----NOTE----- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify interval between each sequenced load block is within $\pm 5\%$ of design interval for each emergency time delay relay.</p>	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.19</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. Energizes permanently connected loads in ≤ 10 seconds; 2. Energizes auto-connected emergency loads through time delay relays, as applicable; 3. Achieves steady state voltage ≥ 3910 V and ≤ 4400 V; 4. Achieves steady state frequency ≥ 59.4 Hz and ≤ 61.2 Hz; and 5. Supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.20</p> <p>-----NOTE-----</p> <ol style="list-style-type: none"> 1. This SR is only required to be met when the applicable DG is connected to its load test resistor bank. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify, with a DG operating in test mode and connected to its load test resistor bank, an actual or simulated ESF actuation signal overrides the test mode by:</p> <ol style="list-style-type: none"> a. Returning DG to ready-to-load operation; and b. Verifying the emergency loads are serviced by offsite power. 	<p>24 months</p>
<p>SR 3.8.1.21</p> <p>-----NOTE-----</p> <p>This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.</p> <p>-----</p> <p>Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by:</p> <ol style="list-style-type: none"> a. Returning DG to ready-to-load operation; and b. Verifying the emergency loads are serviced by offsite power. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.22</p> <p>-----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz.</p>	<p>10 years</p>
<p>SR 3.8.1.23</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. When Unit 2 is in MODE 5 or 6, or moving irradiated fuel assemblies in the containment or auxiliary building, the following Unit 2 SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.10, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.15, SR 3.8.1.16, SR 3.8.1.17, and SR 3.8.1.18. 2. Unit 2 SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the required Unit 2 electrical power distribution subsystem. <p>-----</p> <p>For required Unit 2 AC sources, the SRs of Unit 2 Specification 3.8.1, except SR 3.8.1.9.b, SR 3.8.1.13, SR 3.8.1.14 (ESF actuation signal portion only), SR 3.8.1.19, SR 3.8.1.20, SR 3.8.1.21, and SR 3.8.1.22, are applicable.</p>	<p>In accordance with applicable SRs</p>

BASES

BACKGROUND (continued)

In the event of a loss of preferred power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a loss of coolant accident (LOCA).

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within approximately 1 minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service.

Ratings for Train A and Train B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 3500 kW with 10% overload permissible for up to 2 hours in any 24 hour period (however the continuous service rating is not exceeded in the post accident load profile). The ESF loads that are powered from the 4.16 kV emergency buses are listed in Reference 4.

Each DG has its own starting air system consisting of two redundant starting air trains. Each train has one start receiver that normally contains sufficient air for two EDG start sequences. One start sequence includes a 10 second continuous crank and the second start sequence includes an actual run of the DG. The energy used for the first start sequence is greater than that required for the DG run sequence. Also each DG has its own day tank and fuel oil transfer system. The fuel oil transfer system, which includes two transfer pumps, is capable of transferring fuel oil from the associated fuel oil storage tank to the day tank. Each transfer pump is capable of maintaining the level in the day tank when the associated DG is operating at full load.

An independent onsite standby AC power source consisting of two supplemental diesel generators (SDGs) is provided to automatically supply power to 4.16 kV bus 1, which is normally supplied by the 69 kV alternate qualified offsite circuit and can be manually aligned to directly supply the 4.16 kV emergency buses. The SDGs are used to support extended Completion Times in the event of an inoperable DG.

**APPLICABLE
SAFETY
ANALYSES**

The initial conditions of DBA and transient analyses in the UFSAR, Chapter 14 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

BASES

APPLICABILITY (continued)

provided the associated required equipment is inoperable. This exception is intended to allow declaring the Unit 2 supported equipment inoperable either in lieu of declaring the Unit 2 AC sources inoperable, or at any time subsequent to entering ACTIONS for an inoperable Unit 2 AC Source.

This exception is acceptable since, with the Unit 2 powered equipment inoperable and the associated ACTIONS entered, the Unit 2 AC sources provide no additional assurance of meeting the above criteria.

The AC power requirements for MODES 5 and 6 and other conditions in which AC sources are required are covered in LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

To ensure a highly reliable power source remains with one required offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit(s) on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition D, for two offsite circuits inoperable, is entered. As Noted, this Required Action is not applicable if only a required Unit 2 offsite circuit is inoperable.

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required features failures consist of inoperable features associated with a train, redundant to the train that has no offsite power available.

BASES

ACTIONS (continued)

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to 14 days. This could lead to a total of 17 days, since initial failure to meet the LCO, to restore the offsite circuit. At this time, a DG could again become inoperable, the circuit restored OPERABLE, and an additional 14 days (for a total of 31 days) allowed prior to complete restoration of the LCO. The 17 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and 17 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that LCO 3.8.1.a or b was initially not met, instead of at the time Condition A was entered.

B.1

In order to extend the Completion Time for an inoperable DG from 72 hours to 14 days, the SDGs must be verified within 1 hour after the required DG is declared inoperable. The SDGs shall not be used to extend the Completion Time for more than one inoperable DG (of the four total DGs for both units) at a time. SDG mechanical and electrical reliability is demonstrated by performance of periodic testing and inspections during normal operations. Verification of SDG availability requires: 1) verifying that the SDG equipment is mechanically and electrically ready for automatic operation; 2) verifying that the onsite diesel fuel oil supply is sufficient to allow both SDGs to be operated continuously at design load for 24 hours; and 3) verifying that the SDGs are aligned to automatically supply power to the 4.16 kV bus 1, which can be manually aligned to directly supply the 4.16 kV emergency buses. This verification will be repeated for both SDGs at least once every 12 hours.

BASES

ACTIONS (continued)

B.2

To ensure a highly reliable power source remains with an inoperable DG, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered. As Noted, this Required Action is not applicable if a required Unit 2 DG is inoperable.

B.3

Required Action B.3 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has an inoperable DG.

The Completion Time for Required Action B.3 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

- a. An inoperable DG exists; and
- b. A redundant required feature on another train is inoperable.

If at any time during the existence of this Condition (one required DG inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering one required DG inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

BASES

ACTIONS (continued)

In this condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and the Unit 2 Class 1E Electrical Power Distribution System when required to be OPERABLE. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.4.1 and B.4.2

Required Action B.4.1 provides an allowance to avoid unnecessary testing of OPERABLE DG(s). If it can be determined that the cause of an inoperable DG does not exist on the other required OPERABLE DG(s), SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on other DG(s), the other DG(s) would be declared inoperable upon discovery and Condition F or H of LCO 3.8.1 would be entered. Once the failure is repaired, the common cause failure no longer exists, and Required Action B.4.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG(s), performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of those DG(s).

In the event the inoperable DG is restored to OPERABLE status prior to completing either B.4.1 or B.4.2, the plant corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. 7), 24 hours is reasonable to confirm that the OPERABLE DG(s) is not affected by the same problem as the inoperable DG.

B.5

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition B for a period that should not exceed 72 hours. However, an evaluation performed in accordance with Regulatory Guide 1.177 (Ref. 13) has determined that operation may continue in Condition B for a period that should not exceed 14 days if both SDGs are available.

BASES

ACTIONS (continued)

Therefore, when one required DG is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the Completion Time can be extended from 72 hours to 14 days if both SDGs are verified available for backup operation in accordance with Required Action B.1.

In Condition B, the remaining required OPERABLE DG(s), the offsite circuits, and the SDGs are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and Unit 2 Class 1E Electrical Power Distribution System when required to be OPERABLE. The 14 day Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. A Configuration Risk Management Program (CRMP) shall also be implemented prior to the Completion Time exceeding 72 hours to assess risk of any activities to be performed affecting Unit 1 operation during the extended period beyond 72 hours that the required DG is inoperable. In addition, planned maintenance or inspections using the 14 day Completion Time shall be limited to once per operating cycle per train.

The second Completion Time for Required Action B.5 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of 17 days, since initial failure to meet the LCO, to restore the DG. At this time, an offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of 20 days) allowed prior to complete restoration of the LCO. The 17 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 14 day and 17 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action B.3, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition B was entered.

BASES

ACTIONS (continued)

C.1 and C.2

If one or both SDGs become unavailable with a required DG inoperable, then action is required to restore both SDGs to available status within 72 hours, or to restore the required DG to OPERABLE status within 72 hours in accordance with Regulatory Guide 1.93 (Ref. 6). In Condition C, the remaining required OPERABLE DG(s) and offsite circuits are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and Unit 2 Class 1E Electrical Power Distribution System when required to be OPERABLE. The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. The Completion Time of 72 hours begins with the discovery of unavailability of one or both SDGs. However, since the Completion Time of Condition B began at the time the DG was originally declared inoperable, the total time the DG may be inoperable prior to entering Condition G, which requires that the unit must be brought to a MODE in which the LCO does not apply, is limited to a total of 14 days by Required Action B.5.

D.1 and D.2

Required Action D.1, which applies when two required offsite circuits are inoperable and with inoperability of redundant required features, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for taking this action is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train features are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required features failures consist of inoperable features associated with a train, redundant to the train that has no offsite power available.

The Completion Time for Required Action D.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the

BASES

ACTIONS (continued)

Completion Time only begins on discovery that both:

- a. All required offsite circuits are inoperable; and
- b. A redundant required feature is inoperable.

If at any time during the existence of Condition D (two required offsite circuits inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition D for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable that involve one or more DGs inoperable. However, two factors tend to decrease the severity of this level of degradation:

- a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure; and
- b. The time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

With two of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria.

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A.

BASES

ACTIONS (continued)

E.1 and E.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable, resulting in de-energization. Therefore, the Required Actions of Condition E are modified by a Note to indicate that when Condition E is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems - Operating," must be immediately entered. This allows Condition E to provide requirements for the loss of one offsite circuit and one DG, without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train. Condition E must be entered when the preferred offsite source and DG are inoperable and when the alternate source is not supplying the train.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition E for a period that should not exceed 12 hours.

In Condition E, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition D (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

F.1

With two required DGs inoperable, there is no more than two remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, sufficient standby AC sources may not be available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for the majority of ESF equipment for this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

BASES

SURVEILLANCE REQUIREMENTS (continued)

According to Reference 6, with both unit DGs inoperable, operation may continue for a period that should not exceed 2 hours. This Completion Time assumes complete loss of onsite (DG) AC capability to power minimum loads needed to respond to analyzed event.

G.1 and G.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

H.1

Condition H corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

SURVEILLANCE
REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with Plant Specific Design Criterion (PSDC) 39 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), Regulatory Guide 1.137 (Ref. 10), and IEEE Standard 387-1995 (Ref. 11) as addressed in the applicable SR discussion.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3910 V is 94% of the nominal 4160 V output voltage. This value ensures the ESF pumps have an adequate level of voltage so that they are assured of achieving adequate fluid flow to meet their safety and accident mitigation functions. The specified maximum steady state output voltage of 4400 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum steady

BASES

REFERENCES (continued)

6. Regulatory Guide 1.93, Rev. 0, December 1974.
 7. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
 8. UFSAR, Section 1.4.7.
 9. Regulatory Guide 1.108, Rev. 1, August 1977.
 10. Regulatory Guide 1.137, Rev. 1, October 1979.
 11. IEEE Standard 387-1995.
 12. ASME Operation and Maintenance Standards and Guides (OM Codes).
 13. Regulatory Guide 1.177, August 1978.
-
-

**DONALD C. COOK NUCLEAR PLANT UNIT 2
IMPROVED TECHNICAL SPECIFICATION PAGES WITH THE PROPOSED
CHANGES INCORPORATED**

All affected Technical Specification pages have been provided
Only Bases pages containing new or deleted text or changes to section numbers have been
provided.

- 3.8.1-3
- 3.8.1-4
- 3.8.1-5
- 3.8.1-6
- 3.8.1-7
- 3.8.1-8
- 3.8.1-9
- 3.8.1-10
- 3.8.1-11
- 3.8.1-12
- 3.8.1-13
- 3.8.1-14
- 3.8.1-15
- 3.8.1-16
- 3.8.1-17
- 3.8.1-18
- B 3.8.1-3
- B 3.8.1-6
- B 3.8.1-8
- B 3.8.1-9
- B 3.8.1-10
- B 3.8.1-11
- B 3.8.1-12
- B 3.8.1-13
- B 3.8.1-14
- B 3.8.1-15
- B 3.8.1-35

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. One required DG inoperable.</p>	<p>B.1 Verify both supplemental diesel generators are available.</p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 12 hours thereafter</p>
	<p><u>AND</u></p>	
	<p>B.2 -----NOTE----- Not applicable if a required Unit 1 DG is inoperable. -----</p>	
	<p>Perform SR 3.8.1.1 for the required offsite circuit(s).</p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p>
	<p><u>AND</u></p>	
	<p>B.3 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.</p>	<p>4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)</p>
	<p><u>AND</u></p>	
	<p>B.4.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.</p> <p><u>OR</u></p> <p>B.4.2 Perform SR 3.8.1.2 for OPERABLE DG(s).</p> <p><u>AND</u></p>	<p>24 hours</p> <p>24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>B.5 Restore required DG to OPERABLE status.</p>	<p>14 days</p> <p><u>AND</u></p> <p>17 days from discovery of failure to meet LCO 3.8.1.a or b</p>
<p>C. Required Action and associated Completion Time of Required Action B.1 not met.</p>	<p>C.1 Restore both supplemental diesel generators to available status.</p> <p><u>OR</u></p> <p>C.2 Restore required DG to OPERABLE status.</p>	<p>72 hours</p> <p>72 hours</p>
<p>D. Two required offsite circuits inoperable.</p>	<p>D.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.</p> <p><u>AND</u></p> <p>D.2 Restore one required offsite circuit to OPERABLE status.</p>	<p>12 hours from discovery of Condition D concurrent with inoperability of redundant required features</p> <p>24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. One required offsite circuit inoperable.</p> <p><u>AND</u></p> <p>One required DG inoperable.</p>	<p>-----NOTE-----</p> <p>Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition E is entered with no AC power source to any train.</p> <p>-----</p> <p>E.1 Restore required offsite circuit to OPERABLE status.</p> <p><u>OR</u></p> <p>E.2 Restore required DG to OPERABLE status.</p>	<p>12 hours</p> <p>12 hours</p>
<p>F. Two required DGs inoperable.</p>	<p>F.1 Restore one required DG to OPERABLE status.</p>	<p>2 hours</p>
<p>G. Required Action and associated Completion Time of Condition A, C, D, E or F not met.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Required Action B.2, B.3, B.4.1, B.4.2, or B.5 not met.</p>	<p>G.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>G.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>
<p>H. Three or more required AC sources inoperable.</p>	<p>H.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. SR 3.8.1.1 through SR 3.8.1.22 are applicable only to the AC electrical power sources for Unit 2.
 2. SR 3.8.1.23 is applicable only to the Unit 1 required AC electrical power sources. The Surveillances referenced in SR 3.8.1.23 are the Unit 1 Surveillance Requirements.
-

SURVEILLANCE	FREQUENCY
SR 3.8.1.1 <i>Verify correct breaker alignment and indicated power availability for each offsite circuit.</i>	7 days
SR 3.8.1.2 -----NOTES----- 1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 2. A modified DG start involving gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.8 must be met. ----- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3910 V and ≤ 4400 V, and frequency ≥ 59.4 Hz and ≤ 61.2 Hz.	31 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.3</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.8. <p>-----</p> <p>Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 3150 kW and ≤ 3500 kW.</p>	<p>31 days</p>
<p>SR 3.8.1.4</p> <p>Verify each day tank contains ≥ 101.4 gal of fuel oil.</p>	<p>31 days</p>
<p>SR 3.8.1.5</p> <p>Check for and remove accumulated water from each day tank.</p>	<p>31 days</p>
<p>SR 3.8.1.6</p> <p>Verify each required DG air start receiver pressure is ≥ 190 psig.</p>	<p>31 days</p>
<p>SR 3.8.1.7</p> <p>Verify each fuel oil transfer system operates to automatically transfer fuel oil from the storage tank to the day tank.</p>	<p>92 days</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.8</p> <p>-----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify each DG starts from standby condition and achieves:</p> <ul style="list-style-type: none"> a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 3910 V and ≤ 4400 V, and frequency ≥ 59.4 Hz and ≤ 61.2 Hz. 	<p>184 days</p>
<p>SR 3.8.1.9</p> <p>-----NOTE----- SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the electrical power distribution subsystem. -----</p> <p>Verify:</p> <ul style="list-style-type: none"> a. Automatic transfer from the auxiliary source to the preferred offsite circuit; and b. Manual alignment to the alternate offsite circuit. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.10</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.86. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. <p>-----</p> <p>Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:</p> <ol style="list-style-type: none"> a. Following load rejection, the frequency is ≤ 64.4 Hz; b. Within 2 seconds following load rejection, the voltage is ≥ 3910 V and ≤ 4400 V; and c. Within 2 seconds following load rejection, the frequency is ≥ 59.4 Hz and ≤ 61.2 Hz. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.11</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.86. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. <p>-----</p> <p>Verify each DG does not trip and voltage is maintained ≤ 5000 V during and following a load rejection of ≥ 3150 kW and ≤ 3500 kW.</p>	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.12</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. Energizes permanently connected loads in ≤ 10 seconds; 2. Energizes auto-connected shutdown loads through time delay relays, where applicable; 3. Maintains steady state voltage ≥ 3910 V and ≤ 4400 V; 4. Maintains steady state frequency ≥ 59.4 Hz and ≤ 61.2 Hz; and 5. Supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.13</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and:</p> <ol style="list-style-type: none"> a. In ≤ 10 seconds achieves voltage ≥ 3740 V and frequency ≥ 58.8 Hz; b. Achieves steady state voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 59.4 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are auto-connected through the time delay relays, where applicable, from the offsite power system. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.14 -----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ----- Verify each DG's automatic trips are bypassed on an actual or simulated loss of voltage signal on the emergency bus or an actual or simulated ESF actuation signal except:</p> <ul style="list-style-type: none"> a. Engine overspeed; and b. Generator differential current. 	<p>24 months</p>
<p>SR 3.8.1.15 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 3. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.86. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. <p>----- Verify each DG operates for ≥ 8 hours at a load ≥ 3150 kW and ≤ 3500 kW.</p>	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.16</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 3150 kW and ≤ 3500 kW. <p>Momentary transients outside of load range do not invalidate this test.</p> <ol style="list-style-type: none"> 2. All DG starts may be preceded by an engine prelube period. <p>-----</p> <p>Verify each DG starts and achieves:</p> <ol style="list-style-type: none"> a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 59.4 Hz and ≤ 61.2 Hz. 	<p>24 months</p>
<p>SR 3.8.1.17</p> <p>-----NOTE-----</p> <p>This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.</p> <p>-----</p> <p>Verify each DG:</p> <ol style="list-style-type: none"> a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.18</p> <p>-----NOTE----- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.</p> <p>-----</p> <p>Verify interval between each sequenced load block is within $\pm 5\%$ of design interval for each emergency time delay relay.</p>	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.19</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. Energizes permanently connected loads in ≤ 10 seconds; 2. Energizes auto-connected emergency loads through time delay relays, as applicable; 3. Achieves steady state voltage ≥ 3910 V and ≤ 4400 V; 4. Achieves steady state frequency ≥ 59.4 Hz and ≤ 61.2 Hz; and 5. Supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.20</p> <p>-----NOTE-----</p> <ol style="list-style-type: none"> 1. This SR is only required to be met when the applicable DG is connected to its load test resistor bank. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify, with a DG operating in test mode and connected to its load test resistor bank, an actual or simulated ESF actuation signal overrides the test mode by:</p> <ol style="list-style-type: none"> a. Returning DG to ready-to-load operation; and b. Verifying the emergency loads are serviced by offsite power. 	<p>24 months</p>
<p>SR 3.8.1.21</p> <p>-----NOTE-----</p> <p>This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.</p> <p>-----</p> <p>Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by:</p> <ol style="list-style-type: none"> a. Returning DG to ready-to-load operation; and b. Verifying the emergency loads are serviced by offsite power. 	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.22</p> <p>-----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz.</p>	<p>10 years</p>
<p>SR 3.8.1.23</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. When Unit 1 is in MODE 5 or 6, or moving irradiated fuel assemblies in the containment or auxiliary building, the following Unit 1 SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.10, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.15, SR 3.8.1.16, SR 3.8.1.17, and SR 3.8.1.18. 2. Unit 1 SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the required Unit 1 electrical power distribution subsystem. <p>-----</p> <p>For required Unit 1 AC sources, the SRs of Unit 1 Specification 3.8.1, except SR 3.8.1.9.b, SR 3.8.1.13, SR 3.8.1.14 (ESF actuation signal portion only), SR 3.8.1.19, SR 3.8.1.20, SR 3.8.1.21, and SR 3.8.1.22, are applicable.</p>	<p>In accordance with applicable SRs</p>

BASES

BACKGROUND (continued)

In the event of a loss of preferred power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a loss of coolant accident (LOCA).

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within approximately 1 minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service.

Ratings for Train A and Train B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 3500 kW with 10% overload permissible for up to 2 hours in any 24 hour period (however the continuous service rating is not exceeded in the post accident load profile). The ESF loads that are powered from the 4.16 kV emergency buses are listed in Reference 4.

Each DG has its own starting air system consisting of two redundant starting air trains. Each train has one start receiver that normally contains sufficient air for two EDG start sequences. One start sequence includes a 10 second continuous crank and the second start sequence includes an actual run of the DG. The energy used for the first start sequence is greater than that required for the DG run sequence. Also each DG has its own day tank and fuel oil transfer system. The fuel oil transfer system, which includes two transfer pumps, is capable of transferring fuel oil from the associated fuel oil storage tank to the day tank. Each transfer pump is capable of maintaining the level in the day tank when the associated DG is operating at full load.

An independent onsite standby AC power source consisting of two supplemental diesel generators (SDGs) is provided to automatically supply power to 4.16 kV bus 1, which is normally supplied by the 69 kV alternate qualified offsite circuit and can be manually aligned to directly supply the 4.16 kV emergency buses. The SDGs are used to support extended Completion Times in the event of an inoperable DG.

**APPLICABLE
SAFETY
ANALYSES**

The initial conditions of DBA and transient analyses in the UFSAR, Chapter 14 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

BASES

APPLICABILITY (continued)

provided the associated required equipment is inoperable. This exception is intended to allow declaring the Unit 1 supported equipment inoperable either in lieu of declaring the Unit 1 AC sources inoperable, or at any time subsequent to entering ACTIONS for an inoperable Unit 1 AC Source.

This exception is acceptable since, with the Unit 1 powered equipment inoperable and the associated ACTIONS entered, the Unit 1 AC sources provide no additional assurance of meeting the above criteria.

The AC power requirements for MODES 5 and 6 and other conditions in which AC sources are required are covered in LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

To ensure a highly reliable power source remains with one required offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit(s) on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition D, for two offsite circuits inoperable, is entered. As Noted, this Required Action is not applicable if only a required Unit 1 offsite circuit is inoperable.

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required features failures consist of inoperable features associated with a train, redundant to the train that has no offsite power available.

BASES

ACTIONS (continued)

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to 14 days. This could lead to a total of 17 days, since initial failure to meet the LCO, to restore the offsite circuit. At this time, a DG could again become inoperable, the circuit restored OPERABLE, and an additional 14 days (for a total of 31 days) allowed prior to complete restoration of the LCO. The 17 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and 17 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that LCO 3.8.1.a or b was initially not met, instead of at the time Condition A was entered.

B.1

In order to extend the Completion Time for an inoperable DG from 72 hours to 14 days, the SDGs must be verified within 1 hour after the required DG is declared inoperable. The SDGs shall not be used to extend the Completion Time for more than one inoperable DG (of the four total DGs for both units) at a time. SDG mechanical and electrical reliability is demonstrated by performance of periodic testing and inspections during normal operations. Verification of SDG availability requires: 1) verifying that the SDG equipment is mechanically and electrically ready for automatic operation; 2) verifying that the onsite diesel fuel oil supply is sufficient to allow both SDGs to be operated continuously at design load for 24 hours; and 3) verifying that the SDGs are aligned to automatically supply power to the 4.16 kV bus 1, which can be manually aligned to directly supply the 4.16 kV emergency buses. This verification will be repeated for both SDGs at least once every 12 hours.

BASES

ACTIONS (continued)

B.2

To ensure a highly reliable power source remains with an inoperable DG, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered. As Noted, this Required Action is not applicable if a required Unit 1 DG is inoperable.

B.3

Required Action B.3 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has an inoperable DG.

The Completion Time for Required Action B.3 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

- a. An inoperable DG exists; and
- b. A redundant required feature on another train is inoperable.

If at any time during the existence of this Condition (one required DG inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering one required DG inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

BASES

ACTIONS (continued)

In this condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and the Unit 1 Class 1E Electrical Power Distribution System when required to be OPERABLE. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.4.1 and B.4.2

Required Action B.4.1 provides an allowance to avoid unnecessary testing of OPERABLE DG(s). If it can be determined that the cause of an inoperable DG does not exist on the other required OPERABLE DG(s), SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on other DG(s), the other DG(s) would be declared inoperable upon discovery and Condition F or H of LCO 3.8.1 would be entered. Once the failure is repaired, the common cause failure no longer exists, and Required Action B.4.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG(s), performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of those DG(s).

In the event the inoperable DG is restored to OPERABLE status prior to completing either B.4.1 or B.4.2, the plant corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. 7), 24 hours is reasonable to confirm that the OPERABLE DG(s) is not affected by the same problem as the inoperable DG.

B.5

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition B for a period that should not exceed 72 hours. However, an evaluation performed in accordance with Regulatory Guide 1.177 (Ref. 13) has determined that operation may continue in Condition B for a period that should not exceed 14 days if both SDGs are available.

BASES

ACTIONS (continued)

Therefore, when one required DG is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the Completion Time can be extended from 72 hours to 14 days if both SDGs are verified available for backup operation in accordance with Required Action B.1.

In Condition B, the remaining required OPERABLE DG(s), the offsite circuits, and the SDGs are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and Unit 1 Class 1E Electrical Power Distribution System when required to be OPERABLE. The 14 day Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. A Configuration Risk Management Program (CRMP) shall also be implemented prior to the Completion Time exceeding 72 hours to assess risk of any activities to be performed affecting Unit 2 operation during the extended period beyond 72 hours that the required DG is inoperable. In addition, planned maintenance or inspections using the 14 day Completion Time shall be limited to once per operating cycle per train.

The second Completion Time for Required Action B.5 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of 17 days, since initial failure to meet the LCO, to restore the DG. At this time, an offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of 20 days) allowed prior to complete restoration of the LCO. The 17 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The **"AND"** connector between the 14 day and 17 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action B.3, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition B was entered.

BASES

ACTIONS (continued)

C.1 and C.2

If one or both SDGs become unavailable with a required DG inoperable, then action is required to restore both SDGs to available status within 72 hours, or to restore the required DG to OPERABLE status within 72 hours in accordance with Regulatory Guide 1.93 (Ref. 6). In Condition C, the remaining required OPERABLE DG(s) and offsite circuits are adequate to supply electrical power to the onsite Class 1E Electrical Power Distribution System and Unit 1 Class 1E Electrical Power Distribution System when required to be OPERABLE. The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. The Completion Time of 72 hours begins with the discovery of unavailability of one or both SDGs. However, since the Completion Time of Condition B began at the time the DG was originally declared inoperable, the total time the DG may be inoperable prior to entering Condition G, which requires that the unit must be brought to a MODE in which the LCO does not apply, is limited to a total of 14 days by Required Action B.5.

D.1 and D.2

Required Action D.1, which applies when two required offsite circuits are inoperable and with inoperability of redundant required features, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for taking this action is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train features are normally not included, although, for this Required Action, the turbine driven auxiliary feedwater pump is considered redundant to Trains A and B. Redundant required features failures consist of inoperable features associated with a train, redundant to the train that has no offsite power available.

The Completion Time for Required Action D.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the

BASES

ACTIONS (continued)

Completion Time only begins on discovery that both:

- a. All required offsite circuits are inoperable; and
- b. A redundant required feature is inoperable.

If at any time during the existence of Condition D (two required offsite circuits inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition D for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable that involve one or more DGs inoperable. However, two factors tend to decrease the severity of this level of degradation:

- a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure; and
- b. The time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

With two of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria.

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A.

BASES

ACTIONS (continued)

E.1 and E.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable, resulting in de-energization. Therefore, the Required Actions of Condition E are modified by a Note to indicate that when Condition E is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems - Operating," must be immediately entered. This allows Condition E to provide requirements for the loss of one offsite circuit and one DG, without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train. Condition E must be entered when the preferred offsite source and DG are inoperable and when the alternate source is not supplying the train.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition E for a period that should not exceed 12 hours.

In Condition E, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition D (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

F.1

With two required DGs inoperable, there is no more than two remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, sufficient standby AC sources may not be available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for the majority of ESF equipment for this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

BASES

ACTIONS (continued)

According to Reference 6, with both unit DGs inoperable, operation may continue for a period that should not exceed 2 hours. This Completion Time assumes complete loss of onsite (DG) AC capability to power minimum loads needed to respond to analyzed event.

G.1 and G.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

H.1

Condition H corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with Plant Specific Design Criterion (PSDC) 39 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), Regulatory Guide 1.137 (Ref. 10), and IEEE Standard 387-1995 (Ref. 11) as addressed in the applicable SR discussion.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3910 V is 94% of the nominal 4160 V output voltage. This value ensures the ESF pumps have an adequate level of voltage so that they are assured of achieving adequate fluid flow to meet their safety and accident mitigation functions. The specified maximum steady state output voltage of 4400 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum steady

BASES

REFERENCES (continued)

6. Regulatory Guide 1.93, Rev. 0, December 1974.
 7. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
 8. UFSAR, Section 1.4.7.
 9. Regulatory Guide 1.108, Rev. 1, August 1977.
 10. Regulatory Guide 1.137, Rev. 1, October 1979.
 11. IEEE Standard 387-1995.
 12. ASME Operation and Maintenance Standards and Guides (OM Codes).
 13. Regulatory Guide 1.177, August 1978.
-
-

ATTACHMENT 5 TO AEP:NRC:5811-01

REGULATORY COMMITMENTS

The following table identifies those actions committed to by Indiana Michigan Power Company (I&M) in this document. Any other actions discussed in this submittal represent intended or planned actions by I&M. They are described to the Nuclear Regulatory Commission (NRC) for the NRC's information and are not regulatory commitments.

Commitment	Date
<p>CNP personnel will implement the following compensatory actions:</p> <ul style="list-style-type: none"> • Hold discussions with the system load dispatcher to 1) ensure no significant grid perturbations are expected during the extended allowed outage time (AOT), and 2) request that the system load dispatcher inform CNP if conditions change during extended AOT such that significant grid perturbations do occur or become expected. • Evaluate weather conditions. An extended AOT would not be entered if official weather forecasts for the plant site are predicting severe conditions (tornado, thunderstorm, or ice storm warnings). • Evaluate the condition of the switchyard, offsite power supply, and the grid. An extended EDG or extended 69 kilovolt circuit AOT will not be entered to perform elective maintenance when grid stress conditions are high such as during extreme summer temperatures and/or high demand. • Monitor weather conditions daily in accordance with the CNP on-line risk management program, and take appropriate actions if severe weather is expected. • Prohibit elective switchyard maintenance during an extended EDG AOT. In addition, prohibit elective maintenance on the main, auxiliary (Unit Auxiliary), or startup (Reserve Auxiliary) transformers associated with the unit. 	<p>Prior to entering an extended emergency diesel generator (EDG) or extended 69 kilovolt circuit AOT.</p> <p>Prior to entering an extended EDG or extended 69 kilovolt circuit AOT.</p> <p>Prior to entering an extended EDG or extended 69 kilovolt circuit AOT.</p> <p>During an extended EDG or extended 69 kilovolt circuit AOT.</p> <p>During an extended EDG AOT.</p>

REGULATORY COMMITMENTS

Commitment	Date
<ul style="list-style-type: none"> • Prohibit elective switchyard maintenance during a 69 kilovolt circuit AOT, other than that directly associated with the 69 kilovolt offsite circuit. In addition, prohibit elective maintenance on the main, auxiliary (Unit Auxiliary), or startup (Reserve Auxiliary) transformers associated with the unit. 	<p style="text-align: center;">During the extended 69 kilovolt circuit AOT.</p>
<ul style="list-style-type: none"> • Prohibit maintenance or testing that affects the reliability of the train associated with the operable EDG. 	<p style="text-align: center;">During an extended EDG AOT.</p>
<ul style="list-style-type: none"> • Perform an evaluation per 10 CFR 50.65 (a)(4) if any testing and maintenance activities must be conducted. 	<p style="text-align: center;">During an extended EDG or extended 69 kilovolt circuit AOT.</p>
<ul style="list-style-type: none"> • Designate the SDGs as guarded equipment. 	<p style="text-align: center;">During an extended EDG AOT.</p>
<ul style="list-style-type: none"> • Designate the turbine driven auxiliary feed water pump as guarded equipment. 	<p style="text-align: center;">During an extended EDG or extended 69 kilovolt circuit AOT.</p>