Indiana Michigan
Power Company
500 Circle Drive
Buchanan, MI 49107 1395

INDIANA MICHIGAN POWER

September 21, 2004

AEP:NRC:4811
10 CFR 50.90

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
Extension of Allowed Outage Times for Emergency Diesel Generators, 69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service Water

Reference: "Donald C. Cook Nuclear Plant Units 1 and 2, License Amendment Request – Conversion of Current Technical Specifications (CTS) to Improved Technical Specifications (ITS)," letter AEP:NRC:4901, dated April 6, 2004.

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2, proposes to amend Facility Operating Licenses DPR-58 and DPR-74. The proposed amendment would revise the Technical Specifications (TS) to permit extending the 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). Extending the AOTs would facilitate on-line performance of more comprehensive overhaul, maintenance, inspection, and upgrade activities, thereby helping to maintain or improve reliability of these systems. In addition, the proposed amendment would reduce the likelihood that an emergency TS change or notice of enforcement discretion would be requested as a result of unforeseen corrective maintenance on these systems. I&M is also proposing format changes to the affected TS pages that improve their appearance, but do not alter any requirements.

A001

I&M is developing a plant modification to install two permanent non-safety-related diesel generators at CNP. These supplemental diesel generators (SDGs) will be designed to provide a backup alternating current (AC) power source to either emergency bus in either Unit 1 or 2. The SDGs will have adequate capacity to power required safe shutdown loads in the event of a loss of offsite power and failure of the operable EDG. An evaluation has been performed to determine the benefit to plant risk from installing the SDGs. The evaluation determined that installation of the SDGs will significantly reduce the baseline core damage frequency (CDF) and large early release frequency (LERF). The risk reduction, as measured by delta CDF, has been calculated to be more than 20 percent and the reduction, as measured by delta LERF, has been calculated to be more than 30 percent. These risk reductions will more than offset the small risk increases resulting from the AOT extensions. Therefore, the proposed amendment will require that the SDGs be available if the EDG, CCW, and ESW AOT extensions are used. The risk evaluation also determined that the change in risk resulting from the proposed AOT extension for the 69 kilovolt (kV) system is within Nuclear Regulatory Commission (NRC) guidelines without crediting the availability of the additional diesel generators. Therefore, the proposed amendment will not require that the SDGs be available when the 69 kV AOT extension is used.

I&M will manage the risk associated with maintenance and surveillance during use of the proposed extended AOTs using the CNP configuration risk management program. Although concurrent extended outages in one train of equipment (e.g., EDG, CCW, and ESW Train A or B) would be permitted by the proposed changes to the TS, I&M does not plan to perform major system maintenance on multiple systems simultaneously.

In addition to providing backup AC power to safe shutdown loads, the SDGs will also be capable of supplying back-up power to the distributed ignition system (DIS) containment hydrogen igniters. Each SDG will have the capability to power the DIS in both units. Providing back-up power to the DIS contributes to a reduction in plant risk and may be required to resolve NRC Generic Safety Issue 189, "Susceptibility of Ice Condenser and Mark III Containments to Failure from Hydrogen Combustion During a Severe Accident."

I&M requests approval of the proposed amendment no later than June 30, 2005, to coordinate the changes with implementation of the Improved Technical Specifications (ITS). I&M expects to complete installation of the SDGs in 2005 and, as noted above, the 69 kV AOT extension is needed to complete the final tie-in of the SDGs to the existing plant bus work. Therefore, I&M intends to implement the TS changes for the 69 kV system AOT extension separately, and

in advance of, the TS changes for the EDG, CCW, and ESW AOTs. The proposed TS changes for the EDG, CCW, and ESW AOTs would be implemented after installation of the SDGs is completed. I&M requests that the amendment allow an implementation period of 120 days.

In the referenced letter, I&M proposed conversion of the CNP Current Technical Specifications (CTS) to the ITS specified in NUREG-1431, "Standard Technical Specifications – Westinghouse Plants," Revision 2. Implementation of the ITS is expected to occur in the same time frame as the implementation of the changes proposed in this amendment request. I&M has therefore provided copies of both the CTS and the current draft ITS pages that are affected by this proposed amendment. I&M will coordinate with the NRC Licensing Project Manager to ensure that the appropriate CTS or ITS pages are issued.

Enclosure 1 to this letter provides an affirmation statement pertaining to the proposed amendment. Enclosure 2 provides I&M's evaluation of the proposed TS changes. Attachments 1A and 1B provide CTS pages marked to show changes for Unit 1 and Unit 2, respectively. Attachments 2A and 2B provide CTS pages with the proposed changes incorporated. Attachments 3A and 3B provide ITS pages marked to show changes for Unit 1 and Unit 2, respectively. Attachments 4A and 4B provide ITS pages with the proposed changes incorporated. Attachment 5 contains a list of regulatory commitments made in this submittal.

Copies of this letter and its attachments are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91.

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

Sincerely,

J. N. Jensen
Site Vice President

Enclosures:

1. Affirmation
2. Evaluation of the Proposed Technical Specification Changes

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. List of Regulatory Commitments

c: J. L. Caldwell, NRC Region III
K. D. Curry, Ft. Wayne AEP, w/o enclosures/attachments
J. T. King, MPSC
C. F. Lyon, NRC Washington, DC
MDEQ – WHMD/HWRPS
NRC Resident Inspector

AFFIRMATION

I, Joseph N. Jensen, being duly sworn, state that I am Site 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

Joseph N. Jensen
Site Vice President

SWORN TO AND SUBSCRIBED BEFORE ME
THIS 21 DAY OF September, 2004
Notary Public

My Commission Expires Apr. 4, 2008

DANIELLE M. BURGOYNE
Notary Public, State of Michigan
County of Berrien
My Commission Expires Apr. 4, 2008
Acting in the County of Berrien

Enclosure 2 to AEP:NRC:4811

Evaluation of Proposed Technical Specification (TS) Changes

Evaluation of Proposed Technical Specification Changes

1.0 DESCRIPTION

Pursuant to 10 CFR 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2, proposes to amend Facility Operating Licenses DPR-58 and DPR-74. The proposed amendment would revise the Technical Specifications (TS) to permit extending the 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 proposed amendment would allow more extensive maintenance, inspection, and upgrades to be performed on these systems while the units are operating. In addition, the proposed amendment would reduce the likelihood that an emergency TS change or notice of enforcement discretion would be requested as a result of unforeseen corrective maintenance on these systems. The proposed amendment has been evaluated using a risk-informed approach as set forth in current regulatory guidance. I&M intends to offset the small increase in risk resulting from the EDG, CCW, and ESW AOT extensions by installing two additional diesel generators capable of powering critical components during a loss of all offsite and onsite alternating current (AC) power, and requiring these additional diesel generators to be available when the AOT extensions are used. The availability of these additional diesel generators when combined with the proposed AOT extensions for the EDG, CCW, and ESW systems will result in a net reduction in overall plant risk. I&M has determined that the change in risk resulting from the proposed AOT extension for the 69 kilovolt (kV) system is within Nuclear Regulatory Commission (NRC) guidelines without crediting the availability of the additional diesel generators.

2.0 PROPOSED TS CHANGES

By separate correspondence, I&M has previously proposed conversion of the CNP Current Technical Specifications (CTS) to the Improved Technical Specifications (ITS) specified in NUREG-1431. Implementation of the ITS is expected to occur in the same time frame as the implementation of the changes proposed in this amendment request. I&M has therefore provided copies of both the CTS and the current draft ITS pages that are affected by this proposed amendment.

CTS Changes

TS 3.8.1.1, Action statement b, presently requires restoration of an inoperable EDG to an operable status within 72 hours. If restoration of the EDG cannot be accomplished within this AOT, the unit is to be placed in hot standby within the next 6 hours and in cold shutdown within the following 30 hours. The proposed change would revise the Action statement to extend the AOT from 72 hours to 14 days if the new diesel generators, referred to as supplemental diesel generators (SDGs), are available to provide a back-up source of electrical power. If at any time

during the extended AOT it is determined that one or both SDGs are not available, both SDGs must be restored to available status within 72 hours, or the plant must be placed in hot standby within 6 hours, and cold shutdown within the following 30 hours.

In TS 3.7.3.1, Action statement a presently requires restoration of an inoperable CCW loop to an operable status within 72 hours. If restoration cannot be accomplished within this AOT, the unit is to be placed in hot standby within the next 6 hours and in cold shutdown within the following 30 hours. The proposed change would revise the Action statement to extend the AOT from 72 hours to 14 days. To support this AOT extension, both SDGs must be available to supply back-up electrical power to the operable CCW pump. If at any time during the extended AOT it is determined that one or both SDGs are not available, both SDGs must be restored to available status within 72 hours, or the plant must be placed in hot standby within 6 hours, and cold shutdown within the following 30 hours.

TS 3.7.4.1, Action statement a, presently requires restoration of an inoperable ESW loop to an operable status within 72 hours. If restoration cannot be accomplished within this AOT, the unit is to be placed in hot standby within the next 6 hours and in cold shutdown within the following 30 hours. The proposed change would revise the Action statement to extend the AOT from 72 hours to 14 days. To support this AOT extension, both SDGs must be available to supply back-up electrical power to the operable ESW pump. If at any time during the extended AOT it is determined that one or both SDGs are not available, both SDGs must be restored to available status within 72 hours, or the plant must be placed in hot standby within 6 hours, and cold shutdown within the following 30 hours.

TS 3.8.1.1, Action statement a, presently requires restoration of an inoperable offsite circuit to an operable status within 72 hours. If restoration of the offsite circuit cannot be accomplished within this AOT, each unit is to be placed in hot standby within the next 6 hours and in cold shutdown within the following 30 hours. The proposed change would modify the Action statement to extend the AOT for the alternate offsite circuit (i.e., the 69 kV line) from 72 hours to 14 days, but retain the 72-hour AOT for the 34.5 kV circuit. The SDGs are not required to support this AOT extension.

Changes are also proposed to the CTS Bases to reflect the extended AOTs. The proposed Bases changes note that use of the AOTs with a duration greater than 72 hours for voluntary planned maintenance or inspections should be limited to once per cycle, per train, per unit for the EDGs, and the ESW and CCW systems, and once per year for the 69 kV offsite power supply. The specific changes to the CTS and Bases pages are shown in Attachments 1A through 2B to this letter.

I&M also proposes format changes involving the headers, footers, font, and text justification of the affected TS pages. The format changes improve appearance, but do not alter any requirements.

ITS Changes

Proposed changes to the current draft ITS are included in Attachments 3A through 4B of this letter. The changes shown in these attachments are consistent with changes to the CTS as described above, with the following additional restrictions that are made for consistency with the standard practices of NUREG-1431.

In the ITS, the "allowed outage time" is referred to as the "Completion Time." In ITS 3.8.1, "A.C. Sources – Operating," the Completion Time includes a "second" Completion Time for certain Required Actions. The second Completion Time establishes a limit on the maximum time allowed for any combination of conditions of inoperability during any single continuous failure to meet the Limiting Condition for Operation (LCO). The intent of the second Completion Time is to preclude entry into, and exit from, Actions for separate systems governed by one LCO (i.e., alternating between one system and another) for an indefinite period of time. For ITS 3.8.1, the second Completion Time is derived by adding the individual first Completion Times associated with the Required Actions from LCOs 3.8.1.a (offsite power sources) and 3.8.1.b (EDGs), which are each 72 hours. The current ITS second Completion Time for each of these LCO Actions is 6 days, which is obtained by adding 72 hours to the first Completion Time of 72 hours. For the proposed change, the second Completion Time associated with the 14-day extended Completion Time for an inoperable 69 kV circuit or for an inoperable EDG is 17 days for each. This number is derived by adding 72 hours to the 14-day first Completion Time, and is consistent with the method used to obtain the current second Completion Times in ITS 3.8.1.

3.0 BACKGROUND

3.1 System Descriptions

The principal systems involved in the proposed amendment are the offsite AC electrical power systems, the EDG system, the CCW system, and the ESW system. These systems are described below.

Offsite AC Power Systems

Offsite AC power to CNP is provided by connections to the American Electric Power Company (AEP) transmission system. The AEP transmission system uses 345 kV and 765 kV transmission lines for bulk supply. Connections from the AEP system to other utilities are maintained by the East Central Area Reliability Coordination Agreement, creating a reliable integrated network. In the following descriptions, the component alphanumeric designations given are those for Unit 1, followed by the Unit 2 designations in parentheses.

As shown in Updated Final Safety Analysis Report (UFSAR) Figures 8.1-1A and 8.1-2A, the Units 1 and 2 offsite power sources consist of the 34.5 kV offsite circuit (preferred) from the 345 kV/765 kV switchyards and the 69 kV offsite circuit (alternate). These offsite circuits are physically independent from each other. The preferred offsite system connects the offsite

transmission network to the station through seven offsite circuits. Six 345 kV lines connect to the 345 kV switchyard. The 345 kV switchyard supplies power to a 345/34.5 kV transformer (TR 5) and a 765/345/34.5 kV transformer (TR 4). The seventh offsite circuit is a 765 kV line from the 765 kV switchyard, which also feeds TR 4. TR 4 and TR 5 supply power to the 4.16 kV buses via reserve auxiliary transformers (RATs). The RATs are designated as TR101CD (TR201CD) for Train A and TR101AB (TR201AB) for Train B. The power supply configuration is normally in a split-bus arrangement, with the Train A RATs aligned to TR 4 via circuit breaker 12CD and the Train B RATs aligned to TR 5 via circuit breaker 12AB. Under certain conditions, TR 4 or TR 5 may be aligned to supply both trains in Units 1 and 2. RAT TR101CD (TR201CD) supplies the Train A 4.16 kV emergency bus T11C (T21C) via bus 1C (2C) while emergency bus T11D (T21D) is supplied via bus 1D (2D). RAT TR101AB (TR201AB) supplies the Train B 4.16 kV emergency bus T11A (T21A) via bus 1A (2A) while emergency bus T11B (T21B) is supplied via bus 1B (2B). The Train A and Train B 4.16 kV emergency buses, which are normally supplied by the turbine generator via the unit auxiliary transformers (UATs), will automatically transfer to the RATs as a result of a turbine generator trip.

A 69 kV line supplies the alternate offsite circuit. The 69 kV line supplies transformers TR12EP-1 and TR12EP-2, either of which can be manually aligned, via 4.16 kV Bus 1, to directly supply Train A 4.16 kV emergency buses T11C (T21C) and T11D (T21D) or Train B 4.16 kV emergency buses T11A (T21A) and T11B (T21B). The 69 kV circuit is supplied power from a 69 kV tap station approximately 2 miles away.

AEP System Operations, the organization that operates the offsite transmission network, monitors the preferred offsite network to provide assurance that switchyard voltages will be maintained at levels that support proper in-plant voltages on the engineered safety feature (ESF) buses. The AEP system dispatchers provide notification to CNP Nuclear Operations of potential conditions that are outside of CNP requirements.

The offsite power system is monitored under the CNP Maintenance Rule (MR) Program in accordance with 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." The system is in 10 CFR 50.65 MR category (a)(2), which indicates it is currently meeting the MR unavailability goal/performance criterion of less than or equal to 200 hrs/24 months/source/unit. Availability data for the preferred offsite power system for the 24 months ending June 30, 2004, indicates the following total outage times:

	Planned	Unplanned
Unit 1:	16.8 hours	2.0 hours
Unit 2:	13.4 hours	1.8 hours

Availability data for the 69 kV offsite circuit for the 24 months ending June 30, 2004, indicates the following total planned outage times. There were no unplanned outages during the 24 months. An unplanned outage did occur on July 21, 2004, that lasted for 2 minutes.

	Planned	Unplanned
Unit 1:	13.8 hours	0 hours
Unit 2:	7.2 hours	0 hours

In addition, CNP available historical information was reviewed to identify occurrences of partial or complete loss of offsite power. CNP has not experienced a complete single or dual unit loss of offsite power event. The table below summarizes the partial loss of offsite power events from 1997 through July 2004 that were identified by the review. The table also identifies actions implemented as a result of specific events.

Partial Loss of Offsite Power Events at CNP

Date	Duration (hrs:min)	Plant Mode	Event Description
07/02/97	02:59	U1: 1 U2: 1	The 69 kV alternate offsite circuit was lost during thunderstorm activity. The preferred offsite power source was unaffected by the event.
08/31/98	05:22	U1: 5 U2: 5	The preferred offsite power source was lost to one bus in each unit due to the failure of a station service transformer caused by an underground cable fault. The Unit 1 and the Unit 2 CD EDGs both started and picked up load as expected. Subsequently, the transformer was replaced and the cables were replaced with cable having a higher voltage rating and better insulation material. (Licensee Event Report (LER) 315/1998-040-00)
12/16/99	03:52	U1 & U2: De-fueled	The preferred offsite power source was lost to the Unit 1 CD 4kV safeguards buses due to the inadvertent actuation of a protective relay on the Unit 2 RAT during maintenance activity. This caused the start and loading of the Unit 1 CD EDG. As a result of the event, the interface between CNP and the offsite transmission and distribution (T&D) personnel was changed to provide a CNP single-point of contact as the overall owner of all T&D activities performed at CNP. (LER 315/1999-028-00)
06/08/00	U2: 02:03 U1: 02:49	U1: De-fueled U2: 4	The preferred offsite power source to the Train A buses on both units was lost due to personnel error during switching operations in the 345 kV switchyard. The Unit 1 and Unit 2 CD EDGs started and picked up load as expected. In response to the event, the interface agreement between CNP and the AEP Western Transmission Region was revised to require concurrent verification of AEP switching operations in the switchyard by CNP operations department personnel. (LER 316/2000-004-00)

Date	Duration (hrs:min)	Plant Mode	Event Description
08/16/01	<00:01	U1: 1 U2: 1	A momentary loss of the 69 kV alternate offsite circuit occurred during thunderstorm activity. The preferred offsite power source was unaffected by the event.
06/12/02	09:02	U1: 1 U2: 1	An explosion and oil fire in the in the current transformer (CT) associated with the 345 kV switchyard "L" output feeder breaker resulted in loss of the preferred offsite power source to Units 1 and 2 Train A. Subsequent protective switching by the system load dispatcher resulted in the loss of the preferred offsite power source to Unit 1 Train B. As a result of the event, the testing frequency for the CTs was changed from 4 years to annually. Also, selected 345 kV switchyard breakers were replaced with dry bushing CTs that are not subject to the same failure mode as oil-filled CTs. (LER 2002-006-00)
02/18/03	01:49	U1: 1 U2: 1	During trip checking of new 345kV circuit breaker "L", installed in response to the breaker CT failure event of 06/12/02, an inadvertent operation caused loss of the Train B preferred offsite power source to both units. The alternate offsite power source was unaffected by the event. In response to the event, the Inter-Organizational Agreement for the conduct of switchyard maintenance was revised to require CNP Job Order Activities and detailed instructions for all maintenance, modifications, and testing in the switchyard. Also, engineering responsibilities for approving design changes in the switchyard were clarified. The on-line risk procedure was revised to enable a more realistic assessment of switchyard activities and system alignments.
07/21/04	00:02	U1: 1 U2: 1	The 69 kV alternate offsite circuit was lost during thunderstorm activity. The preferred offsite power source was unaffected by the event. This event is under evaluation.

EDGs

The emergency onsite AC power source for each unit consists of two 4160 volt, 3-phase, 60 cycle, 3500 kilowatt (kW) EDGs. One EDG supplies each ESF train. DG 1-CD (2-CD) is dedicated to 4.16 kV emergency buses T11C (T21C) and T11D (T21D). DG 1-AB (2-AB) is dedicated to 4.16 kV emergency buses T11A (T21A) and T11B (T21B). The EDGs start automatically on a loss of voltage signal to the 4.16 kV buses, which is sensed by loss of voltage relays. Upon sensing loss of voltage, master relays automatically start the EDGs, trip the normal feed circuit breakers for the 4.16 kV buses and trip all motor feeder breakers and 480 volt bus transformer feeder breakers on the buses, the 600 volt bus tie breaker, and all non-essential

600 volt feeder breakers and 480 volt bus breakers. The EDG circuit breaker that connects each EDG output to the 4.16 kV/600 volt bus system is automatically closed when rated voltage and speed are obtained. The EDGs will also start and operate in the standby mode without connecting to the emergency bus on a safety injection (SI) signal without a concurrent loss of voltage signal. When the EDGs are tied to the emergency bus, loads are then sequentially connected by individual time delay relays. The individual time delay relays, therefore, control the permissive and starting signals to motor breakers to prevent overloading the EDG by automatic load application.

In the event of a loss of preferred offsite power, the required ESF electrical loads are automatically connected to the EDGs 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).

The EDGs are monitored under the CNP MR Program in accordance with 10 CFR 50.65, and are currently in the 10 CFR 50.65(a)(2) category. This indicates that the EDGs are meeting their established MR reliability and unavailability goals. Unavailability hours are less than the MR goal/performance criterion of less than or equal to 432 hours per EDG per 24 months. In addition, the NRC reactor oversight process performance indicator data for the period ending June 30, 2004, indicates that the average emergency onsite AC power system unavailability over the previous 12 quarters is 0.9 percent for both Unit 1 and Unit 2, resulting in a "green" performance indicator.

Station Black Out (SBO) Analysis

CNP has demonstrated compliance with the SBO rule (10 CFR 50.63) as discussed in UFSAR Section 8.7. The determination of the required SBO coping duration is based on the probability of an SBO at the site as well as the capability for restoring power. CNP is categorized within Off-site Power Group 2 and Emergency A. C. Power Supply System Configuration Group C in accordance with Regulatory Guide 1.155 (Reference 7.1), and has an EDG Target Reliability of 0.975. The CNP SBO evaluation concluded that the calculated minimum acceptable coping duration is 4 hours. For CNP, which is a two unit nuclear station, the licensing basis SBO is postulated to occur in only one unit since the emergency AC power sources are not completely shared by the two units. In addition, CNP is an AC-independent 4-hour coping plant and, therefore, does not have an alternate AC power source, as defined by 10 CFR 50.63.

CCW System

The CCW system provides a heat sink for the removal of process and operating heat from safety-related components during a DBA or transient. The safety-related components are: the residual heat removal (RHR) heat exchangers; the centrifugal charging pump gear, lube oil, and seal heat exchangers; the SI pump seal and lube oil heat exchangers; the RHR pump seal heat exchangers; and the containment spray pump seal heat exchangers. The CCW system also provides a heat sink for the removal of process and operating heat for various nonessential

components, as well as the spent fuel storage pool, during normal operation. The CCW system serves as a barrier to the release of radioactive byproducts between potentially radioactive systems and the ESW system, and thus to the environment.

As shown in UFSAR Figure 9.5-1, the CCW system is arranged as two independent, full capacity safety-related trains, with isolable non-safety-related components. Each safety-related train includes a full capacity pump, heat exchanger, piping, valves, instrumentation, and a common surge tank. Each safety-related train is powered from a separate bus. The CCW system is designed to perform its function with a single failure of any active component, assuming a loss of offsite power.

The CCW system is monitored under the CNP MR Program in accordance with 10 CFR 50.65, and is currently in the 10 CFR 50.65(a)(2) MR category, which indicates the system is meeting the established MR unavailability goals. The unavailability hours are within the MR goal/performance criterion of less than or equal to 134 hours per train per 24 months. Unavailability, depending on the train, is from about 35 to 55 hours per 24 months. Availability data for the previous 24 months ending June 30, 2004, indicates the following total CCW loop planned and unplanned unavailability times:

Unit 1:

Loop	Planned	Unplanned
1-CCW-A	45.3 hours	0 hours
1-CCW-B	35.1 hours	0 hours

Unit 2:

Loop	Planned	Unplanned
2-CCW-A	55.0 hours	0 hours
2-CCW-B	34.9 hours	0.1 hours

ESW System

The ESW system provides a heat sink for the removal of process and operating heat from safety-related components during a DBA or transient. The safety-related components are the CCW heat exchangers, containment spray heat exchangers, EDGs, auxiliary feedwater system (provides emergency water source), control room air conditioners, and the auxiliary feedwater pump room coolers. The ESW system also provides a heat sink for the removal of process and operating heat for safety-related and non-safety-related components during normal operation.

As shown in UFSAR Figure 9.8-7, the ESW system for each unit consists of two ESW pumps, two duplex strainers, and associated piping and valves. ESW system piping is arranged in two independent headers (trains), each serving certain safety-related components. The two trains are arranged such that a rupture in either train will not jeopardize the safety functions of the ESW system. Each train is served by one ESW pump. One cross-tie valve is available on each train in order to cross-tie the train to one of the opposite unit ESW trains (since each unit train has a

cross-tie valve, both must be open to cross-tie the two trains). Two of the four pumps can supply all of the Unit 1 and Unit 2 ESW flow requirements for unit operation, shutdown, and refueling. Each ESW train is normally cross-tied with the associated opposite unit ESW train, with one ESW pump in each of the cross-tied trains in operation. All four ESW pumps start on an SI signal from either unit. In addition, the CCW heat exchanger ESW outlet valves of the affected unit actuate to a predetermined position to ensure that the required ESW flow distributions are maintained during the recirculation phase of an accident.

The ESW system is monitored under the CNP MR Program in accordance with 10 CFR 50.65, and is currently in the 10 CFR 50.65(a)(1) MR category, which indicates the system is not meeting the established MR unavailability goal. The unavailability goal/performance criterion is less than or equal to 100 hours per train per 24 months. The unavailability at the present time ranges from about 150 hours to 270 hours per ESW loop. The major portion of the unavailability for each ESW loop is due to ESW pump replacements and ESW pump bay cleanings by divers. Availability data for the 24 months ending June 30, 2004, indicates the total ESW loop planned and unplanned unavailability times as listed below. Note that the pump replacement outages that occurred in 2002 were performed under a license amendment that allowed a one-time extension of the ESW AOT from 72 to 140 hours.

Unit 1:			
Loop	Planned	Unplanned	
1-ESW-A	159.5 hours	0 hours	Note: 73.72 hours (46%) of planned unavailability time was due to pump replacement in 2002.
1-ESW-B	246.7 hours	23.1 hours	Note: 119.37 hours (48%) of planned unavailability time was due to pump replacement in 2002 and an additional 63.67 hours (26%) of planned unavailability time was due to pump replacement in 2003.

Unit 2:			
Loop	Planned	Unplanned	
2-ESW-A	140.9 hours	10.8 hours	Note: 84.8 hours (60.2%) of planned unavailability time was due to pump replacement in 2002.
2-ESW-B	214.2 hours	6.3 hours	Note: 103.75 hours (48.4%) of planned outage time was due to pump replacement in 2002.

3.2 Reason for Requesting Amendment

I&M is proposing TS changes to extend the current 72-hour AOT for the EDG, CCW, ESW, and 69 kV systems to 14 days. The proposed amendment would allow more extensive overhaul, maintenance, inspection, and upgrades to be performed on these systems while the units are

operating. The general considerations and system-specific considerations that are relevant to the proposed amendment are described below.

General Considerations

Similar to other licensees, I&M typically limits planned equipment unavailability to approximately half (or less) of the applicable AOT. Thus, a 72-hour AOT limits a scheduled work and retest window to approximately 36 hours or less. The proposed 14-day AOT provides a much longer work window, which will significantly increase the scope of maintenance, inspection, and upgrade activities that can be performed with the unit on-line. For those activities that might be conducted during several successive 72-hour AOTs, performing the entire activity within a single longer AOT will increase overall availability, because certain processes, such as removal from service/return to service, equipment staging, and equipment assembly/disassembly, would not have to be repeated. Additionally, performance of maintenance activities with the unit on-line allows support organizations to focus on the specific maintenance activity, rather than the multitude of activities that are in progress during a unit outage. This increased attention can benefit the quality of the activity. Furthermore, a reduction in shutdown risk is expected as a result of performing maintenance on-line.

Finally, a longer AOT would reduce the likelihood that emergency licensing actions would be requested. The scope of maintenance activities can unexpectedly increase, challenging or precluding completion of the activities within the 72-hour window. This can result in a request for an emergency license amendment or a notice of enforcement discretion, requiring an expedited review by I&M and NRC personnel, and precluding the opportunity for prior public review and comment. An extended AOT would reduce the likelihood that such licensing actions would be requested.

System Specific Considerations

The EDGs are currently demonstrating adequate reliability. However, the EDG operating history has shown that the current 72-hour AOT can impact the ability to perform on-line maintenance, including post-maintenance testing, in a planned and controlled manner. During the previous two years, a forced unit shutdown, a notice of enforcement discretion, and an emergency license amendment have been made necessary by unexpected increases in work scope that could not be completed within the 72-hour EDG AOT. This history has created concern about conducting upgrade or maintenance activities with the unit on-line. An extended AOT would facilitate on-line performance of more comprehensive maintenance, inspection, and upgrade activities, thereby helping to maintain or improve EDG reliability. In addition, an extended AOT would allow more time for recovery from on-line challenges to EDG operability while maintaining acceptable plant risk. Lastly, the EDG availability during plant outages may be improved by performing certain maintenance and testing currently performed during outages while on-line.

The CCW system has not experienced significant operational problems in recent years. Although crevice corrosion of certain welded joints in piping was identified during the 1980's,

the joints were repaired and the chemical treatment of the system was revised to significantly reduce the likelihood of microbiologically induced corrosion. The problems have not recurred. Although the CCW pumps have been reliable, they are approaching the point in their service life at which inspection, overhaul, and upgrade should be performed. Their location in the plant presents access and rigging challenges, which tend to prolong major maintenance efforts. The ESW/CCW heat exchangers will require re-tubing in the future. In addition, I&M anticipates implementation of future unit power uprates to enhance the long-term viability of CNP. As a result, there is the potential that the ESW/CCW heat exchangers will be rebuilt to increase their capacities. Extending the AOT for the CCW system would allow additional time for major pump maintenance, re-tubing, and/or rebuilding with the unit on line, thereby maintaining or improving reliability of the CCW system.

The ESW system has experienced problems that have resulted in the need to replace the pumps several times over the last four years. During the most recent replacement, pumps with an improved design were installed. However, I&M anticipates that the ESW pumps will need to be replaced on a periodic basis due to expected degradation. Pump replacement requires most of the current 72-hour AOT, and does not allow for unforeseen delays that may occur during the work. A one-time AOT extension from 72 hours to 6 days was granted by the NRC to support the pump replacement activities. A permanent AOT extension would eliminate the need to request one-time AOT extensions in the future. In addition, extended AOTs would enable on-line performance of inspections, cleaning, and eddy current testing of the ESW/CCW heat exchangers and the ESW heat exchangers supporting the EDGs. This would allow investigation and resolution of unexpected changes in performance prior to scheduled outages.

The 69 kV alternate offsite circuit line has, overall, operated reliably over the plant life, although there have been some unplanned outages. Most of the outages have been of short duration (a few minutes or less), and have not exceeded the current 72-hour AOT. However, I&M plans to implement modifications to the 69 kV system to maintain or improve reliability. The modifications may include replacement of poles supporting the 69 kV line, installation of surge arrestors, reconfiguration of the line and construction of a new 69 kV switchyard, and potential installation of a phase shifting transformer. Implementation of these modifications with the unit on line would be facilitated by an extended AOT. Additionally, an extended AOT for the 69 kV circuit is needed to complete the one-time installation of the two additional diesel generators that, as described below, will be used to reduce overall plant risk in support of the extended AOTs for the EDG, CCW, and ESW systems.

4.0 TECHNICAL ANALYSIS

CNP has evaluated the proposed amendment using traditional deterministic engineering analyses as well as a risk-informed approach.

4.1 Deterministic Assessment

The deterministic assessment considers whether the proposed amendment is consistent with the defense-in-depth philosophy and consistent with the principle that sufficient safety margins are maintained.

SDGs

As part of a defense-in-depth design approach and to support the risk-informed evaluation, CNP proposes to install two backup SDGs to supply safe shutdown loads. These will be available whenever an EDG, CCW loop, or ESW loop is removed from service for preplanned maintenance work known to require greater than 72 hours or if deemed necessary for unplanned corrective maintenance work that will exceed the 72-hour AOT. Industry precedent for installing an independent AC power source to support extended EDG AOTs has been established at both Waterford-3 and Crystal River-3 (see Section 8.0 of this enclosure). The design of the CNP SDGs is still under development, but they are expected to have the following features:

- The two SDGs will be commercial-grade and will be permanently installed on-site in or near, and connected to, the 69 kV substation. This substation is located in the owner-controlled area just southeast of the plant protected area. The electrical output of the two SDGs will be connected to 4.16 kV Bus 1, between the secondary of transformer 12-EP-1 and circuit breakers 1EP and 2EP, as shown in the figure provided at the end of this enclosure. The connections from the circuit breakers to the 4.16 kV ESF buses in the plant are routed underground.
- Each SDG will have a rated capacity of 2250 to 2800 kW and will be installed within its own metal enclosure, complete with fuel oil tank, closed loop radiator cooling system, engine and generator control panels, output circuit breaker, and miscellaneous support systems and devices. The output of each SDG will be connected via normally closed, manually operated, disconnecting switches to Bus 1. An electrically operated circuit breaker will be provided in the enclosure to allow remote and/or automatic connecting of the SDGs to Bus 1. Remote controls and instrumentation will be located in each unit's control room. This will permit remote control and monitoring of each SDG from the control rooms.
- The SDGs will have the capacity to power at least one train of vital equipment needed to ensure that safe shutdown conditions following an SBO can be maintained.
- A nominal 24-hour on-site fuel supply will be provided for each SDG fuel oil tank.
- Both SDGs will start automatically upon a sustained loss of power on 4.16-kV Bus 1. Upon attaining rated speed and voltage, they will automatically synchronize with each other, and remain available for connection to de-energized 4.16-kV Bus 1. The SDGs will then automatically open the power-operated disconnect switch on Bus 1 to isolate transformer TR12-EP-1, and automatically close the output breakers for both SDGs onto Bus 1. The two SDGs will be connected to the bus in parallel. The unit loads can be applied to the appropriate 4.16 kV ESF bus from the respective unit's control room in accordance with the

emergency operating procedures (EOPs). The operators will also have the ability to manually start and stop the SDGs from the control room and locally.

- The SDGs will not be designed to meet Class 1E or safety-related system requirements.
- The SDG components will be physically separate from safety-related components. Each SDG will be separated from the Class 1E power system by two circuit breakers in series, one of which will be a Class 1E circuit breaker located at the Class 1E bus.
- The SDGs will be equipped with voltage regulators and speed governors to maintain the steady state voltage and frequency output within prescribed limits, which will be bounded by the limits applied to the safety-related EDGs. The SDG supplier will be required to demonstrate the capability to maintain voltage and frequency equal to or better than the safety-related EDGs during starting of block and large motor loads.
- The SDGs will be located in the 69 kV switchyard, which is physically separate from the 345 kV switchyard that provides the preferred offsite AC power source to the units. Since the means of supplying power from the SDGs to the ESF buses is essentially a "dead bus" transfer, operation of the SDGs cannot cause a transient in the power distribution system that could trip an operating unit.
- The SDG components will be protected against the effects of likely weather-related events that could challenge a loss of offsite power.
- Periodic testing to ensure availability and ability to accept, accelerate, and run its assigned loads will be conducted by paralleling each SDG with the 69 kV offsite power circuit. The capability to add or remove load by raising or lowering the speed and voltage of the SDG will be provided.
- Each SDG will have the capability to provide backup power to the DIS in both Units 1 and 2. The DIS is used to control containment hydrogen following an accident. The capability to provide backup power to the DIS may be required for resolution of NRC Generic Safety Issue 189, "Susceptibility of Ice Condenser and Mark III Containments to Failure from Hydrogen Combustion During a Severe Accident," as identified in Reference 7.2.

Impact on SBO Analysis

The assumptions and the results of the SBO analysis, as documented in UFSAR Section 8.7, are not changed by the proposed AOT extensions and the installation of the SDGs. Compliance with 10 CFR 50.63, "Loss of All Alternating Current Power," will not be affected by the proposed amendment and the SDGs will not be credited in the licensing basis SBO analysis. In addition, EDG reliability, as used in the SBO analysis, and the effectiveness of maintenance on the EDGs and support systems, which is monitored pursuant to 10 CFR 50.65, will not be affected by the proposed amendment.

Impact on Degraded Voltage Issue

In a telephone discussion on June 24, 2004, members of the NRC staff identified concerns regarding the impact on the proposed amendment of open issues involving the CNP degraded grid voltage protection arrangement. The degraded grid voltage protection arrangement, the open issues, and the impact of the open issues on the proposed amendment are described below.

During normal plant operation, the 4.16 kV safety-related buses are supplied from the main generators via the UATs. In the event of a reactor/turbine trip, the 4.16 kV buses remain powered by the UATs for 30 seconds following the trip, provided that there is not a corresponding generator fault. The 4.16 kV buses are then automatically transferred to the RATs, which are powered from the grid. The degraded grid voltage protection relays monitor voltage on the 4.16 kV safety related buses. Upon sensing degraded voltage on these buses, the relays actuate to open the breakers supplying the buses from the RATs, start the EDGs, and power the buses from the EDGs. This actuation will only occur when the 4.16 kV buses are being powered from the grid, i.e., via the RATs. Therefore, a degraded grid voltage actuation would not occur for 30 seconds following a reactor/turbine trip.

The open NRC issues regarding this arrangement are documented in NRC Task Interface Agreement (TIA) 2004-02 (Reference 7.3). As documented in that TIA, NRC Region III has requested the NRC Office of Nuclear Reactor Regulation to evaluate the absence of automatic degraded grid voltage protection during normal operation (when power is supplied through the UATs), and during the first 30 seconds following an accident signal, to determine if the design meets the CNP current licensing basis and if it is adequate.

I&M considers that the issues involving the CNP degraded grid voltage protection arrangement do not impact the proposed amendment. The proposed amendment does not affect the degraded grid voltage protection arrangement. The proposed amendment allows extending the amount of time that the unit can operate with an inoperable EDG. The proposed amendment does not affect the manner or timing in which the EDGs are actuated to provide degraded voltage protection. The addition of SDGs does not alter the plant response to a degraded grid voltage condition. The SDGs are designed to provide an additional, manually connected, on-site source of electrical power that would be available if the grid were lost, regardless of the reason. The risk evaluation supporting the proposed amendment is not affected by the degraded grid voltage protection arrangement.

EDG On-line Post-Maintenance Testing

As discussed above, the extended AOT for the EDGs will be used to perform certain on-line maintenance activities that are currently performed during plant outages. The inspections expected to be accomplished during an extended AOT normally do not require a post-maintenance load rejection test to verify operability, since equipment disassembly is primarily for access and not for overhaul of major components. However, if extensive maintenance is performed (e.g., governor replacement), the appropriate post-maintenance tests to

ensure EDG operability would be determined, based on manufacturer's recommendations and maintenance test procedures. Appropriate post-maintenance tests for major work may include a load rejection test to ensure EDG operability. Current CNP practice for this type of post-maintenance test is to perform a 50 percent load rejection test using one of the two load test resistor banks provided for Units 1 and 2. Each load resistor bank is rated for 1750 kW, which is 50 percent of the EDG full load rating. Use of the load bank makes it possible to load an EDG to 50 percent of full load without the need for paralleling the EDG to an energized 4.16 kV bus. The engine performance data obtained from the 50 percent load rejection test is compared to data from previous tests to confirm acceptability. I&M does not expect to perform on-line EDG testing that would require a special plant configuration or operation of other safety-related systems (e.g., simulated loss of offsite power with SI signal test), or testing that involves transients that may impact unit operation (e.g., full load rejection test).

69 kV System

An unavailability of the 69 kV system (the alternate offsite power supply) is already considered in the CNP design and is allowed by the CTS. The proposed license amendment only involves the maximum permissible duration of the AOT. The increased AOT has no effect on the capability of the preferred offsite power supply to support the safety-related loads while the 69 kV system is inoperable. Therefore, the design basis for the 69 kV system is not changed by extending the AOT.

CCW and ESW Systems

The CCW and ESW systems provide defense-in-depth in that they are designed with sufficient redundancy to accommodate single failures. The proposed amendment does not diminish this defense-in-depth in that it does not modify the design and operation of the CCW and ESW systems. In the event of an extended AOT for one inoperable CCW or ESW loop, the SDGs will be available to supply power to the operable loop to provide enhanced power supply reliability, thereby providing additional defense-in-depth.

The AOTs provided in the applicable TS action statements are designed to permit limited operation with a temporary reduction of safety system operability but without an unacceptable reduction in the margin of safety. This license amendment request only involves the maximum duration of the AOT in relation to the potential occurrence of design basis events during that time. Therefore, the design basis for the CCW and ESW systems is not changed by extending the current 72-hour AOT for a single inoperable CCW or ESW loop.

Procedures and Compensatory Measures

Procedures will be modified or developed as necessary to support use of the SDGs for an extended AOT. The risk evaluation described in Section 4.2.1 of this enclosure credited the availability of the SDGs. However, there were no other specific compensatory measures needed to meet the quantitative risk guidelines in Regulatory Guide 1.174 (Reference 7.4) and

Regulatory Guide 1.177 (Reference 7.5). The existing CNP configuration risk management program, described in Section 4.2.3 of this enclosure, includes risk management compensatory measures that I&M intends to implement for the extended EDG, CCW, ESW, and 69 kV AOTs, as appropriate. These measures are summarized below:

- Evaluate weather conditions prior to entering an extended EDG or 69 kV AOT for voluntary planned maintenance. An extended AOT would not be entered for voluntary planned maintenance purposes if official weather forecasts for the plant site are predicting severe conditions (tornado, thunderstorm, or ice storm warnings). Monitor weather conditions daily in accordance with the CNP on-line risk management program, and take appropriate actions if severe weather is expected.
- Restrict elective switchyard maintenance during an extended EDG AOT. In addition, restrict elective maintenance on the main, auxiliary, or startup transformers associated with the unit.
- Restrict elective switchyard maintenance during a 69 kV AOT, other than that directly associated with the 69 kV offsite circuit. In addition, restrict elective maintenance on the main, auxiliary, or startup transformers associated with the unit.
- Restrict maintenance or testing that affects the reliability of the train associated with the operable EDG during an extended EDG AOT. Similarly, for an extended CCW or ESW AOT, restrict maintenance or testing that affects the reliability of the train associated with the operable loop during an extended AOT. If any testing and maintenance activities must be performed while the extended AOT is in effect, an evaluation per 10 CFR 50.65 (a)(4) would be performed.

Also, I&M intends to restrict elective maintenance activities on the SDGs during the time they are used to support an extended AOT. Elective maintenance does not include surveillance activities, such as verifying fuel oil level.

Safety Margin Evaluation

Regulatory Guide 1.177 states that the evaluation of proposed TS changes should assess whether the proposed amendment is consistent with the principle that sufficient safety margins are maintained. The Regulatory Guide also states that sufficient safety margins are maintained when applicable industry codes and standards are met and safety analysis acceptance criteria in the UFSAR are met. The proposed amendment to extend the AOTs specified in the TS for the four systems does not modify or affect compliance with any industry standards. The proposed amendment does not reduce requirements for redundant equipment to be operable during the extended AOTs. Therefore, sufficient redundancy will be maintained to ensure that the accident analyses in the UFSAR remain valid.

4.2 Risk Evaluation

The proposed amendment has been evaluated using a risk-informed approach as described in Regulatory Guide 1.177. This Regulatory Guide describes methods acceptable to the NRC for assessing the nature and impact of proposed TS changes by considering engineering issues and

applying risk insights. The Regulatory Guide provides guidance specifically for risk-informed TS changes (such as AOT extensions) consistent with, but more detailed than, the generally applicable guidance given in Regulatory Guide 1.174. However, the evaluations and conclusions described in this amendment request are also consistent with the guidance of Regulatory Guide 1.174. The three-tier risk assessment methodology of Regulatory Guide 1.177 and the external events assessment are discussed below.

4.2.1 Tier 1: Probabilistic Risk Assessment (PRA) Capability and Insights

Tier 1 assesses the impact of the proposed TS change on CDF, incremental conditional core damage probability (ICCDP), and, when appropriate, LERF and incremental conditional large early release probability (ICLERP).

PRA Modeling

The CNP PRA model is a linked fault tree model (also called "large fault tree"). This type of analysis uses small event trees and large fault trees to develop core damage sequences and model the interaction of components within the systems analysis. Selected initiating events are also modeled via fault trees (in place of point estimates). In general, plant equipment is modeled at the component level, with multiple basic events representing various failure modes.

Dependencies are modeled in a variety of ways. Dependencies within a system are modeled using a parametric MGL (Multiple Greek Letter) method to account for unspecified dependencies. Dependencies between and among systems are modeled via transfers to the supporting systems within the fault trees.

Component availability models include contributions from random failure, as well as test and maintenance unavailability. Common cause failures (CCFs) are included where appropriate (see description of dependency modeling above). Failure rates for the current EDGs, CCW trains, and ESW trains are developed using CNP station-specific performance data combined with generic industry data using a Bayesian update process. Unavailability data is based on actual CNP data. CCFs between the existing EDGs and the SDGs are not modeled because these units are designed by different manufacturers, have different configurations, are exposed to different environmental conditions, require different maintenance procedures, and have independent fuel oil supplies. CCFs between the SDG units are included in the analysis.

A new PRA model was created based on the model of record to estimate the risk impact of extending each of the specified AOTs from 3 days to 14 days combined with adding the SDGs as an additional power source. Several modifications were made to the existing model to account for the addition of the SDGs. For example, hardware and human error probabilities associated with aligning and powering the emergency buses from the SDGs were added to the model. In addition, some structural changes were made to the event trees to include a branch concerning alignment combinations associated with the SDGs to specified equipment during SBO scenarios. The major equipment of interest in the PRA that will be powered by the SDGs during an SBO

scenario includes ESW pumps, CCW pumps, charging pumps, DIS hydrogen igniters, and 250 volt direct current (DC) station battery chargers.

The proposed AOT changes were determined to have a potential impact on the loss of CCW and loss of ESW initiating event frequencies. To account for the potential increase in initiating event frequencies associated with these systems, the fault trees representing these two initiators were revised to include 17 days of potential unavailability, per train, instead of the plant-specific unavailability time that is currently modeled. None of the other initiating event frequencies were judged to be impacted by these AOT changes.

The proposed AOT changes are judged to not significantly change the uncertainties associated with the current PRA results because uncertainties associated with the AOT changes generally affect the base case in a similar fashion. To ensure that the results obtained by the analysis were conservative, and that they were not dominated by modeling assumptions, the PRA model did not credit the following risk reduction capabilities:

- No credit was taken for any contingency actions associated with use of these extended AOTs, including no credit for a reduced probability of loss of offsite power because of protecting the switchyard. Normal station risk management practices direct the switchyard to be protected when specific AOTs, including the EDG AOTs, are entered.
- No credit was taken for extending the availability of DC power, beyond the current 4-hour station battery life, during SBO scenarios. With the new SDGs, the battery chargers will be powered, and reliance on the batteries during SBO conditions will be greatly reduced.
- No credit was taken in the PRA analysis for the installed spare CCW pump. This pump is maintained and capable of being aligned to replace flow to either of the CCW loops on either unit. Procedures exist for the alignment and use of this pump.
- No credit was taken for the availability of the SDGs in the convolution analysis associated with the recovery of offsite power. If one of the two SDGs were to fail to provide power, the remaining SDG would still be capable of providing sufficient power to restore injection capability to a single unit. This alignment, however, may require additional operator actions associated with blocking non-essential loads, and manually aligning the required loads.
- All calculations (ICCDP, ICLERP, delta CDF, delta LERF) assume component testing and maintenance (T&M) unavailability of 17 days for the affected systems. Use of 17 days instead of the requested 14-day extended AOT, envelopes the ITS requirement to have "second Completion Times" in the LCO action statements for TS 3.8.1, as described in Section 2.0 of this enclosure.

Quantitative Assessment

Model Alterations

Structural modifications were made to the CNP PRA model to support the addition of the SDGs. These modifications allowed I&M to evaluate the risk-benefits of the SDGs and provide the foundation for adding the SDGs to the on-line risk-monitoring program using Safety Monitor™

(see discussion of Tier 3 information in 4.2.3 below). The following provides a brief overview of the changes made to the PRA model.

- The existing PRA analysis of record model, i.e., the base case, was modified to remove a non-realistic, excessive CCW system leak basic event that had been inappropriately added during the Westinghouse Owners Group (WOG) peer review comment resolution update. The failure mode that the CCW leak basic event was attempting to model was a single point rupture that disables the entire system. This concern was already modeled in the fault tree as a surge tank rupture event (which has a frequency indicative of a rupture). The CCW excessive leak event was removed since it resulted in the double-counting of a single failure.
- A failure mode-specific probability was obtained for RCP circuit breaker fails-to-open on demand. RCP circuit breakers failing to open on demand is usually encompassed in human reliability analysis (HRA) values, but because of industry events, CNP models the failure explicitly and, as a result, realistic data to support this model was required. Neither this change nor the preceding change affect the delta CDF or ICCDP, and delta LERF or ICLERP values calculated, but this does change the base case CDF and LERF values.
- Additional event trees were added to the existing PRA analysis of record to distinguish the usage of the SDGs between single-unit SBO events and dual-unit SBO events. Specifically, during a dual-unit SBO, the power supplied to the 4 kV bus by the SDGs will be aligned to whichever unit needs it first. An additional function was added to the Dual-Unit Loss of Offsite Power (DLSP) event tree for dual unit SBO to provide the capability to make this distinction in the PRA model. In the modified model, there are five event trees for "single unit SBO from a DLSP," and five event trees for "dual unit SBO from a dual unit DLSP."
- A basic event representing failure of the SDGs to supply power to the 4kV buses was added to the fault trees that represent buses T11A, T11B, T11C, and T11D. Note that the SDGs were assumed to only be able to power both buses of one train of emergency power. A new fault tree was developed to determine the failure probability used for the SDGs as discussed above.

Modeling Assumptions

The SDGs were added to the CNP PRA using a set of assumptions that are conservative. Assumptions were biased toward conservative values due to the absence of detailed information for some of the SDG design specifications. Assumptions were also based on the present SDG design specification package. This section outlines some of the key assumptions and the basis behind them.

SDG Reliability

The SDG power source consists of two diesel generators that synchronize with each other automatically. The system fault tree models a failure of one diesel to start, run, or synchronize as a failure of the SDGs to provide power. The existing emergency diesel start and run failure data was used for each of the SDGs. Using the EDG failure rate data is believed to be conservative. The SDGs are expected to be more mechanically reliable than the existing EDGs. This is based

on advances made in diesel reliability, less stringent starting requirements, and the benefit of a long commercial operating history.

SDG Availability

The SDGs will be operated and maintained according to approved procedures. Load run testing is expected to occur once per month for no more than 4 hours total. Only a fraction of this time is expected to render the SDGs unavailable. To account for the unavailability, one and one third days of unavailability per SDG were assumed for this analysis. While in test, the SDGs will be fully functional and will require minimal additional operator action to exit the test. These additional operator actions were not modeled due to their low overall contribution to risk. The SDGs will be verified available before any scheduled entry into the extended EDG, CCW, or ESW AOT.

SDG Support

The SDGs are independent of external supports other than fuel oil. The availability of fuel oil is included in the analysis. Operator rounds will ensure the replenishment of fuel oil and will also provide an additional level of monitoring of overall SDG condition.

EDG, CCW, ESW Reliability

EDG, CCW, and ESW reliability parameters remain unchanged for this evaluation. The EDG, CCW, and ESW major equipment failure data is based on a Bayesian update that combines generic data with station specific data. Although one of the primary drivers behind this AOT extension request is to extend the LCO time to allow work to be performed on these components that will increase their reliability, no reliability increase was assumed for this analysis.

EDG, CCW, and ESW Unavailability

This risk assessment conservatively assumes no EDG, CCW, or ESW major equipment (pumps/heat exchangers) scheduled maintenance during Modes 2 through 6. All scheduled maintenance on these components is assumed to be performed in Mode 1. The 14-day AOTs are expected to yield some efficiency in maintenance and thereby reduce total unavailability of this equipment. However, no maintenance scheduling efficiency was assumed for this evaluation. Although an additional 10 to 15 days of maintenance per year per train is not expected for any components impacted by these AOT requests, the unavailability associated with each impacted train was increased to a total of 17 days to bound the actual yearly unavailability. This includes increasing the unavailability associated with both the initiating event fault trees and the normal system level fault trees associated with the CNP PRA model.

Human Reliability

The SDGs require human intervention to energize and load an emergency bus. Draft EOPs associated with the human actions required to energize and load the necessary emergency bus have been evaluated using the EPRI HRA calculator. The EPRI HRA calculator was used to document the human actions required to restore power to an emergency bus using the SDGs using the Human Cognitive Reliability/Operator Reliability Experiments/Techniques for Human Error Prediction methodology. This methodology considers timing dependency and stress on the operators to determine probabilities of the operator failing to load the SDGs properly. The total Human Error Probability for failing to load the SDGs was calculated as 9.5E-03.

Common Cause

Dependencies between component failures were considered when modeling the SDGs. The following describes common cause considerations modeled in the CNP PRA.

SDGs and EDGs

Due to physical separation, different manufacturers, different design, different fuel oil supply, different operating conditions, and different maintenance procedures, common cause was not modeled between the SDGs and the EDGs.

EDGs

Common cause is modeled for the EDGs. These engines are similar in manufacturer, design, operating environment, and maintenance.

SDGs

Common cause is modeled for the SDGs. These engines will be similar in manufacturer, design, operating environment, and maintenance.

Initiating Events that Influence SDG Availability

The SDGs do not create any new initiating events for the 69 kV switchyard or impact the frequency of any existing initiating event.

Result Summary

The results shown in Tables 1 and 2 provided at the end of this enclosure were generated using an updated model based on the assumptions outlined in the previous section. Negative numbers represent a risk reduction.

Change in Plant Risk Relative to Guidelines

The addition of the SDGs reduces core damage risk as shown by the negative delta CDF and falls well below Region III of Figure 3 of Regulatory Guide 1.174. The addition of the SDGs reduces LERF as shown by the negative delta LERF and falls well below Region III of Figure 4 of Regulatory Guide 1.174. The LERF risk reduction is a result of the combined benefits accrued by the addition of the SDGs, both reducing the number of SBO CDF sequences and providing a back-up power supply for the DIS hydrogen igniters during SBO conditions. The CDF and LERF risk reductions satisfy the Regulatory Guide 1.174 criteria.

Conclusion

The 69 kV AOT extension is not reliant upon installation of the SDGs since the 69 kV switchyard is not a normal source of power to the units, and can only be aligned as a dead bus transfer, which requires manual actions to implement. Installation of the SDGs does not impact the risk importance of the 69 kV switchyard.

The EDG, CCW, and ESW system AOT extensions are directly dependent upon the installation of the SDGs since the importance of these systems is directly impacted by the addition of the SDGs. The SDGs serve as a partial replacement of the EDG function during an SBO condition, which is currently the most significant CDF and LERF accident sequence for CNP. Installation of the SDGs reduces the contribution of SBO scenarios to CDF and LERF, and reduces the overall impact on CDF and LERF of the systems whose functions will be restored via power from the SDGs.

Even assuming 17 days of test and maintenance on each of the EDG, CCW, and ESW trains, and assuming unavailability of the 69 kV switchyard, with the SDGs installed, there is an overall risk reduction of greater than 20 percent as measured by delta CDF, and an overall risk reduction of greater than 30 percent as measured by delta LERF.

These risk reductions satisfy Regulatory Guide 1.174 limits by maintaining the risk at or below Region III as shown in Figures 3 and 4 of the Regulatory Guide. Additionally, these risk reductions are judged to contain significant conservatisms since the following major risk reduction characteristics were not credited in the underlying risk assessment analysis:

- No credit was taken for any contingency actions associated with these AOTs, including no credit for a reduced probability of loss of offsite power because of protecting the switchyard. Normal station risk management practices direct the switchyard to be protected when specific action statements, including the EDG TS action statement, are entered.
- No credit was taken for extending the availability of DC power beyond the current 4-hour station battery life during SBO scenarios. With the new SDGs, the battery chargers will be powered, and reliance on the batteries during SBO conditions will be greatly reduced.

- No credit was taken in the risk evaluation for the installed spare CCW pump. This pump is maintained capable of being aligned to provide flow to either of the CCW loops on either unit. Procedures exist for the alignment and use of this pump.
- No credit was taken for the availability of the SDGs in the convolution analysis associated with the recovery of offsite power. If one of the two SDGs were to fail to provide power, the remaining SDG would still be capable of providing sufficient power to restore injection capability to a single unit. This alignment, however, would require additional operator actions associated with blocking non-essential loads, and manually aligning the required loads.
- All calculations (ICCDP, ICLERP, delta CDF, delta LERF) assume component T&M unavailability of 17 days for the affected systems. Use of 17 days instead of the requested 14-day extended AOT, envelopes the ITS requirement to have "second Completion Times" in the LCO Action statements for TS 3.8.1, as described in Section 2.0 of this enclosure.

Using more realistic test and maintenance unavailabilities for each of the trains would result in overall risk reductions of greater than 30 percent for CDF and greater than 40 percent for LERF.

Overall Safety Assessment Conclusion

The results of the deterministic evaluation and risk evaluation demonstrate that the SDGs are capable of mitigating the dominant core damage sequences and provide a significant overall risk reduction for station operation.

4.2.2 Tier 2: Avoidance of Risk-Significant Plant Configurations

The goal of the Tier 2 portion of the assessment is to provide reasonable assurance that risk-significant plant equipment outage configurations will not occur when specific plant equipment is out of service consistent with the proposed TS change. The Tier 1 risk analysis calculations credit availability of the SDGs to support the extended AOTs for one inoperable EDG, one inoperable CCW loop, or one inoperable ESW loop. However, there are no other specific compensatory measures that need to be included in the PRA model in order to meet the quantitative risk guidelines in Regulatory Guides 1.174 and 1.177. Section 4.1 of this enclosure discusses compensatory measures that will be considered for implementation of the extended AOTs. These will be implemented as necessary via the configuration risk management program (CRMP) discussed in Section 4.2.3.

Although concurrent extended outages in one train of equipment (e.g., EDG, CCW, and ESW Train A or B) would be permitted by the TS under the proposed extended AOTs, I&M does not intend to perform major system maintenance on all these systems simultaneously. I&M will manage the risk associated with maintenance and surveillance during such concurrent outages using the CRMP.

4.2.3 Tier 3: Risk-Informed Configuration Management

The goal of the Tier 3 portion of the assessment is to ensure that the risk impact of out-of-service equipment is appropriately evaluated prior to performing any maintenance activity. The program is intended to provide the ability to identify risk-significant plant equipment outage configurations in a timely manner during normal plant operation.

CNP has a CRMP in place that has been developed in accordance with 10 CFR 50.65(a)(4). This program is a proceduralized risk-informed assessment process to manage the risk associated with planned and unplanned plant maintenance activities. The procedure governing the program requires an integrated (i.e., both quantitative and qualitative) review of maintenance activities to identify risk significant plant equipment outage configurations. This review is required both during the work management process and for emergent conditions during normal plant operation. Appropriate consideration is given to equipment unavailability, operational activities such as testing, and weather conditions. The procedure includes provisions for performing a configuration-dependent assessment of the overall impact on risk of proposed plant configurations prior to, and during, the performance of maintenance activities that remove equipment from service. This includes consideration of appropriate defense-in-depth aspects associated with the activities.

A quantitative risk assessment is performed to ensure that the activity does not pose any unacceptable risk. This evaluation is performed using the Safety Monitor™ model, which is based on the CNP Level I PRA model. The Safety Monitor™ software is used to assess the impact on CDF and LERF for both scheduled maintenance activities and actual plant conditions. The results are used to support the management of the risk associated with planned and unplanned plant maintenance activities. The risk assessment results are classified using a color code based on the increased risk of the activity. These color code classifications are described in the following table:

Color	Risk
Green	The risk level is acceptable. No contingency planning is required.
Yellow	The risk to nuclear safety or likelihood of plant transient/trip is increased. At the discretion of the Operations Shift Manager, contingency actions may be specified.
Orange	The risk to nuclear safety or likelihood of plant transient/trip is significant. An entry into an Orange condition requires Operations management approval and appropriate contingency plan.

Color	Risk
Red	The risk level is unacceptable without further review and approval. The proposed schedule must be evaluated to determine if the plant configuration can be revised to reduce or eliminate the Red risk significance.

In addition, a risk assessment is performed for both units whenever the following systems/components (as applicable), with cross-unit PRA impact, become unavailable:

- ESW
- CCW
- Non-essential service water
- Plant air compressors (including backup air compressor)
- Motor-driven auxiliary feedwater pumps
- Chemical and volume control system
- AC and DC electrical distribution systems and EDGs (as support systems for the above systems/components)

Proceduralized risk management actions restrict elective risk significant plant equipment outage configurations compliant with the following comprehensive philosophy:

- Weather conditions are evaluated prior to starting significant maintenance activities;
- The condition of the offsite power sources and switchyard are assessed prior to starting significant maintenance activities that could potentially have an effect on offsite or onsite electric power;
- Restrictions are imposed on switchyard maintenance;
- Restrictions are imposed on elective maintenance activities on redundant components;
- Restrictions are imposed on elective maintenance activities on components identified as risk significant given the specific maintenance activity and the current plant configuration;
- Requirements for pre-job briefs are specified; and,
- Risk is re-assessed if an equipment failure/malfunction or emergent condition produces a plant configuration that has not been previously assessed.

4.2.4 PRA Quality

I&M has exhibited a long-term commitment to using, maintaining, and updating the CNP PRA model. In 1992, I&M submitted responses, including a Level 3 internal events PRA, seismic PRA, and a fire PRA to fulfill the requirements of NRC Generic Letter 88-20 (Reference 7.6). IN 1995, I&M submitted extensive revisions to the HRA, seismic, and fire models. Further PRA model updates to address plant modifications and to update data were completed in 1996 and 1997. In June 2001, I&M completed a project to update and make other improvements to the existing version of the PRA. The overall purpose of this project was to enhance the usage of the PRA model to support compliance with 10 CFR 50.65(a)(4) for management of risk during

maintenance activities, and to support the new risk-informed, performance-based regulatory environment. This project included:

- Updating the PRA model to include new plant specific data, making necessary model changes because of procedure and/or design changes, updating the treatment of common cause failures and removing unnecessary or unwarranted conservatisms and simplifications;
- Adding a LERF model to the PRA model;
- Developing a separate Unit 2 model; and
- Developing a shutdown risk model that could be used to support assessment and management of shutdown risk.

In September 2001, the updated PRA model received a certification review in accordance with the WOG certification process. This review led to a number of Facts and Observations (F&Os), including three "A" Level significance F&Os and 24 "B" Level significance F&Os. The WOG Certification process assigns "A" Level significance to F&Os that are considered extremely important and necessary to address to assure the technical adequacy or quality of the PRA model, while "B" Level significance is assigned to F&Os that are considered important and necessary to address, but may be deferred until the next PRA model update.

Following receipt of the draft WOG certification report, I&M undertook a model update that addressed all of the "A" and "B" Level F&Os, with the exception of an "A" Level F&O that concerned internal flooding. Flooding has been specifically addressed for this license amendment request as discussed in Section 4.2.5. The goal of this update was to assure that the F&Os were addressed sufficiently to meet the criteria identified for ASME Quality Category 2 (Reference 7.7). Implementation of these changes to the PRA notebooks was completed in October 2003. Quantification of the revisions was completed in April 2004. Subsequent to the latest update effort, I&M had the F&O resolutions reviewed and validated as satisfactory by an independent contractor. This contractor also performed a gap assessment of the updated model compared to Regulatory Guide 1.200 (Reference 7.8).

The 2001 and 2003 PRA model updates resulted in a number of significant changes to the internal events PRA model. The resulting PRA model is the current PRA model of record, upon which this amendment request is based. The following areas were addressed during the 2001 and 2003 updates:

- Initiating Events
- Event Trees
- Reliability Data
- Human Reliability Analysis
- LERF Model

These updates further improved the quality of the PRA model as summarized below.

Update of Initiating Events

Fifteen internal initiating event categories were evaluated in the PRA model. To provide sufficient resolution for plant maintenance risk evaluations, it was necessary to subdivide a number of the initiating event categories (large and medium LOCAs, steam generator tube ruptures, and steam line breaks) into the individual contributions from each reactor coolant system (RCS) loop. Four separate initiating events were then evaluated for each of these categories. Similarly, the analysis of a loss of a single DC power train was performed for each train separately.

The loss of offsite power was divided into loss of offsite power to a single unit and loss to both units (dual unit loss of offsite power). Similarly, the loss of ESW was split to consider the loss of a single unit's ESW separately from a total (dual unit) loss of ESW.

The frequencies of the initiating events were reassessed based on updated plant specific data and new generic data. In addition, a number of the frequencies were obtained from models built into the overall PRA either as transfers from other initiators or as detailed system models. This included consequential medium and small break LOCAs resulting from a power operated relief valve or safety relief valve (SRV) failing to re-close, station blackouts, anticipated transient without scram (ATWS) events and the special initiators, which are loss of ESW, loss of CCW, and loss of 250 V DC power.

In response to F&Os, the transient initiating event groupings were reassessed resulting in a reevaluation of the frequency of the transient with the steam conversion system available and the transient with the steam conversion system not available. In addition, the interfacing system LOCA frequencies were revised based on industry references to include excessive valve leakage as well as ruptures.

Update of Event Trees

Event trees were developed for each initiating event. To properly separate failure of injection into the RCS from failure to remove heat from the containment, and to provide a model which would allow analysis of maintenance activities that would disable the heat removal function but not the injection function, the heat removal functions were removed from the containment spray and high and low pressure recirculation functions and combined in a new long-term cooling function.

A new "No Large Early Release" branch was added to all sequences where the probability of a LERF was different from zero or unity. Branches and transfers were added for consequential events and for special initiators. This was done to provide an integrated model of all events and to avoid double counting of failures of support systems during the mission time following a transient initiator.

An event tree, similar to the medium LOCA event tree with success in bleed and feed, was prepared for the consequential medium LOCA due to a stuck open SRV. This was necessary because the initiating event does not fail an injection path (as it does for a pipe break in a loop) and the amount of coolant loss is equivalent to the bleed flow from a bleed and feed and, with high pressure injection, bleed and feed is initiated.

Essentially duplicate event trees were added to provide sufficient resolution for configuration risk management as follows:

- Large and medium LOCAs, steam generator tube rupture, and steam line break were divided into four loop-specific event trees;
- Loss of offsite power was divided into two event trees to distinguish single-unit and dual-unit initiators;
- Loss of ESW was split into two event trees to distinguish single-unit and dual-unit initiators;
- Loss of a 250 V DC train was divided into two event trees to distinguish train-specific effects; and
- Steam line breaks downstream of the main steam isolation valves (MSIVs) were removed from the steam line break initiator unless, in addition, an MSIV failed to close.

As a result of F&O resolutions, a number of new event trees were required. New event trees were developed to explicitly consider transfer from one event tree to another given failure of a support system. New event trees were developed for ATWS, medium LOCA caused by a stuck open pressurizer safety valve, small LOCA caused by a stuck open pressurizer relief valve, loss of ESW to both units' CCW system, loss of ESW to a single unit's CCW system, and loss of CCW. In addition, new event trees were developed to explicitly model the unique aspects of the four different interfacing system LOCA initiators.

Update of Reliability Data

The updating of component failure data included collecting and analyzing new CNP failure data for the time period from January 1, 1993, through December 31, 1999, and the updating of CCF data for all components. The scope of the data collection effort was determined by using a critical components list. The following critical component types were identified:

- Turbine and Motor Driven Pumps
- Motor Operated Valves
- Air Operated Valves
- EDGs
- Fans
- Strainers

Operating, demand, and failure data for these components was obtained from surveillance test procedures, control room logs, and diesel generator run logs and entered into a database. This information was combined with previously-collected CNP data and used to perform a Bayesian

update of generic priors to generate a plant-specific failure rate or probability. Other failure data was taken from generic industry sources.

To support the revision of the CCF analysis, the MGL factors were obtained from the latest industry references and combined with the base component unavailability to obtain the failure rates in the CCF expansion.

Update of HRA

As stated above, extensive revisions to the initial Individual Plant Examination (IPE) HRA analysis were submitted in 1995. For the present update (June 2001), the human error probabilities evaluated were limited to those which were affected by changes in procedures or were new to the updated model. The principal re-evaluation involved the revised procedure for switching to cold leg recirculation. This affected the human errors associated with low and high pressure emergency core cooling system recirculation and containment spray recirculation. The revised procedure for a loss of CCW was also used to update the associated human error probabilities. Following the changes in the event trees and system models, the new human interactions were systematically identified and integrated into the existing quantification process. Following quantification, a review of cut-sets containing multiple human errors was conducted to ensure dependencies between operator actions were appropriately treated.

As a result of the resolution of F&Os, pre-initiator miscalibration human errors and human interactions for several sequences were updated. These sequences are low pressure recirculation for small and medium LOCAs and loss of ESW and CCW, reactor coolant pump trip following a loss of CCW or ESW, and RCS depressurization for small and medium LOCAs.

LERF Analysis

The LERF model, added in the June 2001 update, was created based on the guidance set forth in NUREG/CR-6595 (Reference 7.9), which presents a simplified containment event tree for an ice condenser containment specifically created to address the calculation of LERF.

The event tree models included essentially all the functions needed to determine the relevant plant damage state and the conditional probability of a large early release. The conditional probability was determined for each damage state from the above referenced model. To fully integrate the determination of LERF within the PRA model, a LERF branch was added to most of the core damage event trees and each core damage sequence was designated as either a large early release or a no large early release sequence.

As a result of resolving an F&O, the failure of containment isolation was explicitly included as a contributor to LERF via an external transfer in the fault tree.

4.2.5 External Events Risk Assessment

External event contributions to CDF and LERF are not included in the CNP internal events PRA model. External event CDF contributions for initiating events associated with internal fires, seismic, and internal flooding events were evaluated in the CNP Individual Plant Examination for External Events (IPEEE) analysis performed in response to Generic Letter 88-20, Supplement 4 (Reference 7.10). Level 2 and LERF evaluations were not performed as part of the IPEEE submittals. However, assuming that external event-initiated core damage sequences progress to LERF sequences with the same relative likelihood as do the internal event-initiated core damage sequences allows estimation of external event-initiated LERF. The CDF and estimated LERF contributions from external events are summarized as follows:

External Event	CDF[/year]	LERF [/year]
Fire	3.76E-06	1.50E-07
Seismic	3.17E-06	9.82E-07
Flooding	2.17E-07	1.26E-08
Total	7.15E-06	1.14E-06

Other external event studies included in the PRA that are not affected by the proposed amendment are:

- External Flooding
- Aircraft Accidents
- Severe Winds (strong winds and tornadoes)
- Ship Impact Accidents
- Off-Site Hazardous Material Accidents
- On-Site Hazardous Material Accidents
- Turbine Missiles
- External Fires (loss of offsite power scenarios are included in the loss of offsite power initiating event frequency)

The effect of the proposed amendment on the IPEEE analysis for seismic events, fire events, and flooding events is discussed below. The CNP IPE analysis performed in response to Generic Letter 88-20 specifically modeled Unit 1 as the representative unit due to the similarity in design between Unit 1 and Unit 2. The Unit 1 analysis is considered to be representative of both units. Accordingly, special consideration was given to dual unit issues (i.e., dual unit dependencies were considered and evaluated as appropriate). The fire, flooding, and seismic external events IPEEE analyses used the IPE analysis as a foundation, specifically modeling Unit 1 as the representative unit with special consideration given to dual unit issues. Therefore, the Unit 1 external event results discussed below are considered to be representative of both units.

Seismic

In 1992, I&M submitted a probabilistic seismic analysis as part of the IPEEE. Following NRC review of the IPEEE submittal, the seismic IPEEE was updated in 1995 to resolve concerns with the methods and data used for seismic fragility calculations in the 1992 analysis. The 1995 seismic analysis is the current model of record.

The seismic analysis found the following components to be the dominant contributors to the seismic core damage frequency. The dominant components, in order of contribution are:

- Auxiliary Building
- Transformer OT-11 (influence by proximity to block wall)
- Fuel oil day tank for EDGs (influenced by proximity to block wall)
- Turbine-driven auxiliary feedwater pump (random failure)
- 250 volt DC battery racks
- 250 volt DC battery charger
- Miscellaneous motor control centers and reactor protection system racks
- Miscellaneous ice condenser components

The systems for which I&M is requesting AOT extensions (EDGs, CCW, ESW, 69 kV) are not on the list of dominant components. The fuel oil day tanks for the EDGs are important only because they are situated close to block walls that have low seismic fragility. A summary of the importance of each component follows:

EDGs: The existing EDGs are rugged and the high confidence of low probability of failure (HCLPF) values compared to the sensitive components listed above are relatively large. The risk significant aspect of the EDGs is the fuel oil day tanks, each of which is located in close proximity to a block wall having a relatively low HCLPF and a correspondingly high contribution to seismic CDF. The addition of the SDGs will provide an improvement to this performance aspect, because the SDGs and their fuel supply are installed in a separate location. The seismic risk contributor for the EDGs does not impact the seismic response of the SDGs. Thus, the new SDGs can be considered seismically independent of the existing EDGs.

CCW: The CCW pumps are rugged and the HCLPF values compared to the sensitive components listed above are relatively large. Since all CCW pumps will respond in a similar manner during a seismic event, having a single pump out for maintenance prior to a seismic event will make little difference in the plant response.

ESW: The ESW pumps are rugged and the HCLPF values compared to the sensitive components listed above are relatively large. Since all ESW pumps will respond in a similar manner during a seismic event, having a single pump out for maintenance prior to a seismic event will make little difference in the plant response.

69 kV Offsite Power Line: All offsite power will most likely be lost for any seismic event with a peak ground acceleration above 0.1g. This implies that operability of the 69 kV circuit prior to a seismic event is of little consequence since all offsite power will be lost for any substantial seismic event. As a result, the extended AOT for the 69 kV circuit has no affect on plant response to a seismic event.

In summary, the components of interest associated with the proposed amendment play minimal roles in mitigating seismic events. Increased AOTs for these components will have minimal impact on the seismic core damage frequency. In addition, with the installation of the SDGs, the significance of the contribution from the EDG fuel oil day tanks to the seismic risk profile will be reduced.

Fire

The effects of the proposed extended AOTs for the EDGs, CCW, and ESW systems on the results of the CNP IPEEE fire analysis have been qualitatively evaluated for this license amendment request. The 69 kV line is not a credited system in the IPEEE fire analysis and was not considered further since it could not quantitatively affect fire risk. The present revision of the IPEEE fire analysis was updated in 1995 to address concerns raised by the NRC during its review of I&M's submittal in response to Generic Letter 88-20, Supplement 4. Fires in the control room dominate the CDF for internal fire events with a contribution of 1.81E-06/yr. The CDF contribution for a fire in an EDG room (fire zone 15, EDG 1CD or fire zone 16, EDG 1AB) was estimated to be 3.04E-07/yr and 3.50E-7/yr, respectively. The CDF contribution for a fire in the CCW pump area of the Auxiliary Building (fire zone 44S) was estimated to be 3.80E-07/yr. The CDF contribution for a fire in an ESW pump room (fire zone 29A or 29B) was estimated to be 1.07E-07/yr.

The IPEEE fire analysis indicates that the CCW pump area and the ESW pump rooms of the Auxiliary Building are not very susceptible to fires. The main reason for this is that both areas are essentially concrete and steel, and contain minimal combustibles. Also, a postulated fire in the ESW screen house motor control center that disables the ESW pumps is not considered credible and was screened from further evaluation. Furthermore, maintenance activities associated with these components are not expected to change the low susceptibility to a fire. Any heat-producing activities such as welding or grinding are controlled at CNP by plant procedures, including activity-specific controls such as welding permits. The proposed extended AOTs do not affect the conclusions reached in the IPEEE fire analysis.

The IPEEE fire analysis evaluation of control room cabinet fires that could cause a loss of an ESW pump determined that a single panel fire would cause the loss of both ESW pumps in a unit. Given this panel configuration, the IPEEE fire analysis then estimated the frequency of a loss of all ESW due to a fire in a single control room. No resulting frequencies were greater than 1E-08/yr. The proposed AOT extension would not affect these results since both pumps are assumed to fail due to the panel fire.

The fire analysis evaluation of control room cabinet fires that could cause a loss of a CCW pump determined that a single panel fire would cause the loss of both CCW pumps in a unit. Given this panel configuration, the analysis estimated the frequency of a loss of all CCW due to a fire in a single control room. The resulting core damage frequency for the loss of CCW from a control room fire was determined to be 1.81E-06/yr. The proposed AOT extension would not affect these results since both pumps are assumed to fail due to the panel fire.

The fire analysis evaluation of control room cabinet fires that could cause a station blackout determined that the control room station blackout frequency is sufficiently small that it could be ignored. This included the failure of the normal AC power supply for the unit and both units' EDGs. The proposed AOT extensions would have no affect on CDF due to control room cabinet fires that could cause a station blackout.

Flooding

The effect of the proposed AOT extensions on the current IPEEE flooding analysis was also reviewed. The plant areas reviewed were the ESW pump rooms, the CCW pump area of the Auxiliary Building, and the EDG rooms. The conclusion of the current flooding analysis is that the flooding contribution to CDF associated with these components is sufficiently small. Therefore, these areas were eliminated from additional flooding analysis during initial screening. The proposed AOT extensions would have no affect on the CDF contribution due to flooding.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

Indiana Michigan Power Company (I&M) has evaluated whether a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated?

   Response: No

   The proposed changes to the Technical Specifications (TS) will extend the allowed outage time (AOT) for a single inoperable emergency diesel generator (EDG), one inoperable component cooling water (CCW) or essential service water (ESW) loop, or an inoperable 69 kilovolt (kV) offsite circuit from the current limit of 72 hours to 14 days. An independent alternating current (AC) power source consisting of two supplemental diesel generators (SDGs) will be installed to support the extended AOTs for the EDGs and the CCW and ESW systems. The SDGs will supply power to required safe shutdown loads in the affected unit.

The EDGs are backup AC power sources designed to power safe shutdown systems in the event of a loss of offsite power. As such, the EDGs are not initiators for any accident previously evaluated. The CCW and ESW systems provide cooling water to safety-related components. This is a support function, and malfunctions of the CCW and ESW systems are not initiators of any accidents previously analyzed. The 69 kV circuit is an alternate offsite power supply that must be manually connected by the control room operators to provide power to safety-related buses upon loss of the preferred 34.5 kV offsite power source. As such, the 69 kV circuit is not an initiator for any accident previously evaluated. The AOT extension for an inoperable EDG, a CCW or ESW loop, or 69 kV circuit does not introduce any failure mechanisms that would initiate a previously analyzed accident. Therefore, the proposed change permitting extension of the AOTs for the EDG, ESW, CCW, and 69 kV systems do not result in a significant increase in the probability of a previously evaluated accident.

The potential effect of the proposed change on the consequences of a previously evaluated accident has been considered. There are two EDGs per unit, and only one EDG per unit is required to fulfill the onsite AC power system safety function. During the extended AOT, the redundant EDG will be available to provide AC power to safety-related components. There are two CCW loops per unit, and only one CCW loop per unit is required to fulfill the CCW system safety function. During the extended AOT, the redundant CCW loop will be available to provide cooling water to safety-related components. There are two ESW loops per unit, and only one ESW loop per unit is required to fulfill the ESW system safety function for the affected unit. During the extended AOT, the redundant ESW loop will be available to provide cooling water to the safety-related components. The 69 kV offsite circuit is the alternate offsite power source. Only one offsite power source is required to fulfill the offsite power system safety function. During an extended AOT, the preferred offsite source will be available. Thus, the systems affected by the proposed amendment will still be capable of performing the safety functions needed to mitigate the consequences of an accident as previously evaluated.

The format changes improve appearance, but do not affect any requirements.

Therefore, the proposed change will not involve a significant increase in the probability or consequences of any accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

   The proposed change consists of increasing the AOTs allowed by TS for the EDG, CCW, ESW, and 69 kV systems. Extending existing AOTs, does not result in operation of the

plant in any new or different manner, nor does it create any new accident precursors. The format changes improve appearance, but do not affect any requirements.

Therefore, the proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The margins of safety are established through design parameters, operating parameters, and the setpoints at which automatic actions are initiated. The proposed change does not adversely affect any design or operating parameter or any setpoint used in the deterministic accident analyses to establish the margin of safety. Probabilistic risk assessment methods were used to evaluate the risked-based margins of safety for the proposed change. The results of these evaluations indicated the proposed AOT extensions combined with installation of additional on-site electrical power supplies results in a net risk reduction. The format changes improve appearance, but do not affect any requirements.

Therefore, the proposed change will not create a significant reduction in a margin of safety.

In summary, based upon the above evaluation, I&M has concluded that the proposed amendment involves no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

Design Criteria

As described in Updated Final Safety Analysis Report Section 1.4, the Plant Specific Design Criteria (PSDC) define the principal criteria and safety objectives for the Donald C. Cook Nuclear Plant (CNP) design. The following PSDC are relevant to the proposed amendment.

AC Power Systems

Plant Specific Design Criterion 39 – Emergency Power – An emergency power source shall be provided and designed with adequate independency, redundancy, capacity, and testability to permit the functioning of the engineered safety features and protection systems required to avoid undue risk to the health and safety of the public. This power source shall provide this capacity assuming a failure of a single active component.

Cooling Water Systems

Plant Specific Design Criterion 4 – Sharing of Systems – Reactor facilities may share systems or components if it can be shown that such sharing will not result in undue risk to the health and safety of the public.

The above plant specific design criteria were used in the design of CNP and the proposed amendment will not affect compliance with these criteria.

10 CFR 50.36, "Technical Specifications"

10 CFR 50.36(c)(2)(ii) describes the requirements for TS Limiting Conditions for Operation (LCOs) and is applicable to the proposed amendment. The proposed amendment retains the existing LCOs for the 69 kV offsite circuit, EDGs, CCW, and ESW.

In the "Final Policy Statement on Technical Specification Improvements for Nuclear Power Reactors," published in the Federal Register, 58 FR 39132, July 22, 1993, the Nuclear Regulatory Commission (NRC) stated that it:

> "...expects that licensees, in preparing their Technical Specification related submittals, will utilize any plant-specific PRA or risk survey and any available literature on risk insights and PRAs . . . Similarly, the NRC staff will also employ risk insights and PRAs in evaluating Technical Specifications related submittals. Further, as a part of the Commission's ongoing program of improving Technical Specifications, it will continue to consider methods to make better use of risk and reliability information for defining future generic Technical Specification requirements."

The NRC guidance on use of risk information in changing TS requirements is contained in Regulatory Guide 1.174 and Regulatory Guide 1.177. The proposed AOT extensions for the EDG, CCW, ESW, and 69 kV systems were evaluated and found to be acceptable in accordance with the guidance in Regulatory Guide 1.174 and 1.177.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health or safety of the public.

6.0 ENVIRONMENTAL CONSIDERATIONS

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in

the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. Regulatory Guide 1.155, "Station Blackout," dated August 1988.
2. NUREG-0933, "A Prioritization of Generic Safety Issues: Main Report and Supplements," (published periodically).
3. NRC Memorandum TIA 2004-02, Request for Technical Assistance – Degraded Voltage Protection at D. C. Cook, dated June 7, 2004.
4. Regulatory Guide 1.174, "An Approach For Using Probabilistic Risk Assessment In Risk Informed Decisions on Plant-Specific Changes to The Licensing Basis," Revision 1, dated November 1, 2002.
5. Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decision - making: Technical Specifications," dated August 1, 1998.
6. Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities - 10 CFR 50.54(f)," dated November 23, 1988.
7. ASME RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," dated 04-05-02; with Addenda RA-Sa-2003, dated December 5, 2003.
8. Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," dated February 2004.
9. NUREG/CR-6595, "An Approach for Estimating the Frequencies of Various Containment Failure Modes and Bypass Events," dated January 1999.
10. Generic Letter 88-20, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities - 10 CFR 50.54(f), Supplement 4," dated June 28, 1991.

8.0 PRECEDENTS

The NRC has approved similar amendments involving EDG AOT extensions at other pressurized water reactors. The following is not an all-inclusive list of amendments, but is intended to provide examples:

Entergy	Waterford 3	Accession No. ML003734973
Progress Energy	Crystal River 3	Accession No. ML031670993
Entergy	ANO 2	Accession No. ML032240050
South Texas Project	South Texas 1&2	Accession No. ML021300535
Exelon	Byron/Braidwood 1&2	Accession No. ML003749193

The NRC has approved amendments involving fluid system AOT extensions. The following is not an all-inclusive list of amendments, but is intended to provide examples:

South Texas Project	South Texas 1&2 (Component Cooling Water) (Essential Cooling Water)	 Accession No. ML021300134 Accession No. ML021300535
Exelon	Byron 1&2 (Essential Service Water)	 Accession No. ML040610869
I&M	CNP 1 & 2 (Essential Service Water One-Time Extension)	Accession No. ML022420039

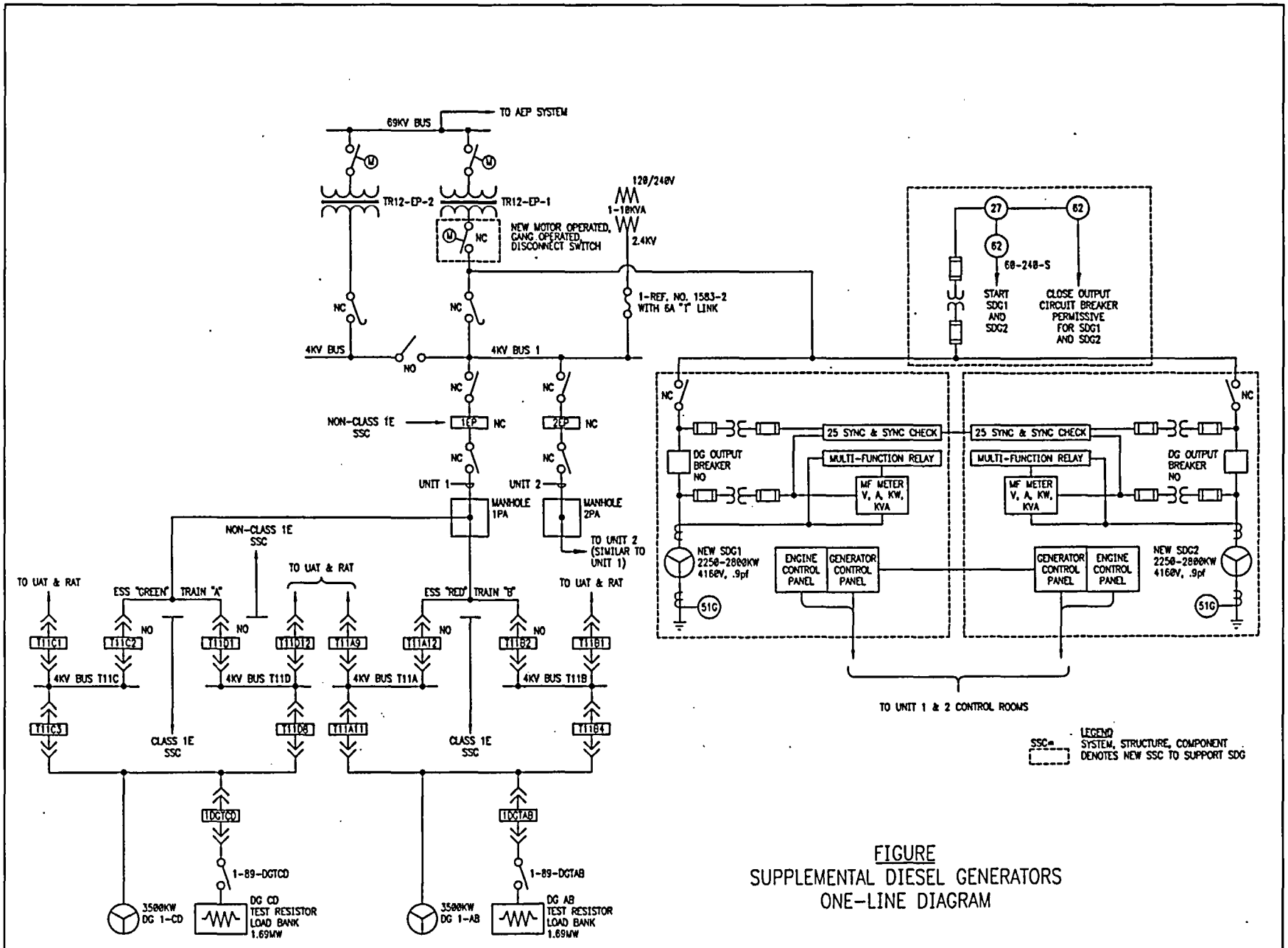

FIGURE
SUPPLEMENTAL DIESEL GENERATORS
ONE-LINE DIAGRAM

Table 1

SUMMARY OF PRA RESULTS

UNIT 1

Note: Negative numbers reflect a risk reduction.

Scenario = Average Test and Maintenance (T&M)	CDF	LERF	Delta CDF	Delta LERF	ICCDP	ICLERP
Current Base Case	3.71E-05	6.74E-06				
Current Base Case with 69 kV Circuit Out-of Service	3.72E-05	6.75E-06	1.20E-07	8.00E-09	5.59E-09	3.73E-10
New Base Case, i.e., SDGs available*	1.99E-05	3.96E-06	-1.72E-05	-2.78E-06		

Scenario = SDGs available*, Average T&M, Train/component listed below in 17 day T&M	CDF	LERF	ICCDP Using Current Base Case	ICLERP Using Current Base Case	ICCDP Using New Base Case	ICLERP Using New Base Case
East CCW**	2.74E-05	4.00E-06	-4.51E-07	-1.27E-07	3.47E-07	1.86E-09
West CCW	2.09E-05	3.96E-06	-7.54E-07	-1.29E-07	4.52E-08	0.00E+00
East ESW**	4.40E-05	4.41E-06	3.22E-07	-1.09E-07	1.12E-06	2.08E-08
West ESW	3.42E-05	4.08E-06	-1.33E-07	-1.24E-07	6.66E-07	5.36E-09
AB EDG	3.52E-05	6.30E-06	-8.48E-08	-2.06E-08	7.14E-07	1.09E-07
CD EDG	3.45E-05	6.27E-06	-1.21E-07	-2.17E-08	6.78E-07	1.08E-07

*SDGs aligned to T11C and T11D.
**Case shown for information only. CRMP would direct alignment of SDGs to T11A and T11B for this train outage.

Table 2

SUMMARY OF PRA RESULTS

UNIT 2

Note: Negative numbers reflect a risk reduction.

Scenario = Average Test and Maintenance (T&M)	CDF	LERF	Delta CDF	Delta LERF	ICCDP	ICLERP
Current Base Case	3.70E-05	6.74E-06				
Current Base Case with 69 kV Circuit Out-of Service	3.71E-05	6.75E-06	1.20E-07	8.00E-09	5.59E-09	3.73E-10
New Base Case, i.e., SDGs available*	1.98E-05	3.96E-06	-1.72E-05	-2.78E-06		

Scenario = SDGs available*, Average T&M, Train/component listed below in 17-day T&M	CDF	LERF	ICCDP using Current Base Case	ICLERP using Current Base Case	ICCDP using New Base Case	ICLERP using New Base Case
East CCW**	2.73E-05	4.00E-06	-4.51E-07	-1.28E-07	3.48E-07	1.86E-09
West CCW	2.08E-05	3.96E-06	-7.54E-07	-1.30E-07	4.56E-08	0.00E+00
East ESW**	4.39E-05	4.40E-06	3.22E-07	-1.09E-07	1.12E-06	2.08E-08
West ESW	3.41E-05	4.07E-06	-1.33E-07	-1.24E-07	6.66E-07	5.36E-09
AB EDG	3.51E-05	6.29E-06	-8.48E-08	-2.09E-08	7.14E-07	1.09E-07
CD EDG	3.44E-05	6.27E-06	-1.22E-07	-2.18E-08	6.78E-07	1.08E-07

*SDGs aligned to T21C and T21D.
**Case shown for information only. CRMP would direct alignment of SDGs to T21A and T21B for this train outage.

Attachment 1A to AEP:NRC:4811

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 7-15
3/4 7-17
3/4 7-18
3/4 8-1
3/4 8-2
B 3/4 7-4
B 3/4 7-4a
B 3/4 8-1

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1

a. At least two independent component cooling water loops shall be OPERABLE.

b. At least one component cooling water flowpath in support of Unit 2 shutdown functions shall be available.

APPLICABILITY: Specification 3.7.3.1.a - MODES 1, 2, 3 and 4.
Specification 3.7.3.1.b - At all times when Unit 2 is in MODES 1, 2, 3, or 4.

ACTION:

When Specification 3.7.3.1.a is applicable:

With only one component cooling water loop OPERABLE, restore at least two loops 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:

a) The requirement to restore the loop to OPERABLE status within 72 hours may be extended to 14 days if both SDGs are verified available and aligned for backup operation, and

b) If at any time during the above identified 14-day period, one or both SDGs become unavailable, restore the SDGs to available status within 72 hours (not to exceed 14 days from the time the component cooling water loop became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

When Specification 3.7.3.1.b is applicable:

With no flowpath to Unit 2 available, return at least one flow path to available status within 7 days, or provide equivalent shutdown capability in Unit 2 and return at least one flow path to available status within the next 60 days, or have Unit 2 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two component cooling water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

c. By verifying pump performance pursuant to Specification 4.0.5.

d. At least once per 18 months by verifying that the unit cross-tie valves can cycle full travel. Following cycling, the valves will be verified to be in their closed positions.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1 a. At least two independent essential service water loops shall be OPERABLE.

b. At least one essential service water flowpath associated with support of Unit 2 shutdown functions shall be available.

APPLICABILITY: Specification 3.7.4.1.a – Either Unit in MODES 1, 2, 3, and 4.
Specification 3.7.4.1.b - At all times when Unit 2 is in MODES 1, 2, 3 or 4.

ACTION:

a. When Unit 1 is in MODES 1, 2, 3, and 4:

With only one essential service water loop OPERABLE, restore at least two loops 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 loop 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, restore the SDGs to available status within 72 hours (not to exceed 14 days from the time the essential service water loop became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. When Unit 2 is in MODES 1, 2, 3 and 4:

1. With any Unit 1 essential service water pump not OPERABLE, within one hour close at least one crosstie valve on the associated header or have Unit 2 enter ACTION a for Unit 2 Specification 3.7.4.1 for the Unit 2 essential service water pump sharing the same header with the inoperable Unit 1 essential service water pump.

2. With no essential service water flow path available in support of Unit 2 shutdown functions, return at least one flow path to available status within 7 days, or have Unit 2 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two essential service water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

~~This page Intentionally left blank.~~

c. By verifying pump performance pursuant to Specification 4.0.5.

d. At least once per 92 days by verifying that each closed crosstie valve, in the available essential service water flowpath associated with support of Unit 2 shutdown functions, can be cycled from the control room.

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.~~ Offsite Circuit inoperable:

1. With the 34.5 kV preferred 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.

2. With the 69 kV alternate 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 14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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

ACTION (Continued)

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.

c. With one offsite circuit and one diesel generator 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 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 at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With the diesel generator restored to OPERABLE status, follow ACTION Statement a.* With the offsite circuit restored to OPERABLE status, follow ACTION Statement b.*

d. With two of the above required offsite A.C. circuits inoperable, restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite source restored, follow ACTION Statement a.*

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With one diesel generator unit restored, follow ACTION Statement b* or c*.

*The ACTION statement time shall be based upon the time associated with the component inoperability, and is not reset when exiting this ACTION statement.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values taken at +10°F and are sufficient to prevent brittle fracture.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident analyses.

An independent A. C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one component cooling water loop is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the allowed outage time can be extended from 72 hours to 14 days, if both SDGs are verified available for backup operation.

During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a CCW loop is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the component cooling water loop 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 component cooling water loop became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will be limited to once per operating cycle per loop.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

The OPERABILITY of the essential service water (ESW) system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the analyses.

The ESW system consists of two independent headers shared between the two units. Each unit has two ESW pumps, one connected to each header. The portion of the header associated with each unit is designated as a loop and consists of that unit's ESW pump and associated cooling loads. Each header may be split into the two independent loops by closing one of two crosstie valves.

An independent A. C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one essential service water loop is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the allowed outage time can be extended from 72 hours to 14 days, if both SDGs are verified available for backup operation.

~~This page intentionally left blank.~~

During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an ESW loop is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the essential service water loop 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 essential service water loop became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will be limited to once per operating cycle per loop.

Limiting Condition for Operation 3.7.4.1.a also ensures that an inoperable Unit 1 ESW pump does not result in flow being diverted from an OPERABLE Unit 2 ESW pump sharing the same header. To be considered OPERABLE for supporting Unit 2 operation in MODES 1, 2, 3, and 4, the Unit 1 ESW pump must meet the OPERABILITY requirements for MODES 1, 2, 3, and 4. A Unit 1 ESW pump that is not OPERABLE, but is available to be started manually, may be considered part of the shutdown flowpath required by Specification 3.7.4.1.b provided at least one crosstie valve in the shutdown flowpath is closed and capable of being opened from the control room.

Limiting Condition for Operation 3.7.4.1.b ensures a shutdown cooling flow path from Unit 1 is maintained available for Unit 2. The available shutdown cooling flow path is necessary to support Unit 2 in the event of a complete loss of ESW in Unit 2 or a 10 CFR 50 Appendix R fire. The available flowpath may have a closed crosstie valve(s) when required by Action b.1. Specification 4.7.4.1.d ensures a closed crosstie valve can be opened from the control room to support the shutdown flow path during a complete loss of ESW in Unit 2. For 10 CFR 50 Appendix R, it is assumed that the valve can be opened by local manual operation.

3/4.7.3 and 3/4.7.4

The OPERABILITY of the Unit 1 flowpaths which support Unit 2 shutdown functions ensures the availability of cooling functions on Unit 2 and addresses the requirements of 10 CFR 50 Appendix R. The required flowpath consists of a pump and associated water supplies and delivery systems. Fire watches posted in the affected opposite unit areas (i.e., Unit 2 areas requiring use of the Unit 1 component cooling water system in the event of a fire) may serve as the equivalent shutdown capability specified in the action statement of Specification 3.7.3.1. In the affected areas, either establish continuous fire watches or verify the OPERABILITY of fire detectors per the Administrative Technical Requirements Manual and establish hourly fire watch patrols. The required opposite unit equipment along with the surveillance requirements necessary to ensure that this equipment is capable of fulfilling its intended Appendix R alternate safe shutdown functions have been established and are included in a plant procedure. An additional plant procedure details how the above noted fire watches will be implemented.

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 A.C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one emergency diesel generator (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. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an EDG is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. 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) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will 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

Attachment 1B to AEP:NRC:4811

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 7-12
3/4 7-13
3/4 8-1
3/4 8-2
B 3/4 7-4
B 3/4 7-4a
B 3/4 8-1

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1

a. At least two independent component cooling water loops shall be OPERABLE.

b. At least one component cooling water flow path in support of Unit 1 shutdown functions shall be available.

APPLICABILITY: Specification 3.7.3.1.a. - MODES 1, 2, 3, 4.
Specification 3.7.3.1.b. - At all times when Unit 1 is in MODES 1, 2, 3, or 4.

ACTION:

When Specification 3.7.3.1.a is applicable:

With only one component cooling water loop OPERABLE, restore at least two loops 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:

a. The requirement to restore the loop to OPERABLE status within 72 hours may be extended to 14 days if both SDGs are verified available, and

b. If at any time during the above identified 14-day period, one or both SDGs become unavailable, restore the SDGs to available status within 72 hours (not to exceed 14 days from the time the component cooling water loop became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

When Specification 3.7.3.1.b is applicable:

With no flowpath to Unit 1 available, return at least one flowpath to available status within 7 days, or provide equivalent shutdown capability in Unit 1 and return at least one flow path to available status within the next 60 days, or have Unit 1 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two component cooling water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

c. By verifying pump performance pursuant to Specification 4.0.5.

d. At least once per 18 months, verify that the unit cross-tie valves can cycle full travel. Following cycling, the valves will be verified to be in their closed positions.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1 a. At least two independent essential service water loops shall be OPERABLE.

b. At least one essential service water flowpath associated with support of Unit 1 shutdown functions shall be available.

APPLICABILITY: Specification 3.7.4.1.a - Either Unit in MODES 1, 2, 3, and 4.
Specification 3.7.4.1.b - At all times when Unit 1 is in MODES 1, 2, 3, or 4.

ACTION:

a. When Unit 2 is in MODES 1, 2, 3, and 4:

With only one essential service water loop OPERABLE, restore at least two loops 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 loop 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, restore the SDGs to available status within 72 hours (not to exceed 14 days from the time the essential service water loop became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. When Unit 1 is in MODES 1, 2, 3 and 4:

1. With any Unit 2 essential service water pump not OPERABLE, within one hour close at least one crosstie valve on the associated header or have Unit 1 enter ACTION a for Unit 1 Specification 3.7.4.1 for the Unit 1 essential service water pump sharing the same header with the inoperable Unit 2 essential service water pump.

2. With no essential service water flow path available in support of Unit 1 shutdown functions, return at least one flow path to available status within 7 days, or have Unit 1 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two essential service water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

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.~~ Offsite circuit inoperable:

1. With the 34.5 kV preferred 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.

2. With the 69 kV alternate 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 14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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

ACTION (Continued)

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.

c. With one offsite circuit and one diesel generator 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 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 at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With the diesel generator restored to OPERABLE status, follow ACTION Statement a.* With the offsite circuit restored to OPERABLE status, follow ACTION Statement b.*

d. With two of the above required offsite A.C. circuits inoperable, restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite source restored, follow ACTION Statement a.*

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With one diesel generator unit restored, follow ACTION Statement b* or c.*

* The ACTION statement time shall be based upon the time associated with the component inoperability, and is not reset when exiting this ACTION statement.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values taken at +10°F and are sufficient to prevent brittle fracture.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident analyses.

An independent A. C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one component cooling water loop is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the allowed outage time can be extended from 72 hours to 14 days, if both SDGs are verified available for backup operation.

During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a CCW loop is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the component cooling water loop 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 component cooling water loop became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will be limited to once per operating cycle per loop.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

The OPERABILITY of the essential service water (ESW) system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident analyses.

The ESW system consists of two independent headers shared between the two units. Each unit has two ESW pumps, one connected to each header. The portion of the header associated with each unit is designated as a loop and consists of that unit's ESW pump and associated cooling loads. Each header may be split into the two independent loops by closing one of two crosstie valves.

An independent A.C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one essential service water loop is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the allowed outage time can be extended from 72 hours to 14 days, if both SDGs are verified available for backup operation.

During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an ESW loop is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the essential service water water loop 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 essential service water loop became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will be limited to once per operating cycle per loop.

Limiting Condition for Operation 3.7.4.1.a also ensures that an inoperable Unit 2 ESW pump does not result in flow being diverted from an OPERABLE Unit 1 ESW pump sharing the same header. To be considered OPERABLE for supporting Unit 1 operation in MODES 1, 2, 3, and 4, the Unit 2 ESW pump must meet the OPERABILITY requirements for MODES 1, 2, 3, and 4. A Unit 2 ESW pump that is not OPERABLE, but is available to be started manually, may be considered part of the shutdown flowpath required by Specification 3.7.4.1.b provided at least one crosstie valve in the shutdown flowpath is closed and capable of being opened from the control room.
Limiting Condition for Operation 3.7.4.1.b ensures a shutdown cooling flow path from Unit 2 is maintained available for Unit 1. The available shutdown cooling flow path is necessary to support Unit 1 in the event of a complete loss of ESW in Unit 1 or a 10 CFR 50 Appendix R fire. The available flowpath may have a closed crosstie valve(s) when required by Action b.1. Specification 4.7.4.1.d ensures a closed crosstie valve can be opened from the control room to support the shutdown flow path during a complete loss of ESW in Unit 1. For 10 CFR 50 Appendix R, it is assumed that the valve can be opened by local manual operation.

3/4.7.3 and 3/4.7.4

The OPERABILITY of the Unit 2 flowpaths which support Unit 1 shutdown functions ensures the availability of cooling functions on Unit 1 and addresses the requirements of 10 CFR 50 Appendix R. The required flowpath consists of a pump and associated water supplies and delivery systems. Fire watches posted in the affected opposite unit areas (i.e., Unit 1 areas requiring use of the Unit 2 component cooling water system in the event of a fire) may serve as the equivalent shutdown capability specified in the action statement of Specification 3.7.3.1. In the affected areas, either establish continuous fire watches or verify the OPERABILITY of fire detectors per the Administrative Technical Requirements Manual and establish hourly fire watch patrols. The required opposite unit equipment along with the surveillance requirements necessary to ensure that this equipment is capable of fulfilling its intended Appendix R alternate safe shutdown function have been established and are included in a plant procedure. An additional plant procedure details how the above noted fire watches will be implemented.

3/4.7.5 CONTROL ROOM EMERGENCY VENTILATION AND CONTROL ROOM AIR CONDITIONING SYSTEMS

The OPERABILITY of the control room emergency ventilation system (CREVS) ensures that the control room will remain habitable for operations personnel during and following all credible accident conditions. In MODES 1-4, the CREVS provides radiological protection to allow operators to take the actions necessary to mitigate the consequences of a design basis accident. The CREVS is also required to be OPERABLE for operations involving the movement of irradiated fuel assemblies to provide protection from a fuel handling accident. The CREVS has two pressurization trains with each pressurization train consisting of a pressurization fan, normal intake air damper, and emergency intake air damper available to align and maintain flow to the control room. The charcoal adsorber/HEPA filter unit consists of the prefilter, charcoal adsorbers, HEPA filter, and filter housing. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation

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 A. C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support AOT extensions and are referred to as the supplemental diesel generators (SDGs). When one emergency diesel generator (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. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an EDG is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. 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) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will 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

Attachment 2A to AEP:NRC:4811

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

All affected pages have been provided, including those containing only relocated text.

3/4 7-15
3/4 7-17
3/4 7-18
3/4 8-1
3/4 8-2
3/4 8-3
3/4 8-4
B 3/4 7-4
B 3/4 7-4a
B 3/4 8-1
B 3/4 8-2
B 3/4 8-3

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1

a. At least two independent component cooling water loops shall be OPERABLE.

b. At least one component cooling water flowpath in support of Unit 2 shutdown functions shall be available.

APPLICABILITY: Specification 3.7.3.1.a - MODES 1, 2, 3 and 4.
Specification 3.7.3.1.b - At all times when Unit 2 is in MODES 1, 2, 3, or 4.

ACTION:

When Specification 3.7.3.1.a is applicable:

With only one component cooling water loop OPERABLE, restore at least two loops 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:

a) The requirement to restore the loop to OPERABLE status within 72 hours may be extended to 14 days if both SDGs are verified available, and

b) If at any time during the above identified 14-day period, one or both SDGs become unavailable, restore the SGs to available status within 72 hours (not to exceed 14 days from the time the component cooling water loop became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

When Specification 3.7.3.1.b is applicable:

With no flowpath to Unit 2 available, return at least one flow path to available status within 7 days, or provide equivalent shutdown capability in Unit 2 and return at least one flow path to available status within the next 60 days, or have Unit 2 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two component cooling water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

c. By verifying pump performance pursuant to Specification 4.0.5.

d. At least once per 18 months by verifying that the units cross-tie valves can cycle full travel. Following cycling, the valves will be verified to be in their closed positions.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1 a. At least two independent essential service water loops shall be OPERABLE.

b. At least one essential service water flowpath associated with support of Unit 2 shutdown functions shall be available.

APPLICABILITY: Specification 3.7.4.1.a – Either Unit in MODES 1, 2, 3, and 4.
Specification 3.7.4.1.b - At all times when Unit 2 is in MODES 1, 2, 3 or 4.

ACTION:

a. When Unit 1 is in MODES 1, 2, 3, and 4:

With only one essential service water loop OPERABLE, restore at least two loops to OPERABLE status within 14 days, 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 loop 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, restore the SDGs to available status within 72 hours (not to exceed 14 days from the time the essential service water loop became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. When Unit 2 is in MODES 1, 2, 3 and 4:

1. With any Unit 1 essential service water pump not OPERABLE, within one hour close at least one crosstie valve on the associated header or have Unit 2 enter ACTION a for Unit 2 Specification 3.7.4.1 for the Unit 2 essential service water pump sharing the same header with the inoperable Unit 1 essential service water pump.

2. With no essential service water flow path available in support of Unit 2 shutdown functions, return at least one flow path to available status within 7 days, or have Unit 2 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two essential service water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

c. By verifying pump performance pursuant to Specification 4.0.5.

d. At least once per 92 days by verifying that each closed crosstie valve, in the available essential service water flowpath associated with support of Unit 2 shutdown functions, can be cycled from the control room.

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. Offsite Circuit inoperable:

1. With the 34.5 kV preferred 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.

2. With the 69 kV alternate 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 14 days 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:

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

ACTION (Continued)

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.

c. With one offsite circuit and one diesel generator 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 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 at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With the diesel generator restored to OPERABLE status, follow ACTION Statement a.* With the offsite circuit restored to OPERABLE status, follow ACTION Statement b.*

d. With two of the above required offsite A.C. circuits inoperable, restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite source restored, follow ACTION Statement a.*

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With one diesel generator unit restored, follow ACTION Statement b* or c*.

f. Specification 3.0.4.b is not applicable to diesel generators.

*The ACTION statement time shall be based upon the time associated with the component inoperability, and is not reset when exiting this ACTION statement.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability, and

b. Demonstrated OPERABLE at least once per 18 months by transferring the unit power source automatically from the normal auxiliary source to the preferred reserve source and by transferring manually to the alternate reserve source.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the day tank,

2. Verifying the fuel level in the fuel storage tank,

3. Verifying that the fuel transfer pump can be started and that it transfers fuel from the storage system to the day tank,

4. Verifying that the diesel starts from standby conditions and achieves in less than or equal to 10 seconds, voltage = 4160±420 V, and frequency = 60±1.2 Hz,*

5. Verifying the diesel is synchronized and loaded and operates for greater than or equal to 60 minutes at a load of 3500 kw**, and

6. Verifying that the diesel generator is aligned to provide standby power to the associated emergency busses.

b. By removing accumulated water***

1) From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and

2) From the storage tanks at least once per 31 days.

c. By sampling new fuel oil*** in accordance with the applicable guidelines of ASTM D4057-81 prior to adding new fuel to the storage tanks and

1) By verifying, in accordance with the tests specified in ASTM D975-81 and prior to adding the new fuel to the storage tanks, that the sample has:

---

* The diesel generator start (10 seconds) from standby conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts for the purpose of this surveillance testing and compensatory action may be at reduced acceleration rates as recommended by the manufacturer so that mechanical stress and wear on the diesel engine are minimized.

** Momentary load transients do not invalidate this test.

*** The actions to be taken should any of the properties be found outside of specified limits are defined in the Bases.

SURVEILLANCE REQUIREMENTS (Continued)

1) By verifying, in accordance with the tests specified in ASTM D975-81 and prior to adding the new fuel to the storage tanks, that the sample has:

a) A kinematic viscosity of greater than or equal to 1.9 centistokes but less than or equal to 4.1 centistokes at 40°C (alternatively, Saybolt viscosity, SUS at 100°F of greater than or equal to 32.6 but less than or equal to 40.1), if gravity was not determined by comparison with supplier's certification.

b) A flash point equal to or greater than 125°F.

2) By verifying, in accordance with the test specified in ASTM D1298-80 and prior to adding the new fuel to the storage tanks, that the sample has either an API gravity of greater than or equal to 30 degrees but less than or equal to 40 degrees at 60EF or an absolute specific gravity at 60/60°F of greater than or equal to 0.82 but less than or equal to 0.88, or an API gravity of within 0.3 degrees at 60EF when compared to the supplier's certificate or a specific gravity of within 0.0016 at 60/60° when compared to the supplier's certificate.

3) By verifying, in accordance with the test specified in ASTM D4176-82 and prior to adding new fuel to the storage tanks, that the sample has a clear and bright appearance with proper color.

4) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are within the appropriate limits when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D2622-82.

d. At least once per 31 days by obtaining a sample of fuel oil from the storage tanks in accordance with ASTM D2276-83, and verifying that total particulate contamination is less than 10 mg/liter when tested in accordance with ASTM D2276-83, Method A*.

e. At least once per 18 months, during shutdown, by:

1. Subjecting the diesel engine to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,

* The actions to be taken should any of the properties be found outside of the specified limits are defined in the Bases.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values taken at +10°F and are sufficient to prevent brittle fracture.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident analyses.

An independent A. C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one component cooling water loop is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the allowed outage time can be extended from 72 hours to 14 days, if both SDGs are verified available for backup operation.

During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a CCW loop is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the component cooling water loop 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 component cooling water loop became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will be limited to once per operating cycle per loop.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

The OPERABILITY of the essential service water (ESW) system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the analyses.

The ESW system consists of two independent headers shared between the two units. Each unit has two ESW pumps, one connected to each header. The portion of the header associated with each unit is designated as a loop and consists of that unit's ESW pump and associated cooling loads. Each header may be split into the two independent loops by closing one of two crosstie valves.

An independent A. C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one essential service water loop is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the allowed outage time can be extended from 72 hours to 14 days, if both SDGs are verified available for backup operation.

During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an ESW loop is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the essential service water loop 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 essential service water loop became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will be limited to once per operating cycle per loop.

Limiting Condition for Operation 3.7.4.1.a also ensures that an inoperable Unit 1 ESW pump does not result in flow being diverted from an OPERABLE Unit 2 ESW pump sharing the same header. To be considered OPERABLE for supporting Unit 2 operation in MODES 1, 2, 3, and 4, the Unit 1 ESW pump must meet the OPERABILITY requirements for MODES 1, 2, 3, and 4. A Unit 1 ESW pump that is not OPERABLE, but is available to be started manually, may be considered part of the shutdown flowpath required by Specification 3.7.4.1.b provided at least one crosstie valve in the shutdown flowpath is closed and capable of being opened from the control room.

Limiting Condition for Operation 3.7.4.1.b ensures a shutdown cooling flow path from Unit 1 is maintained available for Unit 2. The available shutdown cooling flow path is necessary to support Unit 2 in the event of a complete loss of ESW in Unit 2 or a 10 CFR 50 Appendix R fire. The available flowpath may have a closed crosstie valve(s) when required by Action b.1. Specification 4.7.4.1.d ensures a closed crosstie valve can be opened from the control room to support the shutdown flow path during a complete loss of ESW in Unit 2. For 10 CFR 50 Appendix R, it is assumed that the valve can be opened by local manual operation.

3/4.7.3 and 3/4.7.4

The OPERABILITY of the Unit 1 flowpaths which support Unit 2 shutdown functions ensures the availability of cooling functions on Unit 2 and addresses the requirements of 10 CFR 50 Appendix R. The required flowpath consists of a pump and associated water supplies and delivery systems. Fire watches posted in the affected opposite unit areas (i.e., Unit 2 areas requiring use of the Unit 1 component cooling water system in the event of a fire) may serve as the equivalent shutdown capability specified in the action statement of Specification 3.7.3.1. In the affected areas, either establish continuous fire watches or verify the OPERABILITY of fire detectors per the Administrative Technical Requirements Manual and establish hourly fire watch patrols. The required opposite unit equipment along with the surveillance requirements necessary to ensure that this equipment is capable of fulfilling its intended Appendix R alternate safe shutdown functions have been established and are included in a plant procedure. An additional plant procedure details how the above noted fire watches will be implemented.

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 A.C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one emergency diesel generator (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. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an EDG is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. 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) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will 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 occurrence of postulated events. It is further required to immediately initiate action to restore the required A.C. and D.C. electrical power distribution subsystems and to continue this action until restoration is accomplished in order to provide the necessary power to the unit safety systems. Not withstanding performance of the above conservative ACTIONS, a required residual heat removal (RHR) subsystem may be inoperable. In this case, an ACTION is provided to direct declaring RHR inoperable, which results in taking the appropriate RHR actions. The specified completion time of "immediately" is consistent with the required times for actions requiring prompt attention. The restoration of the required distribution subsystems should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power.

Specific surveillance requirements (SRs) of SR 4.8.1.2 may be delayed one time until just prior to the first entry into MODE 4 following the extended outage that commenced in 1997. The delay is permitted to recognize the significant ongoing maintenance to safety systems and components that would be required to be OPERABLE solely to support the referenced surveillances. The delay recognizes the reduced decay heat load and fission product activities resulting from the extended shutdown and consequently the small benefit from performing the surveillances prior to the next entry into MODE 4. It is the intent that these SRs must still be capable of being met, but actual performance is not required until the required safety systems are ready to support entry into MODE 4.

The AB and CD station battery systems provide a reliable source of continuous power for supply and control of plant loads such as switchgear and annunciator control circuits, static inverters, valve control centers, emergency lighting and motor control centers. The design duty cycles of these batteries are composite load profiles resulting from the combination of the three hour Loss Of Coolant Accident/Loss Of Offsite Power battery load profiles and the four hour Station Blackout battery load profiles.

The train N station battery system provides an independent 250 volt DC power supply for power and control of the turbine driven auxiliary feedwater pump train. The limiting conditions of operation for the train N battery are consistent with the requirements of the auxiliary feedwater system. The surveillance requirements for the train N battery system are consistent with the requirements of the AB and CD station batteries. The train N battery loads are derived from equipment in the turbine driven auxiliary feedwater pump train and battery sizing is consistent with the functional requirements of these components. Simulated loads for battery tests are loads equivalent to measured actual loads.

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of physical damage or deterioration does not necessarily represent a failure of SR 4.8.2.3.2.c.1 or 4.8.2.5.2.c.1, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).

The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR provided visible corrosion is removed during the performance of SRs 4.8.2.3.2.c.2 and 4.8.2.5.2.c.2.

Removal of accumulated water as required by 4.8.1.1.2.b.2 is performed by drawing the contents off the bottom of the tank until acceptable results are obtained for either a tape test or a water and sediment test. An acceptable result for the water and sediment content is a measured value less than 0.05 percent volume.

The "proper color" criterion of Surveillance Requirement 4.8.1.1.2.c.3 ensures the translucence of the fuel oil sample will allow observation of water or sediment when analyzed in accordance with ASTM D4176-82. Fuel oil is considered to have proper color if it measures less than or equal to five per ASTM D1500. The addition of visible dyes to fuel oil may interfere with the ASTM D1500 analysis.

The sample specified in 4.8.1.1.2.c.4 is sent offsite for testing. A serious attempt will be made to meet the 31-day limit on the offsite tests; however, if for some reason this limit is not met (e.g., if the sample is lost or broken or if the results are not received in 31 days), the diesel generators should not be considered inoperable. If the sample is lost, broken, or fails the offsite tests and the new oil has already been put into the storage tank, the offsite tests will be performed on a sample taken from the storage tank. If the results on the subsequent storage tank sample are not within specified limits, the diesel generators should be considered OPERABLE and the out-of-spec properties should be returned to within specification as soon as possible.

If the monthly storage tank sample taken in accordance with Specification 4.8.1.1.2.d fails the particulate contamination test, the diesel generators should be considered OPERABLE and the contamination level should be restored to below 10 mg/liter as soon as possible.

The precision leak-detection test described in Surveillance Requirement 4.8.1.1.2.f.2 should be performed as described in NFPA (National Fire Protection Association) -329. As NFPA-329 is revised, the precision leak-detection test may be modified to incorporate changes to the test as described in the revisions to NFPA-329.

The minimum required diesel fuel oil volume is 43,240 gallons. This volume is consistent with operation of one diesel generator continuously for 7 days at rated load, as recommended in Regulatory Guide 1.137, entitled "Fuel Oil System for Standby Diesel Generators." The Technical Specifications require a minimum of 46,000 gallons of fuel. The 46,000 gallons is an indicated volume. This amount includes margin for characteristics such as location of the tank discharge pipes and slope of the tanks.

The Technical Specifications require the day fuel tank to contain a minimum of 70 gallons of fuel. The 70 gallons represents the usable volume of fuel that is available.

For surveillance requirements 4.8.1.1.2.e.4.b, 4.8.1.1.2.e.6.b, and 4.8.1.1.2.e.11, the requirement to verify the connection of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Specification 3.0.4.b is not applicable to an inoperable diesel generator. There is an increased risk associated with entering an OPERATIONAL MODE or other specified condition in the Applicability with an inoperable DG and the provisions of Specification 3.0.4.b, which allow entry into an OPERATIONAL MODE or other specified condition in the Applicability with the Limiting Condition for Operation not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

Attachment 2B to AEP:NRC:4811

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

All affected pages have been provided, including those containing only relocated text.

3/4 7-12
3/4 7-13
3/4 7-13a
3/4 8-1
3/4 8-2
3/4 8-3
B 3/4 7-4
B 3/4 7-4a
B 3/4 7-4b
B 3/4 8-1
B 3/4 8-2
B 3/4 8-3

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1

a. At least two independent component cooling water loops shall be OPERABLE.

b. At least one component cooling water flow path in support of Unit 1 shutdown functions shall be available.

APPLICABILITY: Specification 3.7.3.1.a. - MODES 1, 2, 3, 4.
Specification 3.7.3.1.b. - At all times when Unit 1 is in MODES 1, 2, 3, or 4.

ACTION:

When Specification 3.7.3.1.a is applicable:

With only one component cooling water loop OPERABLE, restore at least two loops 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:

a. The requirement to restore the loop to OPERABLE status within 72 hours may be extended to 14 days if both SDGs are verified available, and

b. If at any time during the above identified 14-day period, one or both SDGs become unavailable, restore the SDGs to available status within 72 hours (not to exceed 14 days from the time the component cooling water loop became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

When Specification 3.7.3.1.b is applicable:

With no flowpath to Unit 1 available, return at least one flowpath to available status within 7 days, or provide equivalent shutdown capability in Unit 1 and return at least one flow path to available status within the next 60 days, or have Unit 1 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two component cooling water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

c. By verifying pump performance pursuant to Specification 4.0.5.

d. At least once per 18 months, verify that the unit cross-tie valves can cycle full travel. Following cycling, the valves will be verified to be in their closed positions.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1 a. At least two independent essential service water loops shall be OPERABLE.

b. At least one essential service water flowpath associated with support of Unit 1 shutdown functions shall be available.

APPLICABILITY: Specification 3.7.4.1.a - Either Unit in MODES 1, 2, 3, and 4.
Specification 3.7.4.1.b - At all times when Unit 1 is in MODES 1, 2, 3, or 4.

ACTION:

a. When Unit 2 is in MODES 1, 2, 3, and 4:

With only one essential service water loop OPERABLE, restore at least two loops 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 loop 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, restore the SDGs to available status within 72 hours (not to exceed 14 days from the time the essential service water loop became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. When Unit 1 is in MODES 1, 2, 3 and 4:

1. With any Unit 2 essential service water pump not OPERABLE, within one hour close at least one crosstie valve on the associated header or have Unit 1 enter ACTION a for Unit 1 Specification 3.7.4.1 for the Unit 1 essential service water pump sharing the same header with the inoperable Unit 2 essential service water pump.

2. With no essential service water flow path available in support of Unit 1 shutdown functions, return at least one flow path to available status within 7 days, or have Unit 1 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two essential service water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection test signal.

c. By verifying pump performance pursuant to Specification 4.0.5.

d. At least once per 92 days by verifying that each closed crosstie valve, in the available essential service water flowpath associated with support of Unit 1 shutdown functions, can be cycled from the control room.

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. Offsite circuit inoperable:

1. With the 34.5 kV preferred 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.

2. With the 69 kV alternate 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 14 days 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:

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

ACTION (Continued)

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.

c. With one offsite circuit and one diesel generator 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 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 at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With the diesel generator restored to OPERABLE status, follow ACTION Statement a.* With the offsite circuit restored to OPERABLE status, follow ACTION Statement b.*

d. With two of the above required offsite A.C. circuits inoperable, restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite source restored, follow ACTION Statement a.*

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With one diesel generator unit restored, follow ACTION Statement b* or c.*

f. Specification 3.0.4.b is not applicable to diesel generators.

---

* The ACTION statement time shall be based upon the time associated with the component inoperability, and is not reset when exiting this ACTION statement.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability, and

b. Demonstrated OPERABLE at least once per 18 months by transferring the unit power source automatically from the normal auxiliary source to the preferred reserve source and by transferring manually to the alternate reserve source.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the day tank,

2. Verifying the fuel level in the fuel storage tank,

3. Verifying that the fuel transfer pump can be started and that it transfers fuel from the storage system to the day tank,

4. Verifying that the diesel starts from standby conditions and achieves in less than or equal to 10 seconds, voltage = 4160±420 V, and frequency = 60±1.2 Hz,*

5. Verifying the diesel is synchronized and loaded and operates for greater than or equal to 60 minutes at a load of 3500 kw**, and

6. Verifying that the diesel generator is aligned to provide standby power to the associated emergency busses.

b. By removing accumulated water***:

1) From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and

2) From the storage tanks at least once per 31 days.

c. By sampling new fuel oil*** in accordance with the applicable guidelines of ASTM D4057-81 prior to adding new fuel to the storage tanks and

1) By verifying, in accordance with the tests specified in ASTM D975-81 and prior to adding the new fuel to the storage tanks, that the sample has:

---

* The diesel generator start (10 seconds) from standby conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts for the purpose of this surveillance testing and compensatory action may be at reduced acceleration rates as recommended by the manufacturer so that mechanical stress and ear on the diesel engine are minimized.

** Momentary load transients do not invalidate this test.

*** The actions to be taken should any of the properties be found outside of specified limits are defined in the Bases.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values taken at +10°F and are sufficient to prevent brittle fracture.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident analyses.

An independent A. C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one component cooling water loop is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the allowed outage time can be extended from 72 hours to 14 days, if both SDGs are verified available for backup operation.

During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a CCW loop is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the component cooling water loop 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 component cooling water loop became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will be limited to once per operating cycle per loop.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

The OPERABILITY of the essential service water (ESW) system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident analyses.

The ESW system consists of two independent headers shared between the two units. Each unit has two ESW pumps, one connected to each header. The portion of the header associated with each unit is designated as a loop and consists of that unit's ESW pump and associated cooling loads. Each header may be split into the two independent loops by closing one of two crosstie valves.

An independent A.C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support allowed outage time (AOT) extensions and are referred to as the supplemental diesel generators (SDGs). When one essential service water loop is inoperable to perform either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the allowed outage time can be extended from 72 hours to 14 days, if both SDGs are verified available for backup operation.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM (Continued)

During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an ESW loop is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day AOT and cannot be restored to available status, the essential service water water loop 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 essential service water loop became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will be limited to once per operating cycle per loop.

Limiting Condition for Operation 3.7.4.1.a also ensures that an inoperable Unit 2 ESW pump does not result in flow being diverted from an OPERABLE Unit 1 ESW pump sharing the same header. To be considered OPERABLE for supporting Unit 1 operation in MODES 1, 2, 3, and 4, the Unit 2 ESW pump must meet the OPERABILITY requirements for MODES 1, 2, 3, and 4. A Unit 2 ESW pump that is not OPERABLE, but is available to be started manually, may be considered part of the shutdown flowpath required by Specification 3.7.4.1.b provided at least one crosstie valve in the shutdown flowpath is closed and capable of being opened from the control room.

Limiting Condition for Operation 3.7.4.1.b ensures a shutdown cooling flow path from Unit 2 is maintained available for Unit 1. The available shutdown cooling flow path is necessary to support Unit 1 in the event of a complete loss of ESW in Unit 1 or a 10 CFR 50 Appendix R fire. The available flowpath may have a closed crosstie valve(s) when required by Action b.1. Specification 4.7.4.1.d ensures a closed crosstie valve can be opened from the control room to support the shutdown flow path during a complete loss of ESW in Unit 1. For 10 CFR 50 Appendix R, it is assumed that the valve can be opened by local manual operation.

3/4.7.3 and 3/4.7.4

The OPERABILITY of the Unit 2 flowpaths which support Unit 1 shutdown functions ensures the availability of cooling functions on Unit 1 and addresses the requirements of 10 CFR 50 Appendix R. The required flowpath consists of a pump and associated water supplies and delivery systems. Fire watches posted in the affected opposite unit areas (i.e., Unit 1 areas requiring use of the Unit 2 component cooling water system in the event of a fire) may serve as the equivalent shutdown capability specified in the action statement of Specification 3.7.3.1. In the affected areas, either establish continuous fire watches or verify the OPERABILITY of fire detectors per the Administrative Technical Requirements Manual and establish hourly fire watch patrols. The required opposite unit equipment along with the surveillance requirements necessary to ensure that this equipment is capable of fulfilling its intended Appendix R alternate safe shutdown function have been established and are included in a plant procedure. An additional plant procedure details how the above noted fire watches will be implemented.

3/4.7.5 CONTROL ROOM EMERGENCY VENTILATION AND CONTROL ROOM AIR CONDITIONING SYSTEMS

The OPERABILITY of the control room emergency ventilation system (CREVS) ensures that the control room will remain habitable for operations personnel during and following all credible accident conditions. In MODES 1-4, the CREVS provides radiological protection to allow operators to take the actions necessary to mitigate the consequences of a design basis accident. The CREVS is also required to be OPERABLE for operations involving the movement of irradiated fuel assemblies to provide protection from a fuel handling accident. The CREVS has two pressurization trains with each pressurization train consisting of a pressurization fan, normal intake air damper, and emergency intake air damper available to align and maintain flow to the control room.

3/4.7.5 CONTROL ROOM EMERGENCY VENTILATION AND CONTROL ROOM AIR CONDITIONING SYSTEMS (Continued)

The charcoal adsorber/HEPA filter unit consists of the prefilter, charcoal adsorbers, HEPA filter, and filter housing. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to less than or equal to 5 rem Total Effective Dose Equivalent, TEDE. This limitation is consistent with the requirements of General Design Criteria (GDC) 19 of Appendix "A", 10 CFR 50.

The control room envelope/pressure boundary consists of the control room, the control room HVAC equipment room, and the plant process computer room. The Limiting Condition for operation is modified by a Note allowing the control room envelope/pressure boundary to be opened intermittently under administrative controls. For entry and exit through doors to the control room, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for control room envelope/pressure boundary isolation is indicated.

If the control room envelope/pressure boundary is inoperable in MODES 1, 2, 3, and 4, the CREVS trains cannot perform their intended functions. Actions must be taken to restore an OPERABLE control room envelope/pressure boundary within 24 hours. During the period that the control room envelope/pressure boundary is inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential hazards such as radioactive contamination, smoke, temperature and relative humidity, and physical security. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour completion time is reasonable based on the low probability of a design basis accident occurring during this time period, and the use of compensatory measures. The 24 hour completion time is a typically reasonable time to diagnose, plan and possibly repair, and test most problems with the control room envelope/pressure boundary.

The Unit 2 control room emergency ventilation system aligns and operates automatically on a Safety Injection (SI) Signal from either Unit 1 or Unit 2. Both pressurization fans start on the SI signal. Procedures direct realignment of the CREVS to single fan operation within two hours after receiving the SI signal. The automatic start from Unit 1 is normally only available when the Unit 1 ESF actuation system is active in modes 1 through 4 in Unit 1.

The Limiting Condition for Operation requires two independent control room heating and cooling systems. Each cooling system requires a functional air handling unit and associated cooling water supply. Cooling water is provided from a chilled water unit. At the design maximum essential service water (ESW) supply temperature of 86°F, a chilled water unit will maintain the control room temperature below 95°F. Cooling water may also be supplied directly by ESW when ESW supply temperature is $\leq$ 65°F.

The control room air conditioning system (CRACS) normally maintains the control room at temperatures at which control room equipment is qualified for the life of the plant. Continued operation at the Technical Specification limit is permitted since the portion of time the temperature is likely to be elevated is small in comparison to the qualified life of the equipment at the limit.

Each control room cooling system can maintain control room temperature $\leq$ 102°F during accident conditions with the control room isolated. At control room temperatures of $\leq$ 102°F, vital control room equipment remains within its manufacturer's recommended operating temperature range.

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 A. C. power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support AOT extensions and are referred to as the supplemental diesel generators (SDGs). When one emergency diesel generator (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. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an EDG is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. 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) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended AOT will 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 D.C. electrical power distribution subsystems and to continue this action until restoration is accomplished in order to provide the necessary power to the unit safety systems. Not withstanding performance of the above conservative ACTIONS, a required residual heat removal (RHR) subsystem may be inoperable. In this case, an ACTION is provided to direct declaring RHR inoperable, which results in taking the appropriate RHR actions. The specified completion time of "immediately" is consistent with the required times for actions requiring prompt attention. The restoration of the required distribution subsystems should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power.

Specific surveillance requirements (SRs) of SR 4.8.1.2 may be delayed one time until just prior to the first entry into MODE 4 following the extended outage that commenced in 1997. The delay is permitted to recognize the significant ongoing maintenance to safety systems and components that would be required to be OPERABLE solely to support the referenced surveillances. The delay recognizes the reduced decay heat load and reduced fission product activities resulting from the extended shutdown and consequently the small benefit from performing the surveillances prior to the next entry into MODE 4. It is the intent that these SRs must still be capable of being met, but actual performance is not required until the required safety systems are ready to support entry into MODE 4.

The AB and CD station battery systems provide a reliable source of continuous power for supply and control of plant loads such as switchgear and annunciator control circuits, static inverters, valve control centers, emergency lighting and motor control centers. The design duty cycles of these batteries are composite load profiles resulting from the combination of the three hour Loss Of Coolant Accident/Loss Of Offsite Power battery load profiles and the four hour Station Blackout battery load profiles.

The train N station battery system provides an independent 250 volt DC power supply for power and control of the turbine driven auxiliary feedwater pump train. The limiting conditions of operation for the train N battery are consistent with the requirements of the auxiliary feedwater system. The surveillance requirements for the train N battery system are consistent with the requirements of the AB and CD station batteries. The train N battery loads are derived from equipment in the turbine driven auxiliary feedwater pump train and battery sizing is consistent with the functional requirements of these components. Simulated loads for battery tests are loads equivalent to measured actual loads.

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of physical damage or deterioration does not necessarily represent a failure of SR 4.8.2.3.2.c.1 or 4.8.2.5.2.c.1, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).

The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR provided visible corrosion is removed during the performance of SRs 4.8.2.3.2.c.2 and 4.8.2.5.2.c.2.

Removal of accumulated water as required by 4.8.1.1.2.b.2 is performed by drawing the contents off the bottom of the tank until acceptable results are obtained for either a tape test or a water and sediment test. An acceptable result for the water and sediment content is a measured value less than 0.05 percent volume.

The "proper color" criterion of Surveillance Requirement 4.8.1.1.2.c.3 ensures the translucence of the fuel oil sample will allow observation of water or sediment when analyzed in accordance with ASTM D4176-82. Fuel oil is considered to have proper color if it measures less than or equal to five per ASTM D1500. The addition of visible dyes to fuel oil may interfere with the ASTM D1500 analysis.

The sample specified in 4.8.1.1.2.c.4 is sent offsite for testing. A serious attempt will be made to meet the 31-day limit on the offsite tests; however, if for some reason this limit is not met (e.g., if the sample is lost or broken or if the results are not received in 31 days), the diesel generators should not be considered inoperable. If the sample is lost, broken, or fails the offsite tests and the new oil has already been put into the storage tank, the offsite tests will be performed on a sample taken from the storage tank. If the results on the subsequent storage tank sample are not within specified limits, the diesel generators should be considered OPERABLE and the out-of-spec properties should be returned to within specification as soon as possible.

If the monthly storage tank sample taken in accordance with Specification 4.8.1.1.2.d fails the particulate contamination test, the diesel generators should be considered OPERABLE and the contamination level should be restored to below 10 mg/liter as soon as possible.

The precision leak-detection test described in Surveillance Requirement 4.8.1.1.2.f.2 should be performed as described in NFPA (National Fire Protection Association) -329. As NFPA-329 is revised, the precision leak-detection test may be modified to incorporate changes to the test as described in the revisions to NFPA-329.

The minimum required diesel fuel oil volume is 43,240 gallons. This volume is consistent with operation of one diesel generator continuously for 7 days at rated load, as recommended in Regulatory Guide 1.137, entitled "Fuel Oil System for Standby Diesel Generators." The Technical Specifications require a minimum of 46,000 gallons of fuel. The 46,000 gallons is an indicated volume. This amount includes margin for characteristics such as location of the tank discharge pipes and slope of the tanks.

The Technical Specifications require the day fuel tank to contain a minimum of 70 gallons of fuel. The 70 gallons represents the usable volume of fuel that is available.

For surveillance requirements 4.8.1.1.2.e.4.b, 4.8.1.1.2.e.6.b, and 4.8.1.1.2.e.11, the requirement to verify the connection of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Specification 3.0.4.b is not applicable to an inoperable diesel generator. There is an increased risk associated with entering an OPERATIONAL MODE or other specified condition in the Applicability with an inoperable DG and the provisions of Specification 3.0.4.b, which allow entry into an OPERATIONAL MODE or other specified condition in the Applicability with the Limiting Condition for Operation not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

Attachment 3A to AEP:NRC:4811

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

Only pages containing new or deleted text have been provided.

3.7.7-1
3.7.8-1
3.8.1-1
3.8.1-2
3.8.1-3
3.8.1-4
3.8.1-5
B 3.7.7-3
B 3.7.8-3
B 3.7.8-4
B 3.8.1-3
B 3.8.1-6
B 3.8.1-7
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 3.8.1-16
B 3.8.1-17
B 3.8.1-35

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CCW train inoperable.	A.1	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by CCW. ----------	
		Restore CCW train to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

3.7 PLANT SYSTEMS

3.7.8 Essential Service Water (ESW) System

LCO 3.7.8 Two ESW trains shall be OPERABLE.

----------NOTE----------
When an ESW train is crosstied with the associated Unit 2 ESW train, OPERABILITY of the ESW train includes the associated Unit 2 ESW pump.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ESW train inoperable.	A.1 ----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," for emergency diesel generator made inoperable by ESW System. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by ESW System. --- Restore ESW train to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System;

b. Two diesel generators (DGs) capable of supplying the onsite Class 1E power distribution subsystem(s);

c. One Unit 2 qualified circuit between the offsite transmission network and the Unit 2 onsite Class 1E AC Electrical Power Distribution System capable of supporting the associated equipment required to be OPERABLE by LCO 3.7.8, "Essential Service Water (ESW) System"; and

d. The Unit 2 DG(s) capable of supporting the associated equipment required to be OPERABLE by LCO 3.7.8.

APPLICABILITY: MODES 1, 2, 3, and 4.

---NOTE---

The Unit 2 electrical power sources in LCO 3.8.1.c and LCO 3.8.1.d are not required to be OPERABLE when the associated required equipment is inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ~~One required~~ 34.5 kV preferred offsite circuit inoperable.	A.1 ----------NOTE---------- Not applicable if ~~a~~ required Unit 2 34.5 kV preferred offsite circuit is inoperable. ----------	
	Perform SR 3.8.1.1 for required OPERABLE 69 kV alternate offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND	

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	A.2	Declare required feature(s) with no 34.5 kV offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND		
	A.3	Restore required 34.5 kV preferred offsite circuit to OPERABLE status.	72 hours AND 617 days from discovery of failure to meet LCO 3.8.1.a or b
B. 69 kV alternate offsite circuit inoperable.	B.1	NOTE Not applicable if required Unit 2 69 kV alternate offsite circuit is inoperable.	
		Perform SR 3.8.1.1 for required OPERABLE 34.5 kV preferred offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND		
	B.2	Declare required feature(s) with no 69 kV offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND		

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.3 Restore required 69 kV alternate offsite circuit to OPERABLE status.	14 days AND 17 days from discovery of failure to meet LCO 3.8.1.a or b
~~B~~C. One required DG inoperable.	~~B~~C.1 ----------NOTE---------- Not applicable if a required Unit 2 DG is inoperable. ---------- Perform SR 3.8.1.1 for the required offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND	
	~~B~~C.2 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition ~~B~~C concurrent with inoperability of redundant required feature(s)
	AND	
	~~B~~C.3.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.	24 hours
	OR	
	~~B~~C.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s).	24 hours
	AND	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	~~B~~C.4 Restore required DG to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days AND ~~6~~17 days from discovery of failure to meet LCO 3.8.1.a or b
~~C~~D. Two required offsite circuits inoperable.	~~C~~D.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable. AND	12 hours from discovery of Condition ~~C~~D concurrent with inoperability of redundant required features
	~~C~~D.2 Restore one required offsite circuit to OPERABLE status.	24 hours

ACTIONS (continued)

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

BASES

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," be entered if an inoperable CCW train results in an inoperable RHR loop. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

If one CCW train is inoperable, and one or both supplemental diesel generators (SDGs) are unavailable, action must be taken to restore OPERABLE status within 72 hours. In this condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function. The 72 hour Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this period.

If one CCW train is inoperable, and both SDGs are available, action must be taken to restore OPERABLE status within 14 days. In this condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function. The 14 day Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, the availability of backup AC power, and the low probability of a DBA occurring during this period. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a CCW train is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16 kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the CCW train Completion Time 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 CCW train became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended Completion Time will be limited to once per operating cycle per train. The SDGs are described in the Background section of B3.8.1.

B.1 and B.2

If the CCW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed

BASES

ACTIONS

A.1

If one ESW train is inoperable, and one or both supplemental diesel generators (SDGs) are unavailable, action must be taken to restore OPERABLE status within 72 hours. In this condition, the remaining OPERABLE ESW train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE ESW train could result in loss of ESW function. As noted in the LCO Note, ESW train OPERABILITY includes the associated Unit 2 ESW pump when the ESW train is crosstied with the associated Unit 2 ESW train. Thus, restoring the inoperable ESW train can be accomplished by closing the crosstie valves between the two trains. Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," should be entered if an inoperable ESW train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," should be entered if an inoperable ESW train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

If one ESW train is inoperable, and both SDGs are available and aligned for backup operation, action must be taken to restore OPERABLE status within 14 days. In this condition, the remaining OPERABLE ESW train is adequate to perform the heat removal function. The 14 day Completion Time is based on the redundant capabilities afforded by the OPERABLE train, the availability of backup AC power, and the low probability of a DBA occurring during this time period. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an ESW train is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16 kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the ESW train Completion Time 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 ESW train became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or

BASES

ACTIONS (continued)

Inspections using the extended Completion Time will be limited to once per operating cycle per train. The SDGs are described in the Background section of B3.8.1.

B.1 and B.2

If the ESW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in 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.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR is modified by a Note indicating that the isolation of the ESW components or systems may render those components inoperable, but does not affect the OPERABILITY of the ESW System.

Verifying the correct alignment for manual, power operated, and automatic valves in the ESW flow path provides assurance that the proper flow paths exist for ESW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.8.2

This SR verifies proper automatic operation of the ESW valves on an actual or simulated actuation signal. The ESW is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

BASES

BACKGROUND (continued)

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within approximately 40 seconds 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 a full load.

An independent AC power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support Completion Time extensions and are referred to as the supplemental diesel generators (SDGs).

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)

A Note has been added taking exception to the Applicability requirements for the required Unit 2 AC sources in LCO 3.8.1.c and LCO 3.8.1.d 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 power 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.1

To ensure a highly reliable power source remains with ~~one~~the required 34.5 kV 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 ~~C~~D, for two offsite circuits inoperable, is entered. As Noted, this Required Action is not applicable if a required Unit 2 34.5 kV offsite circuit is inoperable.

A.2

Required Action A.2, which only applies if the train cannot be powered from ~~an~~ the 34.5 kV 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 34.5 kV offsite power available.

The Completion Time for Required Action A.2 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. The train has no 34.5 kV offsite power supplying its loads; and

b. A redundant required feature on another train is inoperable.

If at any time during the existence of Condition A (~~one~~the required 34.5 kV offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no 34.5 kV offsite power to one train of the onsite Class 1E Electrical Power Distribution System or the required Unit 2 onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System and the Unit 2 Class 1E Distribution System when required to be OPERABLE. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 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.

A.3

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. With one 34.5 kV offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this condition, however, the remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E 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 second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power

BASES

ACTIONS (continued)

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 ~~72hours~~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 or 14 days (for a total of ~~9~~20 days or 31 days) allowed prior to complete restoration of the LCO. The ~~6~~17 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and ~~B~~C are entered concurrently. The "AND" connector between the 72 hour 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 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 the LCO 3.8.1.a or b was initially not met, instead of at the time Condition A was entered.

B.1

To ensure a highly reliable power source remains with the required 69 kV alternate 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 a required Unit 2 69 kV offsite circuit is inoperable.

B.2

Required Action B.2, which only applies if the train cannot be powered from the 69 kV 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

BASES

ACTIONS (continued)

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 69 kV offsite power available.

The Completion Time for Required Action B.2 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. The train has no 69 kV offsite power supplying its loads; and

b. A redundant required feature on another train is inoperable.

If at any time during the existence of Condition B (required 69 kV alternate offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no 69 kV offsite power to one train of the onsite Class 1E Electrical Power Distribution System or the required Unit 2 onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System and the Unit 2 Class 1E Distribution System when required to be OPERABLE. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 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.

BASES

ACTIONS (continued)

B.3

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. With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this condition, however, the remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E 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.

The last Completion Time for Required Action B.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 B 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 or 14 days. This could lead to a total of 17 days or 28 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 (for a total of 20 days or 42 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions B and C 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.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 the LCO 3.8.1.a or b was initially not met, instead of at the time Condition B was entered.

~~B~~C.1

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

BASES

ACTIONS (continued)

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~~C.2

Required Action ~~B~~C.2 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~~C.2 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.

In this condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E Distribution System when required to be

BASES

ACTIONS (continued)

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~~C.3.1 and ~~B~~C.3.2

Required Action ~~B~~C.3.1 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 ~~E~~F or ~~G~~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~~C.3.1 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~~C.3.1 or ~~B~~C.3.2, 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~~C.

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. Thus the 24 hours allowed in Required Actions ~~B~~C.3.1 and ~~B~~C.3.2 is acceptable.

~~B~~C.4

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition ~~B~~C for a period that should not exceed 72 hours.

In Condition ~~B~~C, the remaining required OPERABLE DG(s) and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E Distribution System when required to be OPERABLE. The 72 hour Completion Time takes into

BASES

ACTIONS (continued)

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.

An evaluation performed in accordance with Regulatory Guide 1.177 (Ref. 13) has determined that operation may continue in Condition C for a period that should not exceed 14 days if both SDGs are available. When one emergency 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. The SDGs will be available prior to removing the DG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour Completion Time for the extended unplanned corrective maintenance work. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a DG is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the emergency DG Completion Time 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 emergency DG became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended Completion Time will be limited to once per operating cycle per train.

In Condition C, the remaining required OPERABLE DG(s), offsite circuits, and the SDGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E 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.

The ~~second~~last Completion Time for Required Action ~~B~~C.4 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~~C is entered while, for instance,

BASES

ACTIONS (continued)

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 or 14 days. This could lead to a total of ~~144 hours~~ 17 days or 28 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 or 14 days (for a total of ~~9~~20 days or 42 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and ~~B~~C or B and C 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~~C.2, 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~~C was entered.

~~C~~D.1 and ~~C~~D.2

Required Action ~~C~~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 or B.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 ~~C~~D.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This

BASES

ACTIONS (continued)

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. All required offsite circuits are inoperable; and

b. A redundant required feature is inoperable.

If at any time during the existence of Condition ~~C~~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 ~~C~~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

BASES

ACTIONS (continued)

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 or B, as applicable.

~~D~~E.1 and ~~D~~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 ~~D~~E are modified by a Note to indicate that when Condition ~~D~~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 ~~D~~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.

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

In Condition ~~D~~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 ~~C~~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.

~~E~~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,

BASES

ACTIONS (continued)

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.

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.

~~F~~G.1 and ~~F~~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.

~~G~~H.1

Condition ~~G~~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), and Regulatory Guide 1.137 (Ref. 10), and IEEE Standard 387-1995 (Ref. 11) as addressed in the application 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.2.1 Note 1, while performance of an SR exempted, the SR must still be met). As noted (Note 2 to SR 3.8.1.21), SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the Unit 2 electrical power distribution subsystem since the preferred offsite source is required to support Unit 1 operations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. UFSAR, Section 8.3.
3. Regulatory Guide 1.9, Rev. 3.
4. UFSAR, Section 8.4.
5. UFSAR, Chapter 14.
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 1998.

Attachment 3B to AEP:NRC:4811

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

Only pages containing new or deleted text have been provided.

3.7.7-1
3.7.8-1
3.8.1-1
3.8.1-2
3.8.1-3
3.8.1-4
3.8.1-5
B 3.7.7-3
B 3.7.8-3
B 3.7.8-4
B 3.8.1-3
B 3.8.1-6
B 3.8.1-7
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 3.8.1-16
B 3.8.1-17
B 3.8.1-35

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CCW train inoperable.	A.1	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by CCW. ----------	
		Restore CCW train to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

3.7 PLANT SYSTEMS

3.7.8 Essential Service Water (ESW) System

LCO 3.7.8 Two ESW trains shall be OPERABLE.

----------NOTE----------
When an ESW train is crosstied with the associated Unit 1 ESW train, OPERABILITY of the ESW train includes the associated Unit 1 ESW pump.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ESW train inoperable.	A.1 ----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," for emergency diesel generator made inoperable by ESW System. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by ESW System. --- Restore ESW train to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System;

b. Two diesel generators (DGs) capable of supplying the onsite Class 1E power distribution subsystem(s);

c. One Unit 1 qualified circuit between the offsite transmission network and the Unit 1 onsite Class 1E AC Electrical Power Distribution System capable of supporting the associated equipment required to be OPERABLE by LCO 3.7.8, "Essential Service Water (ESW) System"; and

d. The Unit 1 DG(s) capable of supporting the associated equipment required to be OPERABLE by LCO 3.7.8.

APPLICABILITY: MODES 1, 2, 3, and 4.

----------NOTE----------
The Unit 1 electrical power sources in LCO 3.8.1.c and LCO 3.8.1.d are not required to be OPERABLE when the associated required equipment is inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ~~One required~~ 34.5 kV preferred offsite circuit inoperable.	A.1 ----------NOTE---------- Not applicable if ~~a~~ required Unit 1 34.5 kV preferred offsite circuit is inoperable. ---------- Perform SR 3.8.1.1 for required OPERABLE 69 kV alternate offsite circuit.	1 hour
	AND	AND
		Once per 8 hours thereafter

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	A.2	Declare required feature(s) with no 34.5 kV offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND		
	A.3	Restore required 34.5 kV preferred offsite circuit to OPERABLE status.	72 hours AND 617 days from discovery of failure to meet LCO 3.8.1.a or b
B. 69 kV alternate offsite circuit inoperable.	B.1	NOTE Not applicable if required Unit 1 69 kV alternate offsite circuit is inoperable.	
		Perform SR 3.8.1.1 for required OPERABLE 34.5 kV preferred offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND		
	B.2	Declare required feature(s) with no 69 kV offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND		

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.3 Restore required 69 kV alternate offsite circuit to OPERABLE status.	14 days AND 17 days from discovery of failure to meet LCO 3.8.1.a or b
~~B~~C. One required DG inoperable.	~~B~~C.1 ----------NOTE---------- Not applicable if a required Unit 1 DG is inoperable. ---------- Perform SR 3.8.1.1 for the required offsite circuit(s).	 1 hour AND Once per 8 hours thereafter
	AND	
	~~B~~C.2 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition ~~B~~C concurrent with inoperability of redundant required feature(s)
	AND	
	~~B~~C.3.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.	24 hours
	OR	
	~~B~~C.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s).	24 hours
	AND	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	~~B~~C.4 Restore required DG to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days AND ~~6~~17 days from discovery of failure to meet LCO 3.8.1.a or b
~~C~~D. Two required offsite circuits inoperable.	~~C~~D.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable. AND	12 hours from discovery of Condition ~~C~~D concurrent with inoperability of redundant required features
	~~C~~D.2 Restore one required offsite circuit to OPERABLE status.	24 hours

ACTIONS (continued)

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

BASES

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," be entered if an inoperable CCW train results in an inoperable RHR loop. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

If one CCW train is inoperable, and one or both supplemental diesel generators (SDGs) are unavailable, action must be taken to restore OPERABLE status within 72 hours. In this condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function. The 72 hour Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this period.

If one CCW train is inoperable, and both SDGs are available, action must be taken to restore OPERABLE status within 14 days. In this condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function. The 14 day Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, the availability of backup AC power, and the low probability of a DBA occurring during this period. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a CCW train is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16 kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the CCW train Completion Time 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 CCW train became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended Completion Time will be limited to once per operating cycle per train. The SDGs are described in the Background section of B3.8.1.

B.1 and B.2

If the CCW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed

BASES

ACTIONS

A.1

If one ESW train is inoperable, and one or both supplemental diesel generators (SDGs) are unavailable, action must be taken to restore OPERABLE status within 72 hours. In this condition, the remaining OPERABLE ESW train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE ESW train could result in loss of ESW function. As noted in the LCO Note, ESW train OPERABILITY includes the associated Unit 1 ESW pump when the ESW train is crosstied with the associated Unit 1 ESW train. Thus, restoring the inoperable ESW train can be accomplished by closing the crosstie valves between the two trains. Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," should be entered if an inoperable ESW train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," should be entered if an inoperable ESW train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

If one ESW train is inoperable, and both SDGs are available and aligned for backup operation, action must be taken to restore OPERABLE status within 14 days. In this condition, the remaining OPERABLE ESW train is adequate to perform the heat removal function. The 14 day Completion Time is based on the redundant capabilities afforded by the OPERABLE train, the availability of backup AC power, and the low probability of a DBA occurring during this time period. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an ESW train is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16 kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the ESW train Completion Time 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 ESW train became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or

BASES

ACTIONS (continued)

inspections using the extended Completion Time will be limited to once per operating cycle per train. The SDGs are described in the Background section of B3.8.1.

B.1 and B.2

If the ESW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in 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.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR is modified by a Note indicating that the isolation of the ESW components or systems may render those components inoperable, but does not affect the OPERABILITY of the ESW System.

Verifying the correct alignment for manual, power operated, and automatic valves in the ESW flow path provides assurance that the proper flow paths exist for ESW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.8.2

This SR verifies proper automatic operation of the ESW valves on an actual or simulated actuation signal. The ESW is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

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 40 seconds 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 a full load.

An independent AC power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support Completion Time extensions and are referred to as the supplemental diesel generators (SDGs).

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)

A Note has been added taking exception to the Applicability requirements for the required Unit 1 AC sources in LCO 3.8.1.c and LCO 3.8.1.d 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 power 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.1

To ensure a highly reliable power source remains with ~~one~~the required 34.5 kV 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 ~~C~~D, for two offsite circuits inoperable, is entered. As Noted, this Required Action is not applicable if a required Unit 1 34.5 kV offsite circuit is inoperable.

A.2

Required Action A.2, which only applies if the train cannot be powered from ~~an~~the 34.5 kV 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 34.5 kV offsite power available.

The Completion Time for Required Action A.2 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. The train has no 34.5 kV offsite power supplying its loads; and

b. A redundant required feature on another train is inoperable.

If at any time during the existence of Condition A (~~one~~the required 34.5 kV offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no 34.5 kV offsite power to one train of the onsite Class 1E Electrical Power Distribution System or the required Unit 1 onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System and the Unit 1 Class 1E Distribution System when required to be OPERABLE. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 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.

A.3

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. With one 34.5 kV offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this condition, however, the remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 1 Class 1E 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 second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power

BASES

ACTIONS (continued)

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 or 14 days (for a total of ~~9~~20 days or 31 days) allowed prior to complete restoration of the LCO. The ~~6~~17 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and ~~B~~C are entered concurrently. The "AND" connector between the 72 hour 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 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 the LCO 3.8.1.a or b was initially not met, instead of at the time Condition A was entered.

B.1

To ensure a highly reliable power source remains with the required 69 kV alternate 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 a required Unit 1 69 kV offsite circuit is inoperable.

B.2

Required Action B.2, which only applies if the train cannot be powered from the 69 kV 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

BASES

ACTIONS (continued)

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 69 kV offsite power available.

The Completion Time for Required Action B.2 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. The train has no 69 kV offsite power supplying its loads; and

b. A redundant required feature on another train is inoperable.

If at any time during the existence of Condition B (required 69 kV alternate offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no 69 kV offsite power to one train of the onsite Class 1E Electrical Power Distribution System or the required Unit 1 onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System and the Unit 1 Class 1E Distribution System when required to be OPERABLE. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 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.

BASES

ACTIONS (continued)

B.3

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. With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this condition, however, the remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 1 Class 1E 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.

The last Completion Time for Required Action B.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 B 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 or 14 days. This could lead to a total of 17 days or 28 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 or 14 days (for a total of 20 days or 42 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions B and C 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.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 the LCO 3.8.1.a or b was initially not met, instead of at the time Condition B was entered.

BC.1

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

BASES

ACTIONS (continued)

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~~C.2

Required Action ~~B~~C.2 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~~C.2 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.

In this condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 1 Class 1E Distribution System when required to be

BASES

ACTIONS (continued)

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.3.1 and B.3.2

Required Action B.3.1 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 E or G of LCO 3.8.1 would be entered.

Once the failure is repaired, the common cause failure no longer exists, and Required Action B.3.1 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.3.1 or B.3.2, 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. Thus the 24 hours allowed in Required Actions B.3.1 and B.3.2 is acceptable.

B.4

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition B for a period that should not exceed 72 hours.

In Condition B, the remaining required OPERABLE DG(s) and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 1 Class 1E Distribution System when required to be OPERABLE. The 72 hour Completion Time takes into

BASES

ACTIONS (continued)

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.

An evaluation performed in accordance with Regulatory Guide 1.177, (Ref. 13) has determined that operation may continue in Condition C for a period that should not exceed 14 days if both SDGs are available. When one emergency 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. The SDGs will be available prior to removing the DG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour Completion Time for the extended unplanned corrective maintenance work. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a DG is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the emergency DG Completion Time 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 emergency DG became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended Completion Time will be limited to once per operating cycle per train.

In Condition C, the remaining required OPERABLE DG(s), offsite circuits, and the SDGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E 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.

The ~~second~~last Completion Time for Required Action ~~B~~C.4 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~~C is entered while, for instance,

BASES

ACTIONS (continued)

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 or 14 days. This could lead to a total of ~~144 hours~~17 days or 28 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 or 14 days (for a total of ~~9~~20 days or 42 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and ~~B~~C or B and C are entered concurrently. The "AND" connector between the ~~72 hours~~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~~C.2, 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~~C was entered.

~~C~~D.1 and ~~C~~D.2

Required Action ~~C~~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 or B.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 ~~C~~D.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This

BASES

ACTIONS (continued)

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. All required offsite circuits are inoperable; and

b. A redundant required feature is inoperable.

If at any time during the existence of Condition ~~C~~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 ~~C~~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

BASES

ACTIONS (continued)

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 or B, as applicable.

~~D~~E.1 and ~~D~~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 ~~D~~E are modified by a Note to indicate that when Condition ~~D~~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 ~~D~~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.

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

In Condition ~~D~~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 ~~C~~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.

~~E~~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,

BASES

ACTIONS (continued)

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.

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.

~~F~~G.1 and ~~F~~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.

~~G~~H.1

Condition ~~G~~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), and Regulatory Guide 1.137 (Ref. 10), and IEEE Standard 387-1995 (Ref. 11) as addressed in the application 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.2.1 Note 1, while performance of an SR exempted, the SR must still be met). As noted (Note 2 to SR 3.8.1.21), SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the Unit 1 electrical power distribution subsystem since the preferred offsite source is required to support Unit 2 operations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. UFSAR, Section 8.3.
3. Regulatory Guide 1.9, Rev. 3.
4. UFSAR, Section 8.4.
5. UFSAR, Chapter 14.
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 1998.

Attachment 4A to AEP:NRC:4811

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

Only pages containing new or deleted text have been provided.

3.7.7-1
3.7.8-1
3.8.1-1
3.8.1-2
3.8.1-3
3.8.1-4
3.8.1-5
B 3.7.7-3
B 3.7.8-3
B 3.7.8-4
B 3.8.1-3
B 3.8.1-6
B 3.8.1-7
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 3.8.1-16
B 3.8.1-17
B 3.8.1-35

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CCW train inoperable.	A.1	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by CCW. ----------	
		Restore CCW train to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

3.7 PLANT SYSTEMS

3.7.8 Essential Service Water (ESW) System

LCO 3.7.8 Two ESW trains shall be OPERABLE.

---NOTE---
When an ESW train is crosstied with the associated Unit 2 ESW train, OPERABILITY of the ESW train includes the associated Unit 2 ESW pump.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ESW train inoperable.	A.1 ----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," for emergency diesel generator made inoperable by ESW System. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by ESW System. --- Restore ESW train to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System;

b. Two diesel generators (DGs) capable of supplying the onsite Class 1E power distribution subsystem(s);

c. One Unit 2 qualified circuit between the offsite transmission network and the Unit 2 onsite Class 1E AC Electrical Power Distribution System capable of supporting the associated equipment required to be OPERABLE by LCO 3.7.8, "Essential Service Water (ESW) System"; and

d. The Unit 2 DG(s) capable of supporting the associated equipment required to be OPERABLE by LCO 3.7.8.

APPLICABILITY: MODES 1, 2, 3, and 4.

----------NOTE----------
The Unit 2 electrical power sources in LCO 3.8.1.c and LCO 3.8.1.d are not required to be OPERABLE when the associated required equipment is inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. 34.5 kV preferred offsite circuit inoperable.	A.1 ----------NOTE---------- Not applicable if required Unit 2 34.5 kV preferred offsite circuit is inoperable. ----------	
	Perform SR 3.8.1.1 for required OPERABLE 69 kV alternate offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND	

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	A.2	Declare required feature(s) with no 34.5 kV offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND		
	A.3	Restore required 34.5 kV preferred offsite circuit to OPERABLE status.	72 hours AND 17 days from discovery of failure to meet LCO 3.8.1.a or b
B. 69 kV alternate offsite circuit inoperable.	B.1	----------NOTE---------- Not applicable if required Unit 2 69 kV alternate offsite circuit is inoperable. ----------	
		Perform SR 3.8.1.1 for required OPERABLE 34.5 kV preferred offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND		
	B.2	Declare required feature(s) with no 69 kV offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND		

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.3 Restore required 69 kV alternate offsite circuit to OPERABLE status.	14 days AND 17 days from discovery of failure to meet LCO 3.8.1.a or b
C. One required DG inoperable.	C.1 ----------NOTE---------- Not applicable if a required Unit 2 DG is inoperable. ---------- Perform SR 3.8.1.1 for the required offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND	
	C.2 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)
	AND	
	C.3.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.	24 hours
	OR	
	C.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s).	24 hours
	AND	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	C.4 Restore required DG to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days AND 17 days from discovery of failure to meet LCO 3.8.1.a or b
D. Two required offsite circuits inoperable.	D.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable. AND	12 hours from discovery of Condition D concurrent with inoperability of redundant required features
	D.2 Restore one required offsite circuit to OPERABLE status.	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One required offsite circuit inoperable. AND One required DG inoperable.	----------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. ---------- E.1 Restore required offsite circuit to OPERABLE status. OR E.2 Restore required DG to OPERABLE status.	 12 hours 12 hours
F. Two required DGs inoperable.	F.1 Restore one required DG to OPERABLE status.	2 hours
G. Required Action and associated Completion Time of Condition A, B, C, D, E, or F not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 5.	6 hours 36 hours
H. Three or more required AC sources inoperable.	H.1 Enter LCO 3.0.3.	Immediately

BASES

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," be entered if an inoperable CCW train results in an inoperable RHR loop. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

If one CCW train is inoperable, and one or both supplemental diesel generators (SDGs) are unavailable, action must be taken to restore OPERABLE status within 72 hours. In this condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function. The 72 hour Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this period.

If one CCW train is inoperable, and both SDGs are available, action must be taken to restore OPERABLE status within 14 days. In this condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function. The 14 day Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, the availability of backup AC power, and the low probability of a DBA occurring during this period. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a CCW train is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16 kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the CCW train Completion Time 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 CCW train became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended Completion Time will be limited to once per operating cycle per train. The SDGs are described in the Background section of B3.8.1.

B.1 and B.2

If the CCW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed

BASES

ACTIONS

A.1

If one ESW train is inoperable, and one or both supplemental diesel generators (SDGs) are unavailable, action must be taken to restore OPERABLE status within 72 hours. In this condition, the remaining OPERABLE ESW train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE ESW train could result in loss of ESW function. As noted in the LCO Note, ESW train OPERABILITY includes the associated Unit 2 ESW pump when the ESW train is crosstied with the associated Unit 2 ESW train. Thus, restoring the inoperable ESW train can be accomplished by closing the crosstie valves between the two trains. Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," should be entered if an inoperable ESW train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," should be entered if an inoperable ESW train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

If one ESW train is inoperable, and both SDGs are available and aligned for backup operation, action must be taken to restore OPERABLE status within 14 days. In this condition, the remaining OPERABLE ESW train is adequate to perform the heat removal function. The 14 day Completion Time is based on the redundant capabilities afforded by the OPERABLE train, the availability of backup AC power, and the low probability of a DBA occurring during this time period. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an ESW train is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16 kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the ESW train Completion Time 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 ESW train became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or

BASES

ACTIONS (continued)

inspections using the extended Completion Time will be limited to once per operating cycle per train. The SDGs are described in the Background section of B3.8.1.

B.1 and B.2

If the ESW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in 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.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR is modified by a Note indicating that the isolation of the ESW components or systems may render those components inoperable, but does not affect the OPERABILITY of the ESW System.

Verifying the correct alignment for manual, power operated, and automatic valves in the ESW flow path provides assurance that the proper flow paths exist for ESW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.8.2

This SR verifies proper automatic operation of the ESW valves on an actual or simulated actuation signal. The ESW is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

BASES

BACKGROUND (continued)

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within approximately 40 seconds 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 a full load.

An independent AC power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support Completion Time extensions and are referred to as the supplemental diesel generators (SDGs).

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)

A Note has been added taking exception to the Applicability requirements for the required Unit 2 AC sources in LCO 3.8.1.c and LCO 3.8.1.d 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 power 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.1

To ensure a highly reliable power source remains with the required 34.5 kV 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 a required Unit 2 34.5 kV offsite circuit is inoperable.

A.2

Required Action A.2, which only applies if the train cannot be powered from the 34.5 kV 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 34.5 kV offsite power available.

The Completion Time for Required Action A.2 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. The train has no 34.5 kV offsite power supplying its loads; and

b. A redundant required feature on another train is inoperable.

If at any time during the existence of Condition A (the required 34.5 kV offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no 34.5 kV offsite power to one train of the onsite Class 1E Electrical Power Distribution System or the required Unit 2 onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System and the Unit 2 Class 1E Distribution System when required to be OPERABLE. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 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.

A.3

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. With one 34.5 kV offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this condition, however, the remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E 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 second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power

BASES

ACTIONS (continued)

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 72 hours or 14 days (for a total of 20 days or 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and C 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 the LCO 3.8.1.a or b was initially not met, instead of at the time Condition A was entered.

B.1

To ensure a highly reliable power source remains with the required 69 kV alternate 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 a required Unit 2 69 kV offsite circuit is inoperable.

B.2

Required Action B.2, which only applies if the train cannot be powered from the 69 kV 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

BASES

ACTIONS (continued)

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 69 kV offsite power available.

The Completion Time for Required Action B.2 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. The train has no 69 kV offsite power supplying its loads; and

b. A redundant required feature on another train is inoperable.

If at any time during the existence of Condition B (required 69 kV alternate offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no 69 kV offsite power to one train of the onsite Class 1E Electrical Power Distribution System or the required Unit 2 onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System and the Unit 2 Class 1E Distribution System when required to be OPERABLE. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 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.

BASES

ACTIONS (continued)

B.3

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. With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this condition, however, the remaining required OPERABLE offsite circuits and DGs are adequate tosupply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E 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.

The last Completion Time for Required Action B.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 B 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 or 14 days. This could lead to a total of 17 days or 28 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 or 14 days (for a total of 20 days or 42 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions B and C 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.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 the LCO 3.8.1.a or b was initially not met, instead of at the time Condition B was entered.

C.1

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

BASES

ACTIONS (continued)

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.

C.2

Required Action C.2 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 C.2 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.

In this condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E Distribution System when required to be

BASES

ACTIONS (continued)

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.

C.3.1 and C.3.2

Required Action C.3.1 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 C.3.1 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 C.3.1 or C.3.2, 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 C.

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. Thus the 24 hours allowed in Required Actions C.3.1 and C.3.2 is acceptable.

C.4

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition C for a period that should not exceed 72 hours.

In Condition C, the remaining required OPERABLE DG(s) and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E Distribution System when required to be OPERABLE. The 72 hour Completion Time takes into

BASES

ACTIONS (continued)

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.

An evaluation performed in accordance with Regulatory Guide 1.177 (Ref. 13) has determined that operation may continue in Condition C for a period that should not exceed 14 days if both SDGs are available. When one emergency 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. The SDGs will be available prior to removing the DG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour Completion Time for the extended unplanned corrective maintenance work. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a DG is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the emergency DG Completion Time 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 emergency DG became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended Completion Time will be limited to once per operating cycle per train.

In Condition C, the remaining required OPERABLE DG(s), offsite circuits, and the SDGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E 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.

The last Completion Time for Required Action C.4 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 C is entered while, for instance,

BASES

ACTIONS (continued)

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 or 14 days. This could lead to a total of 17 days or 28 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 or 14 days (for a total of 20 days or 42 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and C or B and C 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 C.2, 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 C was entered.

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 or B.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

BASES

ACTIONS (continued)

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. 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

BASES

ACTIONS (continued)

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 or B, as applicable.

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.

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,

BASES

ACTIONS (continued)

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.

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), and Regulatory Guide 1.137 (Ref. 10), and IEEE Standard 387-1995 (Ref. 11) as addressed in the application 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.2.1 Note 1, while performance of an SR exempted, the SR must still be met). As noted (Note 2 to SR 3.8.1.21), SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the Unit 2 electrical power distribution subsystem since the preferred offsite source is required to support Unit 1 operations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. UFSAR, Section 8.3.
3. Regulatory Guide 1.9, Rev. 3.
4. UFSAR, Section 8.4.
5. UFSAR, Chapter 14.
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 1998.

Attachment 4B to AEP:NRC:4811

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

Only pages containing new or deleted text have been provided.

3.7.7-1
3.7.8-1
3.8.1-1
3.8.1-2
3.8.1-3
3.8.1-4
3.8.1-5
B 3.7.7-3
B 3.7.8-3
B 3.7.8-4
B 3.8.1-3
B 3.8.1-6
B 3.8.1-7
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 3.8.1-16
B 3.8.1-17
B 3.8.1-35

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CCW train inoperable.	A.1	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by CCW. ----------	
		Restore CCW train to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

3.7 PLANT SYSTEMS

3.7.8 Essential Service Water (ESW) System

LCO 3.7.8 Two ESW trains shall be OPERABLE.

----------NOTE----------
When an ESW train is crosstied with the associated Unit 1 ESW train, OPERABILITY of the ESW train includes the associated Unit 1 ESW pump.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ESW train inoperable.	A.1 ----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," for emergency diesel generator made inoperable by ESW System. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by ESW System. --- Restore ESW train to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System;

b. Two diesel generators (DGs) capable of supplying the onsite Class 1E power distribution subsystem(s);

c. One Unit 1 qualified circuit between the offsite transmission network and the Unit 1 onsite Class 1E AC Electrical Power Distribution System capable of supporting the associated equipment required to be OPERABLE by LCO 3.7.8, "Essential Service Water (ESW) System"; and

d. The Unit 1 DG(s) capable of supporting the associated equipment required to be OPERABLE by LCO 3.7.8.

APPLICABILITY: MODES 1, 2, 3, and 4.

----------NOTE----------
The Unit 1 electrical power sources in LCO 3.8.1.c and LCO 3.8.1.d are not required to be OPERABLE when the associated required equipment is inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. 34.5 kV preferred offsite circuit inoperable.	A.1 ----------NOTE---------- Not applicable if required Unit 1 34.5 kV preferred offsite circuit is inoperable. ---------- Perform SR 3.8.1.1 for required OPERABLE 69 kV alternate offsite circuit.	1 hour
	AND	AND
		Once per 8 hours thereafter

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	A.2	Declare required feature(s) with no 34.5 kV offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND		
	A.3	Restore required 34.5 kV preferred offsite circuit to OPERABLE status.	72 hours AND 17 days from discovery of failure to meet LCO 3.8.1.a or b
B. 69 kV alternate offsite circuit inoperable.	B.1	----------NOTE---------- Not applicable if required Unit 1 69 kV alternate offsite circuit is inoperable. ----------	
		Perform SR 3.8.1.1 for required OPERABLE 34.5 kV preferred offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND		
	B.2	Declare required feature(s) with no 69 kV offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND		

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.3 Restore required 69 kV alternate offsite circuit to OPERABLE status.	14 days AND 17 days from discovery of failure to meet LCO 3.8.1.a or b
C. One required DG inoperable.	C.1 ----------NOTE---------- Not applicable if a required Unit 1 DG is inoperable. ---------- Perform SR 3.8.1.1 for the required offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND	
	C.2 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)
	AND	
	C.3.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.	24 hours
	OR	
	C.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s).	24 hours
	AND	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	C.4 Restore required DG to OPERABLE status.	72 hours from discovery of one or both supplemental diesel generators unavailable AND 14 days AND 17 days from discovery of failure to meet LCO 3.8.1.a or b
D. Two required offsite circuits inoperable.	D.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable. AND	12 hours from discovery of Condition D concurrent with inoperability of redundant required features
	D.2 Restore one required offsite circuit to OPERABLE status.	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One required offsite circuit inoperable. AND One required DG inoperable.	----------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. ---------- E.1 Restore required offsite circuit to OPERABLE status. OR E.2 Restore required DG to OPERABLE status.	 12 hours 12 hours
F. Two required DGs inoperable.	F.1 Restore one required DG to OPERABLE status.	2 hours
G. Required Action and associated Completion Time of Condition A, B, C, D, E, or F not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 5.	6 hours 36 hours
H. Three or more required AC sources inoperable.	H.1 Enter LCO 3.0.3.	Immediately

BASES

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," be entered if an inoperable CCW train results in an inoperable RHR loop. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

If one CCW train is inoperable, and one or both supplemental diesel generators (SDGs) are unavailable, action must be taken to restore OPERABLE status within 72 hours. In this condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function. The 72 hour Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this period.

If one CCW train is inoperable, and both SDGs are available, action must be taken to restore OPERABLE status within 14 days. In this condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function. The 14 day Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, the availability of backup AC power, and the low probability of a DBA occurring during this period. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a CCW train is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16 kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the CCW train Completion Time 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 CCW train became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended Completion Time will be limited to once per operating cycle per train. The SDGs are described in the Background section of B3.8.1.

B.1 and B.2

If the CCW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed

BASES

ACTIONS

A.1

If one ESW train is inoperable, and one or both supplemental diesel generators (SDGs) are unavailable, action must be taken to restore OPERABLE status within 72 hours. In this condition, the remaining OPERABLE ESW train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE ESW train could result in loss of ESW function. As noted in the LCO Note, ESW train OPERABILITY includes the associated Unit 1 ESW pump when the ESW train is crosstied with the associated Unit 1 ESW train. Thus, restoring the inoperable ESW train can be accomplished by closing the crosstie valves between the two trains. Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," should be entered if an inoperable ESW train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," should be entered if an inoperable ESW train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

If one ESW train is inoperable, and both SDGs are available and aligned for backup operation, action must be taken to restore OPERABLE status within 14 days. In this condition, the remaining OPERABLE ESW train is adequate to perform the heat removal function. The 14 day Completion Time is based on the redundant capabilities afforded by the OPERABLE train, the availability of backup AC power, and the low probability of a DBA occurring during this time period. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When an ESW train is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16 kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the ESW train Completion Time 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 ESW train became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or

BASES

ACTIONS (continued)

inspections using the extended Completion Time will be limited to once per operating cycle per train. The SDGs are described in the Background section of B3.8.1.

B.1 and B.2

If the ESW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in 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.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR is modified by a Note indicating that the isolation of the ESW components or systems may render those components inoperable, but does not affect the OPERABILITY of the ESW System.

Verifying the correct alignment for manual, power operated, and automatic valves in the ESW flow path provides assurance that the proper flow paths exist for ESW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.8.2

This SR verifies proper automatic operation of the ESW valves on an actual or simulated actuation signal. The ESW is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

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 40 seconds 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 a full load.

An independent AC power source consisting of two diesel generators is provided to supply power to the 4.16 kV ESF buses via the 4.16 kV Bus 1 located in the 69 kV switchyard. These diesel generators are used to support Completion Time extensions and are referred to as the supplemental diesel generators (SDGs).

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)

A Note has been added taking exception to the Applicability requirements for the required Unit 1 AC sources in LCO 3.8.1.c and LCO 3.8.1.d 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 power 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.1

To ensure a highly reliable power source remains with the required 34.5 kV 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 a required Unit 1 34.5 kV offsite circuit is inoperable.

A.2

Required Action A.2, which only applies if the train cannot be powered from the 34.5 kV 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 34.5 kV offsite power available.

The Completion Time for Required Action A.2 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. The train has no 34.5 kV offsite power supplying its loads; and

b. A redundant required feature on another train is inoperable.

If at any time during the existence of Condition A (the required 34.5 kV offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no 34.5 kV offsite power to one train of the onsite Class 1E Electrical Power Distribution System or the required Unit 1 onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System and the Unit 1 Class 1E Distribution System when required to be OPERABLE. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 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.

A.3

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. With one 34.5 kV offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this condition, however, the remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 1 Class 1E 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 second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power

BASES

ACTIONS (continued)

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 72 hours or 14 days (for a total of 20 days or 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and C 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 the LCO 3.8.1.a or b was initially not met, instead of at the time Condition A was entered.

B.1

To ensure a highly reliable power source remains with the required 69 kV alternate 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 a required Unit 1 69 kV offsite circuit is inoperable.

B.2

Required Action B.2, which only applies if the train cannot be powered from the 69 kV 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

BASES

ACTIONS (continued)

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 69 kV offsite power available.

The Completion Time for Required Action B.2 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. The train has no 69 kV offsite power supplying its loads; and

b. A redundant required feature on another train is inoperable.

If at any time during the existence of Condition B (required 69 kV alternate offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no 69 kV offsite power to one train of the onsite Class 1E Electrical Power Distribution System or the required Unit 1 onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with another train, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System and the Unit 1 Class 1E Distribution System when required to be OPERABLE. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 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.

BASES

ACTIONS (continued)

B.3

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. With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this condition, however, the remaining required OPERABLE offsite circuits and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 1 Class 1E 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.

The third Completion Time for Required Action B.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 B 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 or 14 days. This could lead to a total of 17 days or 28 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 or 14 days (for a total of 20 days or 42 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions B and C 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.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 the LCO 3.8.1.a or b was initially not met, instead of at the time Condition B was entered.

C.1

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

BASES

ACTIONS (continued)

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.

C.2

Required Action C.2 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 C.2 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.

In this condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 1 Class 1E Distribution System when required to be

BASES

ACTIONS (continued)

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.

C.3.1 and C.3.2

Required Action C.3.1 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 C.3.1 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 C.3.1 or C.3.2, 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 C.

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. Thus the 24 hours allowed in Required Actions C.3.1 and C.3.2 is acceptable.

C.4

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition C for a period that should not exceed 72 hours.

In Condition C, the remaining required OPERABLE DG(s) and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 1 Class 1E Distribution System when required to be OPERABLE. The 72 hour Completion Time takes into

BASES

ACTIONS (continued)

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.

An evaluation performed in accordance with Regulatory Guide 1.177 (Ref. 13) has determined that operation may continue in Condition C for a period that should not exceed 14 days if both SDGs are available. When one emergency 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. The SDGs will be available prior to removing the DG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour Completion Time for the extended unplanned corrective maintenance work. During normal operation, SDG availability is demonstrated by performance of periodic testing and inspections. When a DG is inoperable and the SDGs are needed as a backup power source, SDG availability is verified 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 kV Substation 4.16-kV Bus 1. A status verification of SDG availability will also be performed on both SDGs at least once every 72 hours by repeating the initial availability verification described above. If one or both SDGs become unavailable during the 14-day Completion Time and cannot be restored to available status, the emergency DG Completion Time 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 emergency DG became inoperable. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. Voluntary planned maintenance or inspections using the extended Completion Time will be limited to once per operating cycle per train.

In Condition C, the remaining required OPERABLE DG(s), offsite circuits, and the SDGs are adequate to supply electrical power to the onsite Class 1E Distribution System and the Unit 2 Class 1E 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.

The last Completion Time for Required Action C.4 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 C is entered while, for instance, an

BASES

ACTIONS (continued)

offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours or 14 days. This could lead to a total of 17 days or 28 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 or 14 days (for a total of 20 days or 42 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 the LCO 3.8.1.a or b. This limit is considered reasonable for situations in which Conditions A and C or B and C 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 C.2, 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 C was entered.

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 or B.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

BASES

ACTIONS (continued)

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. 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

BASES

ACTIONS (continued)

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 or B, as applicable.

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.

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,

BASES

ACTIONS (continued)

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.

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), and Regulatory Guide 1.137 (Ref. 10), and IEEE Standard 387-1995 (Ref. 11) as addressed in the application 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.2.1 Note 1, while performance of an SR exempted, the SR must still be met). As noted (Note 2 to SR 3.8.1.21), SR 3.8.1.9.a is only required to be met when the auxiliary source is supplying the Unit 1 electrical power distribution subsystem since the preferred offsite source is required to support Unit 2 operations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. UFSAR, Section 8.3.
3. Regulatory Guide 1.9, Rev. 3.
4. UFSAR, Section 8.4.
5. UFSAR, Chapter 14.
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 1998.

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Indiana Michigan Power Company (I&M) in this document. Any other statements in this submittal are provided for information only and are not considered regulatory commitments. Please direct questions regarding these commitments to the contact identified in the transmittal letter for this submittal.

REGULATORY COMMITMENT	DUE DATE
Procedures will be developed to support use of the SDGs.	Prior to the first time the extended AOT is entered for the EDG, ESW, and CCW systems.