

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

Automatic load sequencers for Train A and Train B ESF buses shall be OPERABLE.

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

#### ACTIONS

~~-----NOTE-----  
The Standby Auxiliary Transformer (SAT) is available for application to only one of the four 4.16 kV ESF buses at any given time for Units 1 and 2 for use in accordance with Specification 3.8.1 as either an offsite source or to meet the requirements of an LCO 3.8.1 condition.~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for required OPERABLE offsite circuit.	1 hour <u>AND</u> Once per 8 hours thereafter
	<u>AND</u>	(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 Declare required feature(s) with no 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)
	<p><u>AND</u></p> <p>A.3 Restore required offsite circuit to OPERABLE status.</p>	<p>72 hours</p> <p><u>AND</u> 6 14 days from discovery of failure to meet LCO</p>
B. One DG inoperable.	<p><del>B.1 Verify calendar date does not fall on or within July 15 through November 15.</del></p> <p><del>B.2 Verify SAT available.</del></p> <p><u>AND</u></p> <p><del>B.1.1 Perform SR 3.8.1.1 for the required offsite circuit(s).</del></p> <p><u>AND</u></p>	<p><del>1 hour</del></p> <p><del>1 hour</del></p> <p><u>AND</u></p> <p><del>Once per 8 hours thereafter</del></p> <p><del>1 hour</del></p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B. <del>4</del> 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 concurrent with inoperability of redundant required feature(s)
	AND	
	B. <del>5</del> .1 3 Determine OPERABLE DG is not inoperable due to common cause failure.	24 hours
	OR	
	B. <del>5</del> .2 3 Perform SR 3.8.1.2 for OPERABLE DG.	24 hours
	AND	
	B. <del>6</del> .1 Verify an enhanced black-start combustion turbine generator (CTG) is functional by verifying the CTG and the black start diesel generator starts and achieves steady state voltage and frequency.	72 hours
	OR	Within 72 hours prior to entry into Condition B
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	<p><del>B.6.2 Start and run at least one CTG while in Condition B.</del></p> <p><del>AND</del></p> <p><del>B.7 Restore DG to OPERABLE status.</del></p>	<p><del>72 hours</del></p> <p><del>OR</del></p> <p><del>Prior to entry into Condition B for preplanned maintenance.</del></p> <p><del>72 hours</del></p> <p><del>14 days from discovery of failure to meet LCO</del></p> <p><del>AND</del></p>
<p>6 days from discovery of failure to meet LCO</p> <p>C. Required Actions B.1, B.2, B.6.1, or B.6.2 and associated Completion Time not met</p>	<p><del>C.1 Restore DG to OPERABLE status.</del></p>	<p><del>72 hours</del></p>
<p><del>B. Two required offsite circuits inoperable.</del></p> <p>C</p>	<p><del>C</del></p> <p><del>B.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.</del></p> <p><del>AND</del></p> <p><del>C</del></p> <p><del>B.2 Restore one required offsite circuit to OPERABLE status.</del></p>	<p><del>12 hours from discovery of Condition B</del></p> <p><del>C concurrent with inoperability of redundant required features</del></p> <p>24 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p><del>1</del>. One required offsite circuit inoperable. <b>D</b></p> <p><u>AND</u></p> <p>One DG inoperable.</p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems — Operating," when Condition <del>1</del> is entered with no AC power source to one or more trains. <b>D</b> -----</p> <p><del>1</del>.1 Restore required offsite circuit to OPERABLE status. <b>D</b></p> <p><u>OR</u></p> <p><del>1</del>.2 Restore DG to OPERABLE status. <b>D</b></p>	<p>12 hours</p> <p>12 hours</p>
<p><del>1</del>. Two DGs inoperable. <b>E</b></p>	<p><del>1</del>.1 Restore one DG to OPERABLE status. <b>E</b></p>	<p>2 hours</p>
<p><del>1</del>. One automatic load sequencer inoperable. <b>F</b></p>	<p><del>1</del>.1 Restore automatic load sequencer to OPERABLE status. <b>F</b></p>	<p>12 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p><del>X</del> G Required Action and associated Completion Time of Condition A, B, C, D, E, F, <del>or G</del> not met.</p> <p>or</p> <p><del>OR</del> Required Action B.3, B.4, B.5.1, B.5.2, or B.7 and associated Completion Time not met.</p>	<p><del>X</del> G H.1 Be in MODE 3.</p> <p>AND</p> <p><del>X</del> G H.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>
<p><del>X</del> H Three or more required AC sources inoperable.</p>	<p><del>X</del> H H.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

BASES

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LCO  
(continued)

train. For the DGs, separation and independence are complete.

For the offsite AC sources, separation and independence are to the extent practical. A circuit may be connected to more than one ESF bus while the bus is being transferred to the other circuit.

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APPLICABILITY

The AC sources and sequencers are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

- a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and
- b. Adequate core cooling is provided and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

The AC power requirements for MODES 5 and 6 are covered in LCO 3.8.2, "AC Sources — Shutdown."

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ACTIONS

~~A Note prior to the ACTIONS table prompts the user that when the SAT is being applied in accordance with LCO 3.8.1 as an offsite circuit for an ESF bus or to meet the requirements of an LCO 3.8.1 Condition (SAT available) for an ESF bus, it is not "available" for any of the other three 4.16 kV ESF buses during that time. The SAT is available when it is:~~

- ~~• Operable in accordance with plant procedures;~~
- ~~• Not being applied to any of the four 4.16 kV ESF buses for Units 1 and 2 in accordance with Specification 3.8.1 as either an offsite source or to meet the requirements of an LCO 3.8.1 Condition; and,~~
- ~~• Not providing power to the other unit when that unit is in MODE 5 or 6 or defueled.~~

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BASES

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ACTIONS  
(continued)

A.1

To ensure a highly reliable power source remains with one offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit 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 ~~A~~, for two offsite circuits inoperable, is entered. **C**

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are powered from the redundant AC electrical power train. This includes motor driven auxiliary feedwater pumps. Single train systems, such as turbine driven auxiliary feedwater pumps, may not be included.

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:

- a. The train has no offsite power supplying its loads; and
- b. A required feature on the other train is inoperable.

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

Discovering no offsite power to one train of the onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported

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ACTIONS

A.2 (continued)

features, or both, that are associated with the other train that has offsite power, 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 OPERABLE offsite circuit and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System. 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 required 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 OPERABLE offsite circuit and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System.

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

The second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to ~~11 days~~. This could lead to a total of ~~24 days~~, since

72 hours

144 hours

(continued)

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A.3 (continued)

*(for a total of 9 days)* → 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 ~~3 days~~ <sup>72 hours</sup> ~~14 days depending on SAT availability~~ allowed prior to complete restoration of the LCO. The ~~14 day~~ <sup>72 hours</sup> Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and ~~14 day~~ <sup>72 hours</sup> Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met. <sup>6</sup>

<sup>6</sup> Tracking the ~~14 day~~ <sup>72 hours</sup> Completion Time is a requirement for beginning the Completion Time "clock" that is in addition to the normal Completion Time requirements. With respect to the ~~14 day~~ <sup>72 hours</sup> Completion Time, the "time zero" is specified as commencing at the time LCO 3.8.1 was initially not met, instead of at the time Condition A was entered. This results in the requirement when in this Condition to track the time elapsed from both the Condition A "time zero" and the "time zero" when LCO 3.8.1 was initially not met.

B.1

Required Action B.1 addresses the concern that there may be an increased potential for weather-related events that could cause electrical system grid disturbances and/or damage to the switchyard or electrical service to the switchyard during the period of time from July 15 through November 15. If at any time while in Condition B Required Action B.1 cannot be met, then Condition C becomes applicable, and the DG must be restored to OPERABLE status within 72 hours from entry into Condition C. Note that while the Completion Time of 72 hours begins upon entry into Condition C, the total time to restore an inoperable DG cannot exceed 14 days (per the Completion Time of Required Action B.7). Therefore, due to the constraint of Required Action B.1, a DG will not be voluntarily removed from service for maintenance that would require an extended Completion Time during the period from July 15 through November 15.

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ACTIONS  
(continued)

B.2

The 13.8/4.16 kV Standby Auxiliary Transformer (SAT) is a qualified offsite circuit that may be connected to the onsite Class 1E distribution system independently of the RATs and may be utilized to meet the LCO 3.8.1 requirements for an offsite circuit. Its availability permits an extension of the allowable out-of-service time for a DG to 14 days from the discovery of failure to meet LCO 3.8.1. The SAT is available when it is:

- Operable in accordance with plant procedures;
- Not being applied to any of the four 4.16 kV ESF buses for Units 1 and 2 in accordance with Specification 3.8.1 as either an offsite source or to meet the requirements of an LCO 3.8.1 Condition; and,
- Not providing power to the other unit when that unit is in MODE 5 or 6 or defueled.

When one or more of these criteria are not satisfied, the SAT is not available. These criteria are structured to ensure that the SAT is available as an alternate offsite source to support the extended DG Completion Time of 14 days. Therefore, when a DG is inoperable, it is necessary to verify the availability of the SAT within one hour and once per 8 hours thereafter. If Required Action B.2 is not met or the status of the SAT changes after Required Action B.2 is initially met, Condition C must be entered concurrently.

B.2.1

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 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.

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BASES

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ACTIONS  
(continued)

B.12

Required Action B.<sup>2</sup>~~1~~ 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, such as turbine driven auxiliary feedwater pumps, are not included. 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.<sup>2</sup>~~1~~ is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

- a. An inoperable DG exists; and
- b. A required feature on the other train (Train A or Train B) is inoperable.

If at any time during the existence of this Condition (one DG inoperable) a required feature subsequently becomes inoperable, this Completion Time would begin 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 the OPERABLE DG, 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. 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

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<sup>2</sup>  
B.8 (continued)

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.

<sup>3</sup> <sup>3</sup>  
B.8.1 and B.8.2

<sup>3</sup>  
Required Action B.8.1 provides an allowance to avoid unnecessary testing of the OPERABLE DG. If it can be determined that the cause of the inoperable DG does not exist on the OPERABLE DG, SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on the other DG, the other DG would be declared inoperable upon discovery and Condition F of LCO 3.8.1 would be entered. <sup>3</sup>  
Once the failure is repaired, the common cause failure no longer exists, and Required Action B.8.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG, performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of that DG.

<sup>3</sup> <sup>3</sup>  
In the event the inoperable DG is restored to OPERABLE status prior to completing either B.8.1 or B.8.2, the applicable plant procedures will continue to require the evaluation of 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 is not affected by the same problem as the inoperable DG.

B.6.1 and B.6.2

Required Action B.6.1 provides assurance that an enhanced black-start combustion turbine generator (CTG) is functional when a DG is out of service for greater than 72 hours. Required Action B.6.1 is only applicable provided that the two enhanced black-start CTGs have a combined reliability of  $\geq 95\%$  based on a minimum of 20 tests per enhanced black-start CTG and quarterly testing thereafter. This quarterly

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ACTIONS

B.6.1 and B.6.2 (continued)

testing will subject each enhanced black-start CTG to a start and load-run test. The black-start diesel generator will also be tested quarterly, but separately from the enhanced black-start CTGs. Required Action B.6.1 may be met by starting either of the enhanced black-start CTGs and the black-start diesel generator and verifying that they achieve steady state voltage and frequency. The black-start diesel generator may be started separately.

If a DG is to be removed from service voluntarily for greater than 72 hours, it may be advantageous to test an enhanced black-start CTG prior to taking the DG out of service. In such cases where advance notice of removing a DG from service is available, Required Action B.6.1 may be performed up to 72 hours prior to entry into Condition B. In other cases, Required Action B.6.1 must be performed within 72 hours after entry into Condition B. If the reliability of the enhanced black-start CTGs has not been demonstrated or maintained  $\geq 95\%$ , the option of starting and running any one of the six CTGs while in Condition B is available in the form of Required Action B.6.2. In the event of preplanned maintenance that would exceed 72 hours, any one of the six CTGs must be started prior to entry into Condition B and allowed to run for the duration of Condition B. Otherwise, any one of the six CTGs must be started within 72 hours (and allowed to run) after entry into Condition B. If the running CTG should fail while in Condition B, any one of the remaining CTGs must be started within 1 hour. If one of the six CTGs cannot be started within 1 hour, Condition C becomes applicable. Note that Required Action B.6.1 requires that one of the two enhanced black-start CTGs be started, but any one of the six CTGs could be started to satisfy Required Action B.6.2. Since a CTG is started and running while the DG is inoperable, it is not necessary that the CTG have enhanced black-start capability.

B.74

The availability of the SAT provides an additional AC source which permits operation to continue for a period not to exceed 14 days from discovery of failure to meet the LCO.

(continued)

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

AC Sources — Operating  
B 3.8.1

BASES

ACTIONS

<sup>4</sup>  
B.1 (continued)

capacity and capability of  
the remaining AC sources,

In Condition B, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. The ~~14 day~~ Completion Time takes into account the ~~enhanced reliability and availability of offsite sources due to the SAT~~, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The Completion Time for Required Action B.1<sup>4</sup> also establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an offsite circuit is inoperable, the LCO may already have been not met for up to 72 hours. If the offsite circuit is restored within the required 72 hours, this could lead to a total of 144 hours ~~→ 17 days~~, since initial failure to meet the LCO, to restore compliance with the LCO (i.e., restore the DG).<sup>4</sup> However, the ~~14 day~~ Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B (and consequently Condition ~~E~~) are entered concurrently. <sup>D</sup>

At this time, an offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of 9 days) allowed prior to complete restoration of the LCO.

Tracking the ~~14~~<sup>6</sup> day Completion Time is a requirement for beginning the Completion Time "clock" that is in addition to the normal Completion Time requirements. With respect to the Completion Time, the "time zero" is specified as commencing at the time LCO 3.8.1 was initially not met, instead of at the time Condition B was entered. This results in the requirement when in this Condition to track the time elapsed from both the Condition B "time zero" and the "time zero" when LCO 3.8.1 was initially not met.

C.1

If the DG inoperability falls on or within July 15 through November 15 in accordance with Required Action B.1, or if the availability of the SAT cannot be verified and/or maintained in accordance with Required Action B.2, or if no CTG meets the requirements of either Required Action B.6.1 or B.6.2, the DG must be restored to OPERABLE status within 72 hours. The 72-hour Completion Time begins upon entry

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~~C.1~~ (continued)

into Condition C. However, the total time to restore an inoperable DG cannot exceed 14 days (per the Completion Time of Required Action B.5).

The Completion Time of 72 hours (in the absence of the SAT) is consistent with Regulatory Guide 1.93 (Ref. 6). The 72-hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and low probability of a DBA occurring during this period.

~~C~~ ~~B.1~~ and ~~B.2~~

Required Action ~~B.1~~<sup>C</sup>, which applies when two offsite circuits are inoperable, 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 this failure of redundant required features is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are powered from redundant AC safety trains. This includes motor driven auxiliary feedwater pumps. Single train features, such as turbine driven auxiliary pumps, are not included in the list.

The Completion Time for Required Action ~~B.1~~<sup>C</sup> 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. All required offsite circuits are inoperable; and
- b. A required feature is inoperable.

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BASES

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<sup>C</sup>  
~~B~~.1 and <sup>C</sup>  
~~B~~.2 (continued)

<sup>C</sup>  
If at any time during the existence of Condition ~~B~~ (two offsite circuits inoperable) a required feature becomes inoperable, this Completion Time begins to be tracked.

<sup>C</sup>  
According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition ~~B~~ 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 both 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.

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BASES

ACTIONS

<sup>C</sup>  
~~D~~.1 and <sup>C</sup>  
~~D~~.2 (continued)

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

<sup>D</sup>  
~~D~~.1 and <sup>D</sup>  
~~D~~.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~~ are modified by a Note to indicate that when Condition ~~D~~ is entered with no AC source to one or more trains, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems — Operating," must be immediately entered. This allows Condition ~~D~~ 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~~ for a period that should not exceed 12 hours.

In Condition ~~D~~, individual redundancy is lost in both the offsite electrical power system and the on-site 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.

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BASES

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ACTIONS  
(continued)

E  
P.1

With Train A and Train B DGs inoperable, there are no remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, insufficient standby AC sources are available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Reference 6, with both DGs inoperable, operation may continue for a period that should not exceed 2 hours.

F  
P.1

The sequencer(s) is an essential support system to both the offsite circuit and the DG associated with a given ESF bus. Furthermore, the sequencer is on the primary success path for most major AC electrically powered safety systems powered from the associated ESF bus. The sequencers are required to provide the system response to both an SI signal and a loss of or degraded ESF bus voltage signal. Therefore, loss of an ESF bus sequencer affects every major ESF system in the train. The 12 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining sequencer OPERABILITY. This time period also ensures that the probability of an accident (requiring sequencer OPERABILITY) occurring during periods when the sequencer is inoperable is minimal.

(continued)

BASES

ACTIONS  
(continued)

G G  
H.1 and H.2

If the inoperable AC electric power sources or an automatic load sequencer cannot be restored to OPERABLE status within the required Completion Time, or Required Actions B.3, B.4, B.5.1, or B.5.2 cannot be met, 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 plant systems.

H  
X.1

H

Condition X 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 10 CFR 50, Appendix A, GDC 18 (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), as addressed in the FSAR.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3750 V is 90% of the nominal 4160 V output voltage. This value, which is specified in ANSI C84.1 (Ref. 11), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage

(continued)



## 5.6 Reporting Requirements (continued)

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### 5.6.5 Core Operating Limits Report (COLR)

- a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

LCO 3.1.1 "SHUTDOWN MARGIN"

LCO 3.1.3 "Moderator Temperature Coefficient"

LCO 3.1.5 "Shutdown Bank Insertion Limits"

LCO 3.1.6 "Control Bank Insertion Limits"

LCO 3.2.1 "Heat Flux Hot Channel Factor"

LCO 3.2.2 "Nuclear Enthalpy Rise Hot Channel Factor"

LCO 3.2.3 "Axial Flux Difference"

**LCO 3.9.1 "Boron Concentration"**

- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

WCAP-9272-P-A, "WESTINGHOUSE RELOAD SAFETY EVALUATION METHODOLOGY," July 1985 (W Proprietary). (Methodology for Moderator Temperature Coefficient, Shutdown Bank Insertion Limit, Control Bank Insertion Limits, and Nuclear Enthalpy Rise Hot Channel Factor.)

WCAP-10216-P-A, Revision 1A, "RELAXATION OF CONSTANT AXIAL OFFSET CONTROL FQ SURVEILLANCE TECHNICAL SPECIFICATION," February, 1994 (W Proprietary). (Methodology for Axial Flux Difference (Relaxed Axial Offset Control) and Heat Flux Hot Channel Factor (W(Z) surveillance requirements for  $F_q$  Methodology).)

WCAP-10266-P-A, Revision 2, "The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code," March 1987.

- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

(continued)