

August 30, 2004

TSTF-04-05

Thomas H. Boyce, Section Chief  
Technical Specifications Section  
Reactor Operations Branch  
Division of Inspection Program Management  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT: TSTF-468, Revision 0, "Declare Systems Inoperable Due to an Inoperable MCC or Distribution Panel in lieu of ITS 3.8.9"

Dear Mr. Boyce:

Enclosed for NRC review is Revision 0 of TSTF-468, "Declare Systems Inoperable Due to an Inoperable MCC or Distribution Panel in lieu of ITS 3.8.9."

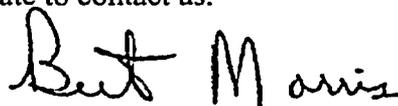
This Traveler is applicable to all five Improved Standard Technical Specification NUREGs and provides the option to declare inoperable those systems supported by an inoperable electrical distribution system in lieu of the existing Actions.

Any NRC review fees associated with the review of TSTF-468 should be billed to the Babcock & Wilcox Owners Group.

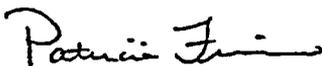
Should you have any questions, please do not hesitate to contact us.



Dennis Buschbaum (WOG)



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Enclosure

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## Technical Specification Task Force

### Improved Standard Technical Specifications Change Traveler

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Follow Supported Systems Actions Due to an Inoperable MCC or Distribution Panel in lieu of ITS 3.8.9

NUREGs Affected:  1430  1431  1432  1433  1434

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Classification: 3) Improve Specifications

Recommended for CLIP?: Yes

Correction or Improvement: Improvement

NRC Fee Status: Not Exempt

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Industry Contact: Paul Infanger, (352) 563-4796, paul.infanger@pgnmail.com

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#### **1.0 Description**

The Required Actions of Specification 3.8.9, Distribution Systems - Operating, are revised to provide the option of following the Conditions and Required Actions of the supported required feature(s) instead of following the existing Required Actions in Specification 3.8.9.

Complementary Bases changes are also made.

#### **2.0 Proposed Change**

Specification 3.8.9, Required Actions A, B, and C are modified to include a Required Action, joined by an OR logical connector, which requires entering the applicable Conditions and Required Actions of associated supported required feature(s) made inoperable by the inoperable bus. The Completion Times for the new Required Actions are the same as the existing Required Actions in ACTION A, B, and C. The Bases are modified to describe the new Required Actions and to state that the new Required Actions should only be used after an evaluation plant risk.

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30-Aug-04

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### **3.0 Background**

The power distribution subsystems listed in Table B 3.8.9-1 in the Bases of Specification 3.8.9 are required to be OPERABLE. This table lists buses, load centers, motor control centers, and distribution panels. If any of these components are deenergized, the associated power distribution subsystem is considered inoperable. The Required Actions of Specification 3.8.9 provides 8 hours to restore an AC electrical power distribution subsystem and 2 hours to restore an AC vital bus or DC electrical power subsystem before requiring a plant shutdown. These times were taken from Regulatory Guide 1.93, Availability of Electric Power Sources, published in December of 1974.

If a bus which supports a required feature is inoperable, the feature has no available electrical power (either normal or emergency power) and the required feature is inoperable. Under LCO 3.0.6, the required feature is inoperable but the Conditions and Required Actions of the associated LCO do not have to be followed. The Conditions and Required Actions of the support system (e.g., the distribution system LCO) are followed instead.

### **4.0 Technical Analysis**

Specification 3.8.9 treats all AC and DC distribution panels as if they were full distribution subsystems or large sections of the distribution subsystems powering a large number and wide variety of systems and components. This is not the case. Some of the buses, load centers, motor control centers, and distribution panels supply power to only a few components on one or two systems.

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30-Aug-04

This presumed complexity led to the treatment of each of these panels as a complete train. Regulatory Guide 1.93 required a very short Completion Time (CT) for electrical distribution system trains (2 hours for DC panels). It did not anticipate or deal with individual distribution panels that support limited equipment. This 2 or 8 hour CT is reasonable for full or large partial subsystems and may be a good initial CT for failure of the simpler ones. It allows the operating staff to focus on restoration and not on which supported component Conditions to enter. However, these very short Completion Times are unreasonable for some components in the distribution system. For example, a distribution panel may power the auxiliaries and controls for a single emergency diesel generator (EDG). If power is removed from the distribution panel, the associated EDG is inoperable. The CT for an inoperable EDG is 72 hours, but ITS 3.8.9 applies a CT of 2 hours for this condition. This short CT is not commensurate with the safety significance of the degradation and may lead to unnecessary plant shutdowns, with the attendant increase in plant risk. In another example, loss of power to a distribution panel may render a Post Accident Monitoring instrument inoperable. If a single PAM instrument is inoperable for any other reason, the Required Actions allow 30 days to restore the instrument followed by a report to the NRC. However, if the PAM instrument is inoperable because the associated distribution panel is deenergized, Specification 3.8.9 would require a plant shutdown in 8 hours.

Maintenance on the less complex panels presents a different set of circumstances from those which apparently led the Regulatory Guide to explicitly exclude preventive maintenance. At that time (1974), before on-line maintenance was anticipated, all such maintenance was done during plant shutdowns. Further, the short CTs were based on the presumed complexity of the distribution systems and the presumed inability of the plant to determine the effect on plant safety from deenergizing a portion of a distribution subsystem. Modern risk management tools allow a rapid evaluation of the effect of a loss of power to various components. Such evaluations are required to be used under 10 CFR 50.65(a)(4). Current techniques of managing on-line maintenance and modern risk assessment tools eliminate the need to always assume an entire bus is deenergized when only selected components are affected. Plant safety is better served by allowing the operator to determine whether to consider the distribution subsystem inoperable or to declare the affected supported feature(s) inoperable.

The Required Actions for the affected supported feature(s) contain appropriate compensatory measures for those inoperable components. The risk from multiple deenergized components is required to be evaluated under 10 CFR 50.65(a)(4). Depending on the number and type of affected components and the results of the on-line risk assessment, operators can choose to follow the existing the distribution subsystem Actions or the Actions of the supported components and take the appropriate compensatory measures.

For example, if an evaluation of the plant risk from an distribution subsystem determines the risk is "green" or "yellow" then the risk is acceptable and the Required Actions from the individual inoperable required feature(s) is appropriate. However, if the result of the risk evaluation is "orange" or "red" then the short Completion Times in the existing Required Actions A.1, B.1, and C.1 are appropriate. The plant risk is a function of what components and how many components are inoperable.

The proposed changes are consistent with the Required Actions in Specification 3.8.10, Distribution Systems - Shutdown, which provides the alternative of declaring the associated supported required feature(s) inoperable.

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30-Aug-04

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## 5.0 Regulatory Analysis

### 5.1 No Significant Hazards Consideration

The TSTF has evaluated whether or not a significant hazards consideration is involved with the proposed generic change 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 or consequences of an accident previously evaluated?

Response: No.

The proposed change provides the option of following the Conditions and Required Actions for supported affected equipment instead of the existing Required Actions when a distribution subsystem is inoperable. The actions taken in response to an inoperable distribution subsystem are not an initiator to any accident previously evaluated. The consequences of an accident with an inoperable distribution subsystem are no different under the proposed Required Actions than under the existing Required Actions. Therefore, neither the probability or the consequences of any accident previously evaluation are increased.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an 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 provides the option of following the Conditions and Required Actions for supported affected equipment instead of the existing Required Actions when a distribution subsystem is inoperable. No new or different accidents result from utilizing the proposed change. The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a significant change in the methods governing normal plant operation. The changes do not alter assumptions made in the safety analysis. The proposed changes are consistent with the safety analysis assumptions.

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

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

Response: No.

The proposed change provides the option of following the Conditions and Required Actions for supported affected equipment instead of the existing Required Actions when a distribution subsystem is inoperable. The proposed change allows the plant to choose the appropriate Required Action to follow based on the severity of the degradation of the distribution subsystem. This may increase the margin of safety as plant shutdowns required due to loss of power to components that are not safety significant may be avoided.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, the TSTF concludes that the proposed change presents 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.

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30-Aug-04

## **5.2 Applicable Regulatory Requirements/Criteria**

The proposed change does not affect the design requirements or operability requirements of any plant system. Required Actions for an inoperable component are not specified in the regulatory requirements. 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 approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

## **6.0 Environmental Consideration**

A review has determined that the proposed change 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. However, the proposed change 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 change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

## **7.0 References**

None.

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## **Revision History**

### **OG Revision 0                      Revision Status: Closed**

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Revision Proposed by: CR3

Revision Description:  
Original Issue

#### **Owners Group Review Information**

Date Originated by OG: 24-Jul-00

Owners Group Comments:  
Make editorial corrections.  
BWOG to revise to use Rev. 2 pages and expanded justification.

Owners Group Resolution: Superceded Date: 02-Aug-00

### **OG Revision 1                      Revision Status: Closed**

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Revision Proposed by: CR3

Revision Description:  
Complete Replacement of Revision 1.

#### **TSTF Review Information**

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30-Aug-04

**OG Revision 1****Revision Status: Closed**

TSTF Received Date: 09-Sep-03 Date Distributed for Review: 09-Sep-03

OG Review Completed:  BWO  WOG  CEOG  BWROGTSTF Comments:  
(No Comments)

TSTF Resolution: Superseded Date: 22-Apr-04

**TSTF Revision 0****Revision Status: Active**

Revision Proposed by: TSTF

Revision Description:  
Remarked on Revision 3 Pages.**TSTF Review Information**

TSTF Received Date: 26-Jun-04 Date Distributed for Review: 26-Jun-04

OG Review Completed:  BWO  WOG  CEOG  BWROGTSTF Comments:  
On hold pending resolution of funding mechanism.

TSTF Resolution: Approved Date: 09-Jul-04

**NRC Review Information**

NRC Received Date: 30-Aug-04

**Affected Technical Specifications**

Action 3.8.9.A Distribution Systems - Operating

Action 3.8.9.A Bases Distribution Systems - Operating

Action 3.8.9.B Distribution Systems - Operating

Action 3.8.9.B Bases Distribution Systems - Operating

Action 3.8.9.C Distribution Systems - Operating

Action 3.8.9.C Bases Distribution Systems - Operating

30-Aug-04

INSERT 1

	<u>OR</u> A.2 Enter applicable Conditions and Required Actions of associated supported required feature(s) made inoperable by AC electrical power distribution subsystem(s).	8 hours <u>AND</u> 16 hours from discovery of failure to meet the LCO
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INSERT 2

	<u>OR</u> B.2 Enter applicable Conditions and Required Actions of associated supported required feature(s) made inoperable by AC vital bus subsystem(s).	2 hours <u>AND</u> 16 hours from discovery of failure to meet the LCO
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INSERT 3

	<u>OR</u> C.2 Enter applicable Conditions and Required Actions of associated supported required feature(s) made inoperable by DC electrical power distribution subsystem(s).	2 hours <u>AND</u> 16 hours from discovery of failure to meet the LCO
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INSERT 4

Alternatively, the Conditions and Required Actions of all associated required features supported by the inoperable subsystem(s) may be declared inoperable. Appropriate restrictions are implemented in accordance with the affected feature's LCO and ACTIONS. If more than one required feature is made inoperable by the inoperable electrical distribution subsystem, a plant risk assessment should be performed prior to selecting Required Action A.2. Provided the effect on plant risk is acceptable, the ACTIONS for the supported inoperable required feature may be followed instead of Required Action A.1.

INSERT 5

Alternatively, the Conditions and Required Actions of all associated required features supported by the inoperable subsystem(s) may be declared inoperable. Appropriate restrictions are implemented in accordance with the affected feature's LCO and ACTIONS. If more than one required feature is made inoperable by the inoperable bus, a plant risk assessment should be performed prior to selecting Required Action B.2. Provided the effect on plant risk is acceptable, the ACTIONS for the supported inoperable required feature may be followed instead of Required Action B.1.

INSERT 6

Alternatively, the Conditions and Required Actions of all associated required features supported by the inoperable subsystem(s) may be declared inoperable. Appropriate restrictions are implemented in accordance with the affected feature's LCO and ACTIONS. If more than one required feature is made inoperable by the inoperable electrical distribution subsystem, a plant risk assessment should be performed prior to selecting Required Action C.2. Provided the effect on plant risk is acceptable, the ACTIONS for the supported inoperable required feature may be followed instead of Required Action C.1.

Distribution Systems - Operating  
3.8.9

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems - Operating

LCO 3.8.9 Train A and Train B AC, DC, and AC vital bus electrical power distribution subsystems shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more AC electrical power distribution subsystems inoperable.</p> <p style="text-align: right; border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;">Insert 1</p>	<p style="text-align: center;">-----NOTE-----</p> <p>Enter applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," for DC trains made inoperable by inoperable power distribution subsystems.</p> <hr/> <p>A.1 Restore AC electrical power distribution subsystem(s) to OPERABLE status.</p>	<p>8 hours</p> <p><u>AND</u></p> <p>16 hours from discovery of failure to meet LCO</p>
<p>B. One or more AC vital buses inoperable.</p> <p style="text-align: right; border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;">Insert 2</p>	<p>B.1 Restore AC vital bus subsystem(s) to OPERABLE status.</p>	<p>2 hours</p> <p><u>AND</u></p> <p>16 hours from discovery of failure to meet LCO</p>

Distribution Systems - Operating  
3.8.9

## ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more DC electrical power distribution subsystems inoperable.  <i>Insert 3</i> →	C.1 Restore DC electrical power distribution subsystem(s) to OPERABLE status.	2 hours  <u>AND</u>  16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.  <u>AND</u>  D.2 Be in MODE 5.	6 hours    36 hours
E. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	E.1 Enter LCO 3.0.3.	Immediately

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.9.1 Verify correct breaker alignments and voltage to [required] AC, DC, and AC vital bus electrical power distribution subsystems.	7 days

## BASES

## LCO (continued)

In addition, tie breakers between redundant safety related AC, DC, and AC vital bus power distribution subsystems, if they exist, must be open. This prevents any electrical malfunction in any power distribution subsystem from propagating to the redundant subsystem, that could cause the failure of a redundant subsystem and a loss of essential safety function(s). If any tie breakers are closed, the affected redundant electrical power distribution subsystems are considered inoperable. This applies to the onsite, safety related redundant electrical power distribution subsystems. It does not, however, preclude redundant Class 1E 4.16 kV buses from being powered from the same offsite circuit.

## APPLICABILITY

The electrical power distribution subsystems 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.

Electrical power distribution subsystem requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.10, "Distribution Systems - Shutdown."

## ACTIONS

A.1 ← and A.2

With one or more Train A and B required AC buses, load centers, motor control centers, or distribution panels (except AC vital buses), in one train inoperable and a loss of function has not occurred, the remaining AC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses, load centers, motor control centers, and distribution panels must be restored to OPERABLE status within 8 hours.

Insert 4 →

## BASES

## ACTIONS (continued)

B.1 ← and B.2

With one or more AC vital buses inoperable, and a loss of function has not yet occurred, the remaining OPERABLE AC vital buses are capable of supporting the minimum safety functions necessary to shut down the unit and maintain it in the safe shutdown condition. Overall reliability is reduced, however, since an additional single failure could result in the minimum required ESF functions not being supported. Therefore, the [required] AC vital bus must be restored to OPERABLE status within 2 hours by powering the bus from the associated [inverter via inverted DC, inverter using internal AC Source, or Class 1E constant voltage transformer].

Insert 5 →

Condition B represents one or more AC vital buses without power; potentially both the DC source and the associated AC source are nonfunctioning. In this situation the unit is significantly more vulnerable to a complete loss of all noninterruptible power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining vital buses and restoring power to the affected vital bus.

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that are without adequate vital AC power. Taking exception to LCO 3.0.2 for components without adequate vital AC power, that would have the Required Action Completion Times shorter than 2 hours if declared inoperable, is acceptable because of:

- a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) and not allowing stable operations to continue,
- b. The potential for decreased safety by requiring entry into numerous applicable Conditions and Required Actions for components without adequate vital AC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train, and
- c. The potential for an event in conjunction with a single failure of a redundant component.

## BASES

## ACTIONS (continued)

The 2-hour Completion Time takes into account the importance to safety of restoring the AC vital bus to OPERABLE status, the redundant capability afforded by the other OPERABLE vital buses, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action B.1 establishes a limit on the maximum time allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an AC bus is inoperable and subsequently returned OPERABLE, the LCO may already have been not met for up to 8 hours. This could lead to a total of 10 hours, since initial failure of the LCO, to restore the vital bus distribution system. At this time, an AC train could again become inoperable, and vital bus distribution restored OPERABLE. This could continue indefinitely.

This 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 the LCO was initially not met, instead of the time Condition B was entered. The 16 hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.

C.1 ← and C.2

With one or more DC buses or distribution panels inoperable, and a loss of function has not yet occurred, the remaining DC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining DC electrical power distribution subsystem could result in the minimum required ESF functions not being supported. Therefore, the [required] DC buses and distribution panels must be restored to OPERABLE status within 2 hours by powering the bus from the associated battery or charger.

Insert 6 →

Condition C represents one or more DC buses or distribution panels without adequate DC power; potentially both with the battery significantly degraded and the associated charger nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all DC power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining trains and restoring power to the affected train.

Distribution Systems - Operating  
3.8.9

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems - Operating

LCO 3.8.9 Train A and Train B AC, DC, and AC vital bus electrical power distribution subsystems shall be OPERABLE.

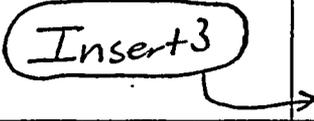
APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more AC electrical power distribution subsystems inoperable.</p> <p><i>Insert 1</i></p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," for DC trains made inoperable by inoperable power distribution subsystems.</p> <hr/> <p>A.1 Restore AC electrical power distribution subsystem(s) to OPERABLE status.</p>	<p>8 hours</p> <p><u>AND</u></p> <p>16 hours from discovery of failure to meet LCO</p>
<p>B. One or more AC vital buses inoperable.</p> <p><i>Insert 2</i></p>	<p>B.1 Restore AC vital bus subsystem(s) to OPERABLE status.</p>	<p>2 hours</p> <p><u>AND</u></p> <p>16 hours from discovery of failure to meet LCO</p>

Distribution Systems - Operating  
3.8.9

## ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more DC electrical power distribution subsystems inoperable. 	C.1 Restore DC electrical power distribution subsystem(s) to OPERABLE status.	2 hours <u>AND</u> 16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. <u>AND</u> D.2 Be in MODE 5.	6 hours  36 hours
E. Two or more electrical power distribution subsystems inoperable that result in a loss of safety function.	E.1 Enter LCO 3.0.3.	Immediately

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to [required] AC, DC, and AC vital bus electrical power distribution subsystems.	7 days

Distribution Systems - Operating  
B 3.8.9

## BASES

## LCO (continued)

In addition, tie breakers between redundant safety related AC, DC, and AC vital bus power distribution subsystems, if they exist, must be open. This prevents any electrical malfunction in any power distribution subsystem from propagating to the redundant subsystem, that could cause the failure of a redundant subsystem and a loss of essential safety function(s). If any tie breakers are closed, the affected redundant electrical power distribution subsystems are considered inoperable. This applies to the onsite, safety related redundant electrical power distribution subsystems. It does not, however, preclude redundant Class 1E 4.16 kV buses from being powered from the same offsite circuit.

## APPLICABILITY

The electrical power distribution subsystems 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.

Electrical power distribution subsystem requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.10, "Distribution Systems - Shutdown."

## ACTIONS

A.1<sup>4</sup> and A.2

With one or more Train A and B required AC buses, load centers, motor control centers, or distribution panels (except AC vital buses), in one train inoperable and a loss of function has not occurred, the remaining AC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses, load centers, motor control centers, and distribution panels must be restored to OPERABLE status within 8 hours.

Insert 4 →

## BASES

## ACTIONS (continued)

B.1 ← and B.2

With one or more AC vital buses inoperable, and a loss of function has not yet occurred, the remaining OPERABLE AC vital buses are capable of supporting the minimum safety functions necessary to shut down the unit and maintain it in the safe shutdown condition. Overall reliability is reduced, however, since an additional single failure could result in the minimum [required] ESF functions not being supported. Therefore, the required AC vital bus must be restored to OPERABLE status within 2 hours by powering the bus from the associated [inverter via inverted DC, inverter using internal AC source, or Class 1E constant voltage transformer].

Insert 5 →

Condition B represents one or more AC vital buses without power; potentially both the DC source and the associated AC source are nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all noninterruptible power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining vital buses and restoring power to the affected vital bus.

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that are without adequate vital AC power. Taking exception to LCO 3.0.2 for components without adequate vital AC power, that would have the Required Action Completion Times shorter than 2 hours if declared inoperable, is acceptable because of:

- a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) and not allowing stable operations to continue,
- b. The potential for decreased safety by requiring entry into numerous Applicable Conditions and Required Actions for components without adequate vital AC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train, and
- c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time takes into account the importance to safety of restoring the AC vital bus to OPERABLE status, the redundant capability afforded by the other OPERABLE vital buses, and the low probability of a DBA occurring during this period.

## BASES

## ACTIONS (continued)

The second Completion Time for Required Action B.1 establishes a limit on the maximum allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an AC bus is inoperable and subsequently returned OPERABLE, the LCO may already have been not met for up to 8 hours. This could lead to a total of 10 hours, since initial failure of the LCO, to restore the vital bus distribution system. At this time, an AC train could again become inoperable, and vital bus distribution restored OPERABLE. This could continue indefinitely.

This 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 the LCO was initially not met, instead of the time Condition B was entered. The 16 hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.

C.1 ← and C.2

With one or more DC buses or distribution panels inoperable, and a loss of function has not yet occurred, the remaining DC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining DC electrical power distribution subsystem could result in the minimum required ESF functions not being supported. Therefore, the [required] DC buses and distribution panels must be restored to OPERABLE status within 2 hours by powering the bus from the associated battery or charger.

Insert 6 →

Condition C represents one or more DC buses or distribution panels without adequate DC power; potentially both with the battery significantly degraded and the associated charger nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all DC power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining trains and restoring power to the affected train.

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems - Operating

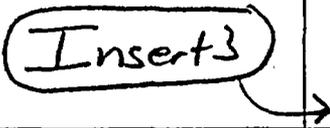
LCO 3.8.9 Train A and Train B AC, DC, and AC vital bus electrical power distribution subsystems shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more AC electrical power distribution subsystems inoperable.</p> <p><i>Insert 1</i></p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," for DC trains made inoperable by inoperable power distribution subsystems. -----</p> <p>A.1 Restore AC electrical power distribution subsystem(s) to OPERABLE status.</p>	<p>8 hours <u>AND</u> 16 hours from discovery of failure to meet LCO</p>
<p>B. One or more AC vital buses inoperable.</p> <p><i>Insert 2</i></p>	<p>B.1 Restore AC vital bus subsystem(s) to OPERABLE status.</p>	<p>2 hours <u>AND</u> 16 hours from discovery of failure to meet LCO</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more DC electrical power distribution subsystems inoperable. 	C.1 Restore DC electrical power distribution subsystem(s) to OPERABLE status.  <u>AND</u>	2 hours  <u>AND</u> 16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.  <u>AND</u> D.2 Be in MODE 5.	6 hours  36 hours
E. Two or more electrical power distribution subsystems inoperable that result in a loss of safety function.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.9.1 Verify correct breaker alignments and voltage to [required] AC, DC, and AC vital bus electrical power distribution subsystems.	7 days

## BASES

## LCO (continued)

In addition, tie breakers between redundant safety related AC, DC, and AC vital bus power distribution subsystems, if they exist, must be open. This prevents any electrical malfunction in any power distribution subsystem from propagating to the redundant subsystem, which could cause the failure of a redundant subsystem and a loss of essential safety function(s). If any tie breakers are closed, the affected redundant electrical power distribution subsystems are considered inoperable. This applies to the onsite, safety related redundant electrical power distribution subsystems. It does not, however, preclude redundant Class 1E 4.16 kV buses from being powered from the same offsite circuit.

## APPLICABILITY

The electrical power distribution subsystems 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.

Electrical power distribution subsystem requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.10, "Distribution Systems - Shutdown."

## ACTIONS

A.1 and A.2

With one or more Train A and B required AC buses, load centers, motor control centers, or distribution panels (except AC vital buses), in one train inoperable and a loss of function has not occurred, the remaining AC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses, load centers, motor control centers, and distribution panels must be restored to OPERABLE status within 8 hours.

Insert 4 →

## BASES

## ACTIONS (continued)

B.1 ← and B.2

With one or more AC vital buses inoperable, and a loss of function has not yet occurred, the remaining OPERABLE AC vital buses are capable of supporting the minimum safety functions necessary to shut down the unit and maintain it in the safe shutdown condition. Overall reliability is reduced, however, since an additional single failure could result in the minimum required ESF functions not being supported. Therefore, the [required] AC vital bus must be restored to OPERABLE status within 2 hours by powering the bus from the associated [inverter via inverted DC, inverter using internal AC source, or Class 1E constant voltage transformer].

Insert 5 →

Condition B represents one or more AC vital buses without power; potentially both the DC source and the associated AC source are nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all noninterruptible power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining vital buses, and restoring power to the affected vital bus.

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that are without adequate vital AC power. Taking exception to LCO 3.0.2 for components without adequate vital AC power, which would have the Required Action Completion Times shorter than 2 hours if declared inoperable, is acceptable because of:

- a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) and not allowing stable operations to continue,
- b. The potential for decreased safety by requiring entry into numerous Applicable Conditions and Required Actions for components without adequate vital AC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train, and
- c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time takes into account the importance to safety of restoring the AC vital bus to OPERABLE status, the redundant capability afforded by the other OPERABLE vital buses, and the low probability of a DBA occurring during this period.

## BASES

## ACTIONS (continued)

The second Completion Time for Required Action B.1 establishes a limit on the maximum allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an AC bus is inoperable and subsequently returned OPERABLE, the LCO may already have been not met for up to 8 hours. This could lead to a total of 10 hours, since initial failure of the LCO, to restore the vital bus distribution system. At this time, an AC train could again become inoperable, and vital bus distribution restored OPERABLE. This could continue indefinitely.

This 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 the LCO was initially not met, instead of the time Condition B was entered. The 16 hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.

C.1 *and C.2*

With one or more DC buses or distribution panels inoperable, and a loss of function has not yet occurred, the remaining DC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining DC electrical power distribution subsystem could result in the minimum required ESF functions not being supported. Therefore, the [required] DC buses and distribution panels must be restored to OPERABLE status within 2 hours by powering the bus from the associated battery or charger.

*Insert 6* →

Condition C represents one or more DC buses or distribution panels without adequate DC power; potentially both with the battery significantly degraded and the associated charger nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all DC power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining trains and restoring power to the affected train.

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems - Operating

LCO 3.8.9 [Division 1] and [Division 2] AC, DC, [and AC vital bus] electrical power distribution subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more AC electrical power distribution subsystems inoperable.</p> <p><i>Insert 1</i></p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," for DC divisions made inoperable by inoperable power distribution subsystems.</p> <p>A.1 Restore AC electrical power distribution subsystem(s) to OPERABLE status.</p>	<p>8 hours</p> <p><u>AND</u></p> <p>16 hours from discovery of failure to meet LCO</p>
<p>B. [ One or more AC vital buses inoperable.</p> <p><i>Insert 2</i></p>	<p>B.1 Restore AC vital bus distribution subsystem(s) to OPERABLE status.</p>	<p>2 hours</p> <p><u>AND</u></p> <p>16 hours from discovery of failure to meet LCO ]</p>

Distribution Systems - Operating  
3.8.9

## ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more [station service] DC electrical power distribution subsystems inoperable. <i>Insert 3</i> →	C.1 Restore DC electrical power distribution subsystem(s) to OPERABLE status.	2 hours <u>AND</u> 16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3. <u>AND</u> D.2 Be in MODE 4.	12 hours  36 hours
E. [ One or more DG DC electrical power distribution subsystems inoperable.	E.1 Declare associated DG(s) inoperable.	Immediately ]
F. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	F.1 Enter LCO 3.0.3.	Immediately

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.9.1 Verify correct breaker alignments and voltage to [required] AC, DC, [and AC vital bus] electrical power distribution subsystems.	7 days

**BASES****LCO (continued)**

associated buses and distribution panels to be energized to their proper voltage from either the associated battery or charger. OPERABLE vital bus electrical power distribution subsystems require the associated buses to be energized to their proper voltage from the associated [inverter via inverted DC voltage, inverter using interval AC source, or Class 1E constant voltage transformer].

In addition, tie breakers between redundant safety related AC, DC, and AC vital bus power distribution subsystems, if they exist, must be open. This prevents any electrical malfunction in any power distribution subsystem from propagating to the redundant subsystem, which could cause the failure of a redundant subsystem and a loss of essential safety function(s). If any tie breakers are closed, the affected redundant electrical power distribution subsystems are considered inoperable. This applies to the onsite, safety related, redundant electrical power distribution subsystems. It does not, however, preclude redundant Class 1E 4.16 kV ESF buses from being powered from the same offsite circuit.

**APPLICABILITY**

The electrical power distribution subsystems are required to be OPERABLE in MODES 1, 2, and 3 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.

Electrical power distribution subsystem requirements for MODES 4 and 5 are covered in the Bases for LCO 3.8.10, "Distribution Systems - Shutdown."

**ACTIONS**

A.1 ← and A.2

With one or more Division 1 and 2 required AC buses, load centers, motor control centers, or distribution panels (except AC vital buses), in one division inoperable and a loss of function has not occurred, the remaining AC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single

## BASES

## ACTIONS (continued)

failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses, load centers, motor control centers, and distribution panels must be restored to OPERABLE status within 8 hours.

Insert 4 →

The Condition A worst scenario is one division without AC power (i.e., no offsite power to the division and the associated DG inoperable). In this Condition, the unit is more vulnerable to a complete loss of AC power. It is, therefore, imperative that the unit operators' attention be focused on minimizing the potential for loss of power to the remaining division by stabilizing the unit, and on restoring power to the affected division. The 8 hour time limit before requiring a unit shutdown in this Condition is acceptable because:

- a. There is a potential for decreased safety if the unit operators' attention is diverted from the evaluations and actions necessary to restore power to the affected division to the actions associated with taking the unit to shutdown within this time limit.
- b. The potential for an event in conjunction with a single failure of a redundant component in the division with AC power. (The redundant component is verified OPERABLE in accordance with Specification 5.5.12, "Safety Function Determination Program (SFDP).")

The second Completion Time for Required Action A.1 establishes a limit on the maximum time allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DC bus is inoperable and subsequently returned OPERABLE, this LCO may already have been not met for up to 2 hours. This situation could lead to a total duration of 10 hours, since initial failure of the LCO, to restore the AC distribution system. At this time a DC circuit could again become inoperable, and AC-distribution could be restored OPERABLE. This could continue indefinitely.

This Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This results in establishing the "time zero" at the time this LCO was initially not met, instead of at the time Condition A was entered. The 16 hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.

## BASES

## ACTIONS (continued)

Required Action A.1 is modified by a Note that requires the applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," to be entered for DC divisions made inoperable by inoperable power distribution subsystems. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. Inoperability of a distribution system can result in loss of charging power to batteries and eventual loss of DC power. This Note ensures that the appropriate attention is given to restoring charging power to batteries, if necessary, after loss of distribution systems.

[B.1 ← and B.2]

With one or more AC vital buses inoperable, and a loss of function has not yet occurred, the remaining OPERABLE AC vital buses are capable of supporting the minimum safety functions necessary to shut down the unit and maintain it in the safe shutdown condition. Overall reliability is reduced, however, since an additional single failure could result in the minimum required ESF functions not being supported. Therefore, the required AC vital bus must be restored to OPERABLE status within 2 hours by powering the bus from the associated [inverter via inverted DC, inverter using internal AC source, or Class 1E constant voltage transformer].

Insert 5 →

Condition B represents one or more AC vital buses without power; potentially both the DC source and the associated AC source are nonfunctioning. In this situation the plant is significantly more vulnerable to a complete loss of all noninterruptible power. It is, therefore, imperative that the operator's attention focus on stabilizing the plant, minimizing the potential for loss of power to the remaining vital buses, and restoring power to the affected AC vital buses.

This 2 hour limit is more conservative than Completion Times allow for the majority of components that are without adequate vital AC power. Taking exception to LCO 3.0.2 for components without adequate vital AC power, that would have Required Action Completion Times shorter than 2 hours if declared inoperable, is acceptable because of:

- [ a. The potential for decreased safety when requiring a change in plant conditions (i.e., requiring a shutdown) while not allowing stable operations to continue,

Distribution Systems - Operating  
B 3.8.9

## BASES

## ACTIONS (continued)

- b. The potential for decreased safety when requiring entry into numerous applicable Conditions and Required Actions for components without adequate vital AC power, while not providing sufficient time for the operators to perform the necessary evaluations and actions to restore power to the affected division, and
- c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time takes into account the importance to safety of restoring the AC vital bus to OPERABLE status, the redundant capability afforded by the other OPERABLE vital buses, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action B.1 establishes a limit on the maximum time allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an AC bus is inoperable and subsequently returned OPERABLE, the LCO may already have been not met for up to 8 hours. This situation could lead to a total duration of 10 hours, since initial failure of the LCO, to restore the vital bus distribution system. At this time an AC division could again become inoperable, and vital bus distribution could be restored OPERABLE. This could continue indefinitely. ]

This Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This allowance results in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time that Condition B was entered. The 16 hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely. ]

C.1 ← and C.2

With one or more station service DC bus or distribution panel inoperable, and a loss of function has not yet occurred, the remaining DC electrical power distribution subsystem is capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining DC electrical power distribution subsystem could result in the minimum required ESF functions not being supported. Therefore, the required DC buses and distribution panels must be restored to OPERABLE status within 2 hours by powering the bus from the associated battery or charger.

Insert 6

Distribution Systems - Operating  
3.8.9

## 3.8 ELECTRICAL POWER SYSTEMS

## 3.8.9 Distribution Systems - Operating

LCO 3.8.9 [Division 1], [Division 2], and [Division 3] AC, DC, [and AC vital bus] electrical power distribution subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

## ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more [Division 1 and 2] AC electrical power distribution subsystems inoperable.</p> <p><i>Insert 1</i></p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," for DC divisions made inoperable by inoperable power distribution subsystems.</p> <p>A.1 Restore [Division 1 and 2] AC electrical power distribution subsystem(s) to OPERABLE status.</p>	<p>8 hours <u>AND</u> 16 hours from discovery of failure to meet LCO</p>
<p>B. [ One or more [Division 1 and 2] AC vital buses inoperable.</p> <p><i>Insert 2</i></p>	<p>B.1 Restore [Division 1 and 2] AC vital bus distribution subsystem(s) to OPERABLE status.</p>	<p>2 hours <u>AND</u> 16 hours from discovery of failure to meet LCO ]</p>

Distribution Systems - Operating  
3.8.9

## ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more [Division 1 and 2] DC electrical power distribution subsystems inoperable.  	C.1 Restore [Division 1 and 2] DC electrical power distribution subsystem(s) to OPERABLE status.	2 hours  <u>AND</u>  16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3.  <u>AND</u>  D.2 Be in MODE 4.	12 hours    36 hours
E. One or more [Division 3] AC, DC, or AC vital bus electrical power distribution subsystems inoperable.	E.1 Declare High Pressure Core Spray System [and 2C Standby Service Water System] Inoperable.	Immediately
F. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	F.1 Enter LCO 3.0.3.	Immediately

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.9.1 Verify correct breaker alignments and voltage to [required] AC, DC, [and AC vital bus] electrical power distribution subsystems.	7 days

Distribution Systems - Operating  
B 3.8.9

## BASES

## LCO (continued)

In addition, tie breakers between redundant safety related AC, DC, and AC vital bus power distribution subsystems, if they exist, must be open. This prevents any electrical malfunction in any power distribution subsystem from propagating to the redundant subsystem, which could cause the failure of a redundant subsystem and a loss of essential safety function(s). If any tie breakers are closed, the affected redundant electrical power distribution subsystems are considered inoperable. This applies to the onsite, safety related, redundant electrical power distribution subsystems. It does not, however, preclude redundant Class 1E 4.16 kV buses from being powered from the same offsite circuit.

## APPLICABILITY

The electrical power distribution subsystems are required to be OPERABLE in MODES 1, 2, and 3 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.

Electrical power distribution subsystem requirements for MODES 4 and 5 are covered in the Bases for LCO 3.8.10, "Distribution Systems - Shutdown."

## ACTIONS

A.1 ← and A.2

With one or more Division 1 and 2 required AC buses, load centers, motor control centers, or distribution panels (except AC vital buses), in one division inoperable and a loss of function has not occurred, the remaining AC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses, load centers, motor control centers, and distribution panels must be restored to OPERABLE status within 8 hours.

Insert 4 →

## BASES

## ACTIONS (continued)

distribution system can result in loss of charging power to batteries and eventual loss of DC power. This Note ensures that the appropriate attention is given to restoring charging power to batteries, if necessary, after loss of distribution systems.

[B.1 ← and B.2]

With one or more Division 1 and 2 AC vital buses inoperable, and a loss of function has not yet occurred, the remaining OPERABLE AC vital buses are capable of supporting the minimum safety functions necessary to shut down and maintain the unit in the safe shutdown condition. Overall reliability is reduced, however, because an additional single failure could result in the minimum required ESF functions not being supported. Therefore, the required AC vital bus must be restored to OPERABLE status within 2 hours by powering the bus from the associated [inverter via inverted DC, inverter using internal AC source, or Class 1E constant voltage transformer].

Insert 5 →

Condition B represents one or more AC vital buses without power; potentially both the DC source and the associated AC source nonfunctioning. In this situation, the plant is significantly more vulnerable to a complete loss of all noninterruptible power. It is, therefore, imperative that the operator's attention focus on stabilizing the plant, minimizing the potential for loss of power to the remaining vital buses, and restoring power to the affected vital bus.

This 2 hour limit is more conservative than Completion Times allowed for the majority of components that are without adequate vital AC power. Taking exception to LCO 3.0.2 for components without adequate AC vital power, that would have Required Action Completion Times shorter than 2 hours if declared inoperable, is acceptable because of:

- a. The potential for decreased safety when requiring a change in plant conditions (i.e., requiring a shutdown) while not allowing stable operations to continue,
- b. The potential for decreased safety when requiring entry into numerous applicable Conditions and Required Actions for components without adequate vital AC power, while not providing sufficient time for the operators to perform the necessary evaluations and actions to restore power to the affected division, and

## BASES

## ACTIONS (continued)

- c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time takes into account the importance to safety of restoring the AC vital bus to OPERABLE status, the redundant capability afforded by the other OPERABLE vital buses, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action B.1 establishes a limit on the maximum time allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an AC bus is inoperable and subsequently returned OPERABLE, the LCO may already have been not met for up to 8 hours. This situation could lead to a total duration of 10 hours, since initial failure of the LCO, for restoring the vital bus distribution system. At this time, an AC division could again become inoperable, and vital bus distribution could be restored to OPERABLE. This could continue indefinitely.

This Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This allowance results in establishing the "time zero" at the time the LCO was initially not met, instead of at the time that Condition B was entered. The 16 hour Completion Time is an acceptable limitation on this potential of failing to meet the LCO indefinitely. ]

C.1 ← and C.2

With one or more Division 1 and 2 DC buses or distribution panels in one [division] inoperable, and a loss of function has not yet occurred, the remaining DC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining DC electrical power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required DC buses and distribution panels must be restored to OPERABLE status within 2 hours by powering the bus from the associated battery or charger.

Insert 6 →

INSERT 1

	<u>OR</u> A.2 Declare associated supported required feature(s) inoperable.	8 hours <u>AND</u> 16 hours from discovery of failure to meet the LCO
--	---	---

INSERT 2

	<u>OR</u> B.2 Declare associated supported required feature(s) inoperable.	2 hours <u>AND</u> 16 hours from discovery of failure to meet the LCO
--	---	---

INSERT 3

	<u>OR</u> C.2 Declare associated supported required feature(s) inoperable.	2 hours <u>AND</u> 16 hours from discovery of failure to meet the LCO
--	---	---

INSERT 4

Alternatively, all required features supported by the inoperable subsystem(s) may be declared inoperable. By allowing the option to declare the required features associated with an inoperable distribution subsystem inoperable, appropriate restrictions are implemented in accordance with the affected feature's LCO and ACTIONS. If more than one required feature is made inoperable by the inoperable electrical distribution subsystem, a plant risk assessment should be performed prior to selecting Required Action A.2. Provided the effect on plant risk is acceptable, the ACTIONS for the supported inoperable required feature may be followed instead of Required Action A.1.

INSERT 5

Alternatively, all required features supported by the inoperable bus may be declared inoperable. By allowing the option to declare the required features associated with an inoperable bus inoperable, appropriate restrictions are implemented in accordance with the affected feature's LCO and ACTIONS. If more than one required feature is made inoperable by the inoperable bus, a plant risk assessment should be performed prior to selecting Required Action B.2. Provided the effect on plant risk is acceptable, the ACTIONS for the supported inoperable required feature may be followed instead of Required Action B.1.

INSERT 6

Alternatively, all required features supported by the inoperable subsystem(s) may be declared inoperable. By allowing the option to declare the required features associated with an inoperable distribution subsystem inoperable, appropriate restrictions are implemented in accordance with the affected feature's LCO and ACTIONS. If more than one required feature is made inoperable by the inoperable electrical distribution subsystem, a plant risk assessment should be performed prior to selecting Required Action C.2. Provided the effect on plant risk is acceptable, the ACTIONS for the supported inoperable required feature may be followed instead of Required Action C.1.