

Compliance and Safety Concerns with Required Actions 3.8.1.B.3.1 and B.3.2

B. One [required] DG inoperable	B.1	Perform SR 3.8.1.1 for the [required] offsite circuit(s).	1 hour
			<u>AND</u>
			Once per 8 hours thereafter
	<u>AND</u>		
	B.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)
	<u>AND</u>		
	B.3.1	Determine OPERABLE DG(s) is not inoperable due to common cause failure.	[24] hours
		<u>OR</u>	
	B.3.2	Perform SR 3.8.1.2 for OPERABLE DG(s).	[24] hours
	<u>AND</u>		
	B.4	Restore [required] DG to OPERABLE status	72 hours

History

- Since the mid-1970's, the NRC Standard Technical Specifications have required that an Operable DG be started when the redundant DG is inoperable.
- GL 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability" included a TS requirement to start the opposite train DG within 24 hours.
 - The intent was ensure that no common cause failure exists.
 - 24 hours was identified as a reasonable amount of time to confirm that the Operable DG was not affected by the same problem as the inoperable DG.

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History

- GL 94-05 (based on NUREG-1366, "Improvements to Technical Specification Surveillance Requirements,") recommended the following TS Action when a DG is inoperable:
 - If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirements 4.8.1.1.2.a.5 and 4.8.1.1.2.a.6 within 8 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.

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History

- Revision 0 of the ISTS, Condition B, contained a Note stating that the common cause determination must be completed even if the EDG was restored to Operable status, provided a 24 hour vice 8 hour Completion Time, and did not include the exceptions in GL 94-05.

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History

- In Revision 1 of the ISTS, the Note was moved to the Bases because common-cause evaluations are required by 10 CFR 50, Appendix B, Criterion XVI for all significant safety related deficiencies (such as an inoperable DG) and once the DG is restored, it's not needed to detect a loss of function.

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Concern

- The existing Required Actions create a challenge to plant safety because successful performance of the common cause failure determination requires information that may be unavailable within the Completion Time or requires more frequent starting of the DGs.

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Concern

- Required Action B.3.1 requires determination that the Operable DG is not inoperable due to a common cause failure within 24 hours.
- The licensee may not know the cause of the DG inoperability within 24 hours and must assume the most likely cause.
- If the assumed cause of the inoperability was incorrect and the 24 hour Completion Time has expired, the licensee must enter Condition G (Required Action and associated Completion Time not met), which requires a plant shutdown.

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Concern

- The shutdown (a plant transient) is required even when the Completion Time for restoring the inoperable DG has not expired and the redundant DG is Operable (i.e., there is no common cause failure).
- Alternatively, the opposite DG can be started. This has the potential to reduce the reliability of the Operable DG due to excessive starts of the DG.

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Example

- DG 11 fails during a required run.
- Preliminary indications of the cause of failure are used to perform a common cause evaluation within the required 24 hour CT.
- 30 hours into the 72 hour CT, it's determined the assumed cause of the failure was incorrect.
- Condition G is entered (be in Mode 3 in 6 hours) for failure to perform the Required Action within the associated Completion Time.

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Considerations

- A common cause failure or inoperable redundant DG is an extremely rare condition
 - A review of Licensee Event Reports 2005 - 2010 was performed to identify common cause failures of two or more trains of DGs.
 - There were no instances in which the Operable DG was found to be inoperable due to a common cause failure.
 - There was only one instance in which the redundant DG was found to be inoperable by Required Action B.3.2. In this instance, there was no common cause failure and would have been revealed during the next SR performance.
 - A survey of licensees identified that plants enter Condition B an average of 27 times per year per unit. Over a five year period for 104 units, the Condition B would have been entered 14,000 times with only one failure identified.

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Considerations

- The TS Common Cause Evaluation is Redundant to the Regulations
 - 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," states: "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition."

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Considerations

- This requirement is acknowledged in the existing TS Bases for Required Actions B.3.1 and B.3.2, which state:
 - "In the event the inoperable DG is restored to OPERABLE status prior to completing either B.3.1 or B.3.2, the [plant corrective action program] will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B."

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Considerations

- Current industry and NRC expectations for common cause evaluations make it very difficult to perform and approve an evaluation in 24 hours, even if the cause of the inoperability is definitely known.

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Considerations

- The Current Requirement Can Result in Increased DG Testing
 - Some licensees have already modified their practices to always start the redundant DG because of the difficulties in performing an adequate common cause failure determination within the allowed time.
 - This may be adverse to safety. As stated in NUREG-1366, "Studies show that [DG] testing too frequently is counterproductive to safety in terms of equipment availability."
 - Simply running the other DG does not prove that there is no common cause failure mechanism or that the DG will be available at the next demand.

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Considerations

- The Condition B requirement to perform a common cause evaluation or start the redundant component is unique in the TS.

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Resolution

- The TSTF would like to work with the NRC to address these concerns.
- These topics have been discussed by the industry for several years and two options were identified.

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Potential Actions to Address the Concerns

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Potential Actions to Address the Concerns

1. Modify the Common Cause Completion Time and include the GL 94-05 exclusions
2. Utilize the 10 CFR 50, Appendix B, requirement for common cause evaluation instead of a TS requirement

Modify the Common Cause Completion Time and include the GL 94-05 exclusions

B.3.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.

Within [24] hours of identification of a potential common cause failure mechanism

OR

B.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s).

Within [24] hours of identification of a potential common cause failure mechanism

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Modify the Common Cause Completion Time and include the GL 94-05 exclusions

- Modify the Bases to state that an inoperable support system, a failure of an independently testable component, or preplanned preventive maintenance or testing are not potential common cause failure mechanisms.
- Advantages:
 - Eliminates plant shutdown due to identification of new failure mechanism after the 24 hour CT expires
 - Eliminates unnecessary evaluations
- Disadvantages
 - 24 hours is still a limited time to perform an evaluation

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Utilize the 10 CFR 50, Appendix B, Requirement for Common Cause Evaluation Instead of a TS Requirement

- Eliminate Required Actions B.3.1 and B.3.2
- Perform Common Cause evaluation under QA Program & Operability Determination Process (ODP)
- The Part 9900 Guidance on ODP states:
 - "Upon discovery of a support system that is not capable of performing its related support function(s), the most important consideration is the possibility of having lost all capability to perform a specified safety function. ... The licensee must verify that the facility has not lost the complete capability to perform the specified safety function. "
- Allows re-evaluation of common cause as new information is discovered.

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Utilize the 10 CFR 50, Appendix B, Requirement for Common Cause Evaluation Instead of a TS Requirement

- Advantages:
 - Eliminates plant shutdown due to identification of new failure mechanism after the 24 hour CT expires
 - Eliminates TS Actions that have been shown to not provide a significant safety benefit
 - Improves consistency with other TS requirements
 - Eliminates requirements duplicative of regulations
 - Consistent with risk-informed approaches
- Disadvantages
 - Timing of evaluation controlled by the QA Program

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Discussion

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