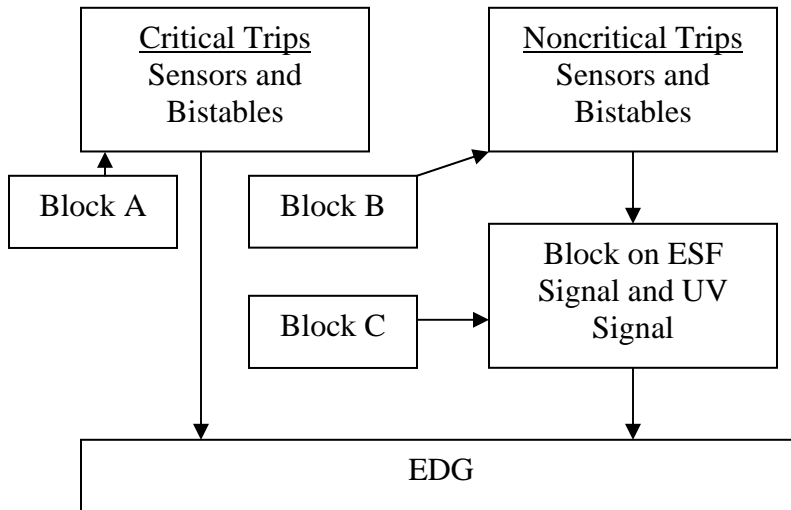


TSTF-400-A, Rev. 1, "Clarify SR on Bypass of DG Automatic Trips"

Background

Emergency Diesel Generators (EDGs) contain trips to protect the EDG from damage. Some of these trips are for critical conditions that will always trip the EDG, such as engine overspeed. Other trips are anticipatory or noncritical and do not represent immediately threatening conditions, such as high jacket water temperature.

When the EDG is started due to an ESF signal and a loss of voltage on the emergency bus, the noncritical trips are bypassed. In this situation, plant risk is lowered by allowing the EDG to operate with an abnormal, but acceptable condition. However, the critical trips will always stop the EDG. Illustrating:



Prior to TSTF-400-A, SR 3.8.1.13 stated:

Verify each DG's automatic trips are bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with an actuation or simulated ECCS initiation signal] except:

- a. Engine overspeed; [and]
- b. Generator differential current [;
- c. Low lub oil pressure;
- d. High crankcase pressure; and
- e. Start failure relay.]

The listed trips, items a through e, represent the critical trips. Therefore, most licensees interpreted SR 3.8.1.13 to require testing the noncritical trip bypass (i.e., Block C). This was supported by the Bases, which stated "This Surveillance demonstrates that DG noncritical protection functions (e.g., high jacket water temperature) are bypassed". This is consistent with Regulatory Guide 1.9, Revision 3, Regulatory Position C.1.8, which requires verification that the noncritical trips are bypassed and does not require verification that the critical trips are not bypassed. The Regulatory Guide makes clear that the purpose of the test is to test the bypasses (i.e., Block C), not the trips themselves.

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The original wording of SR 3.8.1.13 was confusing, because the test verified the non-critical trips were bypassed, but the text of the SR listed the critical trips. This resulted in some licensees believing that two tests were required: one to verify the non-critical trips were bypasses and another to verify that the critical trips were not bypassed.

TSTF-400, Revision 0, was submitted to the NRC on 5/24/2001. Revision 0 simply revised the Bases to clarify the intent of the SR. The NRC agreed with the intent of the change (to the extent of incorporating the Bases change in Revision 3 of the ISTS NUREGs), but subsequently requested that we revise the SR to make the intent perfectly clear. The TSTF submitted TSTF-400, Revision 1, on 11/24/2003 and the NRC issued a Safety Evaluation on November 13, 2004. The Safety Evaluation stated that the change was editorial and did not change the requirements in the STS.

TSTF-400 has been approved by the NRC for adoption in plant specific amendments. For example, TSTF-400 was approved for Grand Gulf on February 1, 2006 (Amendment 169), and D. C. Cook on June 1, 2005 (Amendments 287/269). However, other plants simply made the Bases change described in TSTF-400, Revision 0, under the Technical Specification Bases Control Program.

Problem Statement

On November 7, 2006, the NRC TS Branch informed the TSTF that the NRC Electrical Branch is planning to reject a plant-specific amendment to adopt TSTF-400-A, Revision 1. The NRC provided the following information by e-mail:

The staff position with regards to TSTF-400 is that:

The bypass logic circuits for non-critical trip signals should be tested to verify DG operability. For critical trip signals, the staff believes that the test should include the sensors, if applicable (differential current, engine overspeed, low lube oil pressure, high crankcase pressure, etc.) and the associated trip logic circuits. In-situ testing is preferable. Bench testing would be acceptable only if these sensors can not be tested in place.

Bases:

- 1) The bypass logic circuits for the DG non-critical trip signals should be tested to minimize the risk of a spurious DG trip during a LOOP/LOCA event.
- 2) Critical trip signals should be tested periodically to preclude damage to the EDG if an electrical fault were to occur during a LOOP/LOCA event or whenever the EDG is synchronized with the grid. This defense-in-depth approach would increase DG availability and minimize the consequences due to design bases accidents.

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Analysis

The first statement, "The bypass logic circuits for non-critical trip signals should be tested to verify DG operability," is consistent with TSTF-400-A and Regulatory 1.9.

The second statement, "For critical trip signals, the staff believes that the test should include the sensors, if applicable (differential current, engine overspeed, low lube oil pressure, high crankcase pressure, etc.) and the associated trip logic circuits." This statement is inconsistent with TSTF-400-A, Regulatory Guide 1.9, and the original wording of SR 3.8.1.13. The Staff's position is inconsistent with the STS, before and after TSTF-400, their previous approvals, Regulatory Guide 1.9, and is a backfit of new requirements, as described below:

1. Before TSTF-400, SR 3.8.1.13 stated, "Verify each DG's automatic trips are bypassed ...except ...". Under the Staff's second statement, this wording should be interpreted to include testing the sensors and associated trip logic circuits for the critical trips. That would be a new requirement as the SR makes no mention of sensors or trip logic of the critical trips. The SR only requires testing bypasses.
2. The Staff's Safety Evaluation for TSTF-400-A, Revision 1, states that the purpose of SR 3.8.1.13 is to verify that the noncritical trips are bypassed. The Staff's second statement disagrees with this conclusion and expands the SR beyond the wording of the SR 3.8.1.13.
3. The latest version of Regulatory Guide 1.9, Revision 3 (1993), Section 2.2.12, states, "Protective Trip Bypass Test: Demonstrate that all automatic diesel generator trips (except engine overspeed, generator differential, and those retained with coincidental logic) are automatically bypassed on an SIAS." Regulatory Guide 1.9 does not require testing of the sensors and the associated trip logic circuits of the critical trips. The Staff's second statement imposes a new and different kind of testing than previously required.

In summary, the Staff's position represents a new regulatory position that, if implemented, would impose new plant requirements and testing. The Staff's position is not related to TSTF-400-A, in that the Staff's position would impose new testing not required by the Technical Specifications before or after adoption of TSTF-400-A. Therefore, the NRC should approve plant-specific amendments based on TSTF-400-A.

If the Staff believes that additional DG testing is justified, pursue the imposition of that testing in accordance with 10 CFR 50.109, the Backfit Rule.