Industry/TSTF Standard Technical Specification Change Traveler

Add upper limits to the voltage and time delay setpoints of the loss of voltage relays

Classification: 3) Improve Specifications

NUREGs Affected: ☐ 1430 ☑ 1431 ☐ 1432 ☐ 1433 ☐ 1434

Description:

The proposed change revises SR 3.3.5.3 and associated Bases to add an upper limit for the loss of voltage Allowable Value and the Degraded Voltage Allowable Value. Additionally, "Nominal" is added in front of Trip Setpoint in the SR and associated Bases.

Justification:

The NRC transmitted TSB-22 for TSTF review on 5/19/99. The description for the change states: Proposed change to Westinghouse Section 3.3.5, Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation and its associated Bases. The change consists of adding an upper limit to the Trip Setpoint and Allowable Value of the Loss of Voltage and Degraded Voltage instrumentation specified in Surveillance Requirement SR 3.3.5.3. The Westinghouse ISTS is the only ISTS that does not specify an upper limit for these values.

A review of the other Owner's Groups NUREG's identified that the other OG NUREG's only have an upper and lower limit for the Allowable Value and not the Trip Setpoint. As discussed in the TSB, surveillance requirement SR 3.3.5.3, currently requires that the Trip Setpoint and Allowable Value for the Loss of Voltage and Degraded Voltage instrumentation be greater than or equal to some specified value. Since their is no upper limit specified for the Allowable Value, it is possible (although plant procedures typically specify a calibration tolerance such that if the Trip Setpoint is found outside the specified tolerance range, it is required to be adjusted within the tolerance range such that an upper limit Allowable Value would not be exceeded) that the settings of this instrumentation could be left in a region that would cause separation from the offsite power system following the increased electrical loading associated with a DBA, even though the offsite system voltage is adequate power the safety loads. The proposed change will provide consistency between the OGs NUREGs.

"Trip Setpoint" is revised to "Nominal Trip Setpoint". The use of Nominal Trip Setpoint in the TSs is related to (1) the setting of the actual trip setpoint based on plant conditions and (2) the surveillance of the actual Trip Setpoint as to whether the channel is OPERABLE. The OPERABILITY of the instrumentation channel for the trip setpoint is determined by the relationship of the measured as-found trip setpoint to (1) the calibration tolerance band for the channel, and (2) the Allowable Value for the trip setpoint. If the as-found trip setpoint is within the calibration tolerance band then the instrumentation channel is OPERABLE and the trip setpoint is left as-found. If the as-found trip setpoint is outside the calibration tolerance band, but within the Allowable Value, the instrumentation channel is still OPERABLE, but the channel is readjusted to have the trip setpoint within the calibration tolerance band. If the as-found trip setpoint is outside the Allowable Value, the instrumentation channel is declared inoperable and the appropriate actions for the LCO are entered. A Reviewer's Note is added to the Bases indicating that a TS format incorporating an Allowable Value only my be proposed by a licensee and that for this case, the Nominal Trip Setpoint value is located in the Bases or in a licensee controlled document outside the TS. These changes are consistent with TSTF-355 (TSB-20, Rev. 1) which has been approved by the NRC.

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Revision History

OG Revision 0 **Revision Status: Active** **Next Action: NRC**

Revision Proposed by: NRC

5/26/00

OG Revision 0 **Revision Status: Active** **Next Action: NRC**

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 06-Oct-99

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 26-May-00

TSTF Review Information

TSTF Received Date: 26-May-00 Date Distributed for Review 26-May-00

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:
TSTF reviewed by e-mail.

TSTF Resolution: Approved Date: 26-May-00

NRC Review Information

NRC Received Date: 26-May-00

NRC Comments:
(No Comments)

Final Resolution: NRC Action Pending Final Resolution Date:

Incorporation Into the NUREGs

File to BBS/LAN Date: TSTF Informed Date: TSTF Approved Date:

NUREG Rev Incorporated:

Affected Technical Specifications

Bkgnd 3.3.5 Bases	LOP DG Start Instrumentation
LCO 3.3.5 Bases	LOP DG Start Instrumentation
Action 3.3.5 Bases	LOP DG Start Instrumentation
SR 3.3.5.3	LOP DG Start Instrumentation
SR 3.3.5.3 Bases	LOP DG Start Instrumentation
Ref. 3.3.5.3 Bases	LOP DG Start Instrumentation

INSERT 1:

[REVIEWERs NOTE: Alternatively, a TS format incorporating an Allowable Value only may be proposed by a licensee. In this case the Nominal Trip Setpoint value is located in the TS Bases or in a licensee controlled document outside the TS. Changes to the trip setpoint value would be controlled by 10 CFR 50.59 or administratively as appropriate, and adjusted per the setpoint methodology and applicable surveillance requirements. At their option, the licensee may include the trip setpoint in the surveillance requirement as shown, or suggested by the licensee's setpoint methodology.]

INSERT 2:

A channel is OPERABLE with a trip setpoint value outside its calibration tolerance band provided the trip setpoint "as-found" value does not exceed its associated Allowable Value and provided the trip setpoint "as-left" value is adjusted to a value within the "as-left" calibration tolerance band of the Nominal Trip Setpoint. A trip setpoint may be set more conservative than the Nominal Trip Setpoint as necessary in response to plant conditions.

INSERT 3

The Allowable Value in conjunction with the trip setpoint and LCO establishes the threshold for Engineered Safety Features Actuation System (ESFAS) action to prevent exceeding acceptable limits such that the consequences of Design Basis Accidents (DBAs) will be acceptable. The Allowable Value is considered a limiting value such that a channel is OPERABLE if the setpoint is found not to exceed the Allowable Value during the CHANNEL CALIBRATION. Note that, although a channel is OPERABLE under these circumstances, the setpoint must be left adjusted to within the established calibration tolerance band of the setpoint in accordance with uncertainty assumptions stated in the referenced setpoint methodology, (as-left-criteria) and confirmed to be operating within the statistical allowances of the uncertainty terms assigned.

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.5.3	Perform CHANNEL CALIBRATION with [~~setpoint~~ nominal ~~Allowable Value~~] [Trip Setpoint and Allowable Value] as follows:	[18] months
	a. Loss of voltage Allowable Value ≥ [2912] V and ≤ [ ] V with a time delay of [0.8] ± [ ] second. Loss of voltage Trip Setpoint nominal [2975] V with a time delay of [0.8] ± [ ] second.	
	b. Degraded voltage Allowable Value ≥ [3683] V and ≤ [ ] V with a time delay of [20] ± [ ] seconds. Degraded voltage Trip Setpoint nominal [3746] V with a time delay of [20] ± [ ] seconds.	

B 3.3 INSTRUMENTATION

B 3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

BASES

BACKGROUND

The DGs provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation. Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the switchyard. There are two LOP start signals, one for each 4.16 kV vital bus.

Three undervoltage relays with inverse time characteristics are provided on each 4160 Class 1E instrument bus for detecting a sustained degraded voltage condition or a loss of bus voltage. The relays are combined in a two-out-of-three logic to generate an LOP signal if the voltage is below 75% for a short time or below 90% for a long time. The LOP start actuation is described in FSAR, Section 8.3 (Ref. 1).

Insert 3

and LOP DG Start Instrumentation Setpoints

~~Trip Setpoints and~~ Allowable Values

The Trip Setpoints used in the relays are based on the analytical limits presented in FSAR, Chapter 15 (Ref. 2). The selection of these ~~Trip~~ Setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account.

~~The actual nominal Trip Setpoint entered into the relays is normally still more conservative than that required by the Allowable Value. If the measured setpoint does not exceed the Allowable Value, the relay is considered OPERABLE.~~

Consistent with the requirements of

Setpoints adjusted ~~in accordance with~~ the Allowable Value ensure that the consequences of accidents will be acceptable, providing the unit is operated from within the LCOs at the onset of the accident and that the equipment functions as designed.

nominal

SR 3.3.5.3

Allowable Values and/or Trip Setpoints are specified for each Function in ~~the LCO~~. Nominal Trip Setpoints are also specified in the unit specific setpoint calculations. The ~~nominal~~ trip setpoints are selected to ensure that the setpoint measured by the surveillance procedure does not exceed the

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BASES

and LOP DG Start Instrumentation Setpoints

BACKGROUND Trip Setpoints and Allowable Values (continued)

Allowable Value if the relay is performing as required. If the measured setpoint does not exceed the Allowable Value, the relay is considered OPERABLE. Operation with a Trip Setpoint less conservative than the nominal Trip Setpoint, but within the Allowable Value, is acceptable provided that operation and testing is consistent with the assumptions of the unit specific setpoint calculation. Each Allowable Value and/or Trip Setpoint specified is more conservative than the analytical limit assumed in the transient and accident analyses in order to account for instrument uncertainties appropriate to the trip function. These uncertainties are defined in the "Unit Specific RTS/ESFAS Setpoint Methodology Study" (Ref. 3).

Ref. 3

APPLICABLE SAFETY ANALYSES

The LOP DG start instrumentation is required for the Engineered Safety Features (ESF) Systems to function in any accident with a loss of offsite power. Its design basis is that of the ESF Actuation System (ESFAS).

Accident analyses credit the loading of the DG based on the loss of offsite power during a loss of coolant accident (LOCA). The actual DG start has historically been associated with the ESFAS actuation. The DG loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. The analyses assume a non-mechanistic DG loading, which does not explicitly account for each individual component of loss of power detection and subsequent actions.

The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents discussed in Reference 2, in which a loss of offsite power is assumed.

The delay times assumed in the safety analysis for the ESF equipment include the 10 second DG start delay, and the appropriate sequencing delay, if applicable. The response times for ESFAS actuated equipment in LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," include the appropriate DG loading and sequencing delay.

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APPLICABLE SAFETY ANALYSES (continued)

The LOP DG start instrumentation channels satisfy Criterion 3 of the NRC Policy Statement.

LCO

The LCO for LOP DG start instrumentation requires that [three] channels per bus of both the loss of voltage and degraded voltage Functions shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOP DG start instrumentation supports safety systems associated with the ESFAS. In MODES 5 and 6, the [three] channels must be OPERABLE whenever the associated DG is required to be OPERABLE to ensure that the automatic start of the DG is available when needed. Loss of the LOP DG Start Instrumentation Function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only one turbine driven pump, as well as an increased potential for a loss of decay heat removal through the secondary system.

Insert 2

APPLICABILITY

The LOP DG Start Instrumentation Functions are required in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. Actuation in MODE 5 or 6 is required whenever the required DG must be OPERABLE so that it can perform its function on an LOP or degraded power to the vital bus.

ACTIONS

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the channel is found inoperable, then the function that channel provides must be declared inoperable and the LCO Condition entered for the particular protection function affected.

Because the required channels are specified on a per bus basis, the Condition may be entered separately for each bus as appropriate.

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.2

SR 3.3.5.2 is the performance of a TADOT. This test is performed every [31 days]. The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. For these tests, the relay trip setpoints are verified and adjusted as necessary. The Frequency is based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

SR 3.3.5.3

SR 3.3.5.3 is the performance of a CHANNEL CALIBRATION.

The setpoints, as well as the response to a loss of voltage and a degraded voltage test, shall include a single point verification that the trip occurs within the required time delay, as shown in Reference 1.

A CHANNEL CALIBRATION is performed every [18] months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Frequency of [18] months is based on operating experience and consistency with the typical industry refueling cycle and is justified by the assumption of an [18] month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. FSAR, Section [8.3].
2. FSAR, Chapter [15].
3. Plant Unit Specific RTS/ESFAS Setpoint Methodology Study.