



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-19-097

October 23, 2019

10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Units 1 and 2
Facility Operating License Nos. NPF-90 and NPF-96
NRC Docket Nos. 50-390 and 50-391

Subject: **Watts Bar Nuclear Plant, Units 1 and 2, Non-Voluntary License Amendment Request to Correct Unbalanced Voltage Relay Instrumentation Values (TS-19-22)**

- Reference:
1. TVA letter to NRC, CNL-17-034, "Application to Modify Technical Specification for Browns Ferry Nuclear Plant (TS-512), Sequoyah Nuclear Plant (TS-17-03) and Watts Bar Nuclear Plant (TS-17-20) to resolve Open Phase Issue Identified in NRC Bulletin 2012-01, 'Design Vulnerability in Electrical Power System,' "dated November 17, 2017 (ML17324A349)
 2. TVA Letter to NRC, CNL-18-130, "Revised Application to Modify the Technical Specifications for the Browns Ferry Nuclear Plant (TS-512), Sequoyah Nuclear Plant (TS-17-03) and Watts Bar Nuclear Plant (TS-17-20) to Incorporate New Technical Specification for Unbalanced Voltage Relays," dated November 19, 2018 (ML18324A609)
 3. NRC Letter to TVA, "Browns Ferry Nuclear Plant, Units 1, 2, and 3; Sequoyah Nuclear Plant, Units 1 and 2; Watts Bar Nuclear Plant, Units 1 and 2 - Issuance of Amendment Nos. 309, 332, 292, 345, 339, 128, and 31 Regarding Unbalanced Voltage Protection (EPID L-2017-LLA-0391)," dated August 27, 2019 (ML18277A110)

In References 1 and 2, Tennessee Valley Authority (TVA) submitted a fleet-wide license amendment request (LAR) to change the Technical Specifications (TS) for the TVA fleet to propose adding a new level of protection, "Unbalanced Voltage," to the TS for the loss of power (LOP) instrumentation for the Browns Ferry Nuclear Plant (BFN), Sequoyah Nuclear Plant (SQN), and Watts Bar Nuclear Plant (WBN). In Reference 3, the Nuclear Regulatory Commission (NRC) approved the LAR for BFN (Amendment Nos. 309, 332, and 292), SQN (Amendment Nos. 345 and 339), and WBN (Amendment Nos. 128 and 31). The license amendments are required to be implemented no later than December 25, 2019.

After the issuance of Reference 3, TVA identified the following three incorrect instrument values in WBN Units 1 and 2 TS Table 3.3.5-1, "LOP DG Start Instrumentation," Function 5, "6.9 kV Emergency Bus Undervoltage (Unbalanced Voltage)."

- The Allowable Value (AV) for the unbalanced voltage relay (UVR) low trip voltage
- The AV for the UVR high trip time delay
- The Trip Setpoint for the UVR high trip time delay

The above errors were attributable to transcription errors in References 1 and 2. The correct instrument values were reflected in the TVA UVR setpoint calculation that was in effect when References 1 and 2 were submitted to the NRC. This issue has been entered into the TVA Corrective Action Program.

The UVR low trip voltage AV, as approved by the NRC in Reference 3, exceeds the designated AV in the TVA setpoint calculation as well as the calculated analytical limit. Thus, it will provide an incorrect indicator of degraded channel performance. The UVR high trip time delay AV, as also approved by the NRC in Reference 3, exceeds the designated AV in the TVA setpoint calculation. Thus, it will also provide an incorrect indicator of degraded channel performance. The UVR high trip relay time delay Trip Setpoint, as also approved by the NRC, has inadequate margin to the analytical limit, and also exceeds the AV established by the TVA UVR setpoint calculation. Accordingly, calibrating that instrument function to the NRC-approved trip setpoint could result in immediate inoperability of that channel. In summary, implementation of WBN License Amendments 128/31 will result in the implementation of a non-conservative TS. In accordance with the guidance in NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety," this license amendment request (LAR) is required to resolve non-conservative TS and is not a voluntary request from a licensee to change its licensing basis. Therefore, this request is not subject to "forward fit" considerations as described in the letter from S. Burns (NRC) to E. Ginsberg (NEI), dated July 14, 2010 (ML101960180). Because WBN License Amendments 128/31 have not yet been implemented, the incorrect trip setpoint values pose no immediate operational or operability concern.

TVA is requesting NRC review of this non-voluntary LAR on an expedited basis with a requested approval date of December 13, 2019, with a proposed implementation date of December 25, 2019, which coincides with the implementation date of the Reference 3 license amendments.

The Enclosure provides a description and technical evaluation of the proposed changes, a regulatory evaluation, and a discussion of environmental considerations. Attachment 1 to the Enclosure provides the affected Amendment 128/31 WBN Unit 1 and Unit 2 TS pages, marked up to show the proposed changes. Attachment 2 to the Enclosure provides the revised (clean) respective WBN Unit 1 and Unit 2 TS pages. No TS Bases changes were required.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the TS change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). In accordance with 10 CFR 50.91, "Notice for Public Comment; State Consultation," a copy of this application, with the Enclosure is being provided to the designated Tennessee Official.

Please address any questions regarding this request to Kimberly D. Hulvey, Fleet Licensing Manager, at 423-751-3275. There are no new regulatory commitments contained in this submittal.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 23rd day of October 2019.

Respectfully,



James T. Polickoski
Director, Nuclear Regulatory Affairs

Enclosure:

Evaluation of Proposed Change

cc: (with Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Watts Bar Nuclear Plant
NRC Project Manager - Watts Bar Nuclear Plant
Division of Radiological Health - Tennessee Department of Environment and
Conservation

Enclosure

Evaluation of the Proposed Change

Subject: **Watts Bar Nuclear Plant, Units 1 and 2, Non-Voluntary License Amendment
Request to Correct Unbalanced Voltage Relay Instrumentation Values
(TS-19-22)**

Table of Contents

1.0	SUMMARY DESCRIPTION	2
2.0	DETAILED DESCRIPTION	2
2.1	Background	2
2.2	Description of the Proposed Change	2
2.3	Reason for the Proposed Change	3
3.0	TECHNICAL EVALUATION	4
3.1	Trip Setpoint	4
3.2	Allowable Values	4
4.0	REGULATORY EVALUATION.....	6
4.1	Precedent	6
4.2	Significant Hazards Consideration	6
5.0	ENVIRONMENTAL CONSIDERATION	8
6.0	REFERENCES.....	8

Attachment 1 – Proposed Technical Specification Changes (Unit 1 and 2 Markup)

Attachment 2 – Proposed Technical Specification Changes (Unit 1 and 2 Re-Typed)

1.0 SUMMARY DESCRIPTION

In accordance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.90, "Application for amendment of license, construction permit, or early site permit," Tennessee Valley Authority (TVA) is requesting a license amendment to the Watts Bar Nuclear Plant (WBN) Units 1 and 2 Technical Specifications (TS). This non-voluntary license amendment request (LAR) proposes to revise WBN Units 1 and 2 TS Table 3.3.5-1, "LOP DG Start Instrumentation," Function 5, "6.9 kV Emergency Bus Undervoltage (Unbalanced Voltage)," for the following instrument setpoint values.

- The Allowable Value (AV) for the unbalanced voltage relay (UVR) low trip voltage
- The AV for the UVR high trip time delay
- The Trip Setpoint for the UVR high trip time delay

2.0 DETAILED DESCRIPTION

2.1 BACKGROUND

In References 1 and 2, TVA submitted a fleet-wide LAR to change the TS for the TVA fleet to propose adding a new level of protection, "Unbalanced Voltage," to the TS for the loss of power (LOP) instrumentation for the Browns Ferry Nuclear Plant (BFN), Sequoyah Nuclear Plant (SQN), and WBN. In Reference 3, the Nuclear Regulatory Commission (NRC) approved the LAR for BFN (Amendment Nos. 309, 332, and 292), SQN (Amendment Nos. 345 and 339), and WBN (Amendment Nos. 128, and 31). The license amendments are required to be implemented no later than December 25, 2019.

Following the issuance of Reference 3, TVA identified the following three incorrect instrument values in WBN Units 1 and 2 TS Table 3.3.5-1, "LOP DG Start Instrumentation," Function 5, "6.9 kV Emergency Bus Undervoltage (Unbalanced Voltage)."

- The AV for the UVR low trip voltage
- The AV for the UVR high trip time delay
- The Trip Setpoint for the UVR high trip time delay

The above errors were attributable to transcription errors in References 1 and 2. The correct instrument values were reflected in the TVA UVR setpoint calculation that was in effect when References 1 and 2 were submitted to the NRC.

2.2 DESCRIPTION OF THE PROPOSED CHANGE

The changes described below are being made to Function 5 (6.9 kV Emergency Bus Undervoltage (Unbalanced Voltage)) of WBN Units 1 and 2 TS Table 3.3.5-1.

2.2.1 Trip Setpoint

The Trip Setpoint associated with the UVR high trip time delay function:

18.13 V at 3.95 sec (High)

is revised to read

18.13 V at **3.45** sec (High)

2.2.2 Allowable Values

The Allowable Value associated with the UVR low trip voltage function:

≤ 3.35 V at 10 sec (Lo)

is revised to read

\leq **3.3** V at 10 sec (Lo)

The Allowable Value associated with the UVR high trip time delay function:

≤ 20.0 V at 4 sec (High)

is revised to read

≤ 20.0 V at **3.50** sec (High)

2.3 REASON FOR THE PROPOSED CHANGE

The UVR low trip voltage AV, as approved by the NRC in Reference 3, exceeds the calculated AV in the TVA setpoint calculation as well as the calculated analytical limit. Thus, it will provide an incorrect indicator of degraded channel performance. The UVR high trip time delay AV, as also approved by the NRC in Reference 3, exceeds the calculated AV in the TVA setpoint calculation. Thus, it will also provide an incorrect indicator of degraded channel performance. The UVR high trip relay time delay Trip Setpoint, as also approved by the NRC, has inadequate margin to the analytical limit, and also exceeds the AV established by the TVA UVR setpoint calculation. Accordingly, calibrating that instrument function to the NRC-approved trip setpoint could result in immediate inoperability of that channel.

In summary, implementation of WBN License Amendments 128/31 will result in the implementation of a non-conservative TS. Accordingly, this LAR is being submitted as a non-voluntary LAR in accordance with the guidance in NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety." This issue has been entered into the TVA Corrective Action Program.

3.0 TECHNICAL EVALUATION

3.1 TRIP SETPOINT

The technical basis for the UVR Trip Setpoints was described in Section 3.4 of Enclosure 1 to Reference 2. The setpoint methodology utilized the square root sum of the squares (SRSS) methodology for combining uncertainty terms that are random and independent. SRSS is an established and accepted analytical technique, and ensures that the protective function will occur before the analytical limits are reached. Using the correctly transposed UVR High Trip time delay Trip Setpoint, as proposed for TS Table 3.3.5-1, will restore conformance with the WBN UVR setpoint calculation.

The UVR high voltage time delay Trip Setting was calculated as follows:

Setpoint \leq AL – A_{dbe} where AL is the analytical limit and A_{dbe} is the Total Loop Uncertainty

AL was calculated to be 4.0 seconds

A_{dbe} was calculated to be ± 0.1106 seconds

thus

Setpoint $\leq 4.0 - 0.1106$

Setpoint ≤ 3.88 seconds

Therefore, the proposed TS Trip Setpoint of 3.45 seconds provides an additional 0.43 seconds of margin.

3.2 ALLOWABLE VALUES

The AV is a value or values that the setpoint can have when tested periodically, beyond which the instrument channel shall be evaluated for operability. The AV ensures that sufficient allocation exists to account for instrument uncertainties that either are not present or are not measured during periodic testing (defined as unmeasurables). The AV is determined by calculating the instrument channel uncertainty without including the normal measurable uncertainties such as drift, calibration uncertainties, and uncertainties observed during normal operations. This resultant is defined as the unmeasurable uncertainties of the instrument channel. Using the correctly transposed UVR Low Trip voltage and High Trip time delay AV as proposed in TS Table 3.3.5-1 will restore conformance with the WBN UVR setpoint calculation.

The UVR Low Trip voltage AV was calculated as follows:

The maximum and minimum AV for an increasing setpoint (SP) is defined by the following:

AV (max) = AL – ($|A_{dbe}| - |A_{nf}|$) where A_{dbe} is the Total Loop Uncertainty and A_{nf} is the Normal Measurable Accuracy

AV (min) = SP + $|A_{nf}|$

Enclosure

AL was calculated as 3.329 volts

A_{dbe} was calculated to be ± 0.07541 volts

A_{nf} was calculated to be ± 0.06633 volts

SP was calculated to be 2.96 volts

$$AV (\text{max}) = 3.329 - (|0.07541| - |0.06633|)$$

$$= 3.319 \text{ volts}$$

$$AV (\text{min}) = 2.96 + |0.06633|$$

$$= 3.027 \text{ volts}$$

The selected AV must satisfy the following:

$$AV (\text{min}) \leq AV \leq AV (\text{max}), \text{ or}$$

$$3.027 \text{ volts} \leq AV \leq 3.319 \text{ volts}$$

The proposed UVR Low Trip voltage AV of 3.3 volts meets this criterion.

The UVR High Trip time delay AV was calculated as follows:

The maximum and minimum AV for an increasing SP is defined by the following:

$$AV (\text{max}) = AL - (|A_{dbe}| - |A_{nf}|)$$

$$AV (\text{min}) = SP + |A_{nf}|$$

AL was calculated as 4 seconds

A_{dbe} was calculated to be ± 0.1106 seconds

A_{nf} was calculated to be $+ 0.036946$ seconds, $- 0.041802$ seconds

SP was calculated to be 3.45 seconds

$$AV (\text{max}) = 4 - (|0.1106| - |0.03694|)$$

$$= 3.926 \text{ seconds}$$

$$AV (\text{min}) = 3.45 + |0.041802|$$

$$= 3.492 \text{ seconds}$$

The selected AV must satisfy the following:

$$AV (\text{min}) \leq AV \leq AV (\text{max}), \text{ or}$$

$$3.492 \text{ seconds} \leq AV \leq 3.926 \text{ seconds}$$

The proposed UVR High Trip time delay AV of 3.5 seconds meets this criterion.

3.3 Conclusion

TVA has concluded that the revised Trip Setpoint and Allowable Values are appropriate for this application.

4.0 REGULATORY EVALUATION

4.1 PRECEDENT

Reference 3 provides precedence for this application.

4.2 SIGNIFICANT HAZARDS CONSIDERATION

Tennessee Valley Authority (TVA) is requesting an amendment to Facility Operating Licenses NPF-90 and NPF-96 for Watts Bar Nuclear Plant (WBN), Units 1 and 2, respectively. The proposed amendment would modify Technical Specifications (TS) to correct three instrument values on TS Table 3.3.5-1. Specifically:

- 1) Revising the Function 5 Trip Setpoint associated with the unbalanced voltage relay (UVR) high trip time delay function from "18.13 V at 3.95 sec (High)" to "18.13 V at 3.45 sec (High)."
- 2) Revising the Function 5 Allowable Value associated with the UVR low trip voltage function from " ≤ 3.35 V at 10 sec (Lo)" to " ≤ 3.3 V at 10 sec (Lo)."
- 3) Revising the Function 5 Allowable Value associated with the UVR high trip time delay function from " ≤ 20.0 V at 4 sec (High)" to " ≤ 20.0 V at 3.50 sec (High)."

These changes are required due to transcription errors from the UVR setpoint calculation in the revised License Amendment Request that resulted in License Amendments 128/31 for WBN Unit 1 and 2, respectively.

TVA evaluated the proposed changes to the TS using the criteria in Section 50.92 to Title 10 of the *Code of Federal Regulations* and has determined that the proposed changes do not involve a significant hazards consideration. As required by 10 CFR 50.91(a), the TVA analysis of the issue of no significant hazards consideration is presented below:

1. *Does the proposed amendment involve a significant increase in the probability or consequence of an accident previously evaluated?*

Response: No.

The proposed changes correct the TS to reflect the UVR setpoint calculation. The Trip Setpoint and Allowable Value changes restore the UVR instrumentation function to its analyzed design, and so the probability of an accident previously evaluated is not affected. The changes to the Trip Setpoint will ensure that there is acceptable margin to the associated analytical limit, and the Allowable Values will provide proper indicators of degraded channel performance. Thus, the consequences of an accident with the incorporation of these changes will not be increased.

Enclosure

Based on the above, it is concluded that the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?*

Response: No.

The proposed changes correct the TS to reflect the UVR setpoint calculation. The proposed changes ensure the affected UVR channels are in conformance with the existing plant design, and will operate as credited in and as constrained by existing accident analyses.

Based on the above, it is concluded that the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

The proposed changes correct the TS to reflect the UVR setpoint calculation. The changes result in ensuring the Trip Setpoint has acceptable margin to the associated analytical limits, and that the Allowable Values will provide proper indicators of degraded channel performance. The safety analysis acceptance criteria are not affected by this change. The proposed changes will not result in plant operation in a configuration outside of the design basis.

Based on the above, it is concluded that the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, TVA concludes that the proposed amendment does not involve a 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.

Conclusions

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 issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment 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. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment 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 amendment.

6.0 REFERENCES

1. TVA letter to NRC, CNL-17-034, "Application to Modify Technical Specification for Browns Ferry Nuclear Plant (TS-512), Sequoyah Nuclear Plant (TS-17-03) and Watts Bar Nuclear Plant (TS-17-20) to resolve Open Phase Issue Identified in NRC Bulletin 2012-01, 'Design Vulnerability in Electrical Power System,' "dated November 17, 2017 (ML17324A349)
2. TVA Letter to NRC, CNL-18-130, "Revised Application to Modify the Technical Specifications for the Browns Ferry Nuclear Plant (TS-512), Sequoyah Nuclear Plant (TS-17-03) and Watts Bar Nuclear Plant (TS-17-20) to Incorporate New Technical Specification for Unbalanced Voltage Relays," dated November 19, 2018 (ML18324A609)
3. NRC Letter to TVA, "Browns Ferry Nuclear Plant, Units 1, 2, and 3; Sequoyah Nuclear Plant, Units 1 and 2; Watts Bar Nuclear Plant, Units 1 and 2 - Issuance of Amendment Nos. 309, 332, 292, 345, 339, 128, and 31 Regarding Unbalanced Voltage Protection (EPID L-2017-LLA-0391)," dated August 27, 2019 (ML18277A110)

Attachment 1 to CNL-19-097

Proposed Technical Specification Changes (Unit 1 and 2 Markup)
(2 total pages)

Table 3.3.5-1 (page 2 of 2)
LOP DG Start Instrumentation

FUNCTION	REQUIRED CHANNELS PER BUS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	ALLOWABLE VALUE
5. 6.9 kV Emergency Bus Undervoltage (Unbalanced Voltage)	3	SR 3.3.5.1 SR 3.3.5.2 SR 3.3.5.3	1.30 V at 2.95 sec (Permissive Alarm) 2.96 V at 9.95 sec (Lo) 18.13 V at 3.95 sec (High)	≤ 1.5 V at 3 sec (Permissive Alarm) ≤ 3.35 V at 10 sec (Lo) ≤ 20.0 V at 4 sec (High)

3.3

3.45

3.50

Table 3.3.5-1 (page 1 of 1)
LOP DG Start Instrumentation

FUNCTION		REQUIRED CHANNELS PER BUS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	ALLOWABLE VALUE
1.	6.9 kV Emergency Bus Undervoltage (Loss of Voltage)				
a.	Bus Undervoltage	3	SR 3.3.5.1 SR 3.3.5.2	≥ 5994 V and ≤ 6006 V	≥ 5967.6 V
b.	Time Delay	2	SR 3.3.5.3	≥ 0.73 sec and ≤ 0.77 sec	≥ 0.58 sec and ≤ 0.94 sec
2.	6.9 kV Emergency Bus Undervoltage (Degraded Voltage)				
a.	Bus Undervoltage	3	SR 3.3.5.1 SR 3.3.5.2	≥ 6593.4 V and ≤ 6606.6 V	≥ 6570 V
b.	Time Delay	2	SR 3.3.5.3	≥ 9.73 sec and ≤ 10.27 sec	≥ 9.42 sec and ≤ 10.49 sec
3.	Diesel Generator Start	2	SR 3.3.5.1 SR 3.3.5.2	≥ 4733.4 V and ≤ 4926.6 V with an internal time delay of ≥ 0.46 sec and ≤ 0.54 sec	≥ 2295.6 V with an internal time delay of 0.56 sec at zero volts
4.	Load Shed	4	SR 3.3.5.1 SR 3.3.5.2	≥ 4733.4 V and ≤ 4926.6 V with an internal time delay of ≥ 2.79 sec and ≤ 3.21 sec	≥ 2295.6 V with an internal time delay of ≤ 3.3 sec at zero volts.
5.	6.9 kV Emergency Bus Undervoltage (Unbalanced Voltage)	3	SR 3.3.5.1 SR 3.3.5.2 SR 3.3.5.3	1.30 V at 2.95 sec (Permissive Alarm) 2.96 V at 9.95 sec (Lo) 18.13 V at 3.95 sec (High)	≤ 1.5 V at 3 sec (Permissive Alarm) 3.35 V at 10 sec (Lo) ≤ 20.0 V at 4 sec (High)

3.3

3.45

3.50

Attachment 2 to CNL-19-097

**Proposed Technical Specification Pages (Unit 1 and 2 Re-Typed)
(2 total pages)**

Table 3.3.5-1 (page 2 of 2)
LOP DG Start Instrumentation

FUNCTION		REQUIRED CHANNELS PER BUS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	ALLOWABLE VALUE
5.	6.9 kV Emergency Bus Undervoltage (Unbalanced Voltage)	3	SR 3.3.5.1	1.30 V at 2.95 sec (Permissive Alarm)	≤ 1.5 V at 3 sec (Permissive Alarm)
			SR 3.3.5.2		
			SR 3.3.5.3	2.96 V at 9.95 sec (Lo)	≤ 3.3 V at 10 sec (Lo)
				18.13 V at 3.45 sec (High)	≤ 20.0 V at 3.50 sec (High)

Table 3.3.5-1 (page 1 of 1)
LOP DG Start Instrumentation

FUNCTION		REQUIRED CHANNELS PER BUS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	ALLOWABLE VALUE
1.	6.9 kV Emergency Bus Undervoltage (Loss of Voltage)				
a.	Bus Undervoltage	3	SR 3.3.5.1 SR 3.3.5.2	$\geq 5994 \text{ V}$ and $\leq 6006 \text{ V}$	$\geq 5967.6 \text{ V}$
b.	Time Delay	2	SR 3.3.5.3	$\geq 0.73 \text{ sec}$ and $\leq 0.77 \text{ sec}$	$\geq 0.58 \text{ sec}$ and $\leq 0.94 \text{ sec}$
2.	6.9 kV Emergency Bus Undervoltage (Degraded Voltage)				
a.	Bus Undervoltage	3	SR 3.3.5.1 SR 3.3.5.2	$\geq 6593.4 \text{ V}$ and $\leq 6606.6 \text{ V}$	$\geq 6570 \text{ V}$
b.	Time Delay	2	SR 3.3.5.3	$\geq 9.73 \text{ sec}$ and $\leq 10.27 \text{ sec}$	$\geq 9.42 \text{ sec}$ and $\leq 10.49 \text{ sec}$
3.	Diesel Generator Start	2	SR 3.3.5.1 SR 3.3.5.2	$\geq 4733.4 \text{ V}$ and $\leq 4926.6 \text{ V}$ with an internal time delay of $\geq 0.46 \text{ sec}$ and $\leq 0.54 \text{ sec}$	$\geq 2295.6 \text{ V}$ with an internal time delay of 0.56 sec at zero volts
4.	Load Shed	4	SR 3.3.5.1 SR 3.3.5.2	$\geq 4733.4 \text{ V}$ and $\leq 4926.6 \text{ V}$ with an internal time delay of $\geq 2.79 \text{ sec}$ and $\leq 3.21 \text{ sec}$	$\geq 2295.6 \text{ V}$ with an internal time delay of $\leq 3.3 \text{ sec}$ at zero volts.
5.	6.9 kV Emergency Bus Undervoltage (Unbalanced Voltage)	3	SR 3.3.5.1 SR 3.3.5.2 SR 3.3.5.3	1.30 V at 2.95 sec (Permissive Alarm) 2.96 V at 9.95 sec (Lo) 18.13 V at 3.45 sec (High)	$\leq 1.5 \text{ V}$ at 3 sec (Permissive Alarm) $\leq 3.3 \text{ V}$ at 10 sec (Lo) $\leq 20.0 \text{ V}$ at 3.50 sec (High)