Distribution:

1. Boyer, Robert P
2. Gardner, Troy R
3. Mc Ginnis, Vickie L
4. RESIDENT NRC INSPECT
5. SERV BLDG FILE ROOM -
6. U S NUC REG WASHINGTON, DC
7. USNRC —

Duke Energy
DOCUMENT TRANSMITTAL FORM

Facility: **MCGUIRE NUCLEAR STATION**

SUBJECT

Issue MNS-SLC-16.8.3, DG Supplemental Testing

Date: **3/15/2017**
Document Transmittal #: **TR-NUC-MC-005548**
Purpose: **Issue**

Released By:

Duke Energy
13225 Hagers Ferry Road
Document Management
MG02DM
Huntersville, NC 28078
MNSDCRM@duke-energy.com

Document ID	1	2	3	4	5	6	7
LICN - MC - MNS-SLC-16.8.3 - 001 - ISSUED	FYI|**E**	FYI|**E**	FYI|**E**	PRINT|**LP**	FYI|**E**	R&A|**E**	R&A|**E**

Remarks: **Rev. 159**

A001
NRR

16.8 ELECTRICAL POWER SYSTEMS

16.8.3 Diesel Generator (DG) Supplemental Testing Requirements

COMMITMENT The DG supplemental testing requirements specified below shall be met.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Commitment not met.	A.1 Declare DG inoperable.	Immediately

TESTING REQUIREMENTS

TEST	FREQUENCY
TR 16.8.3.1 Verify the electrolyte level of each DG battery is above the plates.	31 days
TR 16.8.3.2 Verify overall DG battery voltage is ≥ 125 volts under a float charge.	31 days
TR 16.8.3.3 Verify DG batteries and battery racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	18 months

(continued)

TESTING REQUIREMENTS (continued)

TEST		FREQUENCY
TR 16.8.3.4	Verify DG battery-to-battery and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material.	18 months
TR 16.8.3.5	Perform DG battery service test	18 months
TR 16.8.3.6	Remove accumulated water from DG day tank.	After each run of ≥1 hour
TR 16.8.3.7	Perform DG inspection, during shutdown, in accordance with manufacturer's recommendations for this class of standby service.	18 months
TR 16.8.3.8	Verify that the fuel oil transfer pump transfers fuel from each fuel storage tank to the day tank of each DG via the installed cross-connection lines.	18 months
TR 16.8.3.9	----------NOTE---------- This Testing Requirement may be performed in conjunction with periodic pre-planned preventative maintenance activity that causes the DG to be inoperable provided that performance of the Testing Requirement does not increase the time the DG would be inoperable for the maintenance activity alone. ---------- Verify, during shutdown, that the turning gear engaged or emergency stop features prevent DG starting only when required.	18 months
TR 16.8.3.10	Perform a pressure test of those portions of the diesel fuel oil system designed to ASME Section III, subsection ND in accordance with applicable NRC-approved ASME code requirements.	10 years
TR 16.8.3.11	For each fuel oil storage tank: a. Drain the fuel oil; b. Remove the sediment; and c. Clean the tank.	10 years
TR 16.8.3.12	Verify DG battery temperature is ≥45°F.	12 hours

BASES

The Testing Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides and Generic Letters referenced below.

TR 16.8.3.9 is modified with a note. This TR specifies that it is to be performed during shutdown. This note allows the TR to be performed during preplanned Preventative Maintenance (PM) activities that would result in the diesel generator being inoperable. This TR can be performed at that time as long as it does not increase the time the diesel generator is inoperable for the PM activity that is being performed. The note is only applicable at that time. The provision of the note shall not be utilized for operational convenience.

Since the McGuire emergency diesel generator manufacturer (Nordberg) is no longer in business, McGuire engineering is the designer of record. Therefore, in the absence of manufacturer recommendations, McGuire engineering will determine the appropriate actions required for nuclear class diesel service taking into account McGuire diesel generator maintenance and operating history and industry experience where applicable.

Draining of the DG fuel oil stored in the supply tanks, removal of accumulated sediment, and tank cleaning are required at 10 year intervals by Regulatory Guide 1.137 (Ref. 7), paragraph 2.f. To preclude the introduction of surfactants in the fuel oil system, the cleaning should be accomplished using sodium hypochlorite solutions, or their equivalent, rather than soap or detergents. This TR is for preventive maintenance. The presence of sediment does not necessarily represent a failure of this TR, provided that accumulated sediment is removed during performance of the Test.

The DG fuel oil storage tanks are currently deferred from the requirements of the Federal EPA regulations for underground storage tanks (USTs) on the basis that they are controlled through other programs and requirements. McGuire Environmental, Health and Safety group must be consulted regarding any changes to the testing requirements of these tanks to ensure Federal UST regulations are continued to be met.

Verification that the D/G Battery temperature is greater than or equal to 45°F will ensure sufficient battery capacity to perform its design function. This is based on the Diesel Generator Battery and Charger Sizing Calculation. Since a Battery Area Temperature indication is representative of the actual Diesel Generator Battery Temperature, use of this parameter is acceptable. However, if the temperature indication from this instrument is low (< 45°F) or the instrument is out of service, the actual D/G Battery Temperature must be determined. This may be accomplished by measuring the battery skin temperature, the battery electrolyte temperature, or the internal battery compartment temperature.

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of physical damage or deterioration does not necessarily represent a failure of TR 16.8.3.3, provided an evaluation determines that the physical damage or deterioration does not affect the functionality of the battery (its ability to perform its design function).
Monthly monitoring of battery cell electrolyte level and battery voltage was evaluated by STRIDE MC-15-0004.

REFERENCES

1. Regulatory Guide 1.9, Selection of Diesel Generator Set Capacity for Standby Power Supplies, March 10, 1971.

2. Regulatory Guide 1.108, Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants, Revision 1, August 1977.

3. Regulatory Guide 1.137, Fuel-Oil Systems for Standby Diesel Generators, Revision 1, October 1979.

4. Generic Letter 84-15, which modified the testing frequencies specified in Regulatory Guide 1.108.

5. Generic Letter 93-05, which reduced the surveillance requirements for testing of Diesel Generators during power operation.

6. Generic Letter 94-01, which removed the accelerated testing and special reporting requirements for Emergency Diesel Generators.

7. Regulatory Guide 1.137.

8. McGuire Nuclear Station UFSAR, Section 18.2.4, Chemistry Control Program.

9. McGuire License Renewal Commitments MCS-1274-00-00-0016, Section 4.6, Chemistry Control Program..

10. MCC-1381.05-00-0195, The 125 VDC Diesel Generator Battery and Charger Sizing Calculation.

11. IEEE 1106-2005, Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications.

12. MC-15-0004, Vital and EDG Battery STRIDE.