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Indiana Michigan Power
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106
IndianaMichiganPower.com

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AEP-NRC-2018-03
10 CFR 50.90

Docket Nos.: 50-315
50-316

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

Donald C. Cook Nuclear Plant, Unit 1 and Unit 2
License Amendment Request to Revise Technical Specifications Regarding
the Battery Monitoring and Maintenance Program

In accordance with the provisions of Section 50.90 of Title 10 of the Code of Federal Regulations (10 CFR), Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, is submitting a License Amendment Request for an amendment to Technical Specifications (TS) for CNP, Unit 1 and Unit 2.

The proposed amendment would modify TS Section 5.5.15, "Battery Monitoring and Maintenance Program," to align with the latest Institute of Electrical and Electronics Engineers (IEEE) Standard (Std). Specifically, this request would change all references of the IEEE Std 450-1995 "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications" to the updated IEEE Std 450-2010 revision. I&M is requesting this approval because the IEEE-450 standard has been revised to reflect the most state of the art maintenance practices for batteries.

Enclosure 1 to this letter provides an affirmation statement. Enclosure 2 provides an evaluation of the proposed change. Enclosures 3 and 4 provide existing Unit 1 and Unit 2 TS pages, respectively, marked up to show the proposed changes. New clean Unit 1 and Unit 2 TS pages with proposed changes incorporated will be provided to the U. S. Nuclear Regulatory Commission (NRC) Licensing Project Manager when requested.

Enclosures 5 and 6 to this letter provide existing Unit 1 and Unit 2 TS Bases pages, respectively, marked up to show the proposed changes. TS Bases markups are included for information only. Changes to the existing TS Bases, consistent with the technical and regulatory analyses, will be implemented under the Technical Specifications Bases Control Program.

Approval of the proposed amendment is requested in accordance with the normal NRC review schedule for such changes. Once approved, the amendment will be implemented within 90 days. Copies of this letter are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91.

A001
NRR

There are no new regulatory commitments made in this letter. Should you have any questions, please contact Mr. Michael K. Scarpello, Regulatory Affairs Director, at (269) 466-2649.

Sincerely,

Q. Shane Lies
Site Vice President

JMT/mll

Enclosures:

1. Affirmation
2. Evaluation of Proposed Changes
3. Donald C. Cook Nuclear Plant Unit 1 Technical Specification Pages Marked To Show Proposed Changes
4. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Pages Marked To Show Proposed Changes
5. Donald C. Cook Nuclear Plant Unit 1 Technical Specification Bases Pages Marked To Show Proposed Changes (For Information Only)
6. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Bases Pages Marked To Show Proposed Changes (For Information Only)

c: R. J. Ancona – MPSC
A. W. Dietrich, NRC, Washington, D.C.
MDEQ – RMD/RPS
NRC Resident Inspector
K. S. West, NRC Region III
A. J. Williamson – AEP Ft. Wayne, w/o enclosures

Enclosure 1 to AEP-NRC-2018-03

AFFIRMATION

I, Q. Shane Lies, being duly sworn, state that I am the Site Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the U. S. Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

Q. Shane Lies
Site Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 5 DAY OF September, 2018

Notary Public

My Commission Expires 01/21/2025

Enclosure 2 to AEP-NRC-2018-03
Evaluation of Proposed Changes

Subject: Request to modify Technical Specifications Section 5.5.15, "Battery Monitoring and Maintenance Program," to align with the latest Institute of Electrical and Electronics Engineers Standard.

1.0 SUMMARY DESCRIPTION

Pursuant to Title 10 of the Code of Federal Regulations (10 CFR) 90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, proposes an amendment to Technical Specifications (TS) for CNP, Unit 1 and Unit 2.

The proposed amendment would modify TS Section 5.5.15, "Battery Monitoring and Maintenance Program," to align with the latest Institute of Electrical and Electronics Engineers (IEEE) Standard (Std). Specifically this request would change all references of the IEEE Std 450-1995 "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications" to the updated IEEE Std 450-2010 revision.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

The Train AB & CD batteries supply 250-volt direct current (DC) power for operation of turbine generator emergency auxiliaries, switchgear, annunciators, vital bus inverters, motor operated valves, and emergency lighting. The batteries are central power station type designed for continuous duty. The battery system for each unit consists of two separately located sets of 116 lead acid cells connected in series. Each cell is of the sealed type, assembled in a shock absorbing clear plastic container, with covers bonded in place to form a leakproof seal. The batteries are mounted on protected, corrosion resistant steel racks for security and to facilitate maintenance. The Train AB & CD battery each has its own active normal charger and a wired standby charger.

The Train N battery supplies 250-volt DC power for the operation of the turbine driven auxiliary feedwater system and the Anticipated Transient Without Scram Mitigation System Actuation Circuitry inverter. The battery is a central power station type designed for continuous duty. The battery consists of 117 lead acid cells connected in series. The battery is of the sealed type, assembled in a shock absorbing, clear plastic container, with covers bonded in place to form a leakproof seal. The battery is mounted on protected, corrosion resistant steel racks for security and to facilitate maintenance. The battery system contains two battery chargers. Transfer from one charger to the other is manual. No automatic transfer between chargers is provided. The Train N battery is physically and electrically isolated from the other plant batteries.

The Train AB, CD and N batteries and associated systems are described in detail in Chapter 8 of the CNP Updated Final Safety Analysis Report (UFSAR).

2.2 Current Technical Specifications Requirements

CNPs Unit 1 and Unit 2 TS Section 5.5 "Programs and Manuals" lists the programs that shall be established, implemented, and maintained.

TS Section 5.5.15 "Battery Monitoring and Maintenance Program" states:

> *"This program provides for battery restoration and maintenance, based on the recommendations of IEEE Standard 450-1995, "IEEE Recommended Practice for*

Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," or of the battery manufacturer including the following:

a. Actions to restore battery cells with float voltage < 2.13 V; and

b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the minimum established design limit."

2.3 Reason for the Proposed Change

TS 5.5.15, "Battery Monitoring and Maintenance Program," currently requires CNP Unit 1 and Unit 2 to maintain batteries in accordance with the recommendations of IEEE Std 450-1995. This IEEE standard has since been revised with the most current revision being IEEE Std 450-2010. IEEE Std 450-2010 represents the most state of the art maintenance practices for batteries. Of significance is the decreased emphasis placed on specific gravity measurements in favor of float charging current measurements in the 2010 revision. This maintenance philosophy more closely aligns with the vendor recommended maintenance practices, which are designed to minimize specific gravity measurements. CNP would instead use float charging current and cell voltage measurements as indicators of acceptable operation. This change would result in significantly reduced field work for maintenance.

2.4 Description of the Proposed Change

The proposed amendment would modify TS Section 5.5.15, "Battery Monitoring and Maintenance Program," to align with the latest IEEE Standard. Specifically this request would change all references of the IEEE Std 450-1995 "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications" to the updated IEEE Std 450-2010 revision, as endorsed, with certain regulatory positions, in Regulatory Guide 1.129. This change encompasses compliance with Regulatory Guide 1.129 in its entirety, including the standards referenced within Regulatory Guide 1.129.

Enclosures 3 and 4 to this letter provide existing Unit 1 and Unit 2 TS pages, respectively, marked up to show the proposed changes. Enclosures 5 and 6 to this letter provide Unit 1 and Unit 2 TS Bases pages, respectively, marked up to reflect the TS change. The TS Bases pages are provided for information purposes only. Changes to the existing TS Bases, consistent with the technical and regulatory analyses, will be implemented under the Technical Specifications Bases Control Program. New clean Unit 1 and Unit 2 TS pages, with proposed changes incorporated, will be provided to the U. S. Nuclear Regulatory Commission (NRC) Licensing Project Manager when requested.

Background

Regulatory Guide 1.129 "Maintenance, Testing, and Replacement of Vented Lead-Acid Storage Batteries for Nuclear Plants," provides guidance to manage battery degradation such that a battery in service would retain its readiness for supporting design-basis events. It endorses, with certain clarifying regulatory positions, the IEEE Std 450-2010, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications." This standard was developed by the IEEE Power Engineering Society Stationary Batteries Committee and approved by the IEEE Standards Association Standards

Board. IEEE Std 450-2010 provides the recommended maintenance, test schedules, and testing procedures intended to optimize the life and performance of permanently installed, vented lead-acid storage batteries used for standby power applications. It also provides guidance to determine when batteries should be replaced. This standard applies to full-float stationary applications in which a battery charger normally maintains the battery fully charged and supplies the DC loads. IEEE Std 450-2010 is an updated national consensus standard that adds new recommendations and requirements, which reflect the current state of technology for vented lead-acid batteries.

This proposed change to update to IEEE Std 450-2010 was discussed with the battery vendor and they concur that the updated IEEE Std 450-2010 is in compliance with the current vendor manual recommendations for battery monitoring and maintenance.

3.0 TECHNICAL EVALUATION

3.1 Technical Assessment:

The proposed change is to adopt IEEE Std 450-2010 in its entirety in place of IEEE Std 450-1995 for TS 5.5.15 "Battery Monitoring and Maintenance Program." The battery parameters monitored under the program, as well as the frequency they are monitored at, currently follow the recommendations of the IEEE Std 450-1995 "Recommended Practices for Maintenance, Testing, and Replacement of Vented Lead Acid Batteries for Stationary Applications." This change is desired because the 2010 revision of the standard allows for float current to be used to monitor the state of charge of Lead-Calcium batteries rather than the specific gravity measurements required by IEEE Std 450-1995. CNP uses Lead-Calcium cells for all of its TS required batteries. It is important to note that CNP has no TS requirements related to specific gravity, readings are currently taken and recorded as part of monthly, quarterly, and yearly surveillance activities implementing the battery monitoring program because they are recommended by the 1995 revision of the standard. The change would allow the station to stop collecting this data because float current readings, as endorsed by Regulatory Guide 1.129 and NUREG/CR-7148, are already being collected and are a more effective measure of the state of charge of Lead-Calcium cells. For all relevant TS Surveillance Requirements (SR) the IEEE Std 450-2010 requires them to be performed either the same frequency as or more frequent than the IEEE Std 450-1995. The most significant difference is that CNP would have to increase the frequency at which TS SR 3.8.6.6 is performed in order to conform to the guidance in the new standard. No Limiting Conditions for Operation, modes of applicability, required actions, or completion times are impacted by the proposed change. Individual TS SRs and Basis are discussed in detail below.

3.2 Potentially Affected Surveillance Requirements:

All surveillance frequencies discussed below are controlled in accordance with the CNP Surveillance Frequency Control Program.

TS SR 3.8.4.1-Verify battery terminal voltage is greater than or equal to minimum established float voltage.

Both the 1995 revision and the 2010 revision state that this should be done "on a regularly scheduled basis (at least once per month)". This requirement would not change. This

surveillance requirement is currently performed weekly, which is consistent with Regulatory Guide 1.129, Paragraph C.2.

TS SR 3.8.4.3- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design cycle when subjected to a battery service test.

This is currently performed at a 24 month frequency, which is consistent with Regulatory Guide 1.129, Paragraph C.4. The current basis for this surveillance frequency is "engineering judgement" rather than the IEEE standard. The initial requirements will change with the new standard: IEEE Std 450-2010 requires recording the float current of the string prior to testing, which is already taken per the CNP battery discharge testing procedure and specific gravities are not required to be recorded prior to testing for Lead-Calcium cells. Float current stability is measured and recorded to establish state of charge post testing to verify OPERABILITY as is the float voltage of all connected cells, this is consistent with the guidance provided in Regulatory Guide 1.129, Paragraphs C.3 and C.6. There is a NOTE on this requirement in the TS which states that the modified performance test required by TS SR 3.8.6.6 may be performed in lieu of the service test. This is consistent with IEEE 450-2010 which states "A modified performance test can be used in lieu of a service test and/or a performance test at any time." This NOTE is not being changed.

TS SR 3.8.6.1-Verify each battery float current is ≤2 amps.

IEEE Std 450-2010 says that either float current or pilot cell specific gravities should be taken "at least once per month". The 1995 revision does not call out a specific frequency for this data to be taken. CNP currently performs this surveillance weekly, which is consistent with both the IEEE Std 450-2010 and the additional guidance provided by Regulatory Guide 1.129, Paragraph C.2.

TS SR 3.8.6.2- Verify each battery pilot cell voltage is ≥2.07 V

Both revisions of the standard state that this should be taken "on a regularly scheduled basis (at least once per month)". CNP currently collects this data monthly. This requirement is not a change.

TS SR 3.8.6.3- Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.

Both revisions of the standard state that this should be taken "on a regularly scheduled basis (at least once per month)". CNP currently collects this data monthly. This requirement is not a change.

TS SR 3.8.6.4- Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.

Both revisions of the standard state that this should be taken "on a regularly scheduled basis (at least once per month)". CNP currently collects this data monthly. This requirement is not a change.

TS SR 3.8.6.5- Verify each battery connected cell voltage is ≥2.07.

Both revisions of the standard state that this should be done "at least once per quarter". CNP currently collects this data quarterly. This requirement is not a change.

TS SR 3.8.6.6- Verify battery capacity is ≥80% of the manufacturer's rating when subjected to a performance discharge test or modified performance discharge test.

IEEE Std 450-1995 recommends this testing at 5 year intervals until the battery shows signs of degradation or has reached 85% of its service life. IEEE Std 450-2010 says that the performance testing interval should be established factoring in design life and operating temperatures and that the interval should not exceed 25% of the expected service life of the battery. The 1&2-BATT-AB banks have the shortest temperature adjusted qualified life at 14.5 years. According to the 2010 revision of the standard, I&M would have to conduct performance testing on these banks at least once every 43 months, which means every other refueling outage instead of every third which is the current frequency. This is currently accomplished using a modified performance test, which IEEE Std 450-2010 states can be credited for both a performance test and a service test which is consistent with Regulatory Guide 1.129, Paragraph C.4 guidance. All other aspects of the modified performance testing method, including magnitude, duration, and discharge rate, remain the same in the IEEE Std 450-2010 as in the IEEE Std 450-1995 revision. Post testing restoration requires float current and the voltages of each connected cell to be measured and recorded which is consistent with Regulatory Guide 1.129, Paragraphs C.3 and C.6. TS SR 3.8.6.6 requires a minimum of 80% of the manufacturer's rated capacity as well as an accelerated testing frequency of every 24 months when the battery has reached 85% of its service life with ≥100% of the manufacturers rating AND 12 months when the battery shows "degradation" (defined in both standards as a ≥10% decrease in capacity between performance tests or a capacity of ≤90% of the manufacturers rating) or when the battery has reached 85% of its service life with <100% of manufacturers rating. In order to comply with the Regulatory Guide 1.129, Paragraph C.5 this accelerated testing would be a modified performance test rather than a performance test.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

Regulatory Requirements

The General Design Criteria (GDC) listed in 10 CFR 50 Appendix A were published after the CNP construction permits were issued, and the GDC were not included in CNP's original licensing basis. The design of the CNP electrical systems is described in the CNP UFSAR, primarily in Chapter 8. This License Amendment Request (LAR) is submitted in accordance with 10 CFR 50.90.

As described in UFSAR, Section 1.4, the Plant Specific Design Criteria (PSDC) define the principal criteria and safety objectives for the CNP design. The following PSDC are relevant to the proposed amendment:

PSDC CRITERION 5 Records Requirements

The reactor licensee shall be responsible for assuring the maintenance, throughout the life of the reactor, of records of the design, fabrication, and construction of major components of the plant essential to avoid undue risk to the health and safety of the public.

PSDC CRITERION 25 Demonstration of Functional Operability of Protection Systems

Means shall be included for suitable testing of the active components of protection systems while the reactor is in operation to determine if failure or loss of redundancy has occurred.

NUREG/CR-7148 "Confirmatory Battery Testing: The Use of Float Current Monitoring to Determine Battery State of Charge," (Reference 3) provides information on confirmatory battery testing; specifically, the use of float current monitoring to determine battery state-of-charge.

The proposed changes are consistent with the above regulatory requirements and criteria. Therefore, the proposed changes will assure safe operation by continuing to meet applicable regulations and requirements.

4.2 Precedents

The NRC has approved similar LARs to allow for the acceptance of newer revisions of IEEE Std-450, as listed in Precedents 1 and 2. Although the precedents listed below allow for the acceptance of a newer revision of the IEEE-Std-450 (2002), this LAR is requesting approval of a more recent revision IEEE-Std-450 (2010).

1. Letter from Jennivine K. Rankin U. S Nuclear Regulatory Commission (NRC) to Randall K. Edington (Arizona Public Service Company), "Palo Verde Nuclear Generating Station, Units 1, 2, and 3 – Issuance of Amendments Re: License Amendment Request for Adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-500, Revision 2, DC Electrical Rewrite – Update to TSTF-360. (TAC Nos. MF0450, MF0451, and MF0452)," dated June 25, 2014, (Agencywide Documents Access and Management System (ADAMS) Accession Number ML14115A045).

2. Letter from Andrea E. George NRC to Vice President, Operation (Entergy Operation, Inc.), "Arkansas Nuclear One, Unit 1 – Issuance of Amendment Re: "Adoption of Technical Specification Task Force (TSTF) Change Traveler TSTF-500, Revision 2, "DC Electrical Rewrite – Update to TSTF-360" (TAC No. MF0596)," dated November 24, 2014, (ADAMS Accession Number ML14254A133).

4.3 No Significant Hazards Consideration

In accordance with 10 CFR 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, Facility Operating Licenses No. DPR-58 and DPR-74, respectively, proposes to modify Technical Specification (TS) Section 5.5.15, "Battery Monitoring and Maintenance Program," to align with the latest Institute of Electrical and

Electronics Engineers (IEEE) Standard (Std). Specifically this request would change all references of the IEEE Std 450-1995 "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications" to the updated IEEE Std 450-2010 revision.

I&M has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92(c), "Issuance of amendment," as discussed below:

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

   Response: No.

   The design of the protection systems will be unaffected. The reactor protection system and engineered safety feature actuation system will continue to function in a manner consistent with the plant design basis. All design, material and construction standards that were applicable prior to the request are maintained.

   The proposed amendment will not alter any assumptions or change any mitigation actions in the radiological consequence evaluations in the Updated Final Safety Analysis Report (UFSAR).

   Therefore, the proposed change does 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 previously evaluated?

   Response: No.

   No new accident scenarios, failure mechanisms, or single failures are introduced as a result of the proposed change. All systems, structures, and components previously required for the mitigation of an event remain capable of fulfilling their intended design function. The proposed change has no adverse effects on any safety related systems or components and does not challenge the performance or integrity of any safety related system. Further, there are no changes in the method by which any safety-related plant system performs its safety function. This amendment will not affect the normal method of power operation or change any operating parameters.

   Therefore, the proposed changes do 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 margin of safety is established through equipment design, operating parameters, and the setpoints at which automatic actions are initiated. The equipment margins will be

maintained in accordance with the plant-specific design bases. The proposed changes will not adversely affect operation of plant equipment. These changes will not result in a change to the setpoints at which protective actions are initiated. Sufficient Direct Current (DC) capacity to support operation of mitigation equipment is ensured. The changes associated with the Battery Maintenance and Monitoring Program will ensure that the station batteries are maintained in a highly reliable manner. The equipment fed by the DC electrical sources will continue to provide adequate power to safety-related loads in accordance with analysis assumptions.
The TS changes maintain the same level of equipment performance stated in the UFSAR and the current TSs. Therefore, the proposed changes do not involve a significant reduction in the margin of safety.

The proposed change does not involve a significant reduction in a margin of safety because the proposed changes do not reduce the margin of safety that exists in the present CNP TS or UFSAR. The operability requirements of the TS are consistent with the initial condition assumptions of the safety analyses.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, I&M concludes that the proposed amendments do 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.

4.4 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

I&M has evaluated the proposed amendments for environmental considerations. The review has resulted in the determination 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 amendments do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendments meet 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 amendments.

6.0 REFERENCES

1. Regulatory Guide 1.129, "Maintenance, Testing, and Replacement of Vented Lead-Acid Storage Batteries for Nuclear Power Plants," Revision 3, September 2013.

2. Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) 450-2010, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications", Revision of IEEE Std. 450-2002, dated February 25, 2011.

3. U. S. Nuclear Regulatory Commission (NRC), "Confirmatory Battery Testing: The Use of Float Current Monitoring to Determine Battery State of Charge," NUREG/CR-7148, Washington D.C. Agencywide Document Access And Management System (ADAMS) Accession No. ML12313A413.

ENCLOSURE 3 TO AEP-NRC-2018-03

Donald C. Cook Nuclear Plant Unit 1 Technical Specification Pages Marked To Show Proposed Changes

Page 5.5-15

5.5 Programs and Manuals

5.5.15 Battery Monitoring and Maintenance Program

This program provides for battery restoration and maintenance, based on the recommendations of IEEE Standard 450-2010~~1995~~, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," as endorsed, with certain regulatory positions, in Regulatory Guide 1.129, Revision 3, or of the battery manufacturer including the following:

a. Actions to restore battery cells with float voltage < 2.13 V; and

b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the minimum established design limit.

5.5.16 Control Room Envelope Habitability Program

A Control Room Envelope (CRE) Habitability Program shall be established and implemented to ensure that CRE habitability is maintained such that, with an OPERABLE Control Room Emergency Ventilation (CREV) System, CRE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent (TEDE) for the duration of the accident. The program shall include the following elements:

a. The definition of the CRE and the CRE boundary.

b. Requirements for maintaining the CRE boundary in its design condition including configuration control and preventive maintenance.

c. Requirements for (i) determining the unfiltered air inleakage past the CRE boundary into the CRE in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing CRE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

The following is an exception to Section C.1 and C.2 of Regulatory Guide 1.197, Revision 0:

The appropriate application of ASTM E741-00 required by C.1.1 may include minor exceptions to the test methodology. These exceptions shall be documented in the test report.

ENCLOSURE 4 TO AEP-NRC-2018-03

Donald C. Cook Nuclear Plant Unit 2 Technical Specification Pages Marked To Show Proposed Changes

Page 5.5-14

5.5 Programs and Manuals

5.5.14 Containment Leakage Rate Testing Program

a. A program shall establish the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J," dated July 2012, and Section 4.1, "Limitations and Conditions for NEI TR 94-01, Revision 2," of the NRC Safety Evaluation Report in NEI 94-01, Revision 2-A, dated October 2008.

b. The containment design pressure is 12 psig. For the Containment Leakage Rate Testing Program, P_a is 12.0 psig.

c. The maximum allowable containment leakage rate, L_a, at P_a, shall be 0.18% of containment air weight per day.

d. Leakage rate acceptance criteria are:

1. Containment leakage rate acceptance criterion is 1.0 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $\leq 0.60\ L_a$ for the Type B and C tests and $\leq 0.75\ L_a$ for Type A tests.

2. Air lock testing acceptance criterion is overall air lock leakage rate is $\leq 0.05\ L_a$ when tested at $\geq P_a$.

e. The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

5.5.15 Battery Monitoring and Maintenance Program

This program provides for battery restoration and maintenance, based on the recommendations of IEEE Standard 450-2010~~1995~~, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," as endorsed, with certain regulatory positions, in Regulatory Guide 1.129, Revision 3, or of the battery manufacturer including the following:

a. Actions to restore battery cells with float voltage < 2.13 V; and

b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the minimum established design limit.

ENCLOSURE 5 TO AEP-NRC-2018-03

Donald C. Cook Nuclear Plant Unit 1 Technical Specification Bases Pages Marked To Show Proposed Changes

(For Information Only)

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Page 3.8.6-1
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Page 3.8.6-8

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.4

With the exception of this Surveillance, all other Surveillances of this Specification (SR 3.8.4.1 through 3.8.4.3) are applied to the Unit 1 DC sources. This Surveillance is provided to direct that appropriate Surveillances for the required Unit 2 DC sources are governed by the applicable Unit 2 Technical Specifications. Performance of the applicable opposite unit Surveillances will satisfy the opposite unit requirements as well as satisfy the given unit Surveillance Requirement.

The Frequency required by the applicable Unit 2 SR also governs performance of that SR for Unit 1.

As noted, when Unit 2 is in MODE 5 or 6, or moving irradiated fuel assemblies in the containment or auxiliary building, SR 3.8.4.3 is not required to be performed. This ensures that a Unit 1 SR will not require a Unit 2 SR to be performed, when Unit 2 Technical Specifications exempts performance of a Unit 2 SR (however, as stated in the Unit 2 SR 3.8.5.1 Bases, while performance of an SR is exempted, the SR must still be met).

REFERENCES

1. Atomic Energy Commission Proposed General Design Criterion 39, July 1967, and Safety Guide 6.
2. Not Used.
3. Not Used.
4. UFSAR, Section 8.3.4.
5. UFSAR, Section 8.3.6.
6. UFSAR, Chapter 14.
7. UFSAR, Section 8.5.
8. Regulatory Guide 1.93, December 1974.
9. IEEE-450-2010~~1995~~.
10. Regulatory Guide 1.32, February 1977.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery Parameters

BASES

BACKGROUND

This LCO delineates the limits on battery float current as well as cell electrolyte temperature, level, and float voltage for the DC electrical power subsystem batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3.8.4, "DC Sources - Operating," and LCO 3.8.5, "DC Sources - Shutdown." In addition to the limitations of this Specification, the Battery Monitoring and Maintenance Program also implements a program specified in Specification 5.5.15 for monitoring various battery parameters that is based on the recommendations of IEEE Standard 450-2010~~1995~~, "IEEE Recommended Practice For Maintenance, Testing, And Replacement Of Vented Lead-Acid Batteries For Stationary Applications" (Ref. 1).

The battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. The open circuit voltage is the voltage maintained when there is no charging or discharging. Once fully charged with its open circuit voltage, the battery cell will maintain its capacity for some time without further charging per manufacturer's instructions. Optimal long term performance however, is obtained by maintaining a float voltage 2.21 to 2.22 Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self discharge.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 14 (Ref. 2), assume Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation.

The specific Applicable Safety Analyses for the DC Electrical Power System are provided in the Bases for LCO 3.8.4 and LCO 3.8.5.

Battery Parameters satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Battery parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after an anticipated operational transient or a postulated DBA. Battery parameter limits are conservatively established, allowing continued DC electrical system function even with limits not met. Additional preventative maintenance, testing, and monitoring performed in accordance with the Battery Monitoring and Maintenance Program is conducted as specified in Specification 5.5.15.

BASES

ACTIONS (continued)

If the float voltage is found to be satisfactory there is good assurance that, within 12 hours, the battery will be restored to its fully charged condition (Required Action B.2) from any discharge that might have occurred due to a temporary loss of the battery charger.

A discharged battery with float voltage (the charger setpoint) across its terminals indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within 12 hours, avoiding a premature shutdown with its own attendant risk.

If the condition is due to one or more cells in a low voltage condition but still greater than 2.07 V and float voltage is found to be satisfactory, this is not indication of a substantially discharged battery and 12 hours is a reasonable time prior to declaring the battery inoperable.

Since Required Action B.1 only specifies "perform," a failure of SR 3.8.4.1 acceptance criteria does not result in the Required Action not met. However, if SR 3.8.4.1 is failed, the appropriate Condition(s), depending on the cause of the failure, is entered.

C.1, C.2, and C.3

With one or more batteries with one or more cells electrolyte level above the top of the plates, but below the minimum established design limits, the battery still retains sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of electrolyte level not met. Within 31 days the minimum established design limits for electrolyte level must be re-established.

With electrolyte level below the top of the plates there is a potential for dryout and plate degradation. Required Actions C.1 and C.2 address this potential (as well as provisions in Specification 5.5.15, "Battery Monitoring and Maintenance Program"). They are modified by a Note that indicates they are only applicable if electrolyte level is below the top of the plates. Within 8 hours level is required to be restored to above the top of the plates. The Required Action C.2 requirement to verify that there is no leakage by visual inspection and the Specification 5.5.15.b item to initiate action to equalize and test in accordance with manufacturer's recommendation are taken from Annex D of IEEE Standard 450-2010~~1995~~.

BASES

REFERENCES

1. IEEE-450-2010~~1995~~.

2. UFSAR, Chapter 14.

3. IEEE-485-1997.

ENCLOSURE 6 TO AEP-NRC-2018-03

Donald C. Cook Nuclear Plant Unit 2 Technical Specification Bases Pages Marked To Show Proposed Changes

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.4

With the exception of this Surveillance, all other Surveillances of this Specification (SR 3.8.4.1 through 3.8.4.3) are applied to the Unit 2 DC sources. This Surveillance is provided to direct that appropriate Surveillances for the required Unit 1 DC sources are governed by the applicable Unit 1 Technical Specifications. Performance of the applicable opposite unit Surveillances will satisfy the opposite unit requirements as well as satisfy the given unit Surveillance Requirement.

The Frequency required by the applicable Unit 1 SR also governs performance of that SR for Unit 2.

As noted, when Unit 1 is in MODE 5 or 6, or moving irradiated fuel assemblies in the containment or auxiliary building, SR 3.8.4.3 is not required to be performed. This ensures that a Unit 2 SR will not require a Unit 1 SR to be performed, when Unit 1 Technical Specifications exempts performance of a Unit 1 SR (however, as stated in the Unit 1 SR 3.8.5.1 Bases, while performance of an SR is exempted, the SR must still be met).

REFERENCES

1. Atomic Energy Commission Proposed General Design Criterion 39, July 1967, and Safety Guide 6.
2. Not Used.
3. Not Used.
4. UFSAR, Section 8.3.4.
5. UFSAR, Section 8.3.6.
6. UFSAR, Chapter 14.
7. UFSAR, Section 8.5.
8. Regulatory Guide 1.93, December 1974.
9. IEEE-450-2010~~1995~~.
10. Regulatory Guide 1.32, February 1977.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery Parameters

BASES

BACKGROUND	This LCO delineates the limits on battery float current as well as cell electrolyte temperature, level, and float voltage for the DC electrical power subsystem batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3.8.4, "DC Sources - Operating," and LCO 3.8.5, "DC Sources - Shutdown." In addition to the limitations of this Specification, the Battery Monitoring and Maintenance Program also implements a program specified in Specification 5.5.15 for monitoring various battery parameters that is based on the recommendations of IEEE Standard 450-2010~~1995~~, "IEEE Recommended Practice For Maintenance, Testing, And Replacement Of Vented Lead-Acid Batteries For Stationary Applications" (Ref. 1). The battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. The open circuit voltage is the voltage maintained when there is no charging or discharging. Once fully charged with its open circuit voltage, the battery cell will maintain its capacity for some time without further charging per manufacturer's instructions. Optimal long term performance however, is obtained by maintaining a float voltage 2.21 to 2.22 Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self discharge.
APPLICABLE SAFETY ANALYSES	The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 14 (Ref. 2), assume Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation. The specific Applicable Safety Analyses for the DC Electrical Power System are provided in the Bases for LCO 3.8.4 and LCO 3.8.5. Battery Parameters satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	Battery parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after an anticipated operational transient or a postulated DBA. Battery parameter limits are conservatively established, allowing continued DC electrical system function even with limits not met. Additional preventative maintenance, testing, and monitoring performed in accordance with the Battery Monitoring and Maintenance Program is conducted as specified in Specification 5.5.15.

BASES

ACTIONS (continued)

If the float voltage is found to be satisfactory there is good assurance that, within 12 hours, the battery will be restored to its fully charged condition (Required Action B.2) from any discharge that might have occurred due to a temporary loss of the battery charger.

A discharged battery with float voltage (the charger setpoint) across its terminals indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within 12 hours, avoiding a premature shutdown with its own attendant risk.

If the condition is due to one or more cells in a low voltage condition but still greater than 2.07 V and float voltage is found to be satisfactory, this is not indication of a substantially discharged battery and 12 hours is a reasonable time prior to declaring the battery inoperable.

Since Required Action B.1 only specifies "perform," a failure of SR 3.8.4.1 acceptance criteria does not result in the Required Action not met. However, if SR 3.8.4.1 is failed, the appropriate Condition(s), depending on the cause of the failure, is entered.

C.1, C.2, and C.3

With one or more batteries with one or more cells electrolyte level above the top of the plates, but below the minimum established design limits, the battery still retains sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of electrolyte level not met. Within 31 days the minimum established design limits for electrolyte level must be re-established.

With electrolyte level below the top of the plates there is a potential for dryout and plate degradation. Required Actions C.1 and C.2 address this potential (as well as provisions in Specification 5.5.15, "Battery Monitoring and Maintenance Program"). They are modified by a Note that indicates they are only applicable if electrolyte level is below the top of the plates. Within 8 hours level is required to be restored to above the top of the plates. The Required Action C.2 requirement to verify that there is no leakage by visual inspection and the Specification 5.5.15.b item to initiate action to equalize and test in accordance with manufacturer's recommendation are taken from Annex D of IEEE Standard 450-2010~~1995~~.

BASES

REFERENCES

1. IEEE-450-2010~~1995~~.

2. UFSAR, Chapter 14.

3. IEEE-485-1997.