



August 20, 2014

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

Subject: Statement of no significant hazards resulting from license amendment request dated
June 23, 2014 (ML14196A043)

Reference: NBSR Facility License TR-5, Docket 50-184, NRC letter dated July 23, 2014
(TAC No. MF4420)

Sirs:

In a license amendment request dated June 23, 2014, the NIST Center for Neutron Research (NCNR) requested an amendment to the facility license Technical Specifications. As required by 10 CFR 50.91(a), the following analysis is presented to show the proposed amendment does not create a significant hazard using the criteria of 10 CFR 50.92(c).

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

No, the proposed amendment would not increase the probability or consequences of an accident previously evaluated. The proposed amendment modifies maintenance requirements for emergency power systems due to a change in battery technology used in commercially available uninterruptible power supplies (UPS). The proposed amendment will assure the reliability of the emergency power systems utilizing valve-regulated lead acid (VRLA) batteries by increasing the frequency of performance testing as recommended by the battery manufacturer and the IEEE (Institute of Electrical and Electronics Engineers). The IEEE recommends the performance test interval for VRLA batteries (IEEE-1188) should not be greater than 25% of the expected service life or two years, whichever is less. The expected lifespan of a VRLA battery is ten years so a two year testing interval was selected. More frequent performance testing will ensure all the station batteries used for emergency power remain capable of supplying emergency electrical loads for a minimum of four hours as required. The proposed amendment will also correct a typographical error and add the requirement in the Limiting Conditions for Operations (LCO) for at least one of the two replacement UPS system batteries to be available to operate the reactor. Each UPS battery system is capable of independently supplying the designated emergency electrical loads for a minimum of four hours. Power for larger electrical loads such as primary

cooling backup pumps (shutdown pumps) and emergency ventilation fans comes from other sources of emergency electrical power (diesel generators, critical power bus, or 125 VDC station battery).

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

No, the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated. The replacement UPS utilizes a different battery type (VRLA) which has shorter lifespan than traditional Vented Lead Acid (VLA) batteries. Increasing the frequency of performance monitoring as recommended by the IEEE accounts for the shorter lifespan of VRLA batteries and will enable the facility to identify a loss of battery capacity early to permit scheduled replacement of individual system components. Two identical but redundant UPS systems will each provide for a minimum of four hours at fully rated emergency power loading (20 kVA). The actual emergency electrical loads on the UPS will be significantly less because the larger electrical loads will continue to be powered from the 125 VDC station battery directly or from one of two emergency diesel generators. The new system will have higher reliability and capacity than the existing emergency power system.

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


No, the proposed amendment would not involve a significant reduction in a margin of safety. More frequent monitoring of the capacity or performance of the VRLA batteries utilized in the replacement UPS supplying power to critical reactor loads will ensure the UPS performs its design function and loss of battery capacity is detected early before safety margins are reduced.

In addition to the above analysis, included as attachments are the following documents:

1. Pages 23 and 39 from the existing (Amend. 9) TR-5 Technical Specifications;
2. Proposed pages 23 and 39 with changes highlighted by vertical bars in right hand margin.

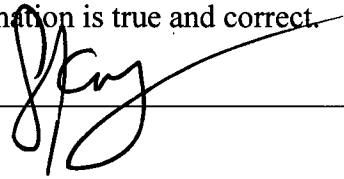
The NCNR appreciates the time required to process these administrative license changes and looks forward to an approved license amendment in the near future. Please contact me directly at 301-975-6210 or by email at sean.okelly@nist.gov if you have any questions.

Sincerely,



Sean O'Kelly, Deputy Director
NIST Center for Neutron Research

I certify under penalty of perjury that this information is true and correct.

Executed on AUG 20, 2014 By: 

cc: U.S. Nuclear Regulatory Commission
ATTN: Xiaosong Yin
One White Flint North
11555 Rockville Pike, MS O12D20
Rockville, MD 20852

Susan T. Gray, Program Manager
Power Plant Assessment Division
Maryland Department of Natural Resources
580 Taylor Avenue (B wing, 3rd floor)
Tawes State Office Building, B3
Annapolis, MD 21401

Attachments

3.6 Emergency Power System

Applicability: Emergency electrical power supplies

Objective: To ensure emergency power for vital equipment.

Specification

The reactor shall not be operated unless at least one (1) of the diesel-powered generators and the station battery are operable, including associated distribution equipment, and the nuclear instrumentation and emergency exhaust fans can be supplied with electrical power from the diesel generator or the battery.

Exception: In order to provide time for prompt remedial action, the Emergency Power may be inoperable for a period of no longer than 15 minutes when the specification is not met or does not exist.

Basis

One diesel-powered generator is capable of supplying emergency power to all necessary emergency equipment. The second diesel-powered generator is provided to permit outages for maintenance and repairs.

The station battery provides an additional source of emergency power for the nuclear instruments and the emergency exhaust fans. These fans may be powered from AC or DC power supplies. The battery is capable of supplying this emergency load for a minimum of 4 hours. By allowing this amount of time and by requiring operability of at least one diesel and the station battery, adequate emergency power sources shall always be available.

3.7 Radiation Monitoring Systems and Effluents

3.7.1 Monitoring Systems and Effluent Limits

Applicability: Radiation monitoring systems

Objective: To detect abnormal levels or locations of radioactivity.

Specifications

The reactor shall not be operated unless:

- (1) Two of three gaseous effluent monitors are operable for normal air, irradiated air, and stack air.

- (4) The voltage and specific gravity of each cell of the station battery shall be tested annually. A discharge test of the entire battery shall be performed once every 5 years.

Basis

- (1) The NBSR is equipped with two diesel power generators, each capable of supplying full emergency load; therefore, only one of the generators shall be required. The diesel generators have proven to be very reliable over decades of service. The quarterly test frequencies are consistent with industry practice and are considered adequate to ensure continued reliable emergency power for emergency equipment.
- (2) This testing frequency of the operable generator will ensure that at least one of the required emergency generators will be operable.
- (3) An annual test of the emergency power equipment under a simulated complete loss of outside power will ensure the source will be available when needed.
- (4) Specific gravity and voltage checks of individual cells are the accepted method of ensuring that all cells are in satisfactory condition. The annual frequency for these detailed checks is considered adequate to detect any significant changes in the ability of the battery to retain its charge. During initial installation, the station battery was discharge tested to measure its capacity. Experience has shown that repeating this test at the specified interval is adequate to detect deterioration of the cells.

4.7 Radiation Monitoring System and Effluents

4.7.1 Monitoring System

Applicability: Radiation monitoring equipment

Objective: To operability of radiation monitors.

Specifications

- (1) The gaseous effluent monitors for normal air, irradiated air and stack air shall be channel tested before startup, after a shutdown of longer than twenty-four (24) hours, or quarterly. Each of the above air monitors shall be channel calibrated annually.
- (2) The fission products monitor shall be channel tested monthly and channel calibrated annually.

3.6 Emergency Power System

Applicability: Emergency electrical power supplies

Objective: To ensure emergency power for vital equipment.

Specification

The reactor shall not be operated unless at least one (1) of the diesel-powered generators and the station batteries (consisting of at least one (1) battery supplying a critical power UPS and one (1) battery supplying the 125 VDC buses) are operable, including associated distribution equipment, and the nuclear instrumentation and emergency exhaust fans can be supplied with electrical power from the diesel generator or the batteries.

Exception: In order to provide time for prompt remedial action, the Emergency Power System may be inoperable for a period of no longer than 15 minutes when the specification is not met or does not exist.

Basis

One diesel-powered generator is capable of supplying emergency power to all necessary emergency equipment. The second diesel-powered generator is provided to permit outages for maintenance and repairs.

The station batteries provide an additional source of emergency power for the nuclear instruments and the emergency exhaust fans. These fans may be powered from AC or DC power supplies. The batteries are capable of supplying this emergency load for a minimum of 4 hours. By allowing this amount of time and by requiring operability of at least one diesel and the station batteries, adequate emergency power sources shall always be available.

3.7 Radiation Monitoring Systems and Effluents

3.7.1 Monitoring Systems and Effluent Limits

Applicability: Radiation monitoring systems

Objective: To detect abnormal levels or locations of radioactivity.

Specifications

The reactor shall not be operated unless:

- (1) Two of three gaseous effluent monitors are operable for normal air, irradiated air, and stack air.

- (4) The voltage and specific gravity of each cell of the Vented Lead Acid (VLA) battery shall be tested annually. A discharge test of the entire battery shall be performed once every 5 years.
- (5) A discharge test of the Valve-Regulated Lead Acid (VRLA) batteries shall be performed once every 2 years.

Basis

- (1) The NBSR is equipped with two diesel power generators, each capable of supplying full emergency load; therefore, only one of the generators shall be required. The diesel generators have proven to be very reliable over decades of service. The quarterly test frequencies are consistent with industry practice and are considered adequate to ensure continued reliable emergency power for emergency equipment.
- (2) This testing frequency of the operable generator will ensure that at least one of the required emergency generators will be operable.
- (3) An annual test of the emergency power equipment under a simulated complete loss of outside power will ensure the source will be available when needed.
- (4) Specific gravity and voltage checks of individual cells are the accepted method of ensuring that all cells of a VLA battery are in satisfactory condition. The annual frequency for these detailed checks is considered adequate to detect any significant changes in the ability of the battery to retain its charge. During initial installation, the station batteries were discharge tested to measure their capacity. Experience has shown that repeating these tests at the specified intervals is adequate to detect deterioration of the cells and loss of battery capacity.

4.7 Radiation Monitoring System and Effluents

4.7.1 Monitoring System

Applicability: Radiation monitoring equipment

Objective: To operability of radiation monitors.

Specifications

- (1) The gaseous effluent monitors for normal air, irradiated air and stack air shall be channel tested before startup, after a shutdown of longer than twenty-four (24) hours, or quarterly. Each of the above air monitors shall be channel calibrated annually.
- (2) The fission products monitor shall be channel tested monthly and channel calibrated annually.