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21G-13-0199
GOV-01-55-04
ACF-13-0223

August 29, 2013

Director, Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Reference: 1) Docket No. 70-143; SNM License 124
2) NRC Inspection Report No. 70-143/2013-003 and Notice of Violation, dated
July 30, 2013

Subject: Reply to Notice of Violation (VIO 70-143/2013-003-01)

Pursuant to the requirements of 10 CFR 2.201, Nuclear Fuel Services, Inc. (NFS) hereby submits the attached response to the violation identified in the referenced NRC inspection report.

If you or your staff have any questions, require additional information, or wish to discuss this matter further, please contact me, or Mr. Mark Elliott, Quality, Safety, and Safeguards Director, at (423) 743-1705. Please reference our unique document identification number (21G-13-0199) in any correspondence concerning this letter.

Sincerely,

NUCLEAR FUEL SERVICES, INC.

Joseph G. Henry, President

JKW/pdj

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Restatement of Violation

During an NRC inspection conducted June 24-28, 2013, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Safety Condition S-1 of Special Nuclear Material License SNM-124 requires that material be used in accordance with the statements, representations, and conditions in the application.

Section 7.4.1, Facility Design Criteria, of the License Application dated August 1, 2011, states that Nuclear Fuel Services, Inc. (NFS) buildings are designed and built to the requirements of NFPA 801, as well as, any applicable state, and local building, electrical, and fire codes in effect at the time of their construction.

Section 5.11 of NFPA 801, "Standard for Fire Protection for Facilities Handling Radioactive Materials," 2008 edition, states that "Emergency Lighting shall be provided for means of egress in accordance with NFPA 101, 'Life Safety Code'."

Section 7.9.3.1.1, Periodic Testing of Emergency Lighting Equipment, of the NFPA 101, 2009 version, states the "Functional testing shall be conducted annually for a minimum of 1.5 hours if the emergency lighting system is battery powered."

Contrary to the above, prior to June 28, NFS failed to functional test the battery powered emergency lighting system annually for a minimum of 1.5 hours. Additionally, the licensee failed to identify an equivalency for the test in which it is demonstrated that the lights will work as intended.

This is a Severity Level IV violation.

Background

In 2010, PIRCS Corrective Action 11556 was initiated in order to identify and implement enhancements to improve the NFS Fire Protection Program (NFS-GH-910) and its compliance with NFPA 801 and current codes and standards. As a part of the actions to satisfy this PIRCS item, a review was conducted to compare NFS procedures for inspection, testing, and maintenance of Fire Protection Systems and equipment to the relevant NFPA requirements. This review was completed in 2012. One of the discrepancies found was the NFPA 101 requirement to perform an annual 1.5-hour "lights out" functional test of the battery backups for emergency lights. NFS issued a memo entitled "Authority Having Jurisdiction Decision for Annual Functional Testing of Emergency Lights," dated June 12, 2013, to document the issue. The NFS Authority Having Jurisdiction (AHJ) determined, for reasons referenced herein, that a reasonable degree of safety was provided by alternative methods and that compliance with the provisions of the Code were met.

Section 7.2.1, Fire Safety Organization, of the Special Nuclear Material License SNM-124 states that "The safety discipline director is the senior manager who has the authority and staff to ensure that fire safety receives appropriate priority. He/she serves as the Authority Having

Jurisdiction (AHJ) for the fire protection program and is consulted regarding any NFPA code conflicts.”

NFPA 801, Section 1.5.4, states the following. “Alternative fire protection methods accepted by the AHJ shall be considered as conforming with this standard.”

NFPA 101, Section 4.6.1.1, states “The authority having jurisdiction shall determine whether the provisions of this Code are met.” Section 4.6.1.3 states “Where it is evident that a reasonable degree of safety is provided, any requirement shall be permitted to be modified if, in the judgment of the authority having jurisdiction, its application would be hazardous under normal occupancy conditions.”

Both NFPA 101, Chapter 3, and NFPA 801, Chapter 3, define the following in the same way:

Approved – Acceptable to the authority having jurisdiction.

Authority Having Jurisdiction (AHJ) – An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment materials, an installation, or a procedure.

Based on questions posed by inspectors during the NRC inspection that was conducted in June, NFS contacted NFPA regarding the issue. The following question was asked, “Does the AHJ have the authority to deviate from this or any other portion of NFPA 101?” A response from NFPA is summarized below.

Section 4.6.1 of the Code defines the role of the AHJ: When it comes to enforcement of the Code, the AHJ is the person/entity to determine whether the provisions of the Code have been met.

If you have a scenario that does not meet the provisions of the Code, you also have the option to determine compliance under the equivalency provisions of Section 1.4. Equivalency presents a powerful design alternative that permits individual and multiple specification-based requirements to be satisfied by components and systems that the authority having jurisdiction is convinced meet the goals, objectives, and intended level of life safety of the Code. What you have described is a perfect example of when you might evaluate a situation using 1.4 through a documented AHJ decision.

Further clarification was requested. The “...question is can the AHJ approve a non-compliance with the NFPA code?” The response from NFPA was “Yes. AHJs determine when compliance has been achieved. If an alternate arrangement to the Code has been presented, they can absolutely approve it.”

Basis for Disputing the Violation

The violation states that “the licensee failed to identify an equivalency for the test in which it is demonstrated that the lights will work as intended.” The inspection report goes on to explain “NRC available guidance in section 7.4.3.2.2 of NUREG-1520, Rev. 1, states that a licensee can apply equivalencies and document them for inspection, but the licensee cannot approve deviations or exceptions from the code unless they provide the basis for exceptions in the license application.”

NFPA Equivalency Provisions

NFPA 101, Sections 1.4 and 1.4.3, define the following terms.

Equivalency – Nothing in this Code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this Code.

Equivalent Compliance – Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this Code.

Clearly NFPA allows equivalency evaluations, in the broadest sense, and, as stated in the “Background” section of this response, the AHJ decision-making authority is not limited such that approval of deviations or exceptions from the Code are prohibited. A guidance document, such as NUREG-1520, is “not a substitute for NRC regulations and compliance is not required” (NUREG-1520, Rev. 1, page iii, Abstract, para. 4).

NFPA Periodic Testing Requirements

NFPA 101, Section 7.9.3.1.1 (3), states “*Functional Testing shall be conducted annually for a minimum of 1-1/2 hours if the emergency lighting system is battery powered.*” This test is utilized to ensure that emergency lights function properly, and there is enough emergency lighting operating capability time for occupants to exit in the event of an emergency or power failure (i.e. batteries function properly, light bulbs function properly, etc.).

NFPA 101, Section 7.9.3.1.1 (1), also requires a monthly 30-second functional test of the emergency lights. NFPA 101, Section 7.9.3.1.1 (2), states that “*The test interval shall be permitted to be extended beyond 30 days with the approval of the authority having jurisdiction.*” However, NFS has not pursued extending the interval and each light is tested each month to verify that it is fully functional, and any issues found are investigated and corrected through the formal Work Management process.

“Lights Out” Scenario

A “lights out” scenario involves numerous electrical breakers to be switched off, thus forcing the emergency lights to function. Many of these breakers serve building lighting as well as components of vital production equipment. Some emergency lights and process equipment are tied to the Uninterruptible Power Supply (UPS) system, and the backup generators would also have to be de-energized to achieve the “lights out” scenario. For normal occupancy conditions, turning off the power to the circuits that contain emergency lights could cause hazardous process conditions. Therefore, from a safety stand point, it is not desirable to perform the 1.5-hour lights out testing at the NFS facility.

Fire Protection staff performed a timed walk-through of all buildings/areas within the MAA. The speed of walk was a slow, regular pace, and the route began in the south end of Building 301, meandered throughout the 300 Complex, and ended by exiting the Doffing and Scanning Areas to the outside. The time of travel was 8 minutes and 34 seconds. During the walk-through,

numerous emergency exit doors to the exterior were passed in favor of exiting through the main entrance to the 300 Complex to establish a more conservative exit time. This walk-through time was substantially lower than the 1.5-hours required time of operation for emergency lights on battery power. Also, numerous emergency lights are located in the areas of the complex which provide redundancy and minimize the negative impact of one light failing to operate.

In order for a difficult egress situation to occur, numerous emergency lights must simultaneously malfunction. Based on the number of emergency exits located throughout the facilities and documents requiring personnel to exit the buildings in the event of loss of power, all personnel should be out of the building in much less than the 1.5-hour requirement.

Defense-In-Depth

There is a redundancy of fire and life safety systems throughout the NFS facility. These defense-in-depth systems work together to provide a total fire and life safety package for life and property protection.

Fire protection systems are routinely and rigorously tested, inspected, and maintained. These systems include the following:

- Fire alarm systems with smoke/heat detection, beam detectors, protectowire, and manual pull stations are placed throughout the 300 Complex and other areas throughout the NFS facility.
- Fire suppression systems, including sprinkler systems, fire trace, and FE-25, are present in portions of the 300 Complex and other buildings at NFS. This also includes the CO₂ fire suppression system in Buildings 302 and 303. In the event of a discharge of this system, personnel must leave the evacuation zone prior to discharge (~70 seconds).
- Fire barriers, fire doors, and fire dampers are located throughout the facilities.

Code-required emergency lighting equipment at emergency exit locations includes a mixture of traditional battery-operated units and self-testing/self-diagnostic battery-operated units. Although not required by Code, additional overhead emergency lighting is provided in some locations. Emergency lighting has been added to facilities constructed prior to this NFPA requirement being introduced.

Emergency lights are activated during power outages in portions or all the facilities located at NFS. Problems with emergency lights that do not function as intended are reported in the PIRCS system. Several PIRCS have been entered noting these issues over the last several years: 40033, 38523, 35710, 21775, 11695, 10254, 10200, and 6376. PIRCS 40074 actually noted that the emergency lights functioned as designed in Building 320. Issues are investigated and corrected through the formal Work Management process.

Testing of transformers is also performed periodically, during which the power to the area covered is lost for more than 1.5 hours. Although these outages are not documented as formal testing of the emergency lights, the emergency lights have been proven to operate in areas without power. Emergency lights that do not function properly are reported in PIRCS as noted above.

Finally, the Security requirements at NFS provide additional defense-in-depth through monitored cameras and routine patrols throughout the facility.

Conclusion

With all the above information considered, the 1.5-hour emergency light operation requirement is not needed for NFS facilities as most occupants will have exited the building through the numerous emergency exits or through the main entrance area of the 300 Complex. Based on the timed walk-through, a 10-minute time to evacuate would be a conservative estimate for the entire 300 Complex and would be a bounding estimate for all other buildings located at the NFS facility as they are smaller when compared to the 300 Complex. Again, 10 minutes is substantially lower than the required 1.5 hour time of operation required for emergency lights on battery power.

The "lights out" 1.5-hour test would not increase the safety margin present within the facilities, and the existing life safety/fire protection systems provide more than adequate safety for plant personnel. The intent of the Code requiring the emergency lights to be tested in a "lights-out" condition is met through consideration of all inspected/tested/maintained fire protection systems present at the NFS facility. The monthly inspection/functional test is therefore sufficient to confirm operability of emergency lights for NFS facilities, provides a reasonable degree of safety, and is deemed equivalent under NFPA 101, Section 1.4. Therefore, the NFS AHJ determined that compliance with the provisions of the Code were met.

The Corrective Steps That Have Been Taken and the Results Achieved

The NFS memo entitled "Authority Having Jurisdiction Equivalency Decision for Annual Functional Testing of Emergency Lights" has been revised to further clarify the basis for the equivalency.

The Corrective Steps That Will Be Taken to Avoid Further Violations

No additional corrective steps are planned at this time.

The Date When Full Compliance Will Be Achieved

NFS has been in compliance since June 12, 2013, when the AHJ Equivalency Decision was issued.