

August 15, 2007

Ms. Rebecca Thompson
Regional Assistance Committee Chair
Branch Chief, Technological Hazards Division
FEMA Region II
26 Federal Plaza, 13th Floor
New York, New York 10278-0002

SUBJECT: NRC EVALUATION OF THE NEW ALERT AND NOTIFICATION SYSTEM
(ANS) DEGRADED BATTERY VOLTAGE TESTING AT INDIAN POINT
NUCLEAR GENERATING UNIT NOS. 2 AND 3

REFERENCES:

1. NRC letter to Entergy regarding Confirmatory Order EA-05-190 for the Indian Point Emergency Notification System, (dated January 31, 2006)
2. Entergy letter (NL-06-076) to NRC regarding the Test Plan for Indian Point Emergency Notification System, (dated July 5, 2006)
3. Acoustic Technology Incorporated (ATI) bench test results, "Relative Sound Level vs. Output Power into the Speaker Array for the HPSS30 Siren," (dated June 4, 2007)
4. Entergy Letter to New York State Emergency Management Office regarding Indian Point Energy Center Alert Notification System Design Supplemental Information, (dated June 29, 2007)

Dear Ms. Thompson:

On August 8, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection and evaluation of the new ANS Degraded Battery Voltage Testing at Indian Point Nuclear Generating Units 2 & 3 (Indian Point/Entergy). The testing was done in accordance with the NRC approved siren test plan submitted to the NRC on July 5, 2006 (NL-06-076) (Reference 2) in accordance with NRC Confirmatory Order (the Order) EA-05-190 (Reference 1). The Degraded Battery Voltage Testing complied with the NRC approved test plan. Activities associated with our review are provided in the Enclosure. The results of the testing demonstrated that the backup power supplies meet the design requirements of the Order.

The testing was performed from March 13, 2007, to July 29, 2007, and was done to demonstrate that the integrated ANS, including control stations, repeaters, and the sirens, would be able to operate in the event of a loss of normal alternating current (ac) power with the battery in its end-of-life condition. The battery testing was performed in four basic steps. First, the batteries were discharged to their simulated end-of-life condition taking into account worst case ambient conditions. The batteries were then left in a standby condition for 24 hours under

normal operating loads without normal ac power. After the 24 hour period, a simulated full activation for a duration of fifteen minutes was conducted on a sample of four sirens using a resistor load bank in place of the actual sirens. The final step was to recharge the batteries to at least 80% capacity within 24 hours indicating a satisfactory test. The results from the tests are described in a letter from Entergy to the New York State Emergency Management Office (Reference 4).

It should be noted that after the initial battery test which began on March 13, 2007, there were re-tests done on one of the sirens and one of the control stations. These tests were performed on July 5, 2007 and July 11, 2007, respectively. In addition, an evaluation was conducted by the licensee's contractor Acoustic Technology Incorporated (ATI) that demonstrated an actual siren could sound for approximately 26 minutes before the batteries were completely depleted (Reference 3). The batteries used in this test were drained to their end-of-life condition in the same manner as the batteries used in the Degraded Battery Voltage Test. The re-tests and evaluations are described in the enclosed "Inspection Activities" table.

If you have any specific questions regarding the degraded battery testing inspection activities, please contact Ron Cureton of my staff at (610) 337-5134 or by e-mail at REC3@nrc.gov.

Sincerely,

/RA/

James M. Trapp, Chief
Plant Support Branch 1
Division of Reactor Safety

Docket Nos: 50-247, 50-286
License Nos: DPR-26, DPR-64

Enclosure: Inspection Activities Table

normal operating loads without normal ac power. After the 24 hour period, a simulated full activation for a duration of fifteen minutes was conducted on a sample of four sirens using a resistor load bank in place of the actual sirens. The final step was to recharge the batteries to at least 80% capacity within 24 hours indicating a satisfactory test. The results from the tests are described in a letter from Entergy to the New York State Emergency Management Office (Reference 4).

It should be noted that after the initial battery test which began on March 13, 2007, there were re-tests done on one of the sirens and one of the control stations. These tests were performed on July 5, 2007 and July 11, 2007, respectively. In addition, an evaluation was conducted by the licensee's contractor Acoustic Technology Incorporated (ATI) that demonstrated an actual siren could sound for approximately 26 minutes before the batteries were completely depleted (Reference 3). The batteries used in this test were drained to their end-of-life condition in the same manner as the batteries used in the Degraded Battery Voltage Test. The re-tests and evaluations are described in the enclosed "Inspection Activities" table.

If you have any specific questions regarding the degraded battery testing inspection activities, please contact Ron Cureton of my staff at (610) 337-5134 or by e-mail at REC3@nrc.gov.

Sincerely,

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Enclosure: Inspection Activities Table

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ENCLOSURE
Inspection Activities Table
March 13 - July 29, 2007

Date	Testing/Evaluation Activity	NRC Inspection Activity	Test Results	Comments
March 13 - March 16, 2007	<p>Initial Degraded Battery Voltage Testing</p> <p>This was an integrated test of the batteries at a sample of locations including 5 control stations, all 4 repeaters, and 4 sirens. The test was done in accordance with the NRC approved test plan submitted July 5, 2006 (NL-06-076).</p>	<p>The inspectors reviewed the test documentation to ensure the test was in accordance with the NRC approved test plan (NL-06-076).</p> <p>The inspectors also reviewed the acceptance criteria documentation/calculations to understand the acceptance criteria's engineering basis.</p> <p>Inspectors observed the testing conducted from March 13 - March 16, 2007 and a subsequent review of test documentation was also completed.</p>	Satisfactory (based on further testing and evaluation)	<p>It was noted that the output from the batteries at the siren locations decreases during the activation. The licensee's vendor (ATI) did a bench test evaluation to show that the siren's amplifier is designed to compensate for a degrading battery and the acoustical output would not be compromised (June 4, 2007 evaluation).</p> <p>The test at Siren 101 was not satisfactory due to problems with the resistor load bank. This siren was retested to ensure that its battery was acceptable (see June 5 - 6, 2007 test).</p> <p>After the March 13 - 16, 2007 test, the licensee discovered that the test at the Orange County control station was not valid because the complete set of batteries for the control station were not tested due to four (4) of the twelve (12) batteries being in a different location than the other eight (8). This control station was retested to ensure all 12 batteries were used in the test (see July 11 - 13, 2007 test).</p>
June 4, 2007	ATI performed a bench test with an actual siren to demonstrate that the acoustical output of the siren would not be affected by the decreasing power output of the battery.	The inspector performed an in office review of ATI's test documentation.	Satisfactory	The raw data from the bench test showed that as the voltage of the battery and the power output from the siren amplifier decreased, the effect on the acoustical output of the siren was minimal.
June 5 - June 6, 2007	Siren 101 was retested due to a loose components on the resistor load bank. This test used a different load bank that qualified as being satisfactory for the test.	The inspector observed the retest of siren 101 and a review of the test documentation was also completed.	Satisfactory	The test results were consistent with the results from the other sirens in the March 13 - March 16, 2007 tests.

Date	Testing/Evaluation Activity	NRC Inspection Activity	Test Results	Comments
July 11 - July 13, 2007	The Orange County control station was retested due to this control station having 12 batteries instead of 8, like the other control stations.	The inspector performed an in office review of the test documentation.	Satisfactory	<p>The control station unit itself has 8 batteries but there are 4 more batteries on the roof of the building supplying power to the radio, also located on the roof. This detail was overlooked during the March 13 - 16, 2007 test so the re-test was done to ensure that all batteries associated with the Orange County control station were involved in the test.</p> <p>The other control stations' components are all co-located.</p>
July 27 - July 29, 2007	<p>Retest of the sirens due to a raise in amplifier volume setting.</p> <p>This test was done to demonstrate that the sirens would be able to pass the Degraded Battery Voltage Test when the amplifier volume setting is raised from 130 to its maximum of 145.</p>	The inspector performed in office and on site reviews of the test documentation.	Satisfactory (based on further evaluation)	<p>The results from the test showed that only one siren (siren 101) passed the re-test of the Degraded Battery Voltage Test on the sirens.</p> <p>This test was subsequently considered a success because it was later understood by the licensee that the gel cell batteries need to be cycled 15 times in order to reach nominal capacity ratings. The batteries used at the sirens that failed had not been cycled and were installed for a short amount of time. Siren 101 had a battery that was installed before the June 5 - 6, 2007 test and was cycled during the June 5 - 6, 2007 test.</p> <p>This test was considered satisfactory due to the use of new batteries that had not been cycled giving the bad results. However, siren 101 passed the test with a battery that had been charged for a length of time and had gone through a complete cycle, showing that this battery was closer to its nominal capacity than the other three.</p> <p>It will be a part of the licensee's preventative maintenance program to ensure that any new battery will be cycled in order to reach its nominal capacity.</p>