Nutherm International, Inc.
www.nutherm.com

501 South 11th Street Mount Vernon, IL 62864 Phone:618-244-6000 Fax:618-244-6641

October 17, 2014

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Reply to a Notice of Nonconformance
Reference: Nuclear Regulatory Commission Inspection Of Nutherm International, Inc. Report No. 99900779/2014-201 and Notice of Nonconformance, dated September 17, 2014

In response to the referenced NRC Notice of Nonconformance (NON), Nutherm International, Inc. provides the enclosed reply (Enclosure). In accordance with the instructions specified in the NON, the Enclosure addresses for each 1) the reason for the noncompliance; 2) the corrective steps that have been taken and the results achieved, 3) the corrective steps that will be taken to avoid future noncompliance; and 4) the date when the corrective actions will be completed.

Nutherm International, Inc. understands and accepts the NON received from the NRC during the inspection and in the published Inspection Report. We take this NON seriously; we are committed to correcting the identified issues and have either completed or initiated actions to remedy the specific findings provided and to avoid further noncompliance.

Please contact me if you have any questions or would like additional information.

Sincerely,
Nutherm International, Inc.

Adrienne B. Smith

Adrienne B. Smith
Quality Assurance Manager

ABS/abs

Enclosure: Reply to NRC Notice of Nonconformance Docket: 99900779 Inspection Report: 2014-201

cc: Richard A. Rasmussen, Chief
Electrical Vendor Inspection Branch
Division of Construction Inspection and Operational Programs
Office of New Reactors

IE09
NRO

Enclosure to Reply to a Notice of Nonconformance
Dated 10/17/2014

Nonconformance 99900779/2014-201-01

Statement of Notice of Nonconformance

Criterion III, "Design Control," of Appendix B to Title 10 of the Code of Federal Regulation (10 CFR) Part 50 states, in part, that "The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program."

Contrary to this, Nutherm failed to verify the adequacy of a design change on a level switch for purchase order (PO) 4500731551 for Public Service Enterprise Group (PSEG). Specifically, Nutherm did not perform an adequate engineering evaluation to justify how a design change on a level switch, from a weld to a fitting, was evaluated and is bounded by initial seismic qualification.

This issue has been identified as Nonconformance 99900779/2014-201-01.

Response:

(1) The Reason for Noncompliance: Nutherm International, Inc. accepts the Non-Conformance and offers the following discussion regarding the reason for this Non-conformance:

Nutherm Corrective Action Request 14-CAR-06 was initiated to document this issue.

As part of the manufacture and dedication of the Nutherm Top Mounted Level Switches, Nutherm purchases components and assembles them into the final Level Switch assembly. Physical comparisons between the components and representative test specimens are conducted to verify critical characteristics by similarity. Verification of similarity between the full assembly to be dedicated and the tested design is conducted by review of the production assembly drawings and drawings representing the originally tested specimen.

Contrary to Nutherm engineering practices, the review between the originally tested design drawings and the current Top Mounted Level Switch design drawings was not adequately conducted or documented. The significance of the welded joint to Swagelok joint design difference was not identified and the basis for continued qualification was therefore not documented. Other changes to the design of these units were adequately addressed prior to implementation.

The cause of this nonconformance is inadequate control of Design Interfaces resulting in a design change without formal review by the Equipment Qualification Department of all changes for impact to the item's qualification. A contributing cause was poor communication between Project Management and the Equipment Qualification Departments allowing the change to be implemented without confirmation that review by the EQ department was completed and documented.

(2) Corrective Steps That Have Been Taken And The Results Achieved:

Nutherm has identified all impacted projects. Nutherm Engineering has reviewed all changes between the construction of these units and the original qualified design to determine if other open issues remain. The difference in the fitting was the only issue identified as unresolved. It has been determined that an additional seismic test utilizing the new configuration of threaded joint will most effectively document continued qualification of the device. The test plan for this seismic test is currently being generated.

(3) Intermediate Corrective Steps to be Taken:

The seismic test of the new connector configuration shall be conducted. The results shall be reviewed by the Nutherm Equipment Qualification Department. Based on the results of the testing, the appropriate Engineering review and analysis shall be completed and documented. If the Engineering conclusion is that the Qualification of the unit is adversely impacted due to this design change, appropriate notifications shall be made.

Corrective Steps That Will be Taken to Avoid Noncompliance:

An additional signature block will be added to Nutherm drawings. This signature will document the review by Equipment Qualification (EQ). This will ensure that the Nutherm initial release and revision process for drawings will include an evaluation by the Nutherm Equipment Qualification department. The Equipment Qualification reviewer shall document the review and evaluation of design changes that could potentially impact qualification in the appropriate Nutherm document(s). This evaluation will be performed prior to initial release of production drawings and revisions to existing production design drawings.

An effectiveness review of the process changes incorporated in the procedure revisions and the training performed will be incorporated specifically into the next Internal Audit Plan.

(4) Date When Corrective Actions Will Be Completed: 2/6/2015

Regulation (10 CFR) Part 50 states, in part, that, "Measures shall be established to assure that applicable regulatory requirements and the design basis... are correctly translated into specifications, drawings, procedures, and instructions."

Contrary to this, Nutherm failed to translate contract requirements into test procedures associated with the testing of a transfer switch associated with PO 00406653 and an isolation system associated with PO 734527. Both POs stated that Nutherm test procedures shall be used for electromagnetic compatibility (EMC) testing. Nutherm's test procedures for EMC testing were written in accordance with Electric Power Research Institute (EPRI) technical report TR-102323, "Guidelines for Electromagnetic Interference Testing in Power Plants," Revision 2. The EPRI standard requires specific International Electrotechnical Commission (IEC) standards and revisions to ensure that the EMC testing is performed in accordance with specific criteria. Since Nutherm did not explicitly state the proper IEC revisions as referenced by the EPRI guidance in their test procedures, the commercial labs that performed the testing used different revisions of the IEC standards. In both cases there was no documentation of test set ups and other variables that may have changed in the standards and no technical evaluation to ensure that the differences were accounted for and bounded by the EPRI requirements in the licensee POs.

This issue has been identified as Nonconformance 99900779/2014-201-02.

Response:

The Reason for Noncompliance: : Nutherm International, Inc. accepts the Non-Conformance and offers the following discussion regarding the reason for this Non-conformance:

Nutherm Corrective Action Request 14-CAR-07 was initiated to document this issue.

The cause of the failure to translate the requirements of the customer's contract to the purchase orders written to Nutherm's vendors was determined to be inadequate procedural guidance. At the time the error occurred, the Procurement Control Quality Assurance Procedure (QAP 4.0.00) did not contain a specific requirement to include the revision of all technical requirements invoked in the purchase order. This resulted in failure to perform the activity.

The cause of the failure to perform a comparison between the code years invoked in the EPRI Technical Report, TR-102323, Revision 2, and the code years performed by the vendors performing the work has also been identified as inadequate procedural guidance. At the time the error occurred, the Equipment Qualification Quality Assurance Procedure (QAP 9.7.6.03) did not include a specific requirement to review and document differences between the customer's required code/standard year/revision and that available from the services vendor. The requirement of performing and documenting this comparison as an integral part of the qualification of the units was not recognized because it was not proceduralized.

(1) Corrective Steps That Have Been Taken And The Results Achieved:

The impacted purchase orders and associated projects have been identified.

The Purchasing Control Quality Assurance Procedure 4.0.00 has been revised to address this issue. Training has been performed on this revision. The training included emphasis regarding the expectation that customer required codes and standards, including standard year or edition, are to be flowed down to Nutherm suppliers via the purchase order.

The Equipment Qualification Quality Assurance Procedure 9.7.6.03 has been revised to more clearly provide procedural guidance for the reconciliation of code years and standards identified as customer requirements and those code years and standards available from sub-suppliers. Training has been performed on this revision.

(2) Intermediate Corrective Steps to be Taken:

A comparison of the requirements of the standards years performed during the qualification testing and the standards years listed in the EPRI standard and the customer procurement documents shall be performed. This comparison shall be performed for all jobs with EMI/RFI testing performed since Revision 2 of the EPRI Technical Report, TR-102323, was issued.

Upon completion of the comparison, a determination of the adequacy of the qualification of the items tested shall be performed. If required, appropriate notifications shall be made.

(3) Corrective Steps That Will be Taken to Avoid Noncompliance:

Procedure revisions and training will be utilized to avoid noncompliance. An effectiveness review of the process changes incorporated in the procedure revisions and the training performed will be incorporated specifically into the next Internal Audit Plan.

(4) Date When Corrective Actions Will Be Completed: 1/8/2015

Criterion III, "Design Control," of Appendix B to Title 10 of the Code of Federal Regulation (10 CFR) Part 50 states, "Where a test program is used to verify the adequacy of a specific design feature in lieu of other verifying or checking processes it shall include suitable qualifications testing of a prototype unit under the most adverse design conditions."

Contrary to this, Nutherm failed to qualify direct current (DC) starter panels under the most severe test sequence specified by the Institute of Electrical and Electronics Engineers (IEEE) 323-1974, "Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations." Specifically, Florida Power & Light (Turkey Point) PO 02312805 stated that the DC starter panels would be qualified in accordance with IEEE 323-1974. IEEE 323-1974, Section 6.3.2, "Test Sequence" paragraph (7) states that the equipment shall be operated while exposed to the simulated post-accident conditions (following exposure to accident conditions)." Since Turkey Point did not provide specific post-accident conditions, Nutherm performed a final baseline test of the panels at normal operating conditions to satisfy this condition. However, since accident conditions are 212 F and 100% humidity and the normal conditions are 104 F and humidity is assumed to be non condensing, testing at the normal conditions does not satisfy the most adverse test sequence specified in IEEE 323-1974; nor was a justification provided to show that operating the panels at normal operating conditions after the design basis accident is more severe or equal to operating the panels at simulated post-accident conditions after the design basis accident.

This issue has been identified as Nonconformance 99900779/2014-201-03.

Response:

The Reason for Noncompliance: Typical Harsh qualification programs have a defined post-accident condition (i.e. LOCA) specified by the customer that is used by Nutherm to simulate enveloping post accident conditions during the qualification test program. In the case referenced above, the customer did not provide specific post-accident conditions. The Nutherm engineer assumed that the post-accident conditions were equivalent to the "Normal" conditions defined by the customer and the qualification testing and sequence was conducted upon this basis.

Contrary to Nutherm engineering procedures and practices, the engineering justification for using "Normal" conditions testing to envelop the post-accident conditions and the assumptions made by Nutherm concerning the post-accident conditions were not adequately documented in the qualification plan submitted to the customer for concurrence and approval. The engineering justification for using these conditions was not adequately documented in the qualification report or other suitable engineering document.

The cause of this nonconforming condition has been identified as less than adequate training. The training received by the Engineer preparing the qualification plan did not adequately include the expectation of clearly defining all assumptions in the plan and report provided to the customer.

Nutherm Corrective Action Request 14-CAR-08 was initiated to document this issue.

(1) Corrective Steps That Have Been Taken And The Results Achieved:

The test sequence for the qualification testing of this unit was reviewed. As documented in the qualification report FPL-12808R, Rev. 2, the DC Starter Panel test specimen was operated 3 times during the 33 minute elevated temperature Accident simulation in order to demonstrate proper operation under Accident conditions. As a conservative measure, an "End of Test" operation of the DC Starter Panel was conducted during a 4 minute period following the required 33 minute accident test. During this "End of Test" operation, the test specimen was cycled while subject to temperatures in excess of the elevated peak temperature of 237°F required during the Accident simulation. This testing demonstrated that the test specimen would operate properly in a post-accident environment at temperatures exceeding the more conservative Accident condition peak temperature. Therefore, the testing conducted in the DC Starter Panel qualification program demonstrated that the DC Starter Panel would perform adequately during a post-accident condition.

The conclusion of this review is that, based on the record of the testing performed throughout the accident sequence, testing was performed and documented at the most adverse test sequence as specified in IEEE 323-1974. There is no impact to the results and conclusions of the qualification report for this unit.

(2) Intermediate Corrective Steps to be Taken:

The FPL-12808R, Rev. 2 qualification report will be revised to include the additional justification for adequate performance in the post-accident conditions as described above.

A review of all harsh qualification programs without LOCA conditions specified will be performed to ensure that post-accident conditions have been sufficiently enveloped and that a justification is documented in cases where a lack of customer specified post-accident conditions was enveloped by "Normal" conditions baseline testing.

As part of the review of the qualification reports, a determination of the adequacy of the qualification of the items tested shall be performed. If required, appropriate notifications shall be made.

(3) Corrective Steps That Will be Taken to Avoid Noncompliance:

Training will be conducted regarding the expectation that all applicable assumptions are included in Nutherm test plans.

As part of the process improvement to prevent recurrence, the standard format for Nutherm Qualifications Plans and Reports will be updated to include a specific "Post-Accident" section that clearly documents the method employed by Nutherm to envelop the post-accident

conditions specified by the customer and also will clearly document and justify any assumptions made by Nutherm for instances in which post-accident conditions are not specified.

An effectiveness review of the process changes incorporated in the procedure revisions and the training performed will be incorporated specifically into the next Internal Audit Plan.

(4) Date When Corrective Actions Will Be Completed: 4/10/2015

Criterion III, "Design Control," of Appendix B to Title 10 of the Code of Federal Regulation (10 CFR) Part 50 states, in part, that, "Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components."

Contrary to the above, Nutherm failed to establish adequate measures for the selection and review for suitability of processes performed at Global Testing Laboratories and Elite Electronics Engineering that are essential to the safety-related functions of the structures, systems, and components. Specifically, Nutherm did not identify or verify critical characteristics in their commercial grade dedication that would ensure that either commercial testing laboratory would have the capabilities necessary to perform the requirements of the electromagnetic interference (EMI) / radio-frequency interference (RFI) standards requested through Nutherm and licensee purchase orders.

This issue has been identified as Nonconformance 99900779/2014-201-04.

Response:

The Reason for Noncompliance: The commercial grade survey for the testing services did not include documenting the critical characteristics that were related to the specific test methods being conducted. The critical characteristics identified in the CGS were general in regards to the testing services program.

No formal Component Dedication Planner was generated for each test, therefore the dedication activities did not adequately identify all critical characteristics for verification for each specific test.

The cause of this nonconforming condition was less than adequate training. The need to perform a specific Component Dedication Planner for each test performed by the testing services laboratory was not recognized. A contributing factor to this nonconformance was the lack of Nutherm procedural guidance concerning dedication of services prior to January 2010. While the Nutherm Quality Assurance Procedure 9.7.10.19, Dedication of Commercial Grade Items, was revised January 8, 2010 establishing the requirement for technical evaluation and generation of a component dedication plan for both physical items and services, the training on this revision was less than adequate. The less than adequate training resulted in no changes in the method used in the dedication of these services after the revision was issued.

Nutherm Corrective Action Request 14-CAR-09 was initiated to document this issue.

(1) Corrective Steps That Have Been Taken And The Results Achieved:

A Technical Evaluation has been initiated to provide an evaluation to determine the critical characteristics and the dedication method for the required critical characteristics as they are

applicable to the testing service provided. A dedication plan has been initiated to identify the critical characteristics and acceptance criteria required to dedicate the services provided by the suppliers of EMI/RFI testing.

All projects impacted by the inadequate dedication of these services have been identified.

(2) Intermediate Corrective Steps to be Taken:

All projects using these testing services shall be reviewed. A gap analysis shall be performed to determine if the documentation of the activities performed at the supplier's facilities provide objective evidence of satisfactory controls of the determined critical characteristics.

Upon completion of the gap analysis, a determination of the adequacy of the dedication of the services shall be performed. If required, appropriate notifications shall be made.

(3) Corrective Steps That Will be Taken to Avoid Noncompliance:

Training shall be performed on the subject of dedication of services.

A standard Component Dedication Plan shall be placed on file for the dedication of EMI/RFI services to be invoked each time EMI/RFI test activities are performed. This standard plan shall ensure that all critical characteristics identified are consistently identified and have consistent acceptance criteria.

An effectiveness review of the process changes incorporated in the procedure revisions and the training performed will be incorporated specifically into the next Internal Audit Plan.

(4) Date When Corrective Actions Will Be Completed: 3/13/2015