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May 1, 2013

U.S. Nuclear Regulatory Commission
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U.S. Nuclear Regulatory Commission
ATTN: Richard A. Rasmussen, Chief
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Division of Construction Inspection and Operational Programs
Office of New Reactors
Washington, DC 20555-0001

Subject: Reply to a Notice of Nonconformance

Reference: Report No. 99901320/2013-201

Dear Sirs:

This letter transmits the response to the Notice of Nonconformance identified in Report No. 99901320/2013-201, documenting the Nuclear Regulatory Commission inspection. Attached is an Engineering justification of this response to the Notice of Nonconformance.

Background: Scientech has six divisions located across the United States. The Nuclear Regulatory Commission conducted an inspection at the Instrumentation and Controls Division of Scientech during the period of March 4-7, 2013. The results apply only to the I&C Division located in Idaho Falls, Idaho. The inspection resulted in one Notice of Nonconformance:

Requirement: Criterion XVI, "Corrective Action," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," states, in part, that "*Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.*"

Finding: Contrary to the above, as of March 3, 2013, the NRC inspection team identified one example where Scientech failed to adequately identify and correct a condition adverse to quality. Specifically, Scientech identified a lack of dedication requirements for mechanical testing of seismically sensitive components such as relays, but failed to address if design changes for relays that have already been supplied to the industry invalidate their seismic qualification.

The report, No. 99901320/2013-201, requires the following four points related to the finding be addressed:

- (1) *The reason for the noncompliance or, if contested, the basis for disputing the noncompliance.* Scientech contests the finding of noncompliance. The practices Scientech has followed are accepted industry wide to establish reasonable assurance, the standard for dedication of seismic adequacy. Rather than correcting a lack of requirements, Scientech identified an opportunity for improvement and voluntarily upgraded their program. The Notice of Nonconformance is disputed

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based on the lack of a requirement to impose programmatic improvements retroactively on previously completed work.

(2) The corrective steps that have been taken and the results achieved.

Scientech has voluntarily started to use a seismic test table to gain supplemental assurance that subcomponents meet design specifications. This is an enhanced receipt inspection, a sampling program to generic criteria, not a qualification program.

(3) The corrective steps that will be taken to avoid noncompliance.

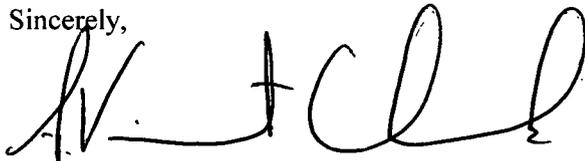
Although Scientech believes there is no noncompliance, our organization will continue to use a seismic test table to gain supplemental assurance that relays and other seismically sensitive components do not chatter. As stated above, this is a sampling program to generic criteria, not a qualification program.

(4) The date the corrective action will be completed.

The seismic table is operational. Material in stock is currently being tested with an estimated completion date of 5/31/2013. New stock is being tested.

Attached is an Engineering discussion in support of this response. We sincerely appreciate the professionalism and the positive attitude of your team. Please contact me with any further questions regarding our response to your inspection of our organization.

Sincerely,



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I&C Division

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Engineering Discussion
of
Scientech's Response
to
Nuclear Regulatory Commission
Report No. 99901320/2013-201
Notice of Nonconformance

Background:

The finding pertains to a Corrective Action Report, CAR 09-007 initiated on 9/29/09. The stated description in the CAR is: *“Current EDBs for Dedication include requirements for purchasing, receipt inspection, manufacturing, inspection, and electrical testing of modules. No requirements for mechanical testing of seismically sensitive components such as relays are included.”*

CAR 09-007 was used to drive an improvement to our program to gain even more assurance, not to correct a deficiency or nonconformance. Scientech upgrades its programs on a regular basis as better and more accurate tools and methods become available. Ten years ago, the cost of a seismic table was prohibitive. At this juncture it is a reasonable addition to our program. No evidence of any nonconformance, in any seismically sensitive component used by Scientech, has been identified. Scientech does not concur with the position that, when a program is enhanced, the upgrade must be retroactively applied to all previous work.

No nonconforming condition was identified in CAR 09-007 because no nonconforming condition existed. Scientech seismically qualifies its safety-related modules to IEEE 344. The basis for qualification/dedication of production modules is:

1. Critical characteristics are defined during design and verified as appropriate for each build through test and inspection.
2. Material is purchased from qualified vendors.
3. Manufacturer and same model number is verified during Receipt Inspection.
4. Materials are controlled.
5. For each module, Manufacturing practices verify that the mounting and physical connections haven't changed.
6. For each module, testing verifies critical aspects of the performance haven't changed.
7. All the above controlled by documented instructions as required by 10CFR50 Appendix B Criterion V.

Scientech believes that these 7 elements form a sufficient basis for 'reasonable assurance' that the components are similar enough to the qualification specimen. This is documented in Engineering Data Briefs for each safety related basic assembly. The EDBs delineate the requirements for dedication, including the purchasing requirements, the receipt inspection requirements, and the testing requirements.

Discussion

Historically, a safety-related component's qualification is by type test – IEEE-323 for environmental qualification and IEEE-344 for performance during and after seismic excitation. At least one unit of each type is tested. Production units are then qualified by similarity to the tested units, based on the procurement of the same components from the same sources and assembly by the same processes. Functional testing of finished electrical equipment is performed to verify proper assembly; qualification testing is not repeated.

In late 2009, Scientech's I&C Division Manager decided to upgrade their program beyond industry norms and enhance receipt inspection of electro-mechanical assemblies. Scientech spent close to a year researching and pricing the available options, and finally decided in late 2010 to expend the capital to purchase a seismic table.

Once that decision was made, three actions were added to the CAR:

- (1) Create procedures for enhanced receipt inspection of electro-mechanical items;
- (2) Revise the QA program to require such enhanced inspections of appropriate new material; and
- (3) Perform such enhanced inspections on appropriate material currently in stock.

Physical modifications to the building were required before the table could be installed, and the table itself was a custom design that had to be manufactured to our specifications. Special foundations had to be built, special anti-vibration precautions taken to avoid affecting the adjacent manufacturing floor, and calibrated test equipment had to be procured, installed, and tested. The custom design included a control system that the manufacturer had to write software for, install, and test. This work took about two years.

While the table was being purchased and installed, Scientech reviewed their existing designs and identified those classes of components where a vendor's design change, that did not affect form, fit, or function, *might* impact the ability of the component to perform properly during and after seismic excitation, and committed to test these components – both those in stock and those bought in the future - as part of an enhanced receipt inspection. Three classes of components were identified where subtle design changes by the manufacturer might affect the ability to withstand seismic excitation, but might not be detected by visual inspection or electrical testing: meters, reed relays, and electro-mechanical relays.

Meters: Further evaluation of meters showed that the stationary coil of the meter is normally in the signal path, and its failure could cause the entire assembly to malfunction. However, there is no credible failure mode of the stationary coil during seismic excitation; it has no moving parts, and it is insulated and varnished such that any loose material in the meter housing cannot affect it. The moving coil of the meter is magnetically coupled to the stationary coil and mechanically connected to the needle through relatively delicate bearings. There are credible failure modes that would cause the needle to jam and no longer indicate properly; however, the indication is not a safety related function. Scientech may continue to seismically test various meters to ensure high quality, but it is not a safety issue under Criterion XVI.

Reed Relays: A similar inspection of reed switches showed that reed switches are only used on one particular version of NUSI modules. They act as an ON-OFF switch to power the module. The credible failure mode under seismic excitation is chatter. The balance of the power circuit is not susceptible to chatter, chatter causes spikes in the input power in the order of milliseconds, even one dropped cycle in a 60 Hz power line (16 milliseconds) will not cause the module power to drop out due to the relatively slow filter capacitor discharge times. Therefore, for Scientech modules, reed relays are not a safety issue under Criterion XVI.

Electro-mechanical Relays: A similar inspection of relays showed that the credible failure mode under seismic excitation is chatter. A design change significant enough to compromise the structural integrity of the relay would be obvious upon visual inspection. The relay output of Scientech's final assemblies is often a safety-related function. Therefore, Scientech determined that electro-mechanical relays should receive the enhanced receipt inspection (seismic testing) at this time.

EDB NUS-G010, Rev 12 was issued 8/28/12 to direct testing a sample of each batch of electro-mechanical relays. Procedures were created to control such testing – not qualification testing, but sufficient to gain additional assurance. Enhanced receipt inspection testing of electro-mechanical relays started in early 2013. The first priority was to test the existing stock; if the existing stock performed properly under seismic excitation, there is reasonable assurance that the relay vendor did not make any design changes since the original qualification that affected seismic response.

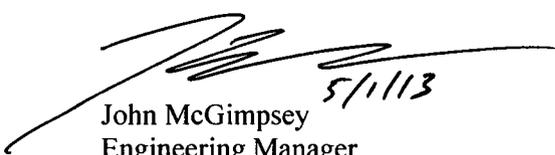
Scientech tested the following relay types and found that all relays performed as expected based on the original qualification testing:

Manufacturer	Model	Description	Results
Panasonic	DS2E-S-DC12V	Relay, 12V 2pdt	Pass
Panasonic	DS2E-S-DC12V	Relay, 12V 2pdt	Pass
US Relays	121AX 14KDAA	Reed Relay	Pass
US Relays	121AX 14KDAA	Reed Relay	Pass
Panasonic	DS4E-S-DC12V	Relay, 12V 4pdt	Pass
NAIS	TF2-12V	Relay, 6.7 mA, 12V	Pass
NAIS	JW2SN-DC-12V	Relay, DPDT, 12V	Pass
Rosemount	7717-175-DAP-Black	Crystal Can Relay	Pass
Panasonic	DS2E-S-DC12V	Relay, 12V 2pdt	Pass
Panasonic	DS2E-S-DC12V	Relay, 12V 2pdt	Pass

Scientech has found no evidence of any nonconforming relays; all relays tested perform as expected based on the original seismic qualification tests. Scientech finds no reasonable basis for concluding that the previous practice of identification critical characteristics, seismic qualification testing, controlled purchase, receipt inspection, assembly, and electrical testing, all in accordance with documented instructions as required by 10CFR50 Appendix B Criterion V, was insufficient to achieve 'reasonable assurance' of proper performance under seismic excitation.

Scientech will continue to perform enhanced receipt inspection (seismic testing) on electro-mechanical relays, and review new designs to identify any other components where such enhanced inspection would provide extra assurance that the components will perform as required under seismic excitation.

Sincerely,



5/1/13
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5/1/2013
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