Versatile Measuring Instruments

White Paper: Mitigating the Risk - CFSI

Revision No.	Prepared/ Revised By	Reviewed By	Approved By	Date	Remarks
0	S. Borland	C. Johnson	C.Johnson	12 July 10	Initial Issue, ECN 652

Prepared Revised By: Scott Borland **Date:** 12 July 2010

Reviewed By: Charles Johnson **Date:** 12 July 2010

Approved By: Charles Johnson **Date:** 12 July 2010

Table of Contents

1 Mitigating the Risk

1.1 Background

The problem facing the nuclear industry in the area of "Counterfeit, Fraudulent and Substandard items" (CFSI), although becoming more prevalent, is nothing new. Back in 1989, the Nuclear Regulator Commission (NRC) issued Generic Letter 89-02 entitled, "Actions to Improve the Detection of Counterfeit and Fraudulently Marked Products" The letter was directed to all holders of operating licenses and construction permits for nuclear power reactors.

In May 1990, the Electric Power Research Institute, (EPRI), published "NP-6629, Guidelines for the Procurement and Receipt of Items for Nuclear Power Plants". This document contains additional information in Appendix C, "Identifying Substandard/Fraudulent Items".

So far, due to the rigorous quality assurance programs required to be in place at nuclear power plants, no counterfeit or fraudulent items have been discovered installed in safety-related applications. How long will this remain to be the case without both suppliers and the utilities taking further steps to mitigate the risk? This problem is not going away.

Counterfeit items, which have entered the nuclear system in the non-safety related arena, include valves, integrated circuits, breakers, and capacitors.

The nuclear utilities in 2009 began to enhance their quality audits with a revision to the Nuclear Procurement Issues Committee (NUPIC) checklist to include a section on CFSI. The expectation is for suppliers to have methods in place to address the issue. The absence of processes addressing CFSI in a suppliers QA program is now resulting in findings by NUPIC audit teams. Shortly afterwards, the Nuclear Industry Assessment Committee (NIAC), a group of nuclear industry suppliers, followed the NUPIC lead and revised their audit checklist, in an attempt to trickle down the requirements to their suppliers. In a recent development, CANPAC has issued a letter to all suppliers on their database regarding the CANDU owners concerns and to make suppliers aware that CANPAC will now be auditing for anti CFSI measures.

1.2 Analysis of Current Processes

The starting point for an organization is to look at the current processes in place to mitigate the risk. This can be done internally or by using an outside source to compare what is in place to recommended actions. This gap analysis method is frequently used when upgrading a quality assurance program.

A review of product categories procured, current procurement methods, personnel training, receipt inspection is required to identify areas open leading to the risk of acceptance of counterfeit items. Most organizations currently rely on receipt inspection to combat CFSI, which is not usually sufficient. Through the development of an "Assessment" Checklist, one can review existing procedures, verify processes and interview personnel to identify weakness or vulnerabilities in current methods.

Following the completion of the analysis identified weaknesses can then be corrected through additional procedures or revisions to current procedures, training and/or increased inspection and testing.

1.3 Training

An important step in the process is training of personnel. This training can be broken down into "Awareness" and "Procedural" sections.

Awareness training involves bringing to the forefront within each organization, current and historic issues with counterfeit, fraudulent and substandard items. This includes:

- Most likely Sources of CFSI
- Counterfeiting Methods
- Types of Fraud
- Departmental Steps to Control CFSI

Procedural training focuses how the organization actively initiates steps to mitigate the risk. This training involves several departments including Quality Assurance, Procurement, Receipt Inspection, Inspection and Test.

1.4 Procurement Process

Vital to a successful defense against CFSI is to know your suppliers. The methods for supplier qualification include audits, surveys and source surveillance. While performing audits or surveys at supplier sites, the NUPIC/NIAC example of including CFSI should be followed. Audits should test the supplier's knowledge on the CFSI issue.

Look for indications that the supplier may be supplying CFSI. These include short lead times on hard to find parts or unusually low bids.

Avoid using brokers and deal with OEMs and authorized distributors whenever possible. This is at times difficult when dealing with obsolescence as is often the case in the nuclear world. If brokers must be used, additional inspections and tests need to be considered.

Specific contract clauses related to CFSI need to be drafted and included in procurement documents. Suppliers need to know the organization's expectations and the implications of supplying CFSI. Payment may be withheld, parts may not be returned and government/law enforcement authorities may be notified.

1.5 Receipt Inspection

Take extra precautions when receiving items prone to risk. Receipt Inspectors need to be provided with as much information as possible in the receiving inspection package. Photos, OEM datasheets, and even if possible, physical examples should be available to inspectors whenever possible. The use of product type specific checklists is also good practice.

A review of the packaging on products and the accompanying documentation can also lead to identification of CFSI. Counterfeiters often falsify material and test reports, and ISO certificates, not just the product.

1.6 Inspection & Testing

Additional inspection and testing for high risk or suspect items beyond receipt inspection will be required. This should be accomplished by developing an "Inspection and Test Plan". The testing may be done in-house but in certain instances will require outsourcing to a third party for part validation.

2 Amidyne Group CFSI Background

Versatile Measuring Instrument (VMI) has been active in the area of CFSI detection area since early in 2009. In August of 2009, a suspect shipment of Phototransistor Optocouplers was identified and later confirmed to be counterfeit. With limited information on what to do once counterfeit parts are discovered, a call was made to EPRI. This highlighted a shortcoming in the work the EPRI Technical Advisory Group was doing in the creation of a guidance document. Subsequently, this led to the involvement of Amidyne in the new EPRI Document (1019163) on CFSI and section on the report process.

The QA department at Amidyne continues to improve processes, training personnel and present on CFSI at conferences and trade shows. Management fully supports all efforts to fight CFSI infiltration into the nuclear supply chain.

Amidyne Group employs a staff of about 40 people, and has recently moved into a new facility in Newmarket. The facility was designed to become a 'one stop shop', consisting of a team of 'utility' engineers with site knowledge, procurement engineers, design engineers and technologists, as well as QA professionals, integrated with a manufacturing and qualification facility. This facility is equipped to provide prototype and manufacturing capabilities, environmental qualification, certain EMC (electronic) qualification capabilities, as well as seismic qualification.

3 Qualifications – Quality Assurance

VMI has been audited by CANPAC, QMI-SAI Global, a NIAC member company and Duke Energy (audit team consisted of Duke Energy, Progress Energy and South Carolina Electric & Gas) and is presently qualified under the following QA designations:

Reverse Engineering:	Z299.2; N286.2; 10CFR50 Appendix B
Design Engineering:	Z299.2; N286.2; 10CFR50 Appendix B
Nuclear Qualification:	Z299.2; N286.2; 10CFR50 Appendix B
Procurement:	N286.1; 10CFR50 Appendix B
Manufacturing:	Z299.2; 10CFR50 Appendix B
System Integration:	Z299.2; 10CFR50 Appendix B
Commercial Grade Dedication:	Z299.2; 10CFR50 Appendix B

4 Contact Information

For further information regarding VMI's capabilities, or for general inquiries, in Canada please contact:

Contact: Rick Oughtred
Title: Director of Operations - Nuclear
Email: roughtred@amidyne.com
Telephone: 1-800-742-1413
905-954-0841
Fax: 905-954-0415

In the United States please contact:

Contact: Steve Werlick
Title: Sales Manager
Email: swerlick@amidyne.com
Telephone: 1-800-742-1413
Cell: 905-217-7096
Fax: 905-954-0415

Quality Assurance

Contact: Scott Borland
Title: Quality Assurance Manager
Email: sborland@amidyne.com
Telephone: 1-800-742-1413
905-954-0841
Fax: 905-954-0415