MANUAL PICKLIST

Electroswitch
180 King Avenue
Weymouth, MA 02188

Company Address:

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Name of Caller: _____

Date Promised: 7/14/16

Ship Via: UPS Red

To Customer: **To Rep:** _____

Our Ticket #: _____

Customer P.O.#: _____

DESCRIPTION

Reason: _____

Approved by: _____

*Inventory items such as switches and parts are to be typed as an order

Shipped: _____
Via: _____
Date: _____

MCH34, REV 1

IE09
NRO

To whom it may concern:

Enclosed are two versions of the corrective action. One is for the NRC and one is for the public posting. NOTE: The one for public posting has been redacted.

Differences between the two versions:

The NRC version had proprietary information detailing some specifics on the material/plating of our critical components, while the public version has the specifics blacked out.

If you require any further clarification, please feel free to contact me.

Larry Friedman

Quality Assurance Manager

Telephone: 781-607-3309

Email: lfriedman@electroswitch.com

Electroswitch	NON CONFORMANCE REPORT	Rev: J	Document no: NONCON-1 CAR #16-011

ANY EMPLOYEE

DATE: 4/28/16	REF. #: NRC Vendor Inspection Docket #99900833	INITIATED BY: Larry Friedman
ITEM: Criterion III of 10CFR50 Appendix B		
NONCONFORMANCE :	Compliance to Criterion III – Design Control	AREA: Design

DESCRIPTION OF NON CONFORMANCE:

Criterion III, Design Control, of 10CFR50 Appendix B in part states "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."

Electroswitch did not procure materials, parts, equipment and/or services from an Appendix B supplier nor were applicable Commercial Grade Surveys, Source Inspections and Material analyses performed for the following materials:

- Precious metal blade overlay material
- Red metal blade material
- Precious metal overlay thickness of switch blade material
- Molding compound of switch insulators
- Carbon steel for securing rods
- Solenoids
- Relays
- Services pertaining to product qualification

QC MGR

IMMEDIATE DISPOSITION/SHORT TERM FIX: (DUE WITHIN 10 WORKING DAYS OF FINDING)

Engineering conducted an internal review of the identified materials to determine what exposure this could be from the viewpoint of Electroswitch, who is the design authority of the product. Below are some activities which would be another indication of correct material:

- Precious metal blade overlay material – contact resistance test after aging (initial and periodic qualifications)
- Red metal blade material – in-process inspections during fabrication operation
- Precious metal overlay thickness of switch blade material - in-process inspections during fabrication operation
- Molding compound of switch insulators – in-process inspections during fabrication operation and dielectric withstanding voltage and insulation resistance test after aging (initial and periodic qualifications)
- Carbon steel for securing rods - in-process inspections during fabrication operation
- Solenoids – circuit configuration test (initial and periodic qualifications)
- Relays – circuit configuration test (initial and periodic qualifications)

See Appendix A for results.

RESPONDED DATE: **5/16/16**

DISPOSITIONED BY: **ED RESZENSKI**

*** All blocks to be completed and legible – no pencil**

Electroswitch	NON CONFORMANCE REPORT	Rev: J	Document no: NONCON-1 CAR #16-011

DEPARTMENT MGR

WHAT CAUSED THE NONCONFORMANCE? (ROOT CAUSE):

When Electroswitch had originally developed their Commercial Grade Dedication program in 1984, it was set up to have the products, which were sold as safety-related Class 1E, dedicated at the final assembly/testing of the product. All materials/components used were purchased as commercial grade.

This dedication program had been assessed as being acceptable by numerous NUPIC audits. In 2012, the NUPIC audit did identify that there was no formal procedure describing the existing dedication program. A documented procedure QCPGA041 Rev. A dated 9/10/13 was written and submitted as part of the corrective action CAR #12-004 to address the finding VA12053-01. See Appendix B.

Because this procedure was accepted, there were no changes to the original concept.

SIGNATURE: **LARRY FRIEDMAN**

ACTIONS TO PREVENT RECURRENCE (CORRECTIVE ACTION):

There will be no additional actions taken to prevent recurrence since Electroswitch has ended its 10CFR50, Appendix B Quality Assurance Program effective March 24, 2016. See Appendix C.

Electroswitch will still continue to manufacture the products; however, they will be sold as commercial product only.

Preventive Action Report Reference # (Where Applicable):

ASSIGNED TO: * **Larry Friedman** DUE DATE: **6/24/16**

* SIGNATURE AT COMPLETION: **LARRY FRIEDMAN** DATE: **7/12/16**

QM

CLOSE OUT DETAILS (REVIEW EFFECTIVENESS OF ACTIONS TAKEN):

Not applicable, due to the fact that Electroswitch has ended the 10CFR50, Appendix B Quality Assurance Program. Electroswitch can provide individual components made from the identified materials listed in the above nonconformance in order to assist any utility with their internal evaluation.

SIGNATURE:	DATE:
Larry Friedman	**7/12/16**

ANY

COMMENTS:

*** All blocks to be completed and legible – no pencil**

[ ]

Electroswitch has been designing and manufacturing switches since 1946. In 1978 Electroswitch developed ESC-STD-1000 "General Specification for Rotary Switches and Relays for Utility Applications including Class 1E equipment Requirements for Nuclear power generating stations". This standard is used to qualify switches and auxiliary relays for utility applications including class 1E equipment requirements for Nuclear Power Generating Stations. This standard also defines the periodic testing that is done to ensure that the product performs to the same electrical and mechanical characteristics the product was originally qualified to. In the 1980's Electroswitch began to qualify switches to ESC-STD - 1000.

Since the initial qualification testing we have conducted 180 periodic class II tests, confirming that the product still performs as when it was originally qualified. The qualification tests and periodic tests are defined within ESC-STD-1000.

The key components of the switches are the contact and terminal materials along with the insulation materials used for the contact decks, barriers and rotors. These have remained unchanged over the almost 4 decades we have been manufacturing these switches. Electrical contact surfaces are [ ] with a minimum thickness [ ]. The key insulating materials are [ ]. Again these have remained unchanged over the life of the products. These key components go through various tests from incoming inspection, in process inspections and final testing of the product.

For the Series 24 switches and Series 31 LSR and Tagging Relay we utilize a double wiping knife blade that constantly cleans the two contact surfaces with each activation of the switch. These blades are manufactured in our Rockland facility under Statistical Process Control which verifies our process of producing these blades is robust and repeatable. As stated before these blades have [ ] bonded to a high grade phosphorus bronze providing low contact resistance with consistent contact force throughout the life of the switch. The terminals used in conjunction with the contacts are also manufactured in our Rockland facility under Statistical Process Control. They also have a minimum of [ ]. These two key components allow us to manufacture a switch where the contact resistance does not exceed 10 milliohms at end of switch life. There has been no change to these materials over the life of the product lines. Our periodic class II testing has confirmed our ability to meet this less than 10 milliohm specification over the life of the product. We have been buying these materials from the same suppliers for many years. These materials are custom made for Electroswitch.

The primary insulating materials used in all our switches are [ ]. Along with their excellent insulating properties [ ] do not break down under radiation. During our qualification testing the [ ] components were able to withstand the harsh environments of 10 megarads of radiation as outlined in ESC-STD-1000. We utilize [ ]. We have continued to use the same suppliers of these [ ] over the past 4 decades.

The series 20 switches utilize [ ] contacts for current carrying and [ ] for insulating material. These key components are manufactured to Electroswitch specifications. This

coupled with a robust assembly process has proven to provide many years of reliable service in both Nuclear and non-nuclear applications.

The switches under this program and their designs are mature. They along with robust manufacturing techniques have proven through testing and field performance that the design and materials are stable. All switches are tested to the same procedures in accordance with ESC-STD-1000, "General Specification for Rotary Switches and Relays for Utility Applications including Class 1E equipment Requirements for Nuclear power generating stations". These products are installed in a huge customer base, only a small portion of which is class 1E oriented. The successful application of these products, and the feedback from "Commercial" utilities support the reliability of the product and verify the consistency of the design. Electroswitch products are used not only in Nuclear Power Plant Applications but also in Utility applications worldwide. Each year we produce over 300,000 switches for the utility, industrial and military markets. In 2014 we received back from the field 51 installed switches with potential issues from our total installed customer base. We shipped 355,601 switches in this same time period. This calculates to a PPM of 143 or 0.0143%

Appendix A

Subject: Dedication Program

1.0 Purpose:

This procedure is to describe the how Electroswitch's commercial grade products for Class IE application are dedicated.

2.0 Scope:

This program applies to commercial grade product which is used in a Class 1E safety related application by the customer.

3.0 Definitions:

3.1 Commercial Grade Item:
A structure, system, or component, or part thereof, that affects its safety function that was not designed and manufactured in accordance with the requirements of ASME NQA-1.

3.2 Critical Characteristics:
Important design, material, and performance characteristics of a commercial grade item or service that, once verified, will provide reasonable assurance that the item or service will perform its intended safety function.

3.3 Dedication:
An acceptance process performed in accordance with ASME NQA-1 to provide reasonable assurance that a commercial grade item or service will successfully perform its intended safety function and, in this respect, is deemed equivalent to an item or services provided under the requirements of ASME NQA-1.

4.0 Background:

Electroswitch is a manufacturer of commercial grade switches and relays. Electroswitch has a 10CFR50 Appendix B quality program. Electroswitch received safety related purchase orders from utilities for complete assemblies. Any purchase order, which contains requirements for use in a Class 1E safety related application, is reviewed under the guidance of Engineering procedure ENGSP017 – Handling Orders and Repairs for Class 1E Applications.

5.0 Dedication Program:

5.1 Electroswitch's program for dedicating commercial grade product is structured as follows:

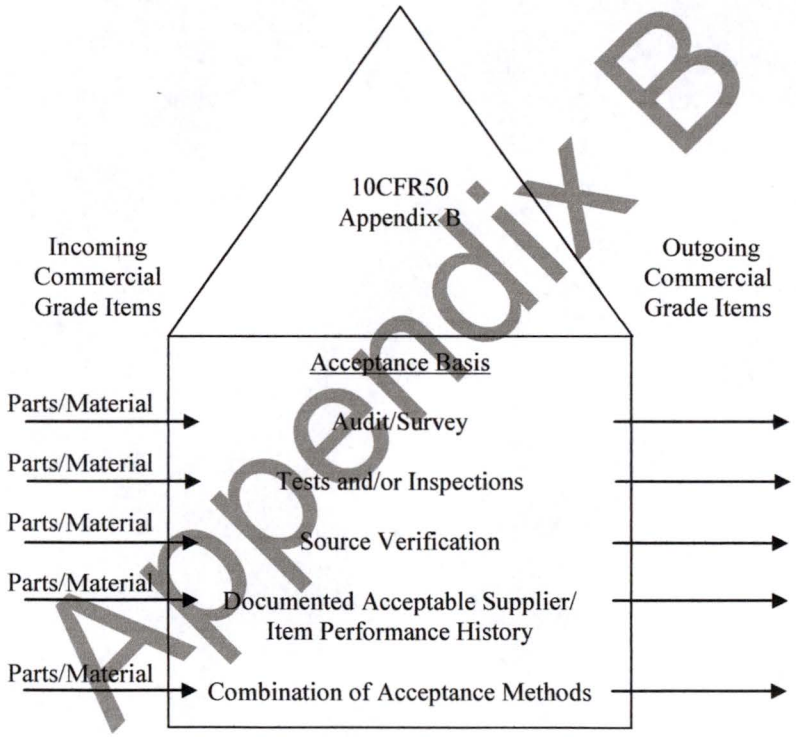
5.1.1 All parts are either manufactured by Electroswitch or purchased from a supplier on Electroswitch's Approved Supplier List. The parts purchased from a supplier are commercial grade and not a basic component and, therefore, the requirements of 10CFR50 Appendix B and 10CFR21 are not invoked. Electroswitch uses Option D, as described in the Supplemental Guidance for the Application of EPRI Report NP-5652, to accept these commercial grade parts. The acceptance basis for these commercial grade parts is that the supplier is on Electroswitch's Approved Supplier List and the parts are received and inspected under the purview of Electroswitch's Quality System.

5.1.2 When a safety related purchase order is received for the product, the manufacturing order is identified as Class 1E. The product is accepted by tests and inspection to assure that the critical characteristics are conforming as defined by Electroswitch's Engineering drawing.

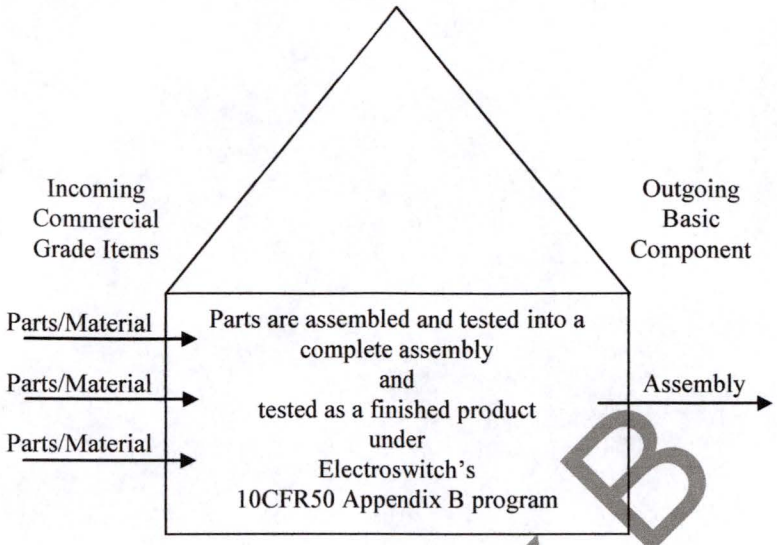
6.0 Reference documents:

- 6.1 Electroswitch Quality Manual
- 6.2 QOP 012 Assembly and Final Test Procedure
- 6.3 ENGSP017 Handling Orders and Repairs for Class 1E Applications
- 6.4 SALES026 Sales Procedure
- 6.5 Supplemental Guidance for the Application of EPRI Report NP-5652
- 6.6 ASME NQA-1 Quality Assurance Requirements for Nuclear Facility Applications

7.0 Appendix



Method Used to Accept Commercial Grade Items
Fig. 1



Pictorial Representation of this procedure
Electroswitch's Method Used to Dedicate Commercial Grade Item
Fig. 2

ELECTROSWITCH • SWITCHES & RELAYS
UNIT OF ELECTRO SWITCH CORP.

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March 24, 2016

Subject: Ending the 10CFR50, Appendix B Quality Assurance Program

Dear Sir or Madam,

This letter is to serve as formal notification that, after a long and in depth review, Electroswitch will be ending its 10CFR50, Appendix B Quality Assurance Program and the acceptance of safety-related Class 1E product orders effective this date. Any open safety-related Purchase Orders will still be fulfilled.

This decision was based upon the declining market conditions as well as the internal costs necessary to satisfy the methodology to dedicate commercial-grade items for use in safety-related application as described in the recently revised EPRI document NP-5652 Revision 1 (Plant Engineering: Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications).

As required by 10CFR21.51, "Reporting of Defects and Noncompliance – Maintenance and Inspection of Records", Electroswitch will retain all the associated records of purchase of basic components for 10 years after the delivery date.

Please note that, under our ISO 9001 Quality System, Electroswitch will still continue to manufacture and sell the same commercial switch products. Electroswitch will accommodate:

1. NUPIC surveys for the purpose of nuclear utilities' Commercial Grade Dedication of Electroswitch products.
2. Source surveillances by the nuclear utilities or 3rd parties for the purpose of Commercial Grade Dedication of Electroswitch products.

We regret we are unable to continue this program and for any inconvenience this may cause.

Please feel free to contact sales with any questions.

Best regards,

Bruce MacDonald
Sales Manager

Larry Friedman
Quality Assurance Manager