



ENGINE SYSTEMS, INC.

175 Freight Road
Rocky Mount, NC 27804

Telephone: 252/977-2720
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January 9, 2020

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Subject: 10CFR21 Reporting of Defects and Non-Compliance -
Engine Systems, Inc. Report No. 10CFR21-0128, Rev. 0

Selenium Surge Suppressor, EMD P/N 8403049

Dear Sir / Madam:

The enclosed report addresses a reportable notification on a selenium surge suppressor, EMD P/N 8403049.

A copy of the report has been mailed to our affected nuclear customers.

Please sign below, acknowledging receipt of this report, and return a copy to the attention of Document Control at the address above (or, fax to number 252/446-1134) within 10 working days after receipt.

Yours very truly,

ENGINE SYSTEMS, INC.

Susan Woolard
Document Control

IE19
NRR

Please let us know if ANY of your mailing information changes - name of recipient, name of company/facility, address, etc. Mark the changes on this acknowledgment form and send to us by mail or FAX to the number above.

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RECEIVED: _____

DATE: _____



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Report No. **10CFR21-0128**

Rev. 0: 01/08/20

10CFR21 REPORTING OF DEFECTS AND NON-COMPLIANCE

COMPONENT: Selenium Surge Suppressor
P/N 8403049

SYSTEM: Emergency Diesel Generator

CONCLUSION: Reportable in Accordance With 10CFR21

Prepared By:

Jun Lin

Engineering Manager

Date:

1/8/2020

Reviewed By:

Dan Roberts

Quality Assurance Manager

Date:

1/8/2020

Report No. 10CFR21-0128

Record of Revisions
Page: 1 of 1

REV	DATE	PAGE	DESCRIPTION
0	01/08/20		Initial issue.

Pursuant to 10 CFR 21.21(d)(4), ESI is presenting the required information as follows:

- (i) Name and address of the individual or individuals informing the Commission.

*John Kriesel
Engineering Manager
Engine Systems Inc.
175 Freight Rd.
Rocky Mount, NC 27804*

*Dan Roberts
Quality Manager
Engine Systems Inc.
175 Freight Rd.
Rocky Mount, NC 27804*

- (ii) Identification of the basic component supplied within the United States which fails to comply or contains a defect.

Selenium surge suppressor P/N 8403049.

- (iii) Identification of the firm supplying the basic component which fails to comply or contains a defect.

Engine Systems Inc. (ESI)

- (iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

Three batches of selenium surge suppressors supplied by ESI between 2011 and 2013 utilize a thread modification that is inadequate for the application. The design specifies the use of a single 1/4-20 x 2-3/4" long bolt to compress the stack of selenium cells as well as mount the suppressor (see Figure 1). Contrary to this requirement, the manufacturer used a #8-32 screw through the body of the stack and added a modified bolt to obtain the required 1/4-20 mounting threads. The modified bolt consisted of a 1/4-20 x 5/8" long bolt that was drilled and tapped in the head to accept #8-32 threads. An attempt to install the selenium surge suppressor by tightening the corresponding mounting nut may result in failure of the modified bolt threads. See photos 1, 2, & 3.

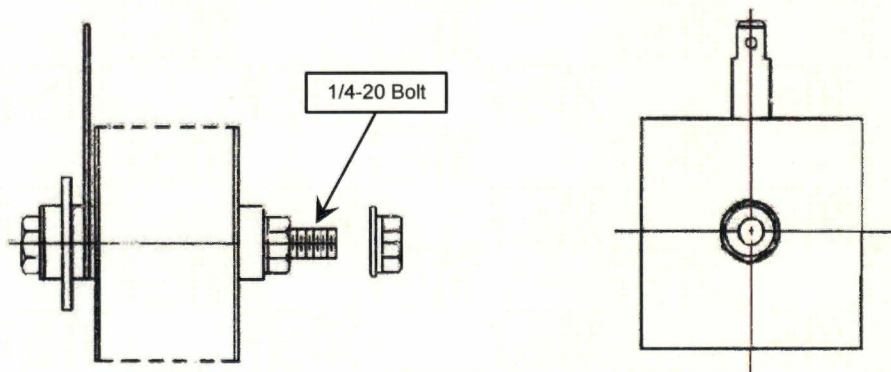
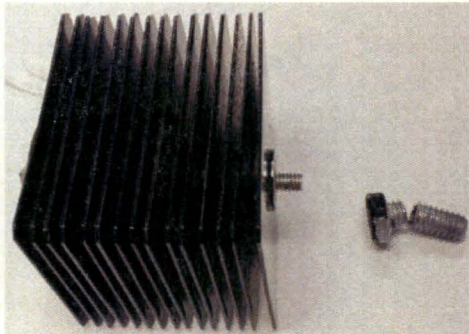
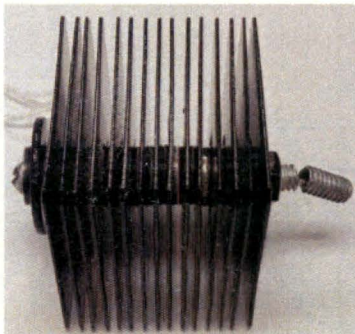


Figure 1: Outline Drawing of Selenium Surge Suppressor P/N 8403049



Photos 1, 2, & 3: Views of Suppressor with Modified Screw

The selenium surge suppressor is a subcomponent of rectifier assembly P/N 8334736 (see Figure 2) used in the Vickers voltage regulator system. The rectifier assembly is shown as components CR1 through CR6 in Figure 3 and each function as a half wave rectifier, used in the static exciter, to furnish DC voltage for excitation of the generator field. The selenium surge suppressor protects the diode from surges by clamping at a voltage below the critical voltage for the diode, thus conducting around the diode at high energy levels.

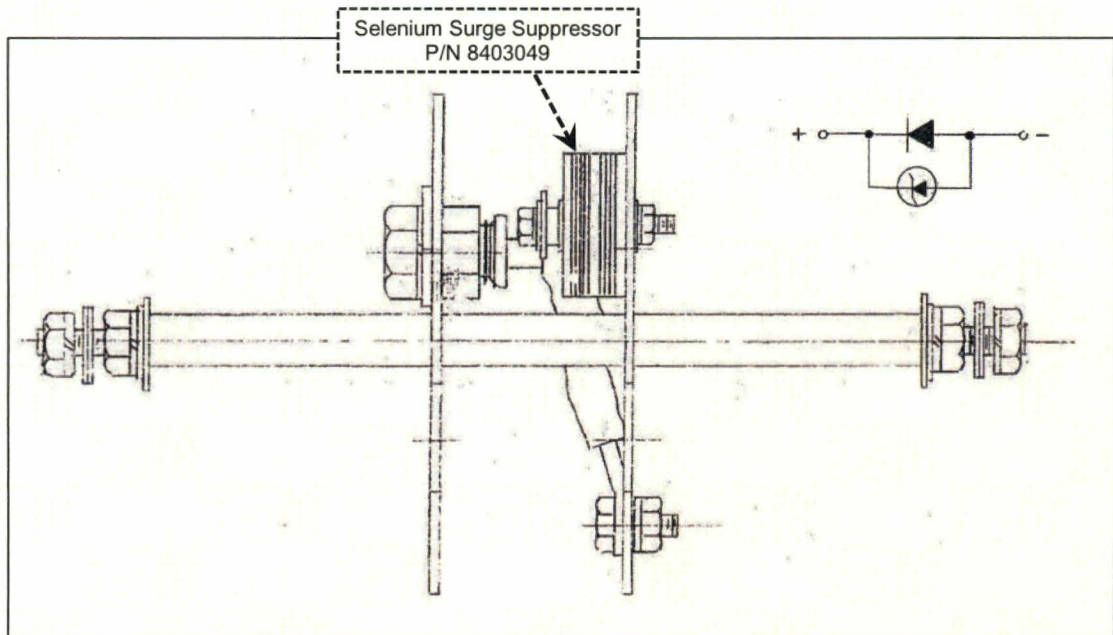


Figure 2: Rectifier Assembly P/N 8334736 (containing P/N 8403049)

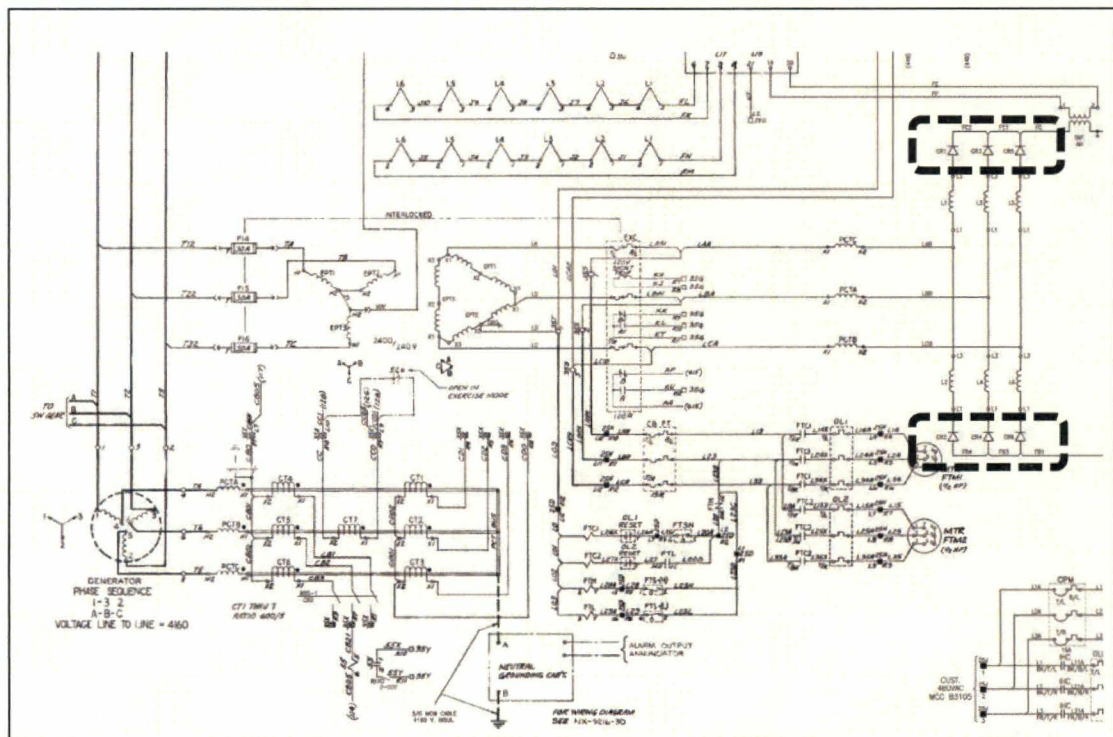


Figure 3: Typical Vickers Voltage Regulator System Schematic

Use of this thread modifier significantly reduces the strength of the mounting threads. Failure of the mounting threads creates the possibility of the suppressor dislodging with the potential to electrically short between the positive and negative plates of the rectifier assembly. An electrical short would affect output of the voltage regulator system which may prevent the emergency diesel generator set from performing its safety-related function. This issue is therefore considered to be a reportable defect as defined by 10CFR-part 21.

(v) The date on which the information of such defect or failure to comply was obtained.

November 14, 2019

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

Description	Customer	ESI Sales Order	Customer P.O.	Qty	C-of-C Date
Selenium Surge Suppressor P/N 8403049	NextEra Energy – Point Beach Nuclear Plant	3007242	00031254	3	01-Nov-11
		3010498	02313190	1	01-Mar-13
	Dominion Virginia Power – Surry Power Station	3011367	4500064790	24	27-Sep-13

(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

For affected users:

- For surge suppressors installed, these are functionally acceptable but may be structurally compromised. The concern is the mounting nut may have unknowingly been tightened beyond the allowable strength of the bolt which could eventually cause the mounting system to fail. ESI recommends inspection and/or replacement at the next opportunity.*
- For surge suppressors not installed, ESI recommends they be returned for replacement.*

For ESI:

This part number has been discontinued and ESI will offer new selenium surge suppressor P/N 8403049-ESI made by a different manufacturer but to the original drawing and design requirements. Within the new dedication package, ESI will include an inspection to verify the issue described in this report is not present. The time frame to source new suppressors and complete dedication activities is 12 weeks.

(viii) Any advice related to the potential defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

N/A