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Telephone: 252/977-2720
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April 21, 2003

U.S. Nuclear Regulator Commission
Document Control Desk
Mail Stop 0P1-17
Washington, DC 20555

Subject: 10CFR21 Reporting of Defects and Non-Compliance -
Engine Systems, Inc. Report No. 10CFR21-0086, Rev. 0

Woodward EGM Controls

Dear Sir:

The enclosed report addresses a reportable notification about Woodward EGM controls.

A copy of the report has also been sent 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

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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Report No. 10CFR21-0086
Rev. 0: 04/18/03

10CFR21 REPORTING OF DEFECTS AND NON-COMPLIANCE

COMPONENT: Woodward EGM Controls,
P/N 9903-014, 9903-016, 9903-188, 9903-460

SYSTEM: Governor Controls

CONCLUSION: Reportable in accordance with 10CFR21.

Prepared By: _____ Engineering Manager Date: 4/18/03

Reviewed By: Michael Nuding Quality Assurance Manager Date: April 18, 2003

COMPONENT:

Woodward EGM Controls, P/N 9903-014, 9903-016, 9903-188, 9903-460.

SUMMARY:

Engine Systems Inc. (ESI) has concluded an investigation of a condition reported with a Woodward EGM control. An EGM control, part number 9903-460, serial number 10019993 was sent to ESI for repair and refurbishment because of an instability problem. After repair/refurbishment, the site reported that the Stability and Amplifier Gain potentiometers were swapped. This condition could have been detected by verifying the control's actuator output signal (terminals 4&5) for a voltage range of at least +/-8 VDC. Woodward's functional test procedure for this part number EGM did not contain a requirement to verify the range of the actuator output signal and therefore the swapped potentiometers were not detected. The Woodward test procedures for all EGM (and the similarly designed EGA) controls supplied by ESI for nuclear service were reviewed for adequacy to detect the swapped potentiometer condition. The test procedures for the part number controls listed in the Component section above were determined to be inadequate. These EGM controls have been previously supplied or refurbished by ESI.

Test procedures for the part numbers listed below were determined to be adequate to detect a swapped potentiometer condition and therefore ***these part numbers are specifically excluded from this notification.*** The EGM and EGA controls listed below have been previously supplied or refurbished by ESI.

Part number	Type		Part number	Type
9903-059	EGM		9903-003	EGA
9903-085	EGM		9903-037	EGA
9903-109	EGM		9903-225	EGA

DISCUSSION:

EGM control, part number 9903-460, serial number 10019993 was sent to ESI for refurbishment. D.C. Cook originally purchased the control new in September 1994, directly from Woodward Governor, and it had never been placed in service. When installed in November 2002, the control exhibited instability and thus it was sent to ESI for repair/refurbishment. ESI sent the control to Woodward Governor for the repair/refurbishment activity. Woodward performed a test upon receipt and the instability could not be identified; the control passed all testing requirements of Woodward's test procedure. Because of the age of the control, a standard refurbishment was performed; seven (7) capacitors and four (4) potentiometers were replaced. The control was successfully tested after refurbishment and ultimately returned to the site during the last week of January 2003. Upon inspection at the site, it was observed that the Stability and Amplifier Gain potentiometers were swapped. Another of the site's controls (same part number), with sequential serial number 10019992 was also inspected and found to have the same condition. Control serial number 10019993 was again returned to ESI to have the potentiometers corrected. The control was corrected and returned to the site in February 2003.

Both EGM controls were manufactured sequentially. Because s/n 1001992 was not refurbished, it is concluded that the potentiometers were incorrectly installed during original fabrication in 1994. When s/n 10019993 was refurbished, a like-for-like component replacement was performed and therefore the error was repeated.

CONCLUSION:

The EGM and EGA controls are used with "compensating" type actuators. For these systems, the actuator output signal is zero volts during steady state conditions and the signal's magnitude and polarity varies in response to load changes. Reversal of the Stability and Amplifier Gain potentiometers will limit the range of the actuator output signal and thus the dynamic response of the control would be limited. This could impact system response during load or speed variations. No other operability effects will occur. Controls that are installed and verified by load testing are therefore excluded from consideration of this reported condition.

CUSTOMERS AFFECTED:

ESI has searched its historical data and has determined the following customers have suspect EGM controls. Only controls supplied or refurbished by ESI are listed. There may be other part number EGM and EGA controls in service that were supplied by others, these will need to be evaluated as they are identified.

CUSTOMER	SITE	PART NUMBER
American Electric	D.C. Cook Nuclear Plant	9903-460
Energy Northwest	Columbia Nuclear Plant	9903-016
Entergy Nuclear	Vermont Yankee Nuclear Plant	9903-014, 9903-188
Entergy Nuclear	Pilgrim Yankee Nuclear Plant	9903-014, 9903-188
Nebraska Public Power	Cooper Nuclear Plant	9903-014
Southern Nuclear	Farley Nuclear Plant	9903-188

CORRECTIVE ACTION:

1. ESI has added the requirement to verify the actuator output signal of all Woodward EGM and EGA controls for +/- 8 VDC minimum range. This requirement is considered a critical characteristic for commercial grade dedication of these controls.

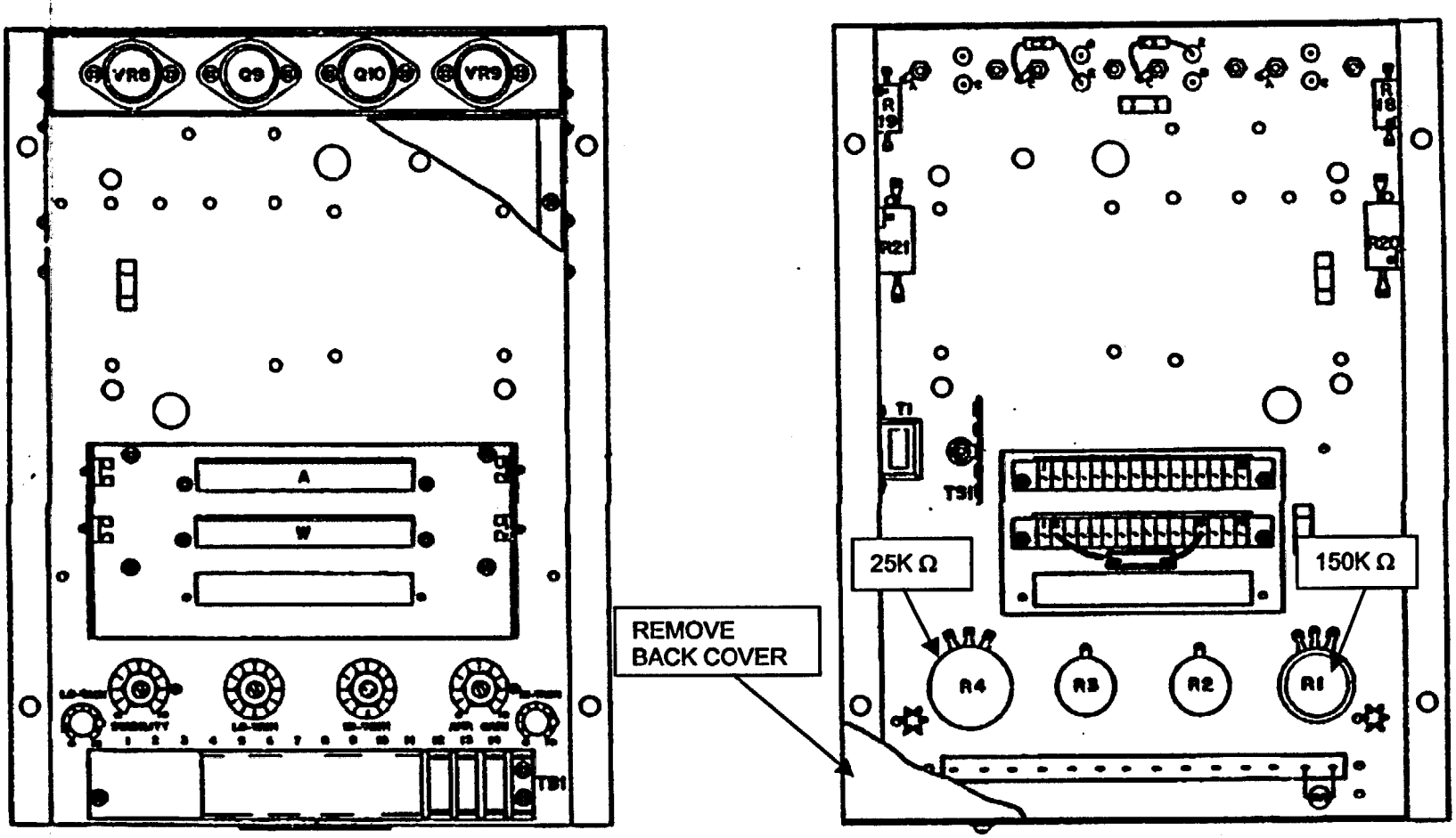
2. Users should inspect all controls listed in the Component section that have not been placed in service or with operability not verified by load testing. This inspection can be performed by removing the control's rear cover and inspecting for the following (reference Exhibit 1):

   a. The Stability potentiometer, circuit designation R1, should be 150K ohms.
   b. The Amplifier Gain potentiometer, circuit designation R4, should be 25K ohms.

3. Any EGM and EGA controls with part numbers different from those presented in this document must also be evaluated for applicability of the condition reported. Contact ESI's Customer Service department with the part number and serial number of the control(s).

4. Controls identified as having reversed potentiometers should be sent to ESI for correction. Contact ESI's Customer Service department for information about sending a control.

EGM COMPONENT LAYOUT



FRONT VIEW

REAR VIEW