

Part 21 (PAR)

Event # 50623

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NRC Notified by: DONNA MULLALY	Notifications: TODD JACKSON	R1DO	
HQ Ops Officer: DANIEL MILLS	FRANK EHRHARDT	R2DO	
Emergency Class: NON EMERGENCY	HIRONORI PETERSON	R3DO	
10 CFR Section:	BOB HAGAR	R4DO	
21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE	PART 21 GROUP	EMAIL	

PART 21 - LACK OF PROPER POWER SUPPLY INDICATION

The following information was summarized from the report obtained from the vendor via facsimile:

Technology for Energy Corporation [TEC] has determined that the Model 1414 Valve Flow Monitoring Systems power supply may not provide proper output voltage contrary to power supply status indicators on the rack. This may result in the power supply not providing necessary power to its associated input sensor. A subsequent loss of the sensor output would result in the inability of the system to indicate any valve flow. Depending on the specific configuration, signals from more than one sensor could be lost on a single failure.

This Model 1414 system design dates back to 1979. TEC has not been made aware of any instances of the described failure mode in the 35 year history of the product design, suggesting that the robustness of power supply design and the users periodic maintenance of the system has provided for acceptable continued operation.

The potentially affected plants include Clinton Unit 1; Comanche Peak Units 1 & 2; Nine Mile Point Unit 2; Palo Verde Units 1, 2, & 3; River Bend Unit 1; Susquehanna Units 1 & 2; Watts Bar Units 1 & 2.

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November 18, 2014

NRC Operations Center
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Possible Substantial Safety Hazard

Attachments:

- (A) Technical Description of TEC Model 1414 Possible Defect
- (B) List of Locations in the USA With TEC Model 1414 Possible Defect

Gentlemen:

The purpose of this letter is to report a possible "Substantial Safety Hazard" in accordance with the requirements of 10CFR Part 21. This information is outlined to correlate with the reporting information requirements of Section 21.21 (d)(4).

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

Technology for Energy Corporation (TEC)
10737 Lexington Drive
Knoxville, TN 37932

Donna J. Mullaly - Responsible Officer

- (ii) *Identification of the basic component which may contain a defect.*

TEC Model 1414-6 and TEC Model 1414-8

- (iii) *Identification of the firm supplying the basic component which may contain a defect.*

Technology for Energy Corporation

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

Technical description of possible defect is contained in attachment A.

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TEC does not have the necessary information to analyze the potential safety hazard. The potential safety hazard should be analyzed by the licensee(s) with respect to the in-plant use of the equipment and the plant procedures.

- (v) *The date on which the information of such possible defect was obtained.*

November 17, 2014

- (vi) *In the case of a basic component which contains a defect, the number and location of these components in use at or supplied for one or more facilities subject to the regulations in this part.*

The list of possibly affected systems and facilities to which supplied is contained in Attachment B.

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

TEC has taken the responsibility of notifying the licensees (as listed in Attachment B) of the possible defect. TEC will supply the licensees the following:

- 1) Technical description of the possible defect.
- 2) Test recommendations.

The corrective action required of TEC shall be completed by December 18, 2014.

The licensees should be responsible for testing and surveillance of their systems to determine if the condition or circumstance presents a significant safety hazard in their use.

- (viii) *Any advice related to the potential defect that is being, or will be given to licensees.*

Action on the part of the licensee is highly dependent of their specific system configuration and individual analysis of the potential safety hazard.

Installation and operation recommendations originally provided with all systems called for periodic testing which would detect a failure of a supply not otherwise monitored by an installed TEC-914. Individual plant surveillance procedures and system safety designation would affect the importance of loss of channel(s) between scheduled surveillance operations. Each plant should make a

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determination as to whether their system tests and frequency are adequate to acceptably detect a loss of unmonitored power supply.

Periodic measurement of Charge Converter Bias Voltages at the rack rear terminal strips and measurement of Output Background Signal on the front panel connectors can confirm the availability of power source. A low Bias Voltage or low background Output Signal compared to adjacent channels and previous measurements could signify loss of associated power supply.

If any additional information is required, please contact the undersigned at (865) 966-5856.

Sincerely,



Donna J. Mullaly
Vice President, Nuclear Division
Technology for Energy Corporation
10737 Lexington Drive
Knoxville, TN 37932

Cc: William Simpkins, President & CEO
Scott Whited, Quality Manager

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ATTACHMENT A

TECHNICAL DESCRIPTION OF TEC MODEL 1414 POSSIBLE DEFECT

TEC has determined that a subset of its Model 1414 Valve Flow Monitoring Systems lack full, live indication of power supply status as indicated on the TEC Model 913 Power Control Module. Systems configured in full 19" racks with a single Model 913 Power Control Module may be displaying output status of only half of the internal power supply voltage levels.

The full-rack systems utilize a split backplane design with twin power supplies bussed to separate halves of the rack. Some systems were supplied with a single TEC-913 installed in the right-most channel which switched on power to supplies on both sides of the rack. The front panel LEDs were illuminated based only on the voltage level out of the right-side power supplies. Full-rack systems with a Model 913 Power Control Module installed in channels 1 and 18 are not affected. Half-rack systems are not affected.

A potential condition or circumstance exists whereby a left-side supply may have source voltage but fail to provide its specified output voltage. Such failure could result in all Model 914 modules in channel 1-9 positions not providing necessary power to its associated input sensor. A subsequent loss of the sensor output would result in the inability of the TEC-914 to indicate any valve flow. Depending on the specific configuration, signals from more than one sensor could be lost on a single failure.

This Model 1414 system design dates back to 1979. Systems with potential defect were delivered both domestically and internationally between 1980 and 2003. They were designed and qualified to meet safety standards in effect in 1979 and there have been no design or qualification efforts made to meet newer regulations. TEC has not been made aware of any instances of the described failure mode in the 35 year history of the product design, suggesting that the robustness of power supply design and the users periodic maintenance of the system has provided for acceptable continued operation.

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ATTACHMENT B**LIST OF LOCATIONS IN THE USA WITH TEC MODEL 1414 POSSIBLE DEFECT**

Plant/Unit	Owner/Utility	Model	Date Delivered
Clinton	Exelon Generation Co., LLC	1414-6-(2)	1981
Comanche Peak 1	TXU Generating Company LP	1414-6-(4)	1985
Comanche Peak 2	TXU Generating Company LP	1414-6-(4)	1985
Nine Mile Point 2	Constellation Energy	1414-8-(4)	1983
Nine Mile Point 2	Constellation Energy	1414-8-(5)	1983
Palo Verde 1	Arizona Public Service Company	1414-8-(3)	1982
Palo Verde 2	Arizona Public Service Company	1414-8-(3)	1982
Palo Verde 3	Arizona Public Service Company	1414-8-(3)	1982
River Bend 1	Entergy Nuclear Operations, Inc.	1414-6-(3)	1984
Susquehanna 1	PPL Susquehanna, LLC	1414-6-(1)	1980
Susquehanna 2	PPL Susquehanna, LLC	1414-6-(1)	1980
Watts Bar 1	Tennessee Valley Authority	1414-6-(3)	1984
Watts Bar 2	Tennessee Valley Authority	1414-6-(3)	1984