



TEC
TECHNOLOGY for ENERGY CORPORATION

July 19, 1985

Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Gentlemen:

Subject: Possible Substantial Safety Hazard

Attachments: (1) Technical Description of TEC Model 914-1 Bar Graph "Latch-Up"
(2) Number and Location of Possibly Defective Components
(3) Letter Issued to Plants Having Affected TEC 914-1 Modules
(w/o attachments)

The purpose of this letter is to report a possible "Substantial Safety Hazard" in accordance with the requirements of 10 CFR Part 21. This information is outlined to correlate with the reporting information requirements of Section 21.21 (b)(3).

- I. Name and address of the individuals informing the Commission.
Technology for Energy Corporation (TEC)
One Energy Center
Pellissippi Parkway
Knoxville, TN 37922
J. E. Mott - Responsible Officer
- II. Identification of the basic component which contains a defect.
TEC Model 914-1 Valve Flow Monitor Module (Acoustic).
- III. Identification of the firm supplying the basic component which contains a defect.
Technology for Energy Corporation
- IV. a. Nature of the defect.
Technical description of the defect is contained in Attachment 1.
b. Safety hazard which could be created by such defect.
TEC shall inform the licensees of the deviation; however, TEC does not have the information necessary to analyze the potential safety hazard. The potential safety hazard should be analyzed by the licensees with respect to the in-plant use of the equipment and the plant operating and casualty procedures.

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V. The date on which the information of such defect was obtained.
July 17, 1985

VI. In the case of a basic component which contains a defect, the number and location of all such components in use at, or supplied for, one or more facilities subject to the regulation in this part.

The number and location of such components are contained in Attachment 2.

VII. The corrective action which is being taken, the name of the organization responsible for the action, and the length of time that will be taken to complete the action.

TEC has taken the responsibility of informing the licensees (as listed in Attachment 2) of the defect. TEC shall supply the licensees the following:

1. Technical description of the defect,
2. Test procedure,
3. Serial numbers of the facility-specific components which could contain this defect.

The corrective action required of TEC shall be completed by 7/20/85.

The licensees should be responsible for implementing the test procedure to determine if their components contain this defect and for replacing any components which fail the test.

VIII. Any advice related to the defect that is being given to the licensees.

The information being given to the licensees is contained in Attachment 3.

If any additional information is required, please contact the undersigned at (615) 966-5856.

Sincerely,



Julian E. Mott, Responsible Officer
Senior Vice President

ATTACHMENT 1

TECHNICAL DESCRIPTION OF TEC MODEL 914-1 BAR GRAPH "LATCH-UP"

TEC has found a quality deviation in the TEC Model 914-1 Valve Flow Monitor Module. This quality deviation is a defective U5 (a Texas Instrument TL490CN Analog Level Detector). Recent data have shown a higher than acceptable defect rate in tests of TEC 914-1 Modules at a nuclear plant.

The symptom of Bar Graph "Latch-Up" is failure of indication to reset upon removal of input signal. After a valve has opened and the input to the TEC 914-1 is at a high level, all LEDs on the front panel bar graph will be lit. After the valve has closed and the input to the TEC 914-1 is at about 0 volts (background), all LEDs on the bar graph should extinguish. In TEC Model 914-1 modules containing a defective U5, the LEDs on the bar graph will remain lit even though the signal output and the RMS output have both decreased to about 0 volts (background).

Alarm outputs correspond to LED bar graph indication, because the alarm outputs are driven by U5. If U5 latches up, an operator can reset the LED bar graph and alarms by cycling power to the Model 914-1. Power may be cycled by turning the power switch on the TEC Model 913 Power Module OFF and then ON again.

A TEC 914-1 with a defective U5 will exhibit latch-up only after RMS output is a nominal 5 V. During normal operation and functional testing, the RMS output will probably not be 5 V. Therefore, the test procedure (914-TP-01) must be followed to detect a defective U5. Evidence indicates that the latch-up is a birth defect (a failure present at manufacture or after a run time of 24 hours or less). Therefore, once the test has been done, it does not need to be redone periodically.

ATTACHMENT 2

Number and Location of Possibly Defective Components

<u>Utility</u>	<u>Plant</u>	<u>Number of Modules</u>
Illinois Power Corporation	Clinton Station	21
Tennessee Valley Authority	Watts Bar	50
	Sequoyah	11
	Bellefonte	6
	Browns Ferry	48
Florida Power & Light	Turkey Point	6
	St. Lucie	14
Pennsylvania Power & Light	Susquehanna	35
Washington Public Power Supply	WNP 2	23
Cincinnati Gas & Electric	Zimmer	10
Consumers Power	Midland	8
Arizona Public Service	Palo Verde	81
Sacramento Municipal Utility District	Rancho Seco	39
Indiana & Michigan Electric Company	Donald C. Cook	9
Baltimore Gas & Electric	Calvert Cliffs	10
Consolidated Edison	Indian Point 2	5
Boston Edison Electric Company	Pilgrim	7
Southern California Edison	San Onofre	8
EG&G Idaho	Loft Facility	1
	Idaho Falls	5
Toledo Edison	Davis Besse	8
Pacific Gas & Electric	Diablo Canyon	8
Omaha Public Power District	Ft. Calhoun	5
Duke Power Company	Catawba	7
	Oconee	12
	McGuire	8
Power Authority of the State of New York	Indian Point 3	9
Portland General Electric	Trojan	4



TECHNOLOGY for ENERGY CORPORATION

July 19, 1985

In reply, refer to:
0785-JEM-6223-914

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* IMPORTANT INFORMATION *
* NUCLEAR SAFETY RELATED *
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Attention: Plant Manager

Subject: TEC Valve Flow Monitor Module
TEC Model 914-1
Quality Deviation
Modules Not Resetting After Valve Cycling
(Exhibiting Bar Graph "Latch-Up")

- Attachments:
- (1) Technical Description of TEC Model 914-1 Bar Graph "Latch-Up"
 - (2) 914-1-TP-01, Test Procedure for Testing the TEC 914-1 Valve Flow Monitor Module for Bar Graph "Latch-Up"
 - (3) Serial Numbers of Modules Shipped by TEC Before TEC began Testing for Bar Graph "Latch-Up"
 - (4) TEC Drawing 914D1001

Enclosure: (1) Connector TEC Part Number 50-300-0121

Gentlemen:

TEC has found a quality deviation in three TEC Model 914-1 Valve Flow Monitor Modules which was reported to the Nuclear Regulatory Commission on July 18, 1985. This deviation results in a failure of the module to reset after indicating full flow through the valve. Note that the monitor does indicate properly when the valve is opened, thus performing its safety-related function. This quality deviation (Bar Graph "Latch-Up") is caused by a defective U5 (a Texas Instrument TL490CN Analog Level Detector). There is evidence that this defect went undetected during factory testing prior to July 1981.

Attachment (3) is a listing of the serial numbers of all affected TEC 914-1 Modules. TEC recommends that all TEC 914-1 Modules be tested according to Attachment (2). This is a bench test and can be performed with the TEC 914-1 removed from the rack. **Modules which have a defective U5 should be replaced.** In the interim, if U5 latches up, an operator can reset by cycling power OFF then ON again.

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July 19, 1985
Page 2

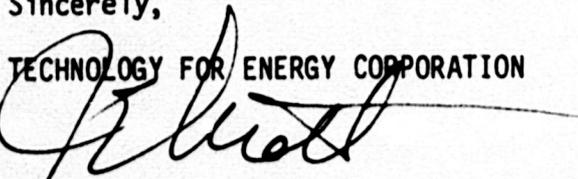
It is not necessary to test the TEC 914-2 modules; U5 on the 914-2 is National Semiconductor part number LM3914N, which does not have a quality deviation. The 914-2 is a direct replacement for the TEC 914-1, identical in form, fit, and function and equally qualified. It was designed to replace the 914-1 after Texas Instruments discontinued production of the TL490CN.

Note that a TEC 914-1 will have "TEC Model 914" photoengraved on both sides of the printed circuit board, while a TEC 914-2 will have "TEC Model 914-2" photoengraved on both sides of the printed circuit board.

Evidence indicates that the latch-up is a birth defect (a failure present at manufacture or after a run-time of 24 hours or less). Therefore, once the test has been done, it does not need to be redone periodically. If you have questions or comments, please notify TEC. If you have further information or suggestions, please share this information. Notify me if I can be of any assistance.

Sincerely,

TECHNOLOGY FOR ENERGY CORPORATION



J. E. Mott
Senior Vice President

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