



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

AEOD/N206

MAY 6 1982

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MEMORANDUM FOR: File

FROM: Kathleen M. Black
Office for Analysis and Evaluation
of Operational Data

SUBJECT: PART 21 REPORT - EBERLINE INSTRUMENT CORPORATION

NRC received a Part 21 report, dated December 21, 1981, from Eberline Instrument Corporation. The report gave details on a design defect in a microcomputer-based radiation monitoring system and lists purchasers of the equipment. The defect is located in a printed circuit board in the central processing unit (CPU).

A Region 2 report of a January 20-22, 1982 inspection of the General Electric Wilmington Manufacturing Department contained the information that the facility criticality monitoring systems and airborne activity monitors supplied by Eberline contained the same defect as that described in the Eberline Part 21 report. General Electric was not given on the December 21, 1982 list of purchasers (limited generally to Part 50 licensees).

I spoke to Julian Wells, QA Manager for Eberline on April 27 to determine whether any other NRC licensees could be using systems containing defective circuit boards. He told me that the equipment that was the subject of the Part 21 report had been designed in response to post-TMI requirements. (Eberline designed the circuit board). One utility in addition to GE and the purchasers listed on the Part 21 report has the defective circuit board. Carolina Power and Light was accidentally omitted from the list but was notified recently of the problem. Eberline has completely accounted for all circuit boards; no circuit boards have been distributed to anyone other than GE, CPL, and the purchasers listed on the Part 21 report.

I have provided Eugene Redden, DOE GTN and James Hooper, DOE COO, with a copy of the Eberline report.

Kathleen Black

Kathleen M. Black
Nonreactor Assessment Staff
Office for Analysis and Evaluation
of Operational Data

cc: L. Higginbotham, IE
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XA

Eberline

A DIVISION OF
**Thermo
Electron
CORPORATION**

Post Office Box 2108
Santa Fe, New Mexico 87501
(505) 471-3232 TWX: 910-985-0678

December 21, 1981

Region IV
Office of Inspection and Enforcement
611 Ryan Plaza Dr.
Suite 1000
Arlington, Texas 76012

Attention Director

Gentlemen:

Eberline Instrument Corporation manufactures radiation monitoring equipment which is sold to the nuclear power facilities. About a week ago, during our testing program, it was discovered that our micro computer based radiation monitoring systems have a design defect on the micro computer printed circuit board. The defect can potentially cause a loss of memory which resets all calibration parameters, including alarm trip levels.

Since this equipment was not sold as qualified or as safety related, there was some question as to whether this was in the realm of 10 CFR 21. However, in reviewing General Provision paragraph 21.1, entitled "Purpose", of this regulation we felt that the defect "could create a possible safety hazard", therefore, we immediately called Region IV and talked to Mr. Uldis Potapous, Chief Vendor Branch who concurred with us that we should handle the problem as outlined in 10 CFR 21.

As outlined in paragraph 21.21, entitled "Notification of 10 CFR 21", we immediately informed the licensee or purchasers of our micro computer based radiation monitoring systems of the defect, whereupon we evaluated the deviation and outlined our corrective action with each of them.

The following part of this letter is our written report required by paragraph 21.21, section 3 and the format corresponds to your sub-sections (i) thru (viii).

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/P

- i) Roger Herd
Eberline Instrument Corporation
President
- ii) Eberline Instrument Corporation
Airport Rd/P.O. Box 2108
Santa Fe, New Mexico 87501

Equipment affected:

Micro computer based radiation monitoring systems

- a) Fixed Airborn Activity Monitor (F.A.A.M.)
- b) Particulate, iodine, noble gas monitors (PING) series 2, 2A, 3 and 4.
- c) Special particulate, iodine, noble gas monitor (SPING) series 3 and 4.
- d) Control terminal, (CT) series 1 and 2.
- e) Portable terminal (PT) series 1.

Defective subassembly is the Central Processing Unit (CPU III).

- iii) Eberline Instrument Corporation sold this type of equipment to the following licensee or purchaser.

- a) American Electric Power
D.C. Cook Nuclear Power Station
Indiana & Michigan Electric Co.
2 Broadway
New York, New York 10004
- b) Alabama Power Co.
Farley Nuclear Power
P.O. Drawer 470
Ashford, AL 36312
- c) Argonne National Laboratory
9700 S. Cass Ave.
Argonne, IL 60439
- d) Bechtel Power Corporation
Arkansas Power Co.
P.O. Box 3965
San Francisco, CA 94119

- e) Bechtel Power Corporation
Grand Gulf Nuclear
15740 Shady Grove Road
Gaithersburg, Maryland 20760
- f) Baldwin Associates
Clinton Power Station
P.O. Box 306
Clinton, IL 61727
- g) Bechtel Power Corporation
Pennsylvania Power & Light Co.
P.O. Box 3965
San Francisco, CA 94119
- h) Cincinnati Gas & Electric
Columbus & Southern Ohio Elect.
Zimmer Nuclear Power Station
Route # 52
Moscow, Ohio 45153
- i) Commonwealth Edison
Dresden Nuclear Power Station
Zion Nuclear Power Station
Quad Cities Nuclear Power Station
P.O. Box 767
Chicago, IL 60690
- j) Dairyland Power Corporation
Genoa, Wisconsin 54632
- k) Detroit Edison Co.
2000 Second Avenue
Detroit, Mich. 48226
- l) Duquesne Light Company
435 Sixth Avenue
Pittsburgh, Penn. 15219
- m) E G & G Idaho
P.O. Box 1625
Idaho Falls, Idaho 83415
- n) Florida Power and Light
Turkey Point Plant
Miami, Florida 33152
- o) St. Lucie Plant
Jensen Beach, Florida 33457

- p) Metropolitan Edison Co.
Three Mile Island Nuclear Co.
P.O. Box 542
Reading, PA 19640
 - q) Northeast Nuclear Energy Co.
P.O. Box 270
Hartford, Conn. 06101
 - r) Northern States Power Co.
Monticello Nuclear Gen. Plant
P.O. Box 600
Monticello, MN 55363
 - s) Pennsylvania Power & Light Co.
2 North 9th St.
Allentown, PA 18101
 - t) Philadelphia Electric Co.
Peachbottom Station
Delta, PA 17314
 - u) Rochester Gas & Electric
89 East Avenue
Rochester, N.Y. 14649
 - v) Wisconsin Public Service Corporation
700 N. Adams Street
Green Bay, Wisconsin 54305
 - w) Wisconsin Electric Power Co.
231 W. Michigan St.
Milwaukee, Wisconsin 53201
- iv) There is a potential source of error in the interrupt structure of the central processing unit (CPU III) board. If two interrupts of increasing priority occur sequentially, the interrupt data can be in a state of transition at the time it is being read by the microprocessor. This results in erroneous data, and there is a complete loss of data and calibration parameters.
- v) We determined that defect was a safety hazard 12/18/81.
- vi) Eberline Instrument Corporation shall be responsible to supply additional hardware in the form of a piggyback board containing a latch which prevents the interrupt data from changing while it is being read. These boards will be supplied to each purchaser outlined in section (iii) of this written report with complete instructions on

how they are to install them in each applicable unit. We have already sent some of these boards to facilities which are online with the whole corrective action program to be completed by the end of February 1982.

viii) We have advised all of our purchasers or licensees by letter of how memory loss can occur. This information is the same as noted in section (iv) of this report.

If the commission needs any additional information related to this defect please let us know at once.

Sincerely yours,

Roger Herd
President

RH:ct