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SSINS No.: 6835
IN 86-22

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

March 31, 1986

IE INFORMATION NOTICE NO. 86-22: UNDERRESPONSE OF RADIATION SURVEY
INSTRUMENT TO HIGH RADIATION FIELDS

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or a construction permit (CP), and research and test reactors.

Purpose:

This information notice is provided to alert licensees of a warning from Eberline to its customers that a microcomputer-based radiation survey instrument, Eberline's Model ESP-1 (with a HP-290 gamma probe) may underrespond to high radiation fields in certain circumstances. It is expected that recipients will review the information for applicability to their radiation monitoring and survey program and consider actions, if appropriate, to preclude similar problems at their facility. However, suggestions contained in this notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

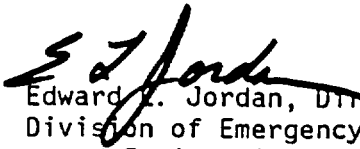
Eberline's microcomputer-based radiation survey instrument, Model ESP-1, has software designed to compensate for detector coincidence counting loss resulting from dead-time to effectively extend the useful range of detection system. When this dead-time correction capability is exceeded (either by preset detector count rate or dead-time correction factor magnitude), an overrange warning feature alerts the user. The ESP-1 instrument is designed to be used with a wide range of different types of detectors (e.g., beta, alpha, neutron, gamma).

During calibration with an HP-290 high-range gamma detector probe, Eberline has recently discovered that the ESP-1 software designed to correct for dead-time losses and provide for overrange warning does not consistently provide adequate overrange warning in high radiation areas. Because some of the gamma detectors may not reach the count-rate setpoint criterion for overrange initiation, Eberline issued a customer warning letter October 23, 1985 (Attachment 1). The warning letter provides sound recommendations and precautions for users for problem identification and prevention. The staff has learned that Eberline has subsequently developed a software modification that reportedly corrects this overrange problem.

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Because of the nature and potential severity of the problem, this information notice is being issued to reinforce the Eberline's customer warning and ensure all potential NRC licensees are made aware of the problem.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.


Edward V. Jordan, Director
Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement

Technical Contacts: James E. Wigginton, IE
(301) 492-4967

Roger L. Pedersen, IE
(301) 492-9425

Attachments:

1. Eberline Customer Letter (October 23, 1985)
2. List of Recently Issued IE Information Notices



Eberline

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

October 23, 1985

Reference: HP-290 Probes

Dear Customer:

Eberline's new microcomputer-based radiation survey instrument, Model ESP-1, is designed to correct for coincidence loss and thus extend the range of each detector probe. It provides an "OVERRANGE" display when the coincidence correction factor exceeds 5 or when the count rate exceeds 2.5×10^6 cpm. With Eberline's HP-290 probe, this indication should occur at about 80 R/h, and it is triggered when the count rate from the GM tube exceeds 2.5×10^6 cpm.

We have discovered that some of the GM tubes which can be used in the HP-290 probe may not reach 2.5×10^6 cpm. In such cases, the detector probe can be in a radiation field considerably above 80 R/h and still provide a reading below 80 R/h. Replacement tubes that have not been selected in accordance with Eberline's overrange criterion may create this problem even if the original GM tube functioned properly.

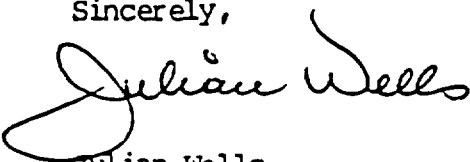
We recommend that you take one or more of the following precautions if you are using a HP-290 probe with an ESP-1:

- 1) Verify that the "OVERRANGE" display occurs at an exposure rate below 100 R/h; or
- 2) Administratively limit your use of HP-290 probes to exposure rates below 50 R/h. In this case, you may want to set the alarm at 50 R/h.

and

- 3) Notify all appropriate individuals in your organization about this precaution or limitation on the use of HP-290 probes.

Sincerely,



Julian Wells
Quality Assurance Manager

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
86-21	Recognition Of American Society Of Mechanical Engineers Accreditation Program For N Stamp Holders	3/31/86	All power reactor facilities holding an OL or CP and all recipients of NUREG-0040 (white book)
86-20	Low-Level Radioactive Waste Scaling Factors, 10 CFR Part 61	3/28/86	All power reactor facilities holding an OL or CP
86-19	Reactor Coolant Pump Shaft Failure At Crystal River	3/21/86	All power reactor facilities holding an OL or CP
86-18	NRC On-Scene Response During A Major Emergency	3/26/86	All power reactor facilities holding an OL or CP
86-17	Update Of Failure Of Automatic Sprinkler System Valves To Operate	3/24/86	All power reactor facilities holding an OL or CP
86-16	Failures To Identify Containment Leakage Due To Inadequate Local Testing Of BWR Vacuum Relief System Valves	3/11/86	All power reactor facilities holding an OL or CP
86-15	Loss Of Offsite Power Caused By Problems In Fiber Optics Systems	3/10/86	All power reactor facilities holding an OL or CP
86-14	PWR Auxiliary Feedwater Pump Turbine Control Problems	3/10/86	All power reactor facilities holding an OL or CP
86-13	Standby Liquid Control System Squib Valves Failure To Fire	2/21/86	All BWR facilities holding an OL or CP

OL = Operating License
CP = Construction Permit