Part 21 (PAR) Event # 51132

Rep Org:	THERMO FISHER SCIENTIFIC	**Notification Date / Time:**	06/05/2015 18:47 (EDT)
Supplier:	MIRION TECHNOLOGIES	**Event Date / Time:**	03/03/2015 00:00 (PDT)
		Last Modification:	07/01/2015
Region:	4	**Docket #:**	
City:	SAN DIEGO	**Agreement State:**	Yes
County:		**License #:**	
State:	CA		
NRC Notified by:	ROBERT BARNES	**Notifications:**	DAVE PASSEHL R3DO
HQ Ops Officer:	NESTOR MAKRIS		PART 21/50.55 REACTORS EMAIL
Emergency Class:	NON EMERGENCY		
10 CFR Section:			
21.21(d)(3)(i)	DEFECTS AND NONCOMPLIANCE		

PART 21 - POSSIBLE SAFETY DEFECT IN NON-INSTALLED POWER RANGE DETECTOR AT PALISADES

The following is an excerpt of a report that was received via email:

"This letter provides information concerning an evaluation performed by Thermo Gamma-Metrics LLC, a part of Thermo Fisher Scientific, regarding potential noncompliance of our dual uncompensated ion chamber power range detector.

"Based upon the evaluation, Thermo Gamma-Metrics has determined that a Reportable Condition under 10 CFR Part 21 exists for plant listed herein. The information contained in this document informs the NRC of the conclusions and recommendations derived from Thermo Gamma-Metrics' preliminary evaluation of this issue.

"An evaluation [was] performed by Thermo Gamma-Metrics LLC, a part of Thermo Fisher Scientific, regarding potential noncompliance of our dual uncompensated ion chamber power range detector.

"Based upon the evaluation, Thermo Gamma-Metrics has determined that a Reportable Condition under 10 CFR Part 21 exists for [Palisades]. The information contained in this document informs the NRC of the conclusions and recommendations derived from Thermo Gamma-Metrics' preliminary evaluation of this issue.

"The detector in question is in storage at Entergy Palisades and has not yet been installed in their Power Range Systems per discussion with [the System Engineer at Palisades].

"A potential defect has been identified by Mirion IST. Thermo Gamma-Metrics cannot determine by itself if the potential defect would represent a substantial safety hazard to Entergy Palisades if installed in a safety related application.

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"We supplied just one potentially defective part from [Mirion] IST to Palisades. [Mirion] IST may have supplied two other potentially defective parts to other vendors per discussions with [Mirion IST.]

"The immediate corrective action is for Thermo Gamma-Metrics to notify Entergy and the NRC of this potential defect. Thermo Gamma-Metrics notified Entergy Palisades on June 2, 2015.

"Thermo Gamma-Metrics will supply a final report on this issue by July 2, 2015 that details the plan for all corrective actions.

"Entergy Palisades should review the letter from Mirion IST. Thermo Gamma-Metrics will help the utility to address and remedy the situation before the power range detector is installed in the power plant."

* * * UPDATE AT 1955 EDT ON 07/01/15 FROM ROB BARNES TO S. SANDIN * * *

The following is an excerpt of a report that was received via email:

"This letter provides information concerning an evaluation performed by Thermo Gamma-Metrics LLC, a part of Thermo Fisher Scientific, regarding noncompliance of our dual uncompensated ion chamber power range detector.

"Based upon the evaluation, Thermo Gamma-Metrics has determined that a Reportable Condition under 10 CFR Part 21 exists for plant listed herein. The information contained in this document informs the NRC of the conclusions and recommendations derived from Thermo Gamma-Metrics' evaluation of this issue.

"Report Notification Information

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

Robert E. Barnes
Technical Service Manager
(858)449-2909 cell

Clark J. Artaud
Global Commercial Director

Jeffery S. Tuetken
Senior Electrical Engineer
Thermo Gamma-Metrics LLC
10010 Mesa Rim Road
San Diego, CA 92121

(ii) Identification of the facility, the activity, or the basic component supplied for such facility which fails to comply or contains a defect.

"The detector in question is in storage at Entergy Palisades and has not yet been installed in their Power Range Systems per discussion with the System Engineer, Mr. Michael Knapp at Palisades.

(iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

"Mirion IST Horseheads, New York

(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

"A potential defect has been identified by Mirion IST as described in . . . [a letter] dated March 3, 2015.

"Entergy Palisades has determined that the potential defect would represent a substantial safety hazard if installed in a safety related application and is returning the detector to Thermo Fisher Scientific for repair on Returned Material Authorization #950. Thermo Fisher will return the dual ion chamber to Mirion IST for repair and recertification.

(v) The date on which the information of such defect or failure to comply was obtained.

"March 3, 2015

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

"We supplied just one potentially defective part from IST to Palisades. IST may have supplied two other potentially defective parts to other vendors per discussions with Eric Brand at Mirion IST.

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

"The immediate corrective action is for Thermo Gamma-Metrics to notify Entergy and the NRC of this potential defect.

"Thermo Gamma-Metrics notified Entergy Palisades on June 2, 2015 . . .

"Thermo Gamma-Metrics will work with Mirion IST to verify the presence or absence of the potential defect in this dual ion chamber and repair the dual ion chamber before returning it to Entergy Palisades, as soon as repairs can be arranged and expected no later than the end of 2015.

(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

"Entergy Palisades has reviewed the letter from Mirion IST and is seeking reparations. Thermo Gamma-Metrics and Mirion IST will help the utility to address and remedy the situation before the power range detector is installed in the power plant.

(ix) In the case of an early site permit, the entities to whom an early site permit was transferred.

"Not applicable - this is not an early site permit concern.

"Should you have any questions regarding this matter, please contact Rob Barnes Technical Service Manager, Thermo Gamma-Metrics LLC, at (858) 882-1356."

Notified R3DO (Kozak) and PART 21/50.55 REACTORS (email).

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Thermo Gamma-Metrics LLC
10010 Mesa Rim Road
San Diego, CA 92121
USA

Phone: (858) 450-9811
Fax: (858) 452-9250

July 1, 2015

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: 10 CFR Part 21 Notification of Power Range Detector Assembly – Final Report

Enclosure: (1) Report Notification Information
(2) Entergy Notification Letter dated June 2, 2015
(3) Mirion IST Letter dated March 3, 2015

This letter provides information concerning an evaluation performed by Thermo Gamma-Metrics LLC, a part of Thermo Fisher Scientific, regarding noncompliance of our dual uncompensated ion chamber power range detector.

Based upon the evaluation, Thermo Gamma-Metrics has determined that a Reportable Condition under 10 CFR Part 21 exists for plant listed herein. The information contained in this document informs the NRC of the conclusions and recommendations derived from Thermo Gamma-Metrics' evaluation of this issue.

Sincerely,

Robert Barnes
Technical Support Manager
Nuclear Market

Report Notification Information

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

Robert E. Barnes
Technical Service Manager
(858)449-2909 cell

Clark J. Artaud
Global Commercial Director

Jeffery S. Tuetken
Senior Electrical Engineer

Thermo Gamma-Metrics LLC
10010 Mesa Rim Road
San Diego, CA 92121

(ii) Identification of the facility, the activity, or the basic component supplied for such facility which fails to comply or contains a defect.

The detector in question is in storage at Entergy Palisades and has not yet been installed in their Power Range Systems per discussion with the System Engineer, Mr. Michael Knapp at Palisades.

(iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

Mirion IST Horseheads, New York

(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

A potential defect has been identified by Mirion IST as described in the Attachment (3) dated March 3, 2015.

Entergy Palisades has determined that the potential defect would represent a substantial safety hazard if installed in a safety related application and is returning the detector to Thermo Fisher Scientific for repair on Returned Material Authorization #950. Thermo Fisher will return the dual ion chamber to Mirion IST for repair and recertification.

(v) The date on which the information of such defect or failure to comply was obtained.

March 3, 2015

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

We supplied just one potentially defective part from IST to Palisades. IST may have supplied two other potentially defective parts to other vendors per discussions with Eric Brand at Mirion IST.

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

The immediate corrective action is for Thermo Gamma-Metrics to notify Entergy and the NRC of this potential defect.

Thermo Gamma-Metrics notified Entergy Palisades on June 2, 2015 as Attachment (2).

Thermo Gamma-Metrics will work with Mirion IST to verify the presence or absence of the potential defect in this dual ion chamber and repair the dual ion chamber before returning it to Entergy Palisades, as soon as repairs can be arranged and expected no later than the end of 2015.

(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

Entergy Palisades has reviewed the letter from Mirion IST and is seeking reparations. Thermo Gamma-Metrics and Mirion IST will help the utility to address and remedy the situation before the power range detector is installed in the power plant.

(ix) In the case of an early site permit, the entities to whom an early site permit was transferred.

Not applicable - this is not an early site permit concern.

Should you have any questions regarding this matter, please contact Rob Barnes, Technical Service Manager, Thermo Gamma-Metrics LLC, at (858) 882-1356.

Copy: Entergy Palisades
Mr. George Lipscomb, US NRC
Mr. Eric Brand, Mirion IST

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The world leader
in serving science

June 2, 2015

Entergy Operations, Inc
PO Box 31995
Jackson MS 39286-1995
Attention: Manager, Operating Experience/CAA
M-ECH-25

Subject: Part 21 – Dual Ion Chamber
Reference: Purchase Order No. 10406898
Thermo Fisher Scientific, San Diego Sales Order No. 26175
Potential 10CFR Part 21 Notification dated March 3, 2015, from Mirion IST

Dear Operating Experience Manager,

On March 3, 2015, we received a notification from Mirion IST (attached) regarding a possible safety defect. We purchased an Uncompensated Ion Chamber, PN NY-10419, SN 143110, for use in a Power Range Detector supplied to you in December, 2014. That detector is PN 201872-101 SN 006, supplied on PO 10406898.

The letter from Mirion IST states that roughly 2.6% of chambers may contain metal slivers that may bridge HV to SIG in a seismic event. They have identified that, "If the bridge (short) were to occur, it would either result in a transitory current surge (similar to a fuse blowing) or a dead short between HV and Signal circuits. The failure, if it occurred, would be a step function (quantized) and readily detectable".

Due to the coincidence logic function of the power range channels, one detector failing during a design basis event would not represent a serious safety hazard, should the defect even be present in this chamber.

Please let us know your preferred remedy to resolve this situation with the detector, and if we can help implement the remedy.

Please feel free to call me if there are any questions.

Robert Barnes
Technical Support Manager
(858) 882-1356 direct phone
rob.barnes@thermofisher.com

ENCLOSURE (2)

MIRION TECHNOLOGIES

Mirion Technologies (IST) Corporation
Sensing Systems Division
315 Daniel Zenker Drive
300 IST Center
Horseheads, NY 14845

607-562-4300
607-562-4482
www.mirion.com

March 3, 2015

Michael Jackson

Thermo Fisher Scientific
10010 Mesa Rim Road
San Diego CA 92121

Notification of Potential Defect Under the Atomic Energy Act of 1954 and 10CFR Part 21

Mirion Technologies (IST) Corporation identified a condition which constitutes a reportable issue under the Atomic Energy Act of 1954 and 10 CFR Part 21. As such, and in accordance with our internal 10 CFR 21 administrative procedure SOP 15-1, we are formally notifying you of this potential issue. Mirion Assigned Tracking Number: # 15-01 .

During an Engineering Seismic Test, a Mirion Uncompensated Ionization Chamber (UIC) exhibited an electrical short between the HV and Signal B circuits. This assembly exhibited no precursor indications and passed all in-process electrical tests prior to seismic testing.

The cause of the failure was investigated by Mirion (IST) Engineering. Mirion (IST) dissected the failed UIC assembly and found a bundle of very small cross sectional diameter/thickness aluminum slivers bridged between the HV electrode ring and the Signal electrode ring of bottom electrode support.

It is postulated that bundle of conductive slivers moved due to the combination of mechanical seismic excitation (primary) and the imposed electric field (secondary).

Mirion (IST) deemed the root cause of the defect to be machining remnants created when the HV electrode ring was fabricated (machined). Mirion (IST) does inspect the HV electrode rings for machining defects, including debris.

The electrode rings are common to multiple detector designs. Mirion (IST) investigated electrode rings on pre-assembled supports and individual HV electrode rings to determine if the defect was present on other assemblies or rings in-house. The inspection included a total of 603 HV electrode rings.

Of the 603 HV electrode rings inspected, 4 rings had (possessed) identified defects. These defects were deemed to be machining remnants. These defects were unlike the UIC failure with a "bundle of slivers". These other HV electrode ring defects were only a single aluminum strand (sliver). These single strand slivers had a cross section diameter/thickness of 3 to 8 μm and with varying lengths estimated to be on the order ~ 0.1 inch or less.

ENCLOSURE (3)

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TECHNOLOGIES

Three (3) of the four (4) identified single strands are considered long enough to potentially bridge between the HV electrode ring and the Signal electrode ring. However given their location, it is highly probable that two (2) of the three (3) single aluminum strands (sliver) would be captivated by the HV electrode during detector assembly. That is, only 1 aluminum strand defect identified in the 603 HV electrode rings seemingly could possibly cause an issue.

2 defects / (603+1) rings = 0.33 percent
|| modified by 8 rings used in two section UIC Assemblies equates to ~ 2.6%

*2 defects = 1 actual failure (shorted condition) plus 1 identified defect that could possibly cause an issue.

There is a low probability of these slivers manifesting into a bridge/short between the HV electrode and Signal electrode. If the bridge (short) were to occur, it would either result in a transitory current surge (similar to a fuse blowing) or a dead short between the HV and Signal circuits. The failure, if it occurred, would be a step function (quantized) and readily detectable.

As these components are operated as part of a system, Mirion Technologies (IST) is not in the position to determine if a failure of these safety related basic components could result in a substantial safety hazard.

The potentially affected Mirion Model Numbers are identified in the attached list.
From the history of Mirion Technologies (IST) customer feedback, there has been a very low number of known occurrences of electrical shorting between conductors. Although there is a low probability of occurrence, Mirion will accept new (unused) assemblies identified in the attached list for evaluation of this potential condition.

Eric P. Brand
Quality Manager
Sensing Systems Division

Cc: Iain Wilson, General Manager
Sensing Systems Division

MIRION TECHNOLOGIES

ATTACHED LIST OF POTENTIALLY AFFECTED TYPES/MODEL NUMBERS

Detector Model	Type	Serial Number	Purchase Order
NY-10419	UIC	143110	M50426