Thermo
ELECTRON CORPORATION

Flow Systems
9303 W. Sam Houston Parkway S.
Houston, TX 77099-5298

713) 272-0404
Fax: (713) 272-2272
www.thermoflowsystems.com

THIS IS A 10CFR PART 21 NOTIFICATION

Contacts: Barry Nicholson
Director of Quality Assurance

Barry Hutchison
Technical Support Leader

July 21, 2003

US Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Subject: Thermo Westronics Model 2100C Series Recorders

This letter is notification of a possible defect associated with Thermo Westronics Series 2100C recorders. The Series 2100C is a DIN size programmable chart recorder utilized in control room applications of Nuclear Power Plants. The recorders in question were manufactured under the Thermo Westronics 10CFR50 Appendix B Quality Program between August 2002 and January 2003.

On or about May 30, 2003, Thermo Electron determined that a random reset anomaly could possibly occur on the Series 2100C recorder. This anomaly surfaced during the manufacture of three (3) commercial grade Series 2100 recorders. When the reset occurs, the recorder must be re-initialized to resume normal function.

The root cause of the anomaly has been traced to a timing issue between the CPU Printed Circuit Board Assembly (PCBA) and the Memory Module. A 27C256 EPROM, used as a decoder on the Memory Module, has changed manufacturers several times during the life of this product. The EPROM as produced by the original manufacturer is no longer available.

Newer versions of this 27C256 EPROM typically function at faster speeds. The faster chip speed can cause a delay in the transition from "send" to "receive" on the CPU Module and thereby result in the reset. This reset event is random and does not occur on every recorder.

After engineering evaluation, Thermo Electron has incorporated a modification to the CPU PCBA to ensure compatibility with the faster EPROM on the Memory Module. This modification eliminates the timing delay and subsequent possibility of the reset. Future shipments of this CPU Module shall incorporate this modification.

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To ensure compatibility on previously installed recorders, the Memory Module shall only be offered as part of a kit that includes the newer version CPU PCBA.

The scope of this notification includes ten (10) Series 2100C safety related recorders, all of which were thoroughly tested and did not exhibit this reset at the time of shipment. However, since it is not possible to determine the exact manufacture date of the 27C256 EPROM used on these recorders, this notification is being issued.

The following is a list of the safety related recorders included in the scope of this notification including Serial Number, Ship Date, Customer, Location Shipped To, and Purchase Order.

Serial Number	Ship Date	Customer	Shipped To	Purchase Order
2100C1824	12/04/02	Com Fed De Electricidad	Laguna Verde, Mex.	01-2-23014-CNP
2100C1827	01/08/03	Dominion Nuclear	Millstone Site	45138755 Rev. 4
2100C1828	02/19/03	Dominion Nuclear	Millstone Site	45138755 Rev. 4
2100C1829	08/16/02	Duke Power Co.	Catawba Site	NE 5462 001
2100C1830	08/16/02	Duke Power Co.	Catawba Site	NE 5462 001
2100C1831	01/25/03	Duke Power Co.	Catawba Site	NE 5462 001
2100C1832	01/25/03	Duke Power Co.	Catawba Site	NE 5462 001
2100C1833	01/28/03	Duke Power Co.	McGuire Site	NE 5703 001
2100C1834	01/28/03	Duke Power Co.	McGuire Site	NE 5703 001
2100C1835	01/28/03	Duke Power Co.	McGuire Site	NE 5703 001

Thermo Electron shall notify the above listed customers and make arrangements to implement the design modification, either by rework at the Thermo Electron – Houston facility, or by providing replacement kits to the customer site. It is estimated that rework associated with the design modification should be completed within sixty (60) days, or as soon as Thermo Electron has been contacted by the identified customers.

Should you have any questions regarding the above, please contact the undersigned.

Sincerely,

Barry Nicholson
Director of Quality Assurance

cc: Larry Quick

General Information or Other (PAR) Event # 40011

Rep Org:	THERMO ELECTRON CORPORATION	**Notification Date / Time:**	07/22/2003 18:13 (EDT)
Supplier:	THERMO ELECTRON CORPORTATION	**Event Date / Time:**	05/30/2003 (CDT)
		Last Modification:	07/22/2003
Region:	4	**Docket #:**	
City:	HOUSTON	**Agreement State:**	Yes
County:		**License #:**	
State:	TX		
NRC Notified by:	BARRY NICHOLSON	**Notifications:**	DANIEL HOLODY R1
HQ Ops Officer:	NATHAN SANFILIPPO		ANNE BOLAND R2
Emergency Class:	NON EMERGENCY		KRISS KENNEDY R4
10 CFR Section:			JACK FOSTER NRR
21.21	UNSPECIFIED PARAGRAPH		

PART 21 NOTIFICATION DUE TO POSSIBLE DEFECT WITH THERMO WESTRONICS SERIES 2100C RECORDERS

The following report was received via fax:

"July 21, 2003

"Subject: Thermo Westronics Model 2100C Series Recorders

"This letter is notification of a possible defect associated with Thermo Westronics Series 2100C recorders. The Series 2100C is a DIN size programmable chart recorder utilized in control room applications of Nuclear Power Plants. The recorders in question were manufactured under the Thermo Westronics 10CFR50 Appendix B Quality Program between August 2002 and January 2003.

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"The root cause of the anomaly has been traced to a timing issue between the CPU Printed Circuit Board Assembly (PCBA) and the Memory Module. A 27C256 EPROM, used as a decoder on the Memory Module, has changed manufacturers several times during the life of this product. The EPROM as produced by the original manufacturer is no longer available.

"Newer versions of this 27C256 EPROM typically function at faster speeds. The faster chip speed can cause a delay in the transition from "send" to "receive"' on the CPU Module and thereby result in the reset. This reset event is random and does not occur on every recorder.

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General Information or Other (PAR) Event # 40011

compatibility with the faster EPROM on the Memory Module. This modification eliminates the timing delay and subsequent possibility of the reset. Future shipments of this CPU Module shall incorporate this modification.

"To ensure compatibility on previously installed recorders, the Memory Module shall only be offered as part of a kit that includes the newer version CPU PCBA.

"The scope of this notification includes ten (10) Series 2100C safety related recorders, all of which were thoroughly tested and did not exhibit this reset at the time of shipment. However, since it is not possible to determine the exact manufacture date of the 27C256 EPROM used on these recorders, this notification is being issued.

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"Thermo Electron shall notify listed customers and make arrangements to implement the design modification, either by rework at the Thermo Electron - Houston facility, or by providing replacement kits to the customer site. It is estimated that rework associated with the design modification should be completed within sixty (60) days, or as soon as Thermo Electron has been contacted by the identified customers."

The affected sites include Laguna Verde, Mexico, Millstone, Catawba, and McGuire.

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General Information or Other (PAR) Event # 40005

Rep Org: GENERAL ELECTRIC COMPANY		**Notification Date / Time:** 07/18/2003 12:13	(EDT)
Supplier: GENERAL ELECTRIC COMPANY		**Event Date / Time:** 07/18/2003	(PDT)
		Last Modification: 07/18/2003	
Region: 4		**Docket #:**	
City: SAN JOSE		**Agreement State:** Yes	
County:		**License #:**	
State: CA			
NRC Notified by: JASON POST		**Notifications:** JACK FOSTER	NRR
HQ Ops Officer: STEVE SANDIN		ANIELLO DELLA GRECA	R1
Emergency Class: NON EMERGENCY		JOHN MADERA	R3
10 CFR Section:		LINDA SMITH	R4
21.21 UNSPECIFIED PARAGRAPH			

PART 21 REPORT INVOLVING IMPACT OF FUEL CHANNEL BOW ON CONTROL ROD BLADES

The following is a portion of text received as a fax:

"July 18, 2003
"MFN 03-045

"Subject: 60 Day Interim Notification: Impact of Fuel Channel Bow on Control Rod Blade Deviations

"Reference: Letter from Jason Post (GENE) to USNRC, 'Interim Surveillance Program for Fuel Channel Bow Monitoring', MFN 03-030 Revision 1, April 30, 2003

"This communication is to inform you that GE Nuclear Energy (GENE) has been evaluating a potentially reportable condition (PRC) on the impact of fuel channel bow on control rod blades. The original channel bow evaluation for increased fuel channel - control rod blade interference did not consider previously evaluated deviations in the control rod blade. Channel bow can cause increased deflection and stresses in control rod blades, which must be considered in control rod blade deviation evaluations. The PRC evaluation is limited to control rod blades delivered to those plants identified in the referenced letter, where an interim surveillance plan for channel bow monitoring is recommended, because those are the only plants where there is a concern about increased fuel channel - control rod blade interference.

"As described in the referenced letter, it was determined that BWR/6 and BWR/4 & 5 C-lattice plants with Global Nuclear Fuel (GNF) thick/thin channels potentially have increased channel bow that can cause fuel channel control rod blade interference. An interim surveillance program was provided to augment the surveillance requirements in the plant Technical Specifications until other actions, which mitigate or limit the potential for control rod - fuel channel interference due to channel bow can be identified and implemented. This surveillance program provides early indication of potentially degraded operational performance and assurance that action is taken before reaching excessive levels of control rod interference. This surveillance plan is limited to BWR/6 and BWR/4&5 C-

General Information or Other (PAR) Event # 40005

lattice plants with GNF thick/thin channels and GENE control rods. There have been no indications of excessive interference on BWR/2, 3 and 4 D-lattice plants, and as a result, they are excluded from the interim surveillance program.

"The PRC evaluation was initiated by GENE on May 19, 2003. GENE will not have completed the evaluation by July 18, 2003, when the 60 day evaluation period expires. Therefore, GENE is submitting this 60 Day Interim Notification under 10CFR21.21(a)(2) to inform the NRC that we are working on the issue, and to commit to report the results
of the evaluation no later than September 23, 2003."

GE Nuclear Energy has identified the following as affected plants: Clinton, Nine Mile Point 2, Fermi 2, Grand Gulf, River Bend, Limerick 1 & 2 and Perry 1.

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GE Nuclear Energy

General Electric Company
175 Curtner Ave., San Jose, CA 95125

July 18, 2003
MFN 03-045

Document Control Desk
United States Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

Subject: **60 Day Interim Notification: Impact of Fuel Channel Bow on Control Rod Blade Deviations**

Reference: Letter from Jason Post (GENE) to USNRC, "Interim Surveillance Program for Fuel Channel Bow Monitoring", MFN 03-030 Revision 1, April 30, 2003

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As described in the referenced letter, it was determined that BWR/6 and BWR/4 & 5 C-lattice plants with Global Nuclear Fuel (GNF) thick/thin channels potentially have increased channel bow that can cause fuel channel – control rod blade interference. An interim surveillance program was provided to augment the surveillance requirements in the plant Technical Specifications until other actions, which mitigate or limit the potential for control rod - fuel channel interference due to channel bow can be identified and implemented. This surveillance program provides early indication of potentially degraded operational performance and assurance that action is taken before reaching excessive levels of control rod interference. This surveillance plan is limited to BWR/6 and BWR/4&5 C-lattice plants with GNF thick/thin channels and GENE control rods. There have been no indications of excessive interference on BWR/2, 3 and 4 D-lattice plants, and as a result, they are excluded from the interim surveillance program.

MFN 03-045
July 17, 2003

The PRC evaluation was initiated by GENE on May 19, 2003. GENE will not have completed the evaluation by July 18, 2003, when the 60 day evaluation period expires. Therefore, GENE is submitting this 60 Day Interim Notification under 10CFR21.21(a)(2) to inform the NRC that we are working on the issue, and to commit to report the results of the evaluation no later than September 23, 2003.

Please contact me if you have any questions on this information at (408) 925-5362.

Sincerely,

Jason Post

Jason. S. Post, Manager
Engineering Quality and Safety Evaluations

Attachment:

1. Plants Recommended for Surveillance Program

cc: S. D. Alexander (NRC-NRR/DISP/PSIB) Mail Stop 6 F2
J. F. Foster (NRC-NRR/DRIP/RORP) Mail Stop 12 H2
A. B. Wang (NRC-NRR/DLPM/LPD4) Mail Stop 7 E1
J. F. Klapproth (GENE)
H. J. Neems (GENE)
G. B. Stramback (GENE)
B. J. Erbes (GENE)
PRC File

MFN 03-045
July 17, 2003

ATTACHMENT 1
Plants Recommended for Surveillance Program

	Utility	Plant
X	AmerGen Energy Co.	Clinton
	AmerGen Energy Co.	Oyster Creek
	Carolina Power & Light Co.	Brunswick 1
	Carolina Power & Light Co.	Brunswick 2
	Constellation Nuclear	Nine Mile Point 1
X	Constellation Nuclear.	Nine Mile Point 2
X	Detroit Edison Co.	Fermi 2
	Dominion Generation	Millstone 1
	Energy Northwest	Columbia
	Entergy Nuclear Northeast	FitzPatrick
	Entergy Nuclear Northeast	Pilgrim
X	Entergy Operations, Inc.	Grand Gulf
X	Entergy Operations, Inc.	River Bend
	Entergy Nuclear Northeast	Vermont Yankee
	Exelon Generation Co.	CRIT Facility
	Exelon Generation Co.	Dresden 2
	Exelon Generation Co.	Dresden 3
	Exelon Generation Co.	LaSalle 1
	Exelon Generation Co.	LaSalle 2
X	Exelon Generation Co.	Limerick 1
X	Exelon Generation Co.	Limerick 2
	Exelon Generation Co.	Peach Bottom 2
	Exelon Generation Co.	Peach Bottom 3
	Exelon Generation Co.	Quad Cities 1
	Exelon Generation Co.	Quad Cities 2
X	FirstEnergy Nuclear Operating Co.	Perry 1
	Nebraska Public Power District	Cooper
	Nuclear Management Co.	Duane Arnold
	Nuclear Management Co.	Monticello
	Pooled Equipment Inventory Co.	PIM
	PPL Susquehanna LLC.	Susquehanna 1
	PPL Susquehanna LLC	Susquehanna 2
	Public Service Electric & Gas Co.	Hope Creek
	Southern Nuclear Operating Co.	Hatch 1
	Southern Nuclear Operating Co.	Hatch 2
	Tennessee Valley Authority	Browns Ferry 1
	Tennessee Valley Authority	Browns Ferry 2
	Tennessee Valley Authority	Browns Ferry 3