

11/10/2006

U.S. Nuclear Regulatory Commission Operations Center Event Report

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General Information or Other (PAR)

Event # 42880

<b>Rep Org:</b> SOUTHERN TESTING SERVICES	<b>Notification Date / Time:</b> 10/05/2006 19:20 (EDT)
<b>Supplier:</b> OTEK CORPORATION	<b>Event Date / Time:</b> 10/05/2006 (EDT)
	<b>Last Modification:</b> 11/10/2006
<b>Region:</b> 1	<b>Docket #:</b>
<b>City:</b> KNOXVILLE	<b>Agreement State:</b> Yes
<b>County:</b>	<b>License #:</b>
<b>State:</b> TN	
<b>NRC Notified by:</b> WILLIAM R. WILLIS	<b>Notifications:</b> PAUL KROHN R1
<b>HQ Ops Officer:</b> PETE SNYDER	THOMAS DECKER R2
<b>Emergency Class:</b> NON EMERGENCY	VERN HODGE (Email)
<b>10 CFR Section:</b>	
21.21 UNSPECIFIED PARAGRAPH	

#### POTENTIAL DEFECT IN OTEK PANEL METERS

Southern Testing Services (STS) provided information on a potential defect in OTEK Panel Meters. The information applies to 90-265 Volt AC / 10- 32 Volt DC, OTEK Part Numbers: HI-Q114, HI-Q116, HI-Q117, HI-Q118, and HI-Q119.

"STS has identified a potential failure cause for the HI-Q class meters that would result in a frozen indicator with no indication that the failure has occurred. The specific failure mode is a failure of the main processor (only) that freezes the display processor. The frozen display inhibits the detection of the main processor failure except by cycling power to the Panel Meter. This failure mode was previously addressed in the Failure Mode Effects Analysis (FMEA) conducted by STS in Test Report S4000-RP-03; however, no credible causes for the failure beyond infant mortality were postulated or had been experienced at the time. Infant mortality failures are minimized by the dedication process that verifies operation of the units prior to shipment to the client.

"STS has just learned from OTEK that of one (1) OTEK Panel Meter had experienced a main processor failure which resulted in a frozen display indicator. This Panel Meter was reportedly in a non-nuclear application. OTEK determined that the likely cause of this failure was a high frequency spike on the power lines caused by running the meter off of a DC generator.

"The STS EMI/RFI qualification program for the OTEK meters qualified them with an anomaly, limiting the surge protection to 500 [Volts peak to peak] for DC powered units. Additionally, high frequency susceptibility testing was successfully completed with a continuous signal of 3.5 [Volts RMS] on the power lines (both AC and DC powered units) from 10 kHz to 200 MHz. Additional testing was done on AC powered units at 7 [Volts RMS]. Testing was conducted in accordance with EPRI TR-102323 to the methods specified in EN 61000-46. The units passed the susceptibility testing at the limits specified, as reported in Test Report S4000-RP-03.

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"Based on the successful surge and high frequency susceptibility testing conducted by STS, it is concluded that the single known failure noted by OTEK was related to operating outside of the parameters tested during qualification of these OTEK meters. The likelihood of such a failure in a nuclear safety related application is considered to be remote."

STS determined that 294 units were provided to nuclear plants in potentially safety related applications where EMI/RFI requirements were imposed. The following plants were effected purchasers: Vermont Yankee, Pilgrim, St. Lucie, and Brown's Ferry.

"OTEK is currently in the process of updating the display board processor programming to detect a failure of the main processor, and provide an indication on the display that a main processor failure has occurred. STS will coordinate with the above utilities when this update becomes available."

\*\*\* UPDATE FROM SOUTHERN TESTING SERVICES (W. WILLIS) TO M. RIPLEY 0840 EST 11/10/06 \*\*\*

The following information was provided via facsimile:

"The date on which the information of such defect or failure to comply was obtained: OTEK notified STS via email on September 18, 2006 following in-person conversations on September 12, 2006 with Southern Testing Services and TVA personnel.

"In case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part.

A total of 294 units have been provided to Nuclear Plants in potentially safety-related applications where EMI/RFI requirements were imposed. The following Effected Purchasers have been identified: Vermont Yankee, St. Lucie, Pilgrim, Brown's Ferry

"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: OTEK has provided a prototype meter with the display processor code modified to detect failure of the main processor and provide an indication on the meter by generating a full scale bargraph colored amber. STS has successfully performed testing on the unit to confirm proper operation of the modified display processor code. STS will coordinate with the above utilities when testing of this update is complete to upgrade or replace the existing units if required by the utilities. OTEK will include the modified software in the HI-Q series meters in all new orders, starting immediately.

"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:

STS and Otek acknowledge the definition of 'Defect' within 10 CFR, Part 21 but believe the issue is more accurately described as an absence of a specific failure mode indication that was not previously required."

Notified R1 DO (N. Perry), R2 DO (P. Fredrickson), and NRR Part 21 (EMAIL & FAX)

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42880 UPDATE

November 10, 2006

Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555  
Phone: (301) 816-5100  
Fax: (301) 816-5151

Subject: **Written Notification for USNRC Event Number 42880 Dated 10/05/06**

Dear Sir/Madam:

The following is submitted as the written notification required by 10 CFR 21.21(3)(ii). It also provides some additional information with regard to the manufacture's solution.

1. Name and address of the individual or individuals informing the Commission:

**Southern Testing Services (STS)  
10627 Lexington Drive  
Knoxville, TN 37932  
President: Mr. Allen Davidson**

**Telephone: (865) 966-5330  
Fax: (865) 675-5399**

2. Identification of the facility, the activity, or the basic component supplied for such facility or such activity with the United States which fails to comply or contains a defect:

**Panel Meter, 90-265 VAC/10-32 VDC, Otek Part Numbers HI-Q114, HI-Q116, HI-Q117, HI-Q118, HI-Q119, HI-Q2000, HI-QTBS.**

3. Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect:

**Original Equipment Manufacturer:  
Contact:**

**OTEK Corporation  
Dr. Otto Fest  
Tel: (520) 748-7900**

**Dedicating Entity:**

**Southern Testing Services  
(See Contact Information in Item 1, above)**

4. 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:

STS has identified a potential failure cause for the HI-Q class meters that would result in a frozen indicator with no indication that the failure has occurred. The specific failure mode is a failure of the *main processor* (only) that freezes the *display processor*. The frozen display inhibits the detection of the main processor failure except by cycling power to the Panel Meter. This failure mode was previously addressed in the Failure Mode Effects Analysis (FMEA) conducted by STS in Test Report S4000-RP-03; however, no credible causes for the failure beyond infant mortality were postulated or had been experienced at the time. Infant mortality failures are minimized by the dedication process that verifies operation of the units prior to shipment to the client.

STS has just learned from OTEK that of one (1) OTEK Panel Meter had experienced a *main processor* failure which resulted in a frozen *display indicator*. This Panel Meter was reportedly in a non-nuclear application. OTEK determined that the likely cause of this failure was a high frequency spike on the power lines caused by running the meter off of a DC generator.

The STS EMI/RFI qualification program for the OTEK meters qualified them with an anomaly, limiting the surge protection to 500 V<sub>P-P</sub> for DC powered units. Additionally, high frequency susceptibility testing was successfully completed with a continuous signal of 3.5 V<sub>RMS</sub> on the power lines (both AC and DC powered units) from 10 kHz to 200 MHz. Additional testing was done on AC powered units at 7 V<sub>RMS</sub>. Testing was conducted in accordance with EPRI TR-102323 to the methods specified in EN 61000-4-6. The units passed the susceptibility testing at the limits specified, as reported in Test Report S4000-RP-03.

Based on the successful surge and high frequency susceptibility testing conducted by STS, it is concluded that the single known failure noted by OTEK was related to operating outside of the parameters tested during qualification of these OTEK meters. The likelihood of such a failure in a nuclear safety related application is considered to be remote.

5. The date on which the information of such defect or failure to comply was obtained:

OTEK notified STS via email on September 18, 2006 following in-person conversations on September 12, 2006 with Southern Testing Services and TVA personnel.

6. In case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part:

A total of 294 units have been provided to Nuclear Plants in potentially safety-related applications where EMI/RFI requirements were imposed. The following Affected Purchasers have been identified.

Vermont Yankee  
Pilgrim

St. Lucie  
Brown's Ferry

- 7. 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.

**O TEK has provided a prototype meter with the display processor code modified to detect failure of the main processor and provide an indication on the meter by generating a full scale bargraph colored amber. STS has successfully performed testing on the unit to confirm proper operation of the modified display processor code. STS will coordinate with the above utilities when testing of this update is complete to upgrade or replace the existing units if required by the utilities. OTEK will include the modified software in the HI-Q series meters in all new orders, starting immediately.**

- 8. 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:

**STS and Otek acknowledge the definition of "Defect" within 10 CFR, Part 21 but believe the issue is more accurately described as an absence of a specific failure mode indication that was not previously required."**

If there are any further questions, please don't hesitate to contact us.

Very truly yours,



William R. Willis  
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 Utility Services Division of ATC  
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