



Science Applications International Corporation
An Employee-Owned Company

KAH-032-94
February 11, 1994

SUBJECT: Notification of Potential Defect in Assembly of Group Rod Indicator Display (GRID), Step-Counter

REFERENCE: (a) 10 CFR 21 Reports of Nonconformances

ENCLOSURE: (1) Component Manufacturer's Data - Contains Illustrations of Backplane Mounting and Bezel Assembly
(2) Options for Correction of Verified Defect
(3) Step-by-Step Procedure for Evaluating and Correcting Grid Unit Nonconformances at Your Facility
(4) Nonconformance Report, Hardware Problem/Failure Report & Corrective Action Request

Dear SAIC GRID Product User:

In accordance with our reference (a) responsibility to report product nonconformances within thirty days, please be advised that Science Applications International Corporation (SAIC) identified a potential product assembly defect in our Group Rod Indicator Display (GRID), Step-Counter product which, according to our records, you have purchased from us for your facility. This letter confirms the verbal notification you were provided.

On Sunday, January 23, 1994, an SAIC representative conducted a root cause analysis on two GRID units which had failed to function properly at the Salem Nuclear Power Plant in Hancock's Bridge, New Jersey, . The malfunction was identified and duplicated during the root cause assessment process. We established that the root cause of these units' failures was improper assembly of the LCD to the backplane. The lock-ramp pins (see enclosure (1) diagram) appeared to not be completely engaged during the assembly process, which failed to create the necessary air-tight connection. Over time, this assembly error allowed oxidation to corrupt the electrical transmission through the connector strips.

SAIC recommends a visual inspection be conducted immediately on any GRID units in your possession. In order to visually identify a possible defect, please refer to the enclosure (1) diagram which illustrates what a properly assembled GRID unit should look like. Any deviation from the diagram in the lock-ramp pin penetration in printed circuit board backplane should be suspect. If you have identified a possible fault, refer to enclosure (2) for options for correction of a verified defect.

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9402170121 940211
PDR PT21 EECSAI
94 PDR

6725 Odyssey Drive, Huntsville, Alabama 35806, (205) 971-6400

Other SAIC Offices: Albuquerque, Atlanta, Boston, Chicago, Colorado Springs, Dayton, Denver, El Paso, Las Vegas, Los Angeles, Norfolk, Oak Ridge, Omaha, Orlando, St. Ann, San Diego, San Francisco, Santa Barbara, Shalimar, Tucson and Washington, DC

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The enclosure (3) step-by-step procedure should be followed in order to preserve the integrity of the unit. Please be advised that any unit still under warranty should be returned to SAIC for disassembly in accordance with enclosure (2). Please refer to the enclosure (1) diagram/illustration in performing the procedure. Troubleshooting assistance is available via telephone by contacting one of the following SAIC representatives during normal business hours:

Rodney Brand	(205) 971-6665
Marty Ramsdell	(205) 971-6434
FACSIMILE	971-6579

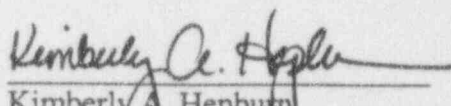
Please note that despite the fact that this unit is not safety-related equipment, the data displayed is used to make safety-related decisions. If a failure of the counter causes a big enough difference in the count of steps, then a safety-related decision is made and the reactor may be shut down.

The distribution list below indicates all locations and numbers of units supplied by SAIC according to our records.

Any formal correspondence concerning this notification should be directed to the attention of the undersigned who may be contacted at (205) 971-6424 (telephone) or 971-6761 (facsimile).

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

By: 
Kimberly A. Hepburn
Senior Contracts Representative

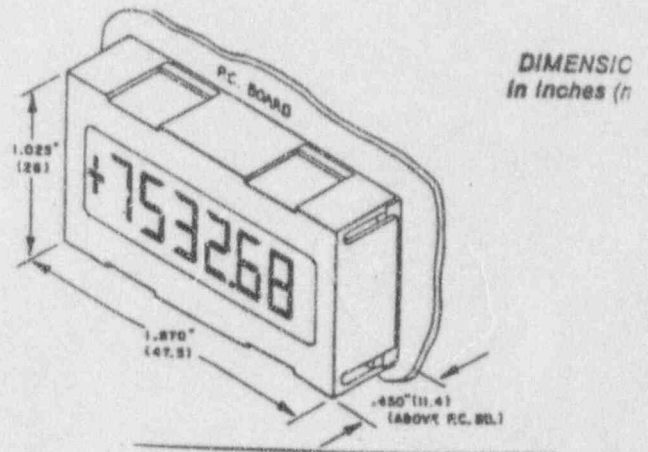
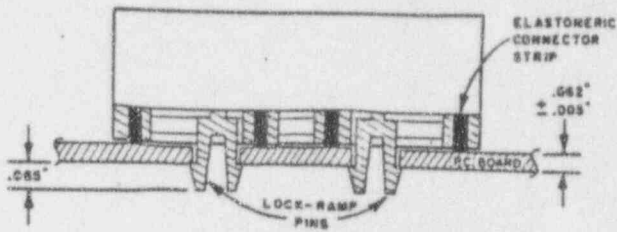
Dist: Diablo Canyon (21)
Farley (14)
Ginna (8)
Kenaunee (28)
Millstone (42)
NRC Training Center (16)
Point Beach (2)
Prairie Island (8)
Robinson (14)
Salem (47)
Sequoyah (38)
Watts Bar (14)

Enclosure (1)
KAH-032-94

*COMPONENT MANUFACTURER'S DATA - CONTAINS ILLUSTRATIONS
OF BACKPLANE MOUNTING AND BEZEL ASSEMBLY
FOR USE IN VISUAL INSPECTION OF GRID UNIT*

MOUNTING & DIMENSIONS

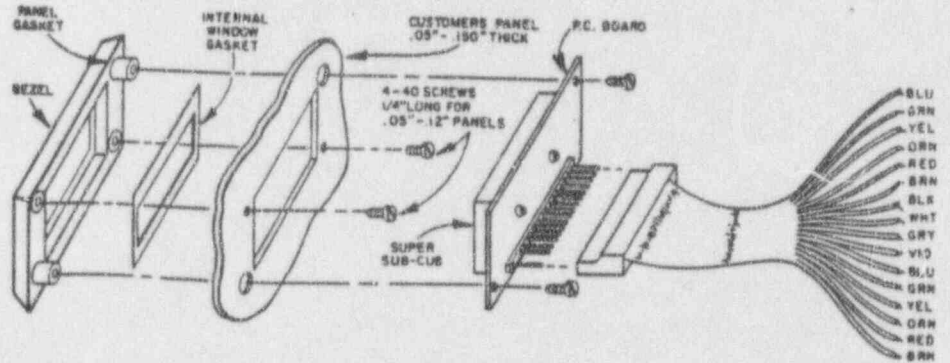
Snap in mounting on the P.C. Board is facilitated by two, split, lock-ramp pins which engage mounting holes drilled in the P.C. Board. The silicone rubber elastomeric connectors compress to accommodate P.C. Board thickness variation of $\pm .005$ ".



PANEL BEZEL KIT FOR THE SUPER SUB-CUB (P/N HWK-50-000)

This kit provides a convenient way to adapt the SUPER SUB-CUB for panel mounting. The kit includes the black plastic bezel, the panel and internal window gaskets, P.C. Board, 12" ribbon cable and mounting screws.

ASSEMBLY



Enclosure (2)
KAH-032-94

OPTIONS FOR CORRECTIONS OF VERIFIED DEFECT

As a client of SAIC, if you believe your GRID unit is under warranty, the unit should be returned to SAIC for correction of nonconformance. You may elect to repair units yourself which are not under warranty utilizing the enclosure (1) step-by-step procedures OR you may return the unit to SAIC for repair in our facility at no cost to you.

In order to return a unit to SAIC for repair, please notify the SAIC representatives listed of shipping schedule and tracking numbers to verify the receipt of your units. Please mark all return units as follows:

ATTENTION: Custom Products
Science Applications International Corporation
6725 Odyssey Drive
Huntsville, AL 35806

Include the point of contact for return shipment and correct shipping address.

Enclosure (3)
KAH-032-94

*STEP-BY-STEP PROCEDURE FOR
EVALUATING AND CORRECTING
GRID UNIT NONCONFORMANCES*

STEP 1:

If your unit(s) is installed in the panel, remove cover, visually inspect locking ramps. If defect is suspected, disconnect unit and place in static-controlled environment for disassembly.

STEP 2:

Remove backplane connector and backplane/LCD from bezel. Note: removal of 2 screws required using a #1 Phillips head screw driver.

STEP 3: NOTE: STATIC PROTECTION REQUIRED

Disassemble LCD from backplane without breaking locking lugs. Depress the locking lugs sufficiently to press through mounting hole.

STEP 4: NOTE: STATIC PROTECTION REQUIRED

Remove elastomeric strips from backplane and LCD.

STEP 5:

Clean connection area of strips with alcohol and cotton swabs to eliminate any residual oxidation. This will not be visible. Clean the entire area. Then clean printed backplane contact pads using the same method. Allow alcohol to evaporate. (At least 10 minutes).

STEP 6: NOTE: STATIC PROTECTION REQUIRED

To reassemble unit, place connector strips into LCD. Note static protection required. Reassemble backplane. Note keying pin. Depress backplane overlocking lugs ensuring proper engagement of locking lugs in mounting hole. Note, if necessary, use a tool to spread gap sufficiently to ensure engagement of locking lugs.

Enclosure (4)
KAH-032-94

*NONCONFORMANCE REPORT, HARDWARE PROBLEM/FAILURE REPORT
& CORRECTIVE ACTION REQUEST*



Science Applications International Corporation
 An Employee-Owned Company
 6725 Odyssey Dr.
 Huntsville, AL 35806-3301

VMNR# 200 2029
 QA CONTROL#
 ORIGINATOR Ben
 DATE 1-31-94

VENDOR MATERIAL NONCONFORMANCE REPORT

VENDOR	PROJECT	PURCHASE ORDER NO.		
SAIC	CDD	Pa-429117-02		
DESCRIPTION OF COMPONENT	PART NO.	SERIAL NO.		
GRID Step Counter	GRID-A/B	---		
DRAWING	SPECIFICATION	QTY ORDERED	QTY RECEIVED	QTY REJECTED
131-9900528-01	Non Safety Related	46	46	3

QUALITY ASSURANCE

DESCRIPTION OF NONCONFORMANCE:
 (PROVIDE SKETCH IF REQUIRED)

Product nonconformance is identified as a product assembly defect in the Group Rod Indicator Display (GRID) Step Counter. Failure is identified as improper assembly of the LCD to the backplane. The lock-ramp pins did not completely engage during the assembly process, which failed to create the necessary air-tight connection. Over time, this assembly error allowed oxidation to corrupt the electrical transmission through the connector strips.

INSPECTOR SIGNATURE: [Signature] DATE: 11 31 194

REQUESTOR

CORRECTIVE ACTION/DISPOSITION:

THE CORRECTIVE ACTION IS TO IDENTIFY THIS STEP OF ASSEMBLY AS A SPECIAL PROCESS THROUGH Q.A. AND PLACE AN IN-LINE INSPECTION OF THIS PROCESS. GIVE TRAINING TO ASSEMBLERS WITH PRESENCE OF Q.A. DOCUMENT SPECIAL PROCESS ASSEMBLY PROCEDURES AND SPECIAL PROCESS INSPECTION PROCEDURES.

REQUESTOR SIGNATURE: [Signature] DATE: 2 11 194

PURCHASING

EVALUATION OF CORRECTIVE ACTION:

PURCHASING SIGNATURE: _____ DATE: / /

HARDWARE PROBLEM/ FAILURE REPORT



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1. Equipment Description <u>GRID Step Counter</u>	Serial Number/Location <u>081993-20, 081993-08, 081993-02</u>	Down Time --	HPR # <u>561</u> <small>(Assigned by QA)</small>								
Description Of Problem Or Failure GRID units failed to function properly at Salem Nuclear Power Plant in Hancock's Bridge, New Jersey. Problem appears to be oxidation corrupting the electrical transmission through the connector strips. Problems noted include: #081993-20 Locked Up. Count Inhibited. #081993-08 Drop of count. Reset during controlled ramping. #081993-02 Count ramping without control. Oscillating.			Originating Project <u>CDD</u>								
			Error Detected During: <table style="margin-left: 20px;"> <tr> <td>Normal Op</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Diagnostics</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Field Test</td> <td><input checked="" type="checkbox"/></td> </tr> </table>	Normal Op	<input type="checkbox"/>	Diagnostics	<input type="checkbox"/>	Field Test	<input checked="" type="checkbox"/>		
Normal Op	<input type="checkbox"/>										
Diagnostics	<input type="checkbox"/>										
Field Test	<input checked="" type="checkbox"/>										
Problem Type: <table style="margin-left: 20px;"> <tr> <td>CS Hardware</td> <td><input type="checkbox"/></td> </tr> <tr> <td>DS Hardware</td> <td><input type="checkbox"/></td> </tr> <tr> <td>DA Hardware</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Documentation</td> <td><input type="checkbox"/></td> </tr> </table>				CS Hardware	<input type="checkbox"/>	DS Hardware	<input type="checkbox"/>	DA Hardware	<input type="checkbox"/>	Documentation	<input type="checkbox"/>
CS Hardware	<input type="checkbox"/>										
DS Hardware	<input type="checkbox"/>										
DA Hardware	<input type="checkbox"/>										
Documentation	<input type="checkbox"/>										
Originator <u>Michael B</u> Phone <u>26554</u> Date <u>1/31/94</u>											
2. Production Manager <u>Rodney Brand</u> Date: <u>2-11-94</u> Assigned To: <u>Rodney Brand</u> Date: <u>2-11-94</u>											
3. Remedial Or Corrective Action NOTE: If the corrective action required items to be changed, identify the type of change activity (Swap, Replace, Move, etc.) and provide firmware revisions and from/to locations as appropriate Vendor Field Service Report Number _____ Up Time _____			DOCUMENT CHANGES Yes <input type="checkbox"/> No <input type="checkbox"/> Drawings _____ ECO # _____ Documents _____ DCO # _____								
THE ROOT CAUSE OF FAILURE IS IMPROPER ASSEMBLY OF THE LCD BACKPLANE TO THE LCD DISPLAY. THIS ALLOWS AN ELECTRICAL CONNECTION TO FORM WITHOUT A GAS TIGHT SEAL. AFTER TESTING AND INSTALLATION THE CONNECTION PAD CAN FORM OXIDATION WHICH CORRUPTS TRANSMISSION OF SIGNALS THROUGH THE CONNECTION. LOCKUP CAN BE CAUSED BY THE INHIBIT SIGNAL GOING TO A LOW VOLTAGE STATE. RESET CAN BE CAUSED BY THE RESET SIGNAL GOING TO A LOW VOLTAGE STATE. OSCILLATION CAN BE CAUSED BY ADD OR SUBTRACT SIGNAL AT THE THRESHOLD VOLTAGE STATE FOR COUNT DETECTION. CORRECTIVE ACTION TO CLEAR FAILURES IS TO DISASSEMBLE AND CLEAN CONTACTS THEN REASSEMBLE PROPERLY.											
Closed By <u>Rodney Brand</u> Date <u>2-11-94</u>											
4. QA Status Accounting Initial Report: <u>MCS</u> Date: <u>2-11-94</u> Remedial Action: _____ Date: _____ Route To CM: <u>MCS</u> Date: <u>2-11-94</u>											

Completion of ALL BLOCKS is mandatory - Originator to complete Part 1.

SUBMIT THIS FORM TO QA UPON COMPLETION OF TOP OR BOTTOM BLOCKS

CORRECTIVE ACTION REQUEST



An Employee-Owned Company

DATE: 1-31-94 CONTROL NO.: CA-94-01

TO: Rodney Brand (SAIC)

NONCONFORMING MATERIAL

P.O. NO. P2-42917-02 SERIAL NO. —

FROM: SAIC

DISCREPANCY IN PROCESS

QUALITY ASSURANCE REVIEW

THE FOLLOWING CONDITION IS BROUGHT TO YOUR ATTENTION FOR CORRECTIVE ACTION. PLEASE INDICATE THE CAUSE AND CORRECTIVE ACTION TO PREVENT RECURRENCE IN THE SPACES PROVIDED BELOW. SIGN AND DATE THE CORRECTIVE ACTION STATEMENT AND RETURN THIS FORM TO THE SENDER WITHIN 30 DAYS.

DISCREPANT CONDITION:

GRID units failed to function properly at Salem Nuclear Power Plant in Hancock's Bridge, New Jersey. Problem appears to be oxidation corrupting the electrical transmission through the connector strips. Serial # 081993-20 locked up and had count inhibited. Serial # 081993-08 had drop of count and reset during controlled ramping. Serial # 081993-02 had count ramping without control and oscillating.

SIGNATURE: Michelle B

CAUSE:

THE ROOT CAUSE OF FAILURE IS IMPROPER ASSEMBLY OF THE LCD BACKPLANE TO THE LCD DISPLAY. THIS ALLOWS AN ELECTRICAL CONNECTION TO FORM WITHOUT A GAS TIGHT SEAL. AFTER TESTING AND INSTALLATION THE CONNECTION PAD CAN FORM OXIDATION WHICH CORRUPTS TRANSMISSION OF SIGNALS THROUGH THE CONNECTION.

SIGNATURE: Rodney Brand

CORRECTIVE ACTION TO PREVENT RECURRENCE:

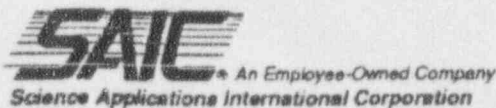
THE CORRECTIVE ACTION IS TO IDENTIFY THIS STEP OF ASSEMBLY AS A SPECIAL PROCESS THROUGH Q.A. AND PLACE AN IN-LINE INSPECTION OF THIS PROCESS. GIVE TRAINING TO ASSEMBLERS WITH PRESENCE OF Q.A. DOCUMENT SPECIAL PROCESS ASSEMBLY PROCEDURES AND SPECIAL PROCESS INSPECTION PROCEDURES.

ACTIVITY:

SIGNATURE: Rodney Brand DATE: 2-11-1994 CONCURRENCE: _____

QUALITY ASSURANCE AUDIT

APPROVED DISAPPROVED SIGNATURE: Michelle B DATE: 2-11-94



FORM NO. 12910

REV. LTR

SH / OF /