Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

April 23, 2012

10 CFR 50.4

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 2
NRC Docket No. 50-391

Subject: WATTS BAR NUCLEAR PLANT (WBN) UNIT 2 – INSTRUMENTATION AND CONTROLS STAFF INFORMATION REQUESTS

References:
1. Supplemental Safety Evaluation Report (SSER) 22, 23, 24 and 25 Appendix HH Watts Bar Unit 2 Action Items Table
2. NRC to TVA e-mail (J. Poole, NRC to G. Arent, TVA), "Draft Request for Additional Information on Open Items 80 and 81," sent March 20, 2012

The purpose of this letter is to respond to NRC requests for additional information (RAIs) provided in Reference 2. These RAIs are related to open items in Reference 1.

Enclosure 1 to this letter provides TVA's responses to the information requested by NRC. Enclosure 2 contains a list of attachments that support TVA's responses provided in Enclosure 1. Enclosure 3 provides the new regulatory commitment contained in this letter.

If you have any questions, please contact Gordon Arent at (423) 365-2004.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 23rd day of April 2012.

Respectfully,

R. A. Hruby, Jr.

Raymond A. Hruby
General Manager, Technical Services
Watts Bar Unit 2

D030
NRR

Enclosures:

1. TVA Responses to Instrumentation and Controls Staff Information Requests
2. List of Attachments
3. New Regulatory Commitment

cc (Enclosures):

U. S. Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, Georgia 30303-1257

NRC Resident Inspector Unit 2
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

Enclosure 1
TVA Letter Dated April 23, 2012
TVA Responses to Instrumentation and Controls Staff Information Requests

ACRONYMS AND ABBREVIATIONS

The following acronyms/abbreviations are used in this letter:

EMC	Electro-Magnetic Compatibility
GA-ESI	General Atomics Electronic Systems Inc.
Hz	Hertz
I/F	Current to Frequency
kHz	Thousand Hertz
MIL Std	Military Standard
NRC	Nuclear Regulatory Commission
RAI	Request for Additional Information
SER	Safety Evaluation Report
SSER	Supplemental Safety Evaluation Report
TVA	Tennessee Valley Authority
WBN	Watts Bar Nuclear Plant

NOTE

1. For the NRC RAIs in this letter, a response has been provided in previous TVA letters. The NRC subsequently requested additional information. Previous TVA responses are not repeated below. Additional NRC information requests are identified in this letter as "**NRC Follow-up Request.**" TVA responses to these items are identified as "**TVA Response to NRC Follow-up Request.**"

RAI RESPONSES

1. NRC Follow-up Request (SSER 23 Appendix HH Item Number 80)

NRC Staff has reviewed this GA-ESI document 04038800-1SP and 04508905-2SP (referenced in 04038800-1SP and submitted via ML110620236) documents. These documents explain the similarities and differences in the old I/F converter and the new I/F converter model (GA-ESI P/N 04501351-003). It also explains some of the improvements related to shielding for better EMC protection. However, there is no test data or analysis provided to support the missing frequency range (i.e. 50 kHz to 150 kHz). In the NRC letter to TVA dated September 21, 2011 (ML112590046) NRC staff explained that both the Regulatory Guide 1.180, Rev. 1 and MIL Std 461-E require the test range from 30 Hz to 150 kHz for low frequency susceptibility test. Therefore, TVA is requested to provide test data for closing this item. If majority of the components have already been tested under some other similar tests for the required frequency range, then an analysis with justification for the differences may be provided as an alternate.

TVA Response to NRC Follow-up Request

Analysis of the tests performed and follow-up information provided by General Atomics Electronic Systems Inc. (GA-ESI) determined that the current to frequency (I/F) converter had been tested from 50 kHz to 150 kHz. However, a gap in the required response data between 30 to 100 Hz exists. Based on the above, TVA will retest the I/F converter over the required range of 30 Hz to 150 kHz and provide a test report to the NRC by August 31, 2012.

2. NRC Follow-up Request (SSER 23 Appendix HH Item Number 81)

TVA to provide the particulars of the test machine for staff to confirm the statement that the test machine is indeed a pass/fail machine prior to accepting the alternate package for acceptable commercial dedication as a sample.

TVA Response to NRC Follow-up Request

The GA-ESI response is provided in non-proprietary GA-ESI Letter # 010-01038-005, "NRC Open Item 81," dated April 16, 2012 (Attachment 1), which describes the overall test equipment setup. The equipment test procedure that documents the test as pass/fail is non-proprietary Emerson Network Power Surge Protection, Document IPR-TST126, "Test Procedure Assembly Numbers I, IC, IC+ Series," Revision 0, dated October 25, 2004 (Attachment 2). The GA-ESI translation of the test procedure from Spanish to English is contained in non-proprietary Attachment 3. The IC+105 Test Parameters are provided in non-proprietary Attachment 4.

Enclosure 2
TVA Letter Dated April 23, 2012
List of Attachments

Note: While project coversheets have not been included, the attachments have been reviewed and approved by Engineering prior to submittal.

1. Non-proprietary GA-ESI Letter # 010-01038-005, "NRC Open Item 81," dated April 16, 2012 (Letter Item 2, SSER 23 Appendix HH Item 81)

2. Non-proprietary Emerson Network Power Surge Protection, Document IPR-TST126, "Test Procedure Assembly Numbers I, IC, IC+ Series," Revision 0, dated October 25, 2004 (Letter Item 2, SSER 23 Appendix HH Item 81)

3. Non-proprietary Emerson Network Power Surge Protection, Document IPR-TST126, "Test Procedure Assembly Numbers I, IC, IC+ Series," Revision 0, dated October 25, 2004. Translated to English by GA-ESI. (Letter Item 2, SSER 23 Appendix HH Item 81)

4. Non-proprietary IC+105 Test Parameters (Letter Item 2, SSER 23 Appendix HH Item 81)

Attachment 1

Non-proprietary GA-ESI Letter # 010-01038-005, "NRC Open Item 81," dated April 16, 2012 (Letter Item 2, SSER 23 Appendix HH Item 81)

GENERAL ATOMICS
ELECTRONIC SYSTEMS

April 16, 2012

Letter # 010-01038-005

Watts Bar Nuclear Plant
Watts Bar NP, HW 68, PO Box 2000, FSB-1G
Spring City, TN 37381

Attention: Steven Clark

Subject: NRC Open Item 81

Reference: PO 00077448-1
IPR-TST126
IPR-TST126 Translated
IC+105 Test Parameters

Dear Mr. Clark,

Open Item 81:

TVA provided the non-proprietary GA-ESI letter 010-01038-001 as attachment 10 to the December 22, 2011 letter (ML12018A213). This letter states that, "The AC Filter is subjected to functional testing by the vendor. GA-ESI documentation indicates the testing was verified during a previous GA-ESI vendor audit. Recent follow up conversations with the vendor indicate the functional test is performed using an automated testing machine, and the results are Pass/Fail. A test report is not produced during the test, rather, the Certificate of Conformance is provided to certify successful completion of the testing. Attached is a documentation package for a different component, a power supply, which is tested by GA-ESI during receipt inspection."

Request for Additional Information:

TVA to provide the particulars of the test machine for staff to confirm the statement that the test machine is indeed a pass/fail machine prior to accepting the alternate package for acceptable commercial dedication as a sample.

RESPONSE:

The vendor's test equipment was developed in-house, and consists of an automated test controlled by a PC. The test equipment uses a California Instruments CI 6000L 3-Phase Power Supply and a Fluke 45 Dual Display Multimeter, both controlled via a General Purpose Interface Bus (GPIB). Test steps include a continuity check to verify Line and Load are not shorted/open and the application of nominal voltage to verify LED is turned on.

GENERAL ATOMICS ELECTRONIC SYSTEMS, INC.
4949 GREENCRAIG LANE, SAN DIEGO, CA 92123 • (858) 522-8300 • (858) 522-8301

GENERAL ATOMICS
ELECTRONIC SYSTEMS

The vendor provided the test instruction and the associated test parameters. These documents are attached and demonstrate the test results are Pass/Fail. [Please note the vendor's test instruction was provided in Spanish and translated to English by GA-ESI; both versions are attached since only the Spanish version contains the vendor's letterhead.]

Sincerely,

Joseph Heithaus
Project Manager

Note: This letter and the referenced documents are non-proprietary.

GENERAL ATOMICS ELECTRONIC SYSTEMS, INC.
4949 GREENCRAIG LANE, SAN DIEGO, CA 92123 • (858) 522-8300 • (858) 522-8301

Attachment 2

Non-proprietary Emerson Network Power Surge Protection, Document IPR-TST126, "Test Procedure Assembly Numbers I, IC, IC+ Series," Revision 0, dated October 25, 2004 (Letter Item 2, SSER 23 Appendix HH Item 81)

EMERSON.
Network Power
Surge Protection

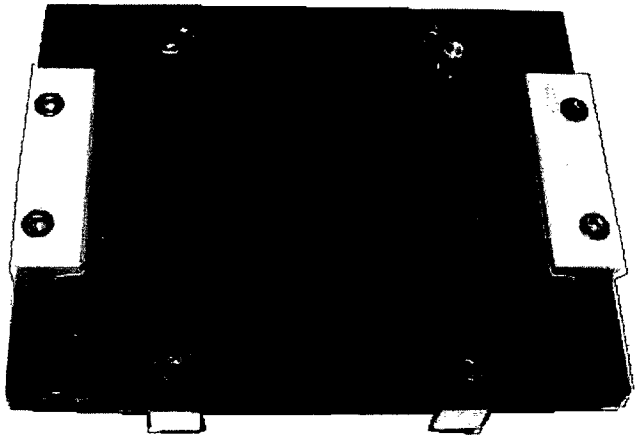
INSTRUCCION DE PRUEBA

REV	DESCRIPCION	FECHA	ELABORA	APRUEBA
0	LIBERADA	10/25/04	OP	

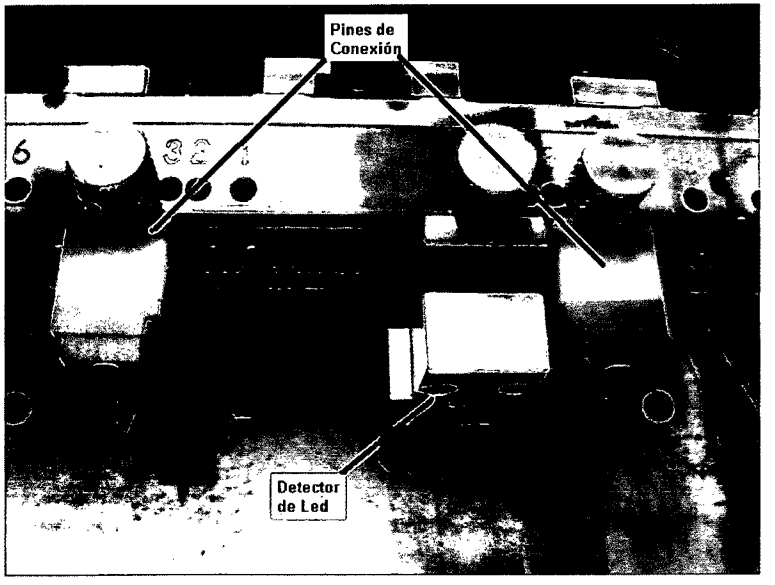
NUMERO DE ENSAMBLE: I, IC,IC+ SERIES

DOCUMENTO: IPR-TST126

Pasos a seguir:	
Paso	Acción
1	Montar el fixture TR-0081 sobre la base de prueba TR-080
2	Cargar el programa de prueba correspondiente al modelo.
3	Colocar la calza correspondiente al modelo.
3	Colocar los pines de conexion de manera adecuada para un buen contacto si el producto tiene conectores de tornillos verticales. Si el producto tiene conectores de tornillos horizontales, no colocar ningun par de pines de conexion. Si el producto tiene cables en lugar de conectores, coloque los cables en los orificion que exiten bajo la base del producto segun indica la tabla 1. Ajuste el fixture.
4	Colocar el detector de led cuando se prueben modelos que cuenten con LED.
5	Colcoar el producto perfectamente bien dentro de la calza. Cierre la guarda de seguridad.
5	Ejecutar la prueba automática.
6	Si la prueba muestra la leyenda "PASA", pasar el producto a la siguiente operacion, de lo contrario colocarlo en el contenedor de FALLAS y llamar al técnico de diagnóstico.



Calza para modelo IC+105



Pines de conexión y detector de led

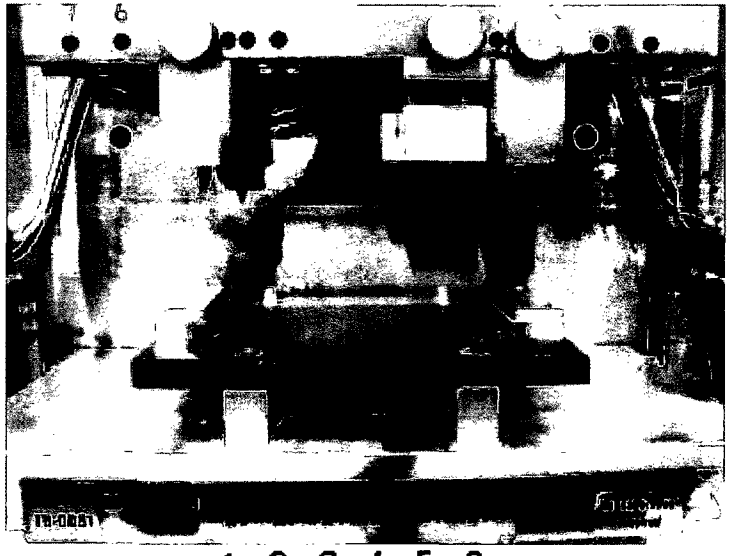
EMERSON.
Network Power
Surge Protection

INSTRUCCION DE PRUEBA

NUMERO DE ENSAMBLE: I, IC,IC+ SERIES

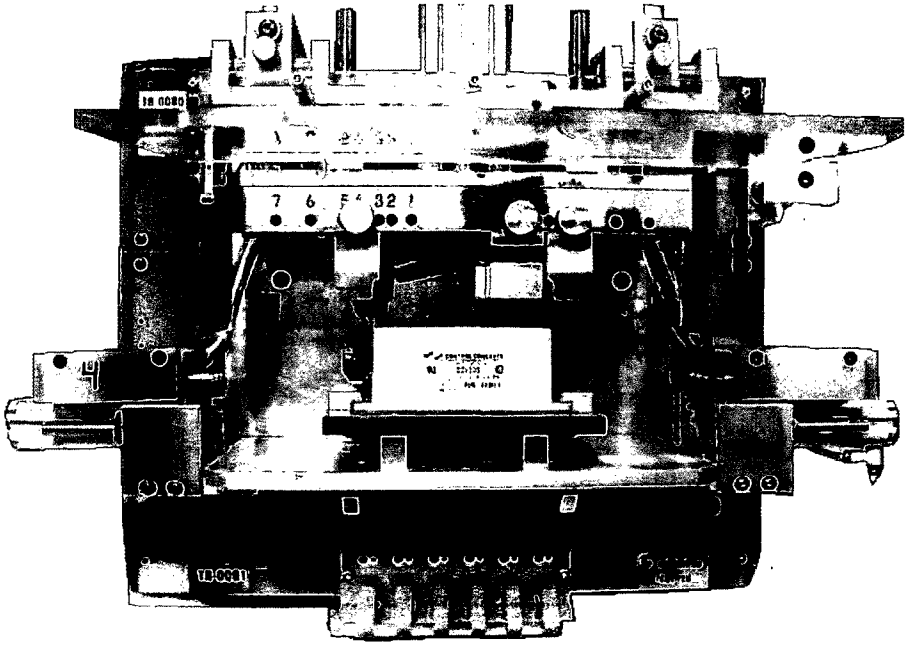
DOCUMENTO: IPR-TST126

REV	DESCRIPCION	FECHA	ELABORA	APRUEBA
0	LIBERADA	10/25/04	OP	



Cable	Punto
L (LINE)	1
N (LINE)	2
GND (LINE)*	3
L (LOAD)	4
N (LOAD)*	5
GND (LOAD)*	6
*Algunos modelos NO cuentan con este cable	

Tabla 1



Producto listo para ser probado

Attachment 3

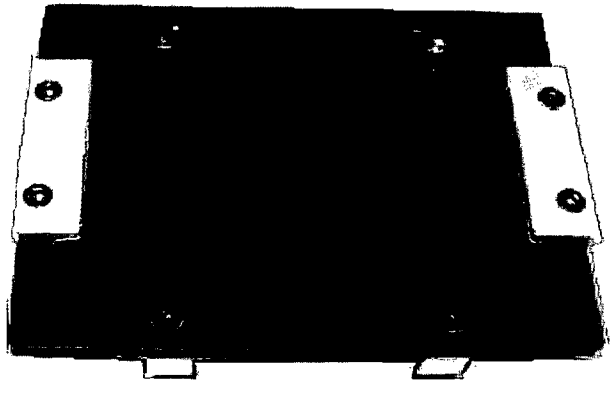
Non-proprietary Emerson Network Power Surge Protection, Document IPR-TST126, "Test Procedure Assembly Numbers I, IC, IC+ Series," Revision 0, dated October 25, 2004. Translated to English by GA-ESI. (Letter Item 2, SSER 23 Appendix HH Item 81)

TEST PROCEDURE

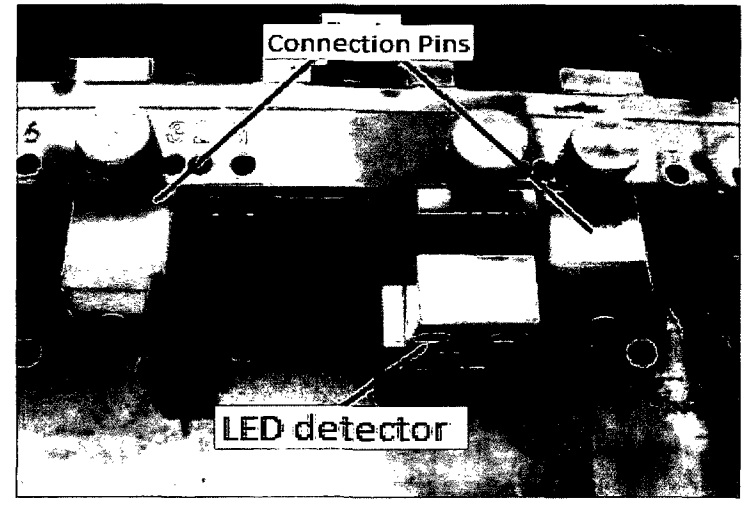
REV	DESCRIPTION	DATE	DEVELOPED	APPROVED
0	Issued	10/25/2004		

ASSEMBLY NUMBER:
DOCUMENT:

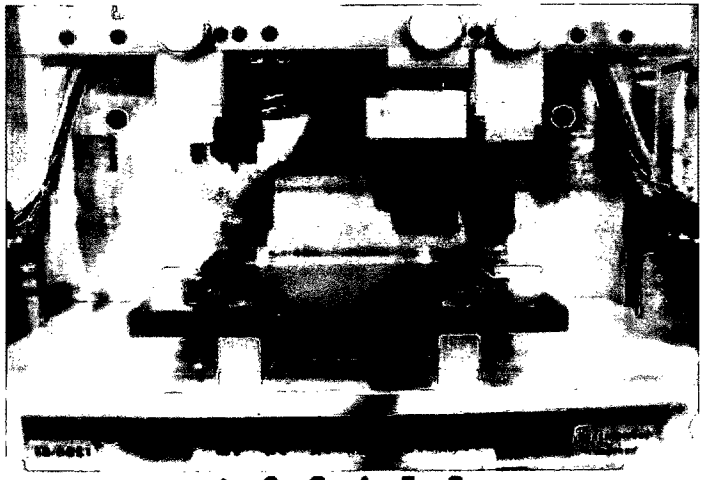
Step	Action
1	Mount TR-0081 fixture on TR-080 test plate
2	Load test program corresponding to model
3	Place spacer base corresponding to model
3	If product has vertical screw connectors, place connection pins in a manner to provide good contact. If the product has horizontal screw connectors, do not place any pair of connection pins. If the product has cables instead of connectors, place cables in the holes on lower part of the base of the product as indicated on table 1. Adjust the fixture.
4	Place LED detector when testing models with LED.
5	Place product perfectly within spacer base. Close the security guard.
5	Execute the automatic test.
6	If the test shows "PASS" move product to next operation, if not, place product in the FAILED container and contact diagnostics technician.



Spacer base for model 1C + 105



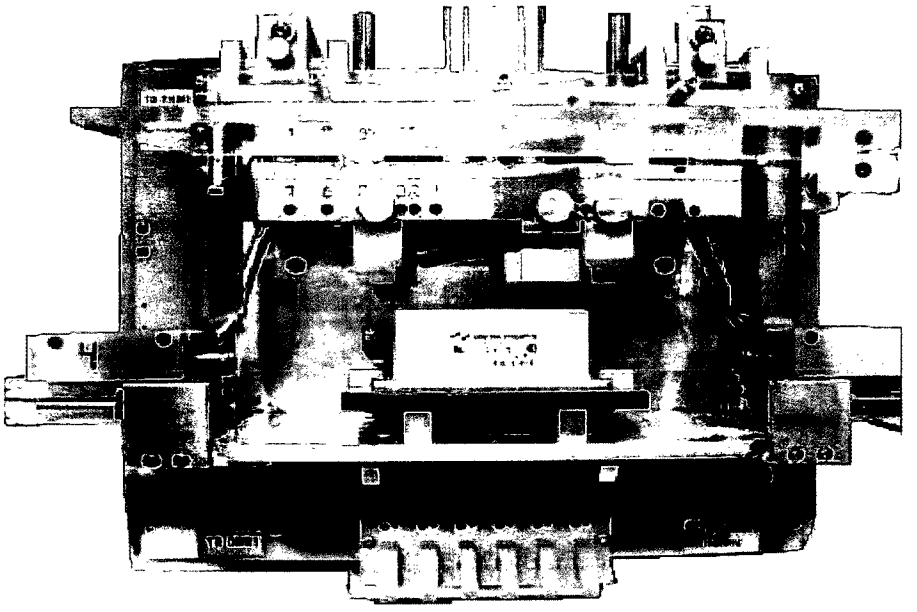
Connection pins and LED detector



Cable	Location
L (LINE)	1
N (LINE)	2
GND (LINE)*	3
L (LOAD)	4
N (LOAD)	5
GND (LOAD)*	6

* Some models do not include this cable

Table 1



Product ready to be tested

Attachment 4

Non-proprietary IC+105 Test Parameters
(Letter Item 2, SSER 23 Appendix HH Item 81)

IC+105

From	To	Expected measurement	
		Min	Max
Continuity Check via remote GPIB DMM - [Ohms]			
L (Line)	L (Load)		10
N (Line)	N(Load)		10
GND (Line)	GND (Load)		10
Short Check via remote GPIB DMM - [Ohms]			
L (Line)	N (Line)	10M	
L (Line)	GND (Line)	10M	
N (Line)	GND (Line)	10M	
Vdrop Check (400VAC @ 1mA) - [mA]			
L (Line)	L (Load)	0.01	0.25
N (Line)	N(Load)	0.01	0.25
GND (Line)	GND (Load)	0	0.04
Apply nominal voltage (127 VAC)			
Test LAMP ON via photocell			

Enclosure 3
TVA Letter Dated April 23, 2012
New Regulatory Commitment

MIL Std 461-E low frequency susceptibility testing from 30 Hz to 150 kHz of the I/F converter will be completed and a test report submitted by August 31, 2012. (Letter item 1, SSER 23 Appendix HH Item Number 80)