APPENDIX A

Nutherm International Incorporated
Docket No. 99900779/87-01

NOTICE OF NONCONFORMANCE

This NRC inspection was performed as a result of allegations received by the NRC in regard to disregard of the NRC quality assurance (QA) program requirements by Nutherm International Incorporated (NI). Based on the results of this inspection conducted on November 16-20, 1987, it appears that certain of your activities were not conducted in accordance with NRC requirements. These items are set forth below and have been identified and classified in accordance with the requirements of Appendix B to 10 CFR Part 50.

1. Criterion II, "Quality Assurance Program" of Appendix B to 10 CFR Part 50 requires, in part, that the applicant [or designee] shall establish a quality assurance program which complies with the NRC requirements.

   Contrary to the above, the following examples were noted where NI did not adequately translate the requirements of Appendix B into its QA program:

   (a) Section 10, "Inspection," of the NI QA manual (QAM) does not prohibit a person from inspecting their own work;

   (b) Section 10, "Inspection," of the NI QAM, as written, does not require QA inspection/monitoring activities in the NI equipment testing lab facility; and

   (c) NI has not established procedures to control its periodic use of rented measuring and test equipment. Examples of typical rental equipment are as follows:

   (1) NI #158, Bechman voltage meter;
   (2) NI #313, Waltow meter;
   (3) NI #103, Meghom meter; and
   (4) NI #315, B&K Scope

2. Criterion III, "Design Control," of Appendix B to 10 CFR Part 50 requires, in part, that measures shall be established to assure that the specified design bases are correctly translated into procedures and instructions to assure that appropriate quality standards are specified and included. Design control shall also provide measures for verifying or checking the adequacy of design, such as by the performance of design reviews.

   Criterion VI, "Document Control," of Appendix B to 10 CFR Part 50 requires, in part, that measures shall be established to control issuance of documents and assure that documents are reviewed for adequacy and approved for release by authorized personnel.

Section 5 of the NI QAM, dated June 18, 1986, requires, in part, that: (1) The project engineer shall be responsible for generating the project instructions, procedures and drawings necessary; (2) the QA manager shall be responsible for verifying that activities affecting quality are implemented in accordance with instruction; and (3) the engineering manager shall be responsible for review of all instructions, procedures and drawings that are generated.

Section 3 of the NI QAM, dated June 18, 1986, requires in part, that: (1) the QA manager shall be responsible for verifying the implementation of an effective design control program; (2) the engineering manager shall be responsible for ensuring that the designers, engineers, analysts and verifiers are in conformance with the design control program; (3) design control measures shall be implemented to verify the adequacy of the design; and (4) verifying or checking the design consists of, at least, a formal review of the design, spot checking of calculations/analyses, and assessing the results against the original design basis.

Section 4 of the previous revision of the NI QAM, dated January 30, 1985, requires, in part, that: (1) the engineering design document review and approval shall be performed by qualified design engineers; and (2) the QA manager shall review procedures to assure that they include appropriate acceptance criteria and test prerequisites.

Paragraph 4.6 of NI QA procedure QAP No. 3.0.00, from revision 0, dated February 16, 1985 through revision 2 dated November 17, 1986, requires, in part, that once a project manager has completed a design drawing, in accordance with the required procedures, they shall submit it to the engineering manager for approval.

Contrary to the above, the following items were noted:

(a) The below listed NI "Qualification Results Index" (QRI) forms, which are used as specific hardware instruction riders to NI's generic functional and test procedures that delineate the design parameters for testing, do not correctly and/or fully translate the design requirements into testing parameter requirements and quality standards, and do not indicate that an independent technical review was performed by qualified personnel.

	QRI Number	Prepared by/Title	Approved by/Title	Hardware
(1)	#1494, 12/85 #GPU-1759	SDJ/Design Engineer	BE/QA Engineer	Rotary Relay
(2)	#1495, 12/85 #GPU-1759	SDJ/Design Engineer	BE/QA Engineer	Control Switch
(3)	#1403, 10/85 #NMP-1841	SS/Engineer	JH/Vice President	Switch
(4)	#1467, 3/86 #NMP-1841	PB/EQ Secretary	None	Selector Switch

	QRI Number	Prepared by/Title	Approved by/Title	Hardware
(5)	#1759, 1/86 #GPU-1759	SDJ/Design Engineer	None	Control Switch
(6)	#1514, 12/85 #GPU-1759	GH/Metallurgist	None	Rotary Relay
(7)	#1579, 1/86 GPU-1897	PB/EQ Secretary	None	Thyrite Secondary Protector
(8)	#1526, 1/86	GH/Metallurgist AE/EQ Secretary	None	Current Alarm
(9)	#1570, 3/86 #1759-63	SDJ/Design Engineer	None	Signal Isolator
(10)	#1540, 1/86 #FPL-1676	DW/Technical Asst.	None	OSA Relay

(b) The following listed equipment qualification (EQ) procedures and functional test procedures did rot indicate that an independent technical review was performed to verify the adequacy of the design requirements for testing:

	Procedure Title/Number	Prepared by/Title	Approved by/Title
(1)	Operations Aging for Thyrite Protector, #9.7.10.30, 5/86	PB/EQ Secretary	RH/QA Manager
(2)	Baseline Test for Cycle Duration of Thyrite Protector, #9.7.10.29, 5/86	PB/EQ Secretary	RH/QA Manager
(3)	Baseline Testing of Solitech Controllers, #9.7.10.22, 12/85	LH/President	RH/QA Manager
(4)	Procedure for Mechanical Cycle Aging Airflow Switches, #9.7.10.17, 11/85	MAM/QA Assistant	RH/QA Manager
(5)	Baseline Testing of Disconnect Switches, #9.7.10.6, 11/85	MAM/QA Assistant	RH/QA Manager
(6)	Operational Aging of Push button Selector Switches, #9.7.10.10, 4/86	PB/EQ Secretary	RH/QA Manager

Procedure Title/Number	Prepared by/Title	Approved by/Title
(7) Function Test for AC Transformers, #9.7.10.39, 9/29/86	HB/Project Manager	RH/QA Manager
(8) Baseline Testing for Voltage Relays, #9.7.10.26, 1/86	SDJ/Design Engineer	RH/QA Manager
(9) Functional Testing for Temperature Controllers, #7.2.07, 2/85	BE/QA Engineer	RH/QA Manager
(10) Functional Testing for Analog and Digital Meters #7.2.0.6, 3/86	SDJ/Design Engineer	RH/QA Manager
(11) Functional Testing of Solid State Power Controllers, #7.2.13, 10/86	SDJ/Design Engineer	RH/QA Manager

(c) Several design drawings in the pre-1986 time period indicated that the engineering manager did not perform the required design verification activity. Specifically:

(1) Dwg. #7023-56767-53, 11/12/85, GPU-1759
(2) Dwg. #7013-55215-53, 12/13/85, C-1167
(3) Dwg. #5001-54983-43, 4/27/83, BE-1214
(4) Dwg. #7023-56994-33, 8/21/86, GPU-2169
(5) Dwg. #4033-56689-33, 10/3/85, GPU-1712
(6) Dwg. #1023-55953-33, 10/30/84, TVA-1497

3. Criterion X, "Inspection," of Appendix B to 10 CFR Part 50 requires, in part, that inspection activities to verify the quality of the work shall be performed by persons other than those who performed the activity being inspected and that such persons shall not report directly to the immediate supervisors who are responsible for the work being inspected. Additionally, if direct inspection is disadvantageous, indirect control by monitoring of the processing methods and personnel shall be provided.

Contrary to the above, the following areas were identified where NI is not providing adequate QA inspection/verification controls of its quality related activities. Specifically:

(a) NI has not implemented its program for the inspection or monitoring of activities affecting quality for any of the work activities that are performed in its equipment testing laboratory, except for its annually scheduled QA audit;

(b) Discussions with NI lab personnel and a review of several of NI's current typical "functional test result" (FTR) forms for completed tests which had been verified by QA revealed that management is allowing the lab technicians that performed the work to sign the FTR form in the "QA inspector approval" block. Therefore, a review of a completed form would lead one to believe that QA had monitored and approved the testing results; however, in practice, the lab technician is signing for the testing results that he has performed; and

(c) Discussions with NI personnel and a review of records indicated that on the previous revision of the FTR forms, the testing lab supervisor used the "QA approval" block for his signature. Therefore, a review of these FTR forms would also appear to indicate that a QA approval had been obtained. However, in practice, the lab supervisor was inserting his signature in the QA approval block.

4. Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50, requires, in part, that a test program be established to assure that all of the required testing is performed in accordance with procedures/instructions which incorporate the requirements and acceptance limits contained in applicable design documents. Additionally, the program requires that the procedures include provisions for ensuring that all prerequisites for the given test have been met, that adequate test instrumentation is used, and that the test results are documented and evaluated to assure that test requirements have been satisfied.

Contrary to the above, the following items were noted during NRC inspections of the current in-house work activities being performed in the NI testing/EQ area:

(a) During testing activities of an undervoltage relay device for NI project #TVA-2605, it was observed that the device was being tested with an electrical current value that was approximately 2.5 times less than required by the manufacturer's technical specification for the inductive load application of the relay;

(b) During testing activities of an AC contactor device for NI project #BPC-2475, it was observed that a resistive load was being used in lieu of the required inductive load, and that the required adjustable AC power supply was not being used;

(c) A review of test results for NI project #1841, in conjunction with discussions with NI personnel, determined that the voltage meter that was recorded as being used has a maximum readout capability of 10 amperes, but the test results indicated that the total load of the performed test was 11 amperes;

(d) Procedure 9.7.6.03, "Procedure for Issuing an Equipment Qualification Procedure or Report," does not reference or indicate that the IEEE-323 EQ report format requirements are necessary to prepare and establish NI's EQ reports; and

(e) Even though typical NI procedures such as 9.7.10.10, "Operational Aging of Push Button and Selector Switches," require that the technician record the indicated voltage and current following each operation (cycle), it was revealed that this is typically not performed. An extreme example was noted where the lab technician recorded two out of 6000 cycles. One reading was the starting value and the other was the last cycle value.

5. Criterion XVII, "Quality Assurance Records," of Appendix B to 10 CFR Part 50 requires, in part, that sufficient records shall be maintained to furnish evidence of activities affecting quality and shall include at least: results of reviews, inspections, tests, audits, monitoring of work performance, and closely related data such as qualifications of personnel.

Contrary to the above, it was found that the NI personnel records did not indicate adequate evidence of qualifications for several current and past NI employees. The following NI employee files were found to be either incomplete, incorrect, or indeterminate as to the relevant job experience and education. The initials of the applicable personnel are: HB, CG, GW, SS, DW, GJ, SDJ, LH, and PB.

6. Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50, requires, in part, that the audits be performed by personnel not having direct responsibilities in the areas being audited.

Section 4.4 of NI's QAP #18.10.00 "Auditor Training Program," requires, in part, that all personnel conducting an audit shall be independent of any direct responsibilities for performance of the activities which they audit.

Contrary to the above, NI management allowed a QA inspector, who had direct QA department responsibilities, to be the lead auditor for the last two QA department annual audits. The report numbers are QA-86-AE, dated 12/23/86, and QA-85, dated 12/6/85.