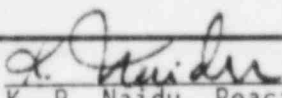



ORGANIZATION: ROCHESTER INSTRUMENT SYSTEMS
ROCHESTER, NEW YORK

REPORT NO.: 99900222/85-01	INSPECTION DATE(S): 8/26-27/85	INSPECTION ON-SITE HOURS: 9
CORRESPONDENCE ADDRESS: Rochester Instrument Systems ATTN: Mr. S. Rogoff President 255 North Union Street Rochester, New York 14605		
ORGANIZATIONAL CONTACT: A. Wayne Engbrecht TELEPHONE NUMBER: 716-263-7735		
PRINCIPAL PRODUCT: Monitoring instruments such as undervoltage relays and square root extractors.		
NUCLEAR INDUSTRY ACTIVITY: Less than 5%.		
ASSIGNED INSPECTOR:  K. R. Naidu, Reactive Inspection Section, (RIS)		12/06/85 Date
OTHER INSPECTOR(S):		
APPROVED BY:  E. W. Merschoff, Chief, RIS, Vendor Program Branch		12/12/85 Date
INSPECTION BASES AND SCOPE: A. <u>BASES</u> : 10 CFR Part 21 and 10 CFR 50 Appendix B. B. <u>SCOPE</u> : Review of records related to square root extractors supplied to the Trojan nuclear power plant; review Rochester Instrument Systems' (RIS) evaluation of a Part 21 report by Stone & Webster related to undervoltage relay set point drift problem identified at Shoreham nuclear power plant; review of corrective action taken on findings documented in Inspection Report 99900222/77-01		
PLANT SITE APPLICABILITY: Trojan Nuclear Power Plant, 50-344; Shoreham Nuclear Power Plant, 50-322.		

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A. Inspection Issues

1. Rochester Instrument Systems (RIS) supplied nine square root extractors, type SC-1330-C, to Portland General Electric Company (PGE) for installation in the Trojan nuclear power plant (Trojan). The objective of this inspection was to determine the adequacy of backup documentation to support the certificate of conformance supplied with the square root extractors.
2. Stone & Webster, the architect engineer for Shoreham nuclear power plant, reported to the NRC in a letter dated July 22, 1985, that type PR-2035 undervoltage relays manufactured by RIS demonstrated a tendency to drift from their calibrated set points. Long Island Lighting Company, the owner of Shoreham, reported the same defect in a letter dated July 23, 1985. The objective of this inspection was to determine whether RIS adequately evaluated the problem.

B. Background Information

RIS manufactures monitoring instruments for nuclear power plants, commercial power plants, and chemical processing plants at several locations in the USA, Canada, and England. RIS implements quality assurance programs QA-100 and QA-200 during the manufacture of commercial grade and nuclear grade items respectively. The QA personnel scrutinize all sales orders received and assign, as appropriate, the QA program to be implemented.

C. Corrective Action Taken on Part 21 Report

Stone and Webster informed the NRC in a letter dated July 22, 1985 that undervoltage relays, type PR-2035, installed at Shoreham demonstrated a tendency to drift from the calibrated set points. Long Island Lighting Company (LILCO) also informed the NRC in a letter dated July 23, 1985 of a similar problem and shipped the relays to RIS. RIS received the relays, tested them, and confirmed that there was a drift in the set points. In a letter dated September 25, 1985, RIS provided a preliminary notification to the NRC of a potential defect relative to PR-2035 type undervoltage relays. In a final report dated October 11, 1985, RIS informed the NRC that the defective relays returned by Shoreham were tested in the "as found" condition. The test results indicate that the stated minimum deadband tolerance was unobtainable. The deadband is the voltage difference between the undervoltage resets. For undervoltage units with P1 type input modules, the calculated minimum deadband adjustment should have been 0.5% of the nominal input voltage or 0.6

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VAC (0.5% x 120 VAC). Undervoltage units shipped from Shoreham were found to have the following deadband adjustments:

Serial Number 71232-2	1.4 volts A.C.
Serial Number 71232-3	0.7 volts A.C.
Serial Number 71232-6	0.9 volts A.C.

RIS revised both the undervoltage circuitry and its Product Bulletin. RIS stated that the existing RR-2035 relays will be replaced in the following nuclear power plants within the next 6-9 weeks.

Long Island Lighting Company	17 units
Virginia Electric Power Company	59 units
Pacific Gas and Electric Company	18 units
Public Service Electric & Gas Company	21 units

D. Inspection Findings and Other Comments

1. Shop Tour

The inspector, accompanied by the QA Manager, toured the manufacturing facilities and observed the assembly of components on printed circuit boards for various instruments. Workmanship procedures were available at the work stations. Receipt inspections and in process inspections were being conducted as appropriate. All the test and measuring equipment were observed to have current calibration stickers. No nonconformances were identified in the above areas.

2. Review of Purchase Order Processing

The inspector reviewed the Portland General Electric Company (PGE) Purchase Order (PO) No.-29319, dated February 22, 1985 and supplement 1 dated March 21, 1985, to Branon Instruments (BI) Portland, Oregon. BI forwarded the PO to RIS for the supply of nine Model SC-1330-C type Square Root Extractors (SRE). The PO described the technical requirements and furnished the environmental conditions, such as temperature, pressure, humidity, and radiation, in which the SREs would be installed. Supplement 1 of the PO deleted the radiation requirements and stated that the SREs need not be qualified to IEEE-323

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environmental qualification requirements. The PO did not require the vendor to implement a quality assurance program meeting the requirements of 10 CFR 50 Appendix B, however the PO required the vendor to conform to 10 CFR Part 21 requirements. The RIS QA manual requires all purchase orders for small instrument type orders to be reviewed by a quality committee prior to release to manufacturing. Review of the records indicates that the PGE PO was stamped "Nuclear QA-200 Program." The QA manager stated that the personnel who process incoming orders are trained to recognize an order intended for installation in a nuclear power plant and are required to stamp them "QA-200" even if the PO does not specifically require the implementation of a 10 CFR 50 Appendix B program. The PGE PO was routed through a distributor and contained statements relative to 10 CFR Part 21, Certificate of Compliance, and background radiation which alerted RIS personnel to recognize that the SREs were intended for installation in a nuclear power plant. The QA manual requires the issuance of a Certificate of Compliance for all QA-200 orders.

The relevant shop orders and test records were readily retrievable. Review of the records indicates that the RIS QA-200 program was implemented during the manufacturing and testing processes.

3. Review of QA Records

- a. The QA records pertaining to the nine Square Root Extractors, type 5C-1330-C, with serial numbers 750781-1 to 9, were reviewed. The records indicate that the RIS Nuclear Quality Assurance Program QA-200 was imposed during the manufacture of the items. Test reports indicate that each instrument was tested and determined acceptable. The Seismic Qualification Report, A-295-80 dated April 30, 1980, prepared by Corporate Consulting and Development Company, Raleigh, North Carolina, was available to substantiate the validity of the certificate of conformance issued by RIS to Portland General Electric Company.
- b. Long Island Lighting Company (LILCO) purchase order (PO) 347758, dated August 21, 1979, requested RIS to supply eight Class 1E undervoltage relays, type PR-2035-P1-T1-0. The relays were specified to be manufactured to the RIS QA-200 program. LILCO subsequently issued PO 373386, dated

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September 9, 1981, for the supply of three additional identical undervoltage relays, also to be manufactured under RIS QA-200 program. LILCO imposed 10 CFR Part 21 reporting requirements in the PO. The test reports indicate the relays were satisfactory.

No nonconformances were identified in the above areas.

3. Observation of Instrument Testing and Calibration

At the NRC inspector's request, RIS inspection personnel demonstrated typical tests on one undervoltage relay and one square root extractor. Documented test procedures were used. Test equipment had current calibration stickers.

No nonconformances were identified in the above area.

E. Corrective Action Taken on Previously Identified Findings

IE report 99900222/77-01 identified four items which required corrective action. In their letter dated July 14, 1977, RIS outlined the corrective action taken. During this inspection, the inspector verified the implementation of this corrective action.

1. Item 1 identified that the mission of various organizations performing activities which affect nuclear safety related functions was not defined. The current revision of the QA manual, dated February 1985, defines the mission adequately.
2. Item 2 identified that the job descriptions of the QA personnel were inadequately defined. The Manager of Industrial Relations had documented the job descriptions of four QA positions.
3. Item 3 identified that the design control procedure was inadequate. The Engineering Department developed Procedure 30-1 which appears to be adequate.
4. Item 4 identified that a procedure to assure selection and suitability of parts was not developed. Procedures G-1 and F have been developed which adequately address the control of purchased material and control of materials parts and components respectively.

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F. Persons Contacted

Rochester Instrument Systems

S. Rogoff, President

*A. W. Engbrecht, Quality Assurance Manager

P. Shah, Product Manager

*D. W. Seward, Quality Assurance Audit Leader

*Denotes those individuals present at the exit interview.

G. Exit Interview

The inspector met with individuals identified in Section F at the conclusion of the inspection and discussed the scope and results of the inspection.