ORGANIZATION: TEXAS INSTRUMENTS, INC.
JOHNSON CITY, TENNESSEE

REPORT NO.: 99901028/85-01	INSPECTION DATE(S): 8/28, 29/1985	INSPECTION ON-SITE HOURS: 12

CORRESPONDENCE ADDRESS: Texas Instruments
ATTN: Mr. M. McDonnell
Vice President, Industrial Systems Division
Erwin Highway
Johnson City, Tennessee 37605-1255

ORGANIZATIONAL CONTACT: R. Carper
TELEPHONE NUMBER: 615-461-2056

PRINCIPAL PRODUCT: Recorders and Process Instruments.

NUCLEAR INDUSTRY ACTIVITY: Less than 1% of the orders are nuclear related.

ASSIGNED INSPECTOR: K. R. Naidu, Reactive Inspection Secion (RIS) — Date: 2/6/86

OTHER INSPECTOR(S):

APPROVED BY: E. W. Merschoff, Chief, RIS, Vendor Program Branch — Date: 2/6/86

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and 10 CFR 50 Appendix B.

B. SCOPE: Review the implementation of Texas Instruments' quality assurance program and 10 CFR Part 21 reporting program.

PLANT SITE APPLICABILITY: Trojan Nuclear Power Plant (50-344).

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A. Inspection Issues

Portland General Electric Company issued Purchase Order (PO) Nos. N-29235, 29244 and 29235 for the supply of ten TIGRAPH 200 type recorders. The PO required that the recorders meet the requirements of IEEE-323 and IEEE-344 but did not invoke compliance to 10 CFR Part 21 or 10 CFR 50 Appendix B. Texas Instruments (TI) supplied ten TIGRAPH 200 type recorders to Portland General Electric Company (PGE), Portland, Oregon for installation at the Trojan Nuclear Power Plant (Trojan). TI issued Certificates of Conformance (CoC) stating that the recorders were qualified to IEEE-323 and IEEE-344 standards. The objective of the inspection was to determine the validity of the CoC.

B. Background Information

TI manufactures programmable controllers and recorders at this manufacturing facility for use at chemical processing plants. TI recently introduced the TIGRAPH 200 process recorder. This equipment can record analog signals from one to six input channels on heat sensitive paper. Printing is accomplished with a fixed solid state thermal print head having a horizontal print resolution of 100 dots per inch. All moving parts are confined to the chart drive system. TI stated that they received several inquiries from owners of nuclear power plants concerning these recorders. Florida Power & Light Company and Tennessee Valley Authority performed pre-award surveys but did not qualify TI as an approved vendor due to inadequacies of TI's quality assurance program.

C. Inspection Results

1. The TI QA manual does not comply with criteria I, II, X, and XVIII of 10 CFR 50 Appendix B. Therefore, the validity of the CoC is questionable to the extent that there is no assurance that recorders manufactured will meet the quality of the recorders which successfully withstood environmental and seismic tests.

2. TI had not developed and implemented a procedure to evaluate deviations or inform the licensee or purchaser of the deviations in order that they may evaluate the deviations. However, the requirements of 10 CFR 21 were not imposed on TI by PGE.

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D. Inspection Findings and Other Comments

1. Plant Tour

The TI Product Manager accompanied the NRC inspector on a plant tour of the areas associated with receipt inspection, storage of components, assembly of components on printed circuit boards, wave soldering machines, inprocess inspections, assembly of recorders and test of the recorders. Detailed procedures to test the recorders were available at the work station.

2. Review of the TI Quality Assurance (QA) Manual

Review of the TI QA manual indicated that it does not meet the requirements of 10 CFR 50 Appendix B in the following areas:

a. Criterion 1. Section 2 of the QA manual describes the organization of the Industrial Systems Division of the TI facility located in Johnson City. The organization does not depict the role of quality control activities in the implementation of this QA program. Job descriptions of the QC/QA personnel are not specified.

b. Criterion II - QA Program. Section 3 briefly discusses the TI program which is supplemented by information provided in sections 4, 5, 6, and 9. The role of Quality Control is not adequately described in this section. Furthermore, TI Management's periodic review on the adequacy of the QA program is not specified.

c. Criterion X - Inspections. Sections 5.5, 5.7, 6.2, 6.3, 6.9, and 6.13, address the inspections performed during in-process, final and testing. However, the role of quality control is not mentioned.

d. Criterion XVIII - Audits. Section 13 describes a system of audits to verify compliance to requirements. However, the frequency of the audits and the qualification of the auditors are not mentioned. Furthermore, management audits or independent audits to determine the adequacy of the QA program are not addressed.

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3. Review of Quality Assurance Records

   a. The TI TIGRAPH department maintains a log in which test data on TIGRAPH recorders are documented by the serial numbers. The CoC furnished to PGE listed the serial numbers of the recorders; the inspector reviewed the test data on these serial numbers and determined them acceptable.

   b. Wyle Laboratories, Huntsville, Alabama performed a mild environment aging analysis on the TIGRAPH recorder. The report dated July 1985 summarizes that the process recorder will withstand radiation effects of 5.071 E3 rads gamma (10-year total integrated dose at 33°C (91.4°F)) without deleterious effects.

   c. Wyle Laboratories, Huntsville, Alabama, subjected the recorder to a seismic simulation on May 3 and May 8, 1985 and determined that the specimen possessed sufficient integrity to withstand, without compromise of structure or electrical functions, the prescribed random multi-frequency tests.

The CoC is based on the tests performed on a specimen recorder. TI does not have an acceptable QA program which meets 10 CFR 50 Appendix B. The validity of the CoC is questionable to the extent that recorders manufactured subsequent to the testing may not have the same quality if it is not manufactured under an acceptable QA program.

D. Persons Contacted

*R. Carper, Product Marketing Manager, Texas Instruments
M. Ferguson, Legal Advisor, Texas Instruments
D. Schewk, Manager, Quality & Reliability, Texas Instruments
R. Wetherall, Manager, Product Assurance, Texas Instruments
D. Fricky, Quality & Reliability Engineer, Texas Instruments
G. Bawgus, Product Assurance Inspector, Texas Instruments
*C. Presnell, Marketing Manager, Texas Instruments

*Denotes those persons who attended the exit interview at the conclusion of the inspection.

E. Exit Interview

The inspector met with individuals identified in Section D and discussed the scope and findings of the inspection.