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**GROUP A
RECORDS BEING RELEASED IN THEIR ENTIRETY**

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION I

Report No. 70-33/81-04

Docket No. 70-33 License No. SNM-23 Safeguards Group 1

Licensee: Texas Instruments Inc.

34 Forest Street

Attleboro, Massachusetts

Facility Name: Texas Instruments Inc.

Inspection At: Attleboro, Massachusetts

Inspection Conducted: March 31, April 1,2, 1981

Date of Last Material Control and Accounting Inspection: February 27, 1981

Type of Inspection: Announced Material Control and Accounting

Inspectors: E. Woltner
E. Woltner, Auditor

4/23/81
date

date

date

Approved by: J.H. Joyner
J.H. Joyner, Acting Chief, Material Control and
Accounting Section, Technical Inspection Branch

5/12/81
date

Inspection Summary:

Inspection on March 31, April 1-2, 1981 (Report No. 70-33/81-04)

Areas Inspected: Physical Inventory Reconciliation, and Records and Reports.
The inspection involved 21 inspector hours onsite by one NRC inspector and
was begun during the regular hours

Results: The licensee was found to be in compliance with NRC requirements
in the areas examined during the inspection.

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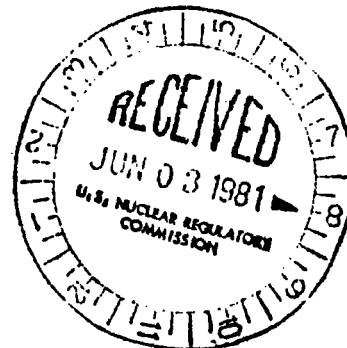


UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

15 MAY 1981

Docket No. 70-33

Texas Instruments Incorporated
ATTN: Mr. William K. Goetz
Manufacturing Manager,
Metal Systems Department
34 Forest Street
Attleboro, Massachusetts 02703



Gentlemen:

Subject: Inspection 70-33/81-04

This refers to the routine safeguards inspection conducted by Mr. E. Woltner of this office on March 31, April 1-2, 1981 of activities authorized by NRC License No. SNM-23 and to the discussions of our findings held by Mr. Woltner with Mr. F. Sherman of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of findings of your control and accounting procedures for safeguarding special nuclear materials and your facility security measures for physical protection are deemed to be commercial or financial information within the meaning of 10 CFR 9.5(a)(4) and shall be subject to disclosure only in accordance with the provisions of 10 CFR 9.12; therefore, the enclosed inspection report will not be placed in the Public Document Room and will receive limited distribution.

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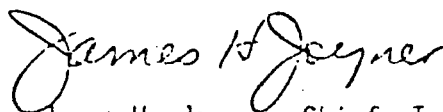
. Texas Instrument Inc.

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15 MAY 1981

No reply to this letter is required; however, should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,



James H. Joyner, Chief, Technical
Inspection Branch, Division of
Engineering and Technical Inspection

Enclosure:

Office of Inspection and Enforcement Inspection
Report Number 70-33/81-04 (Contains 2.790(d) info)

cc(with copy of report cover sheet only)

W. Quimby, Assistant Vice President and Manager,

Metallurgical Materials Division

F. L. Sherman, Manager, HFIR Project



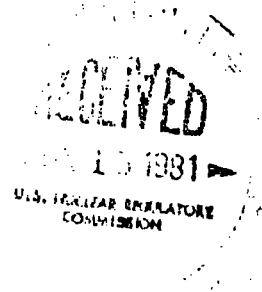
ENCLOSURES TRANSMITTED HERewith
CONTAIN 10 CFR 2.790 INFORMATION

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

11 JUN 1981

Docket No. 70-33

Texas Instruments Incorporated
ATTN: Mr. William K. Goetz
Manufacturing Manager,
Metal Systems Department
34 Forest Street
Attleboro, Massachusetts 02703



Gentlemen:

Subject: Inspection 70-33/81-05

This refers to the routine inspection conducted by Mr. H. Zibulsky of this office on May 11-15, 1981 of activities authorized by NRE License No. SNM-23 and to the discussions of our findings held by Mr. Zibulsky with Mr. F. Sherman of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of findings of your control and accounting procedures for safeguarding special nuclear materials and your facility security measures for physical protection are deemed to be commercial or financial information within the meaning of 10 CFR 9.5(a)(4) and shall be subject to disclosure only in accordance with the provisions of 10 CFR 9.12; therefore, the enclosed inspection report will not be placed in the Public Document Room and will receive limited distribution.

No reply to this letter is required; however, should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

James H. Joyner, Chief, Technical
Inspection Branch, Division of
Engineering and Technical Inspection

Enclosure: Office of Inspection and Enforcement Inspection
Report Number 70-33/81-05 (Contains 2.790 Information)

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CONTAIN 10 CFR 2.790 INFORMATION

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 70-33/81-07

Docket No. 70-33

License No. SNM-23 Priority I Category UR

Licensee: Texas Instruments Incorporated

34 Forest Street

Attleboro, Massachusetts

Facility Name: HFIR Project

Inspection at: Attleboro, Massachusetts

Inspection conducted: June 8-12, 1981

Inspectors: *W. W. Kinney*
W. W. Kinney, Project Inspector

7/13/81
date signed

date signed

date signed

Approved by: *H. W. Crocker*
H. W. Crocker, Chief, Fuel Facility Projects
Section, Project Branch #2

7/13/81
date signed

Inspection Summary:

Inspection on June 8-12, 1981 (Report No. 70-33/81-07)

Areas Inspected: Routine, unannounced inspection by a region-based inspector of licensee action on a previously identified enforcement item; nuclear safety; operations; safety committee activities; training; maintenance; procedure control; facility changes and modifications; and action on IE Circular 80-20. The inspection involved 29 inspector-hours onsite by one NRC region-based inspector.
Results: No items of noncompliance or deviations were identified.

Region I Form 12
(Rev. April 77)

DETAILS

1. Persons Contacted

- *W. K. Goetz, Metal Systems Department Manufacturing Manager
- *F. L. Sherman, HFIR Project Manager
- *R. J. Schwensfeir, Jr., Nuclear Safety Manager

The inspector also interviewed the equipment repair and maintenance managers, a safety engineer, a process and design engineer, a manufacturing foreman, and four manufacturing operators during the course of the inspection.

* denotes those present at the exit interview.

2. Licensee Action on a Previously Identified Enforcement Item

(Closed) Infraction (70-33/80-06-01): There were two drums at the waste compactor work location and the MSQ posting for the location allowed only one drum to be located at the work station. The licensee posted a sign on the drum used to receive and hold contaminated waste stating "Do Not Store Drum at Waste Compactor Work Station." The inspector also noted that the posted drum was not stored at the waste compactor work station.

3. Nuclear Safety

a. Conformance With Posted MSQ's (Maximum Safe Quantity)

The inspector examined the HFIR Project work area. Each work station and storage area had a MSQ posting which listed the nuclear safety limits for the work station or storage area. The amounts of fissile material at the work stations or storage areas were noted to be within the posted limits.

b. Criticality Monitors

The inspector examined each of the four criticality monitors in service in the HFIR area. The monitors were located in accordance with Attachment A of the approved license application. The power was on at each monitor since the green light on each monitor was lighted. Each monitor was pre-set to alarm at 15 mR/hr.

The inspector observed the nuclear safety manager perform the weekly check of the operation of the four criticality monitors. The power to the alarm sirens was disconnected. Then a radiation source was moved close to each of the four monitors. In each case the instruments responded properly. After the monitors were checked, the power to the alarm sirens was restored.

The inspector reviewed the records of: the weekly operational checks of the criticality monitors; the quarterly tests of the system including the sounding of the siren alarms; and the quarterly calibration of the monitors for the period of April 1980 through May 1981. The weekly tests were conducted each week except for the vacation shutdown period of two weeks in July 1980. The quarterly calibration checks of the monitors were performed on schedule. One of the monitors was found to be out of calibration on September 11, 1980. The unit was replaced with the spare monitor which was in proper calibration. The licensee immediately attempted to get the unit out of calibration recalibrated. After some difficulties the unit was made to be a properly calibrated operational spare unit in March 1981. Except for this one instance the units were found to be in proper calibration during the quarterly calibration checks. The quarterly operational checks of the criticality monitoring alarm systems were performed on schedule. During May 1980 and May 1981, the alarms were sounded and evacuation drills were performed. During the August, November, and February tests the alarms were sounded at 6:30 a.m., 10:00 a.m., and 5:00 p.m.

During the May 1981 evacuation drill, it was noted that modifications to the non-nuclear facilities in Building 10 had caused sirens not to be audible in the west side of the facility. The licensee is taking appropriate action to assure that the alarm sirens are audible to all Building 10 personnel.

c. Nuclear Safety Evaluations

The inspector reviewed the Requests for Criticality Safety Analysis and the resulting Criticality Safety Analyses and Approvals which were performed during the period from April 1980 through May 1981. There were 10 requests, Request Nos. 31-40, which were considered. Changes in the Maximum Safe Quantities (MSQ's) allowed at various work stations were analyzed, and different MSQ's were authorized within the constraints of the license. One requested MSQ change was not approved, since the requested MSQ was outside the constraints of the license.

d. Monthly Criticality Safety Audits

The inspector reviewed the reports of the monthly audits made during April 1980 through May 1981. The Nuclear Safety Manager inspects each work station for presence of the MSQ posting and for compliance with the MSQ posting. The responsible manufacturing foreman or quality assurance engineer is part of the auditing team. There were no problems noted in any of the audit reports.

4. Operations Review

The licensee has completed the fabrication of fuel elements. Currently, they are fabricating fuel plates for their customers.

The inspector selected five operating procedures, Standard Operations, reviewed them and then discussed them with cognizant operators at the appropriate work stations. The Standard Operations were:

<u>S.O. No.</u>	<u>Revision</u>	<u>Title</u>	<u>Date</u>
8	AA	Weigh Compact Changes	5/29/79
13	Z	Anneal Fuel Plate Compacts	9/10/79
29	BB	Hot Roll Bonding Plates	3/17/81
44	M	"Sieve and Blend" as Received	11/5/79
		U ₃ O ₈	
1024	J	Roll Swaging Fuel Elements	10/15/80

Each of the four operators interviewed demonstrated good knowledge of the nuclear safety requirements for the operation described by the procedures given in the different Standard Operations. They also demonstrated knowledge of the precautions they should take for their personal radiation protection. There was only one difference between the operations described by the operators and the operation described in the Standard Operation.

Standard Operation No. 44, Revision M, "SEIVE AND BLEND" AS RECEIVED U₃O₈ dated November 5, 1979, states, "All personnel must wear rubber gloves. Gloves to be discarded in contaminated waste drum." When the procedure was revised in 1979, the box used for the operation had sleeves attached to the gloveports rather than gloves. The operator wore rubber gloves as personal protection from the U₃O₈ powder. The licensee improved the contamination control of the box by replacing the sleeves attached to the gloveports with gloves. The operators now intentionally place their bare hands in the glovebox gloves. This discrepancy in the Standard Operation procedure was pointed out to HFIR Project management. They indicated they would take appropriate action.

A controlled copy of each Standard Operation was present at each work location and were available to the operators. The copies were of the latest revision.

The alpha survey instrument used at the exit from the Fuel Manufacturing Area (FMA) was operating properly. The inspector observed that the operating personnel surveyed themselves upon leaving the FMA. Laboratory coats and rubber shoe covers used as protective clothing are stored on the potentially contaminated side of the clothing change line.

The housekeeping in the HFIR Project area appeared to be good.

During the inspection of the machining area, it was noted that personnel were not wearing eye protection as called for by signs at the entrance to the area. Responsible management took prompt action when this fact was pointed out.

5. Safety Committee

The licensee is not required to have and does not have a formal safety committee. Safety and regulatory topics are discussed in the weekly meetings attended by management associated with the HFIR Project.

The inspector reviewed progress reports for the period from January 2, 1980, through June 2, 1981. Selected progress reports from No. 750 through 821 were reviewed. Each progress report had separate sections addressing nuclear safety, security, safeguards, and training. Items concerning radiation and nuclear safety were noted. For instance, the fact that gloves instead of sleeves were installed on the box used for sieving and weighing U_3O_8 powder was mentioned in the reports. The addition of roughing filters to this glovebox and to the ventilation system for the liquid waste boil off unit was also discussed.

6. Training

a. Initial Training

As part of the training program, the licensee trains newly hired security and other support personnel in the radiological and nuclear safety aspects of the HFIR Project operations. The licensee had signatures of personnel receiving the training on March 27 through April 30, 1980, and on December 2 through December 12, 1980.

The licensee also had Certificates of First Training for HFIR Project which were signed by the trainees. During the period of April 1980 through May 1981, six persons received such training and signed the certificates.

The licensee also had a record of the training of an individual in health physics. This individual assumed some of the health physics duties after this training.

b. HFIR Employee Training

HFIR employees were retraining in nuclear and radiological safety using nuclear safety procedures 2.6.1 and 2.6.2. All persons associated with HFIR Project received the training and signed a sheet that they had been trained. Most of the people received the training on August 27, 1980 and the training was completed by October 17, 1980.

c. Emergency Training

Training of offsite organizations was accomplished. On May 30, 1980, three firemen participated as observers in the annual HFIR Project emergency evacuation drill. On August 5, 1980, the civil defense director of Attleboro was informed on: the HFIR Project Emergency Plan; the HFIR Project Emergency Procedures Manual; the emergency organization including interface with offsite organizations; and use of the HFIR Project Emergency Procedures Manual. On August 18, 19, 22, and 25 training of the Attleboro Fire Department was accomplished on the following topics: (1) basis for emergency preparedness; (2) emergency organization; (3) concerns at HFIR Project; (4) classification of emergencies relative to HFIR Project; (5) communications; and (6) fire fighting considerations. On September 25, 1980, the Nuclear Safety Manager met with the Chief of the Attleboro Police Department.

Annual training on HFIR emergency planning and response was given to site and building emergency team leaders, the site fire marshal, and the site safety director on September 17, 1980. Topics covered were: the HFIR Project emergency plan and procedures; emergency organization; and, hazards specific to the HFIR Project.

During May 1981 the annual HFIR Project emergency training was accomplished. On May 12, 1981, an emergency response training session was held for HFIR production and QA personnel. The topics covered were: (1) introduction; (2) emergency evacuation instructions; and (3) evacuation routes. On May 18, 1981, annual training was held for Texas Instruments safety officials concerned with the HFIR Project. The topics covered were: (1) introduction; (2) HFIR Project emergency plans and procedures; (3) hazards; (4) emergency organization; (5) classification of emergencies; (6) capabilities of and communication links among emergency organizations; and, (7) sequence of emergency actions. On May 19, 1981, annual training was held for HFIR productions and QA management personnel. The topics covered were: (1) introduction; (2) HFIR emergency organization; (3) response to specific classes of emergencies; and, (4) evacuation drills. On May 20, 1981, the annual criticality evacuation drill was held for all three shifts.

During the May 20, 1981 drill, Texas Instruments made telephone contacts with the Massachusetts Nuclear Incident Advisory Team and the U. S. Department of Energy Radiation Assistance Program Office. The Attleboro Fire Department participated in the drill.

The fact that the alarm sirens were not audible in all locations during the May 20, 1981 drill was discussed in section 3.b. of this report.

7. Maintenance

Maintenance of the HFIR area and equipment which is not performed by the HFIR Project personnel is performed by two different groups, the Facilities Maintenance group and the Equipment Repair and Maintenance group. Facilities Maintenance maintains the structures, ventilation systems, piping systems, electrical systems, and various alarm systems. Equipment Repair and Maintenance maintains the equipment inside the structures used to manufacture products.

The Manager of Nuclear Safety provides the controls necessary to assure the radiological safety of any maintenance personnel working on HFIR Project facilities or equipment.

Texas Instruments uses a "Cutting and Welding Permit" program. This program requires that a Cutting and Welding Permit is needed any time a cutting or welding job causing hot slag must be done outside of a designated cutting and welding area.

The permit system uses a card on which the necessary precautions required to be taken are listed. Authorization to perform the cutting and/or welding is shown by the signature of the "Fire Safety Supervisor." The card has a final checkup section which calls for checking the work and all adjacent areas to which sparks and heat might have spread for a period of 30 minutes after the work was completed. The fact this checkup was done is shown by a signature.

The licensee has "Hot Work Procedures" for electricians. These procedures are essentially safety procedural requirements for electricians. These procedures call for the wearing of proper protective rubber gloves and glasses; use of rubber mats; use of "lock and tag" procedures; and, when necessary, use of insulating rubber for protection against accidental contact of the body with live circuits.

8. Procedure Control

The operating procedures used are in the form of Route Cards and Standard Operations. A Route Card is present with the item or items being fabricated. The Standard Operations are located at the appropriate work station.

The licensee uses Engineering Change Notices to control the issuance of new or revised Route Cards or Standard Operations. The Engineering Change Notice is issued by the HFIR Project Manager. According to the licensee, if the Engineering Change Notice, Route Card, or Standard Operation involves nuclear or radiological safety or special nuclear material control and accounting the document is given to the Manager of Nuclear Safety for review and approval. When the Engineering Change Notice is distributed, the secretary hand carries the revised or new documents to the various recipients and obtains and destroys any obsolete documents resulting from the issuance of the Engineering Change Notice.

The Engineering Change Notice involved in the issuance of a Route Card or Standard Operation is listed on the issued document.

9. Facility Changes and Modifications

The licensee has made no significant changes or modifications to the HFIR Project facilities or equipment. Minor changes to the material handled at work locations have been made. Nuclear safety evaluations were made prior to implementation of these minor changes.

The licensee is making plans for the decommissioning of the facility. A comprehensive decommissioning plan has been prepared in the draft form. Meetings on the decommissioning are being held one or two times a week by the HFIR Project Manager.

10. Non Licensed Buried Waste

In early August 1980, Texas Instruments informed Region I that while digging a trench for a pipeline slightly contaminated material from an old burial ground was dug up. The material which was dug up did not come from the HFIR area. It came from the burial of waste from nonlicensed activities which were performed by Metals and Controls as contractors to the federal government.

The safety engineer for Texas Instruments, a trained health physicist, surveyed the material dug up and placed any contaminated material into 55 gallon drums. Eleven 55 gallon drums were sent to the Barnwell, South Carolina, burial site on October 31, 1980.

To the best of the safety engineer's recollection the burial trench filled over twenty years ago was about eight feet wide, 20 to 30 feet long, and 15 to 20 feet deep.

The licensee revised the drawing for the compressed air line and marked the location where the radioactive low specific activity waste material dump was excavated.

11. IE Circular No. 80-20: Changes in Safe-Slab Tank Dimensions

The licensee does not use solutions containing fissile material in its processes; therefore, they do not have any tanks using geometry for nuclear criticality safety. This problem of changes of dimensions of safe-slab tanks holding fissile material solutions does not pertain to the licensee.

12. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on June 12, 1981. The inspector presented the scope and findings of the inspection.

The inspector noted that the operators are not following Standard Operation No. 44, when they work in the glovebox and sieve and blend U_3O_8 powder. The standard operation calls for the operators to wear rubber surgeon's gloves while working in the box, and the operators now work barehanded in rubber glovebox gloves. The licensee just recently replaced the sleeves attached to the ports on the box with rubber gloves. This improvement was not addressed in Standard Operation No. 44.

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 70-33/82-04

Docket No. 70-33

License No. SNM-23 Priority 1 Category UR

Licensee: Texas Instruments Incorporated

34 Forest Street

Attleboro, Massachusetts 02702

Facility Name: HFIR Project

Inspection at: Attleboro, Massachusetts

Inspection conducted: September 1-3, 1982

Inspector: J. Roth

J. Roth, Project Inspector

9/20/82
date signed

Accompanied by: E. Shum,

NRC-NMSS

date signed

Approved by: R. K. Keimig

R. K. Keimig, Chief, Projects Branch #2,
DPRP

9-21-82
date signed

Inspection Summary:

Inspection on September 1-3, 1982 (Report No. 70-33/82-04)

Areas Inspected: Special, announced inspection by a region-based inspector (18 hours) of: review of operations, closeout surveys, environmental programs, and, licensee/licensing meeting.

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

- * F. Sherman, Manager, HFIR Project
- R. J. Schwensfeir, Manager, Nuclear Safety and Nuclear Material Control
- * R. L. Churchill, Program Manager, Metal Systems Department
- F. J. Veale, Jr., Manager, Environmental Engineering
- R. Mossman, Facilities Manager

The inspector also interviewed three other licensee employees during this inspection.

* denotes those present at the exit interview.

2. Facility Examination

a. In-Plant

The inspector observed that decommissioning of the HFIR area in Building 10 was completed and that all contaminated waste had been shipped to an authorized burial site. The licensee also completed the decontamination and final contamination survey since the last inspection. This information is contained in letters and reports submitted to NRC-NMSS dated May 17, June 24 and July 9, 1982.

No violations were identified.

b. Burial Site

The inspector examined the burial site area located approximately 100 yards north-northeast of Building 11. The licensee originally installed monitoring wells to a maximum depth of 10 feet at a distance of no closer than 50 feet to the perimeter of the burial site. Subsequently, the licensee installed additional wells around the burial site at a distance of about 100 feet from the original line of wells. Since the last inspection, the licensee installed several new wells around the burial site at a distance of about 150 feet from the second line of wells. During examination of the burial site area, the inspector conducted a cursory radiation survey using a Ludlum Model 12S MicroR Meter which was last calibrated on August 25, 1982. Radiation levels over the burial site ranged from 7 to 10 microR per hour on contact with the surface. Background in the area appeared to be about 5 to 6 microR per hour.

Texas Instruments Incorp.

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SEP 22 1982

cc w/encl:

Public Document Room (PDR)

Nuclear Safety Information Center (NSIC)

Commonwealth of Massachusetts (2)

bcc w/encl:

N. Ketzlach, NRC-NMSS

E. Shum, NRC-NMSS

Region I Docket Room (w/concurrences)

Chief, Operational Support Section (w/o encl)

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RI: DPRP
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9/21/82

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According to the licensee, elevated activity was found in well 27. As a result, the licensee obtained two core samples at this location (one, 27N, located about 2-3 feet north of the well, and another, 27S, located about 2-3 feet south of the well). The core samples, taken to a depth of about 12 feet at 2 foot increments, were split in half (one half for the licensee, one half for the NRC). The licensee will analyze each sample and the sample analysis will be verified by the NRC, as necessary.

No violations were identified.

3. Confirmatory Surveys

a. HFIR Area

The inspector observed while selected portions of the HFIR area, in Building 10, were being surveyed by NRC inspectors to confirm the licensee's survey results as reported to NRC-NMSS in letters dated May 17, June 24, and July 9, 1982. The results of this confirmatory survey are documented in Inspection Report No. 70-33/82-03.

b. Other Facilities

The confirmatory surveys discussed above were conducted to facilitate release, for unrestricted use, areas of Building 10 currently in use for the HFIR Project. These areas included the HFIR fuel manufacturing area, HFIR general manufacturing area, the chemistry laboratory, the metallurgical laboratory and the HFIR project offices.

During a review of the facility prior history by NMSS personnel, it was determined that nuclear materials were previously handled in the remainder of Building 10, and in portions of Building 4 (Former Buildings H, K and L). Work with radioactive materials in these areas was conducted under contract with the U.S. AEC for the production of reactor components and Naval Reactor cores. As a result of this review, the inspector requested documentation from the licensee which would verify that the affected areas had been properly decommissioned and decontaminated. The inspector also requested copies of reports to verify that confirmatory surveys had been conducted by the U.S. AEC upon completion of the facility decommissioning in 1968. Current NRC records do not contain this information (82-04-01). The licensee will attempt to retrieve a copy of the requested documents.

4. Licensee/Licensing Discussions

The inspector was accompanied by a representative of the NRC-NMSS staff to discuss the status of programs being conducted to characterize the extent, distribution and type of radioactivity found in the 10 CFR 20.304 burial site discussed previously in paragraph 2b.

The licensee completed an initial evaluation of the burial site and submitted a report, "Environmental Report - Radiological Survey of the Texas Instruments Complex," during August, 1982 to NRC-NMSS.

During the meeting, the licensee was given the criteria established by NRC-NMSS for disposition of the area and discussions were held to define the measurements and information needed by NMSS to complete an evaluation of the burial site.

The licensee will divide the area into grids, conduct radiation surveys (beta-gamma) at 1 meter above the surface, define the area of contamination (soil analysis), define the depth of contamination (core sampling), conduct ground water contamination analysis, and, will determine the background radiation in the vicinity of the site.

5. Exit Interview

The inspector met with the licensee representatives (denoted in paragraph 1) prior to the end of this inspection on September 2, 1982. The inspector summarized the scope and findings of the inspection and stated that no violations were identified. Licensee representatives stated that in-house records would be reviewed and/or DOE Naval Reactors would be contacted to obtain the documents requested by the inspector with respect to prior surveys of Buildings 4 and 10 in 1968 (paragraph 3b).

DETAILS

1. Persons Contacted

- A. *F. L. Sherman, Manager HFIR Project
- B. #R. J. Schwensfeir, Jr., Manager Nuclear Safety and Materials
- C. #W. H. Daft, Health Physics Technician
- D. R. Churchill, Contracts Manager

#present at entrance interview

*present at exit interview

2. Background

The HFIR Project was engaged in the manufacture of research reactor fuel elements using only high enriched uranium (93% uranium-235) under NRC License No. SNM-23. The HFIR Project facility was located in Building 10 at the Attleboro, Massachusetts site of Texas Instruments, Inc. (see Attachment 1). Manufacturing operations included blending and compacting SNM as enriched U_3O_8 and aluminum powders, hot roll-bonding compacts into aluminum-clad fuel plates, assembling fuel plates into fuel elements. All SNM associated with the HFIR Project, from receipt and storage through processing and packaging for shipment, was confined to the HFIR facility, the Metallographic Laboratory and the Chemical Laboratory subsequent to 1968.

All processing of unclad SNM was performed in the Fuel Manufacturing Area (FMA) in dry boxes or hoods with ventilation conforming to NRC requirements. The FMA was separated by partitions from the surrounding General Manufacturing Area (GMA) and was maintained at a negative pressure relative to the surrounding GMA. No exposed or unclad SNM was processed in the GMA.

Completed fuel elements and fuel plates and scrap containing U_3O_8 were removed from the facility by the US Department of Energy. Contaminated waste was sent to an NRC licensed facility for burial.

No chemical or recovery operations were performed on the SNM during manufacturing processing subsequent to 1968.

3. Entrance Interview

The inspectors discussed the purpose and scope of their inspection and the results of the Texas Instruments Closeout Survey Report dated May 17, 1982, with the individuals identified in paragraph 1.

4. Areas Surveyed

Surveys were limited to the roof of Building A-10 (see Attachment 1) near the exhausts from the high efficiency filter system and the fuel manufacturing area (see Attachment 2), the ceiling of the general and fuel manufacturing areas of the HFIR facility (see Attachment 3), the walls, floors, columns and holes in the general and fuel manufacturing areas of the HFIR facility (see Attachments 4 and 5), the offices and hallway of the HFIR facility Project Manager (see Attachment 6), the Metallographic Laboratory (see attachment 7), and the Jarrell Ash Atomic absorption analyzer in the Chemical Laboratory.

5. Methodology and Instruments

Methodology

A 5x5 meter chalkline grid corresponding to the licensee's Figure 5.1 of the May 17, 1982, Closeout Survey Report was layed out in the floor of the HFIR project area (see Attachments 3, 4, and 5). Within the 5x5 meter area at least two 1x1 meter grids selected by the licensee and 3 independent 1x1 meter grids were surveyed for direct alpha, beta-gamma radiation levels. At least 2 wipes for removable alpha, beta-gamma contamination (one corresponding to the licensee's wipe) were taken in each 5x5 meter grid of the HFIR facility. Ceiling surveys were taken in areas corresponding to the floor grid of the HFIR area. At least 2 wipes were taken in each ceiling area of the HFIR facility surveyed.

Direct measurements were taken at 0°, 90°, and 180° from north at 1, 2, and 4 meter distances on the roof around the exhaust from the high efficiency filter system and at 0°, 90°, and 225° from north at 0.5 and 1 meter distances on the roof around the exhaust from the fuel manufacturing area.

Direct measurements were taken on the floor in the HFIR office and hallway, on the floor and table tops in the Metallographic Laboratory (see Attachment 6, 7) and on the drawers and control panel of the Jarrell Ash Atomic absorption analyzer in the Chemical Laboratory.

Instruments

The following instruments were used for direct measurements:

- *1. Eberline Model PAC-1SA alpha counter, calibrated August 25, 1982.
- *2. Eberline Model PAC-4S alpha counter, calibrated June 15, 1982.
3. Ludlum Model 12S microR meter, calibrated August 25, 1982.
4. Ludlum Model 14C-GM with thin end window probe, calibrated June 15, 1982.

*Determined to be 50% efficient in counting against a Th-230 certified standard of 4,290 dpm dated November 27, 1978.

All wipes were taken to Region I and were counted for 1 minute in a TENNELEC LB 1000 Series Low Background alpha, beta gas flow counting system having an alpha background of 0.03 cpm and a beta background of 1.16 cpm with an alpha efficiency of 20.6% and beta efficiency of 26.3% as of September 7, 1982.

6. Independent Measurements

Four hundred ten (410) individual direct alpha, beta-gamma measurements were taken in the facility areas identified in paragraph 4. Direct alpha measurements did not exceed 600 dpm (95%-50 dpm) except for HFIR area at ceiling grids 12/56, 12/57 (1200 dpm) and 8/67 (1300 dpm) (See Attachment 3) and at floor grids 16/37, 16/38 (800 dpm) and 18/58 (1100 dpm) (See Attachment 4). (Note: 1st number of grid indicates west to east row, 2nd number indicates south to north block on attachments 3, 4, and 5). Direct beta-gamma measurements did not exceed 10 micro R per hour except for levels in the HFIR area at floor grids 11/31 (120 micro R/hr) and 15/71 (90 micro R/hr) (See Attachment 4). A total of one hundred fifty four (154) wipes for removable alpha, beta contamination were taken in the facility areas diagramed in Attachments 3, 4, 5, and 6. All wipes for removable contamination were less than 200 dpm alpha, and 50 dpm beta (majority being less than 10 dpm alpha, 30 dpm beta) with the exception of one wipe on the ceiling pipes in the HFIR area at ceiling grid 8/65, 8/66, 8/67 being 543 dpm alpha and 357 dpm beta.

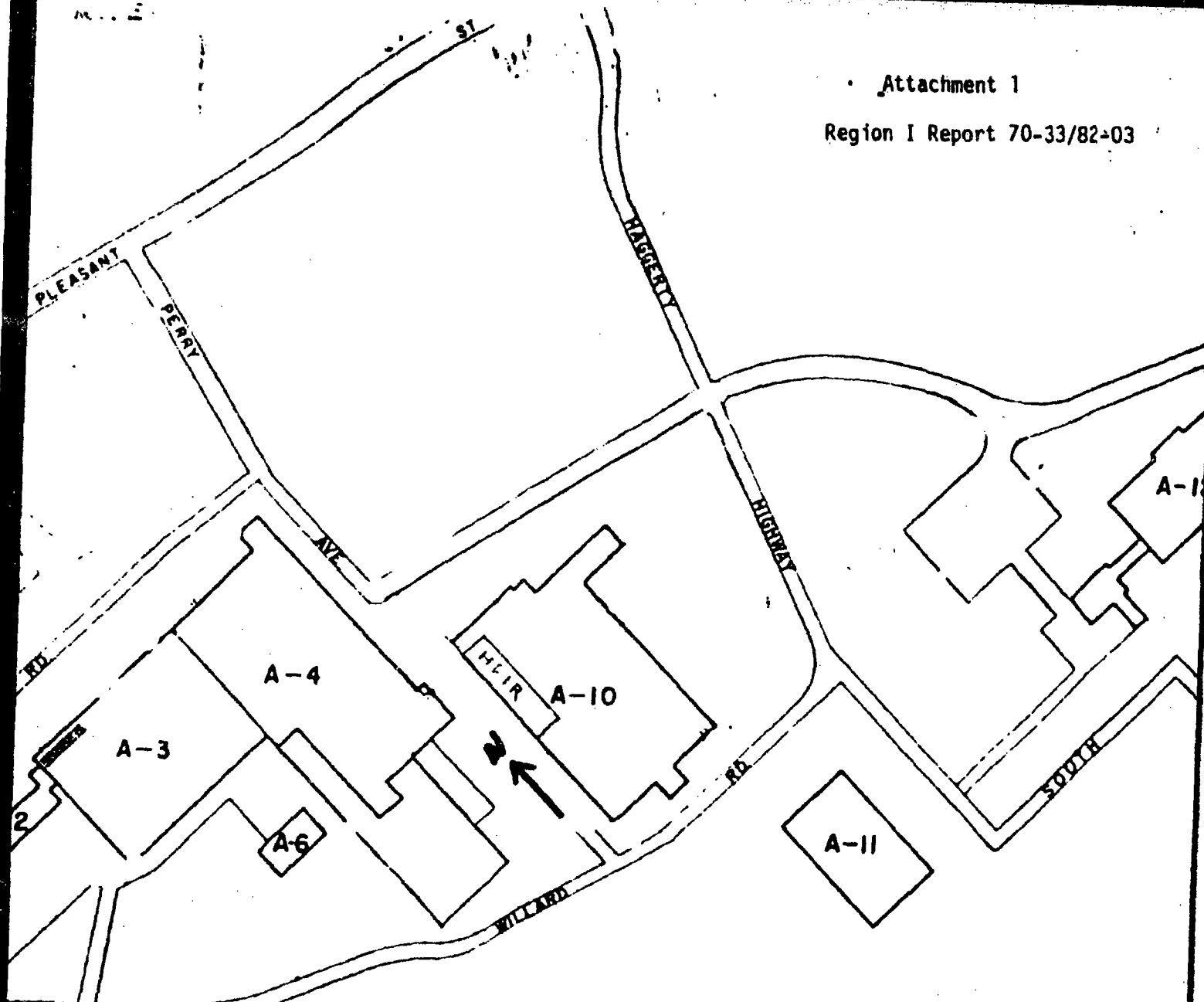
7. Exit Interview

The inspectors summarized the scope and results of the inspection with the individual identified in paragraph 1.

8. Conclusion

Fixed and removable contamination levels measured during this inspection are comparable to those in the licensee's close-out survey and are within the limits established in Annex C of the facility license (Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of License for Byproduct, Source, or Special Nuclear Material, dated November, 1976).

Attachment 1
Region I Report 70-33/82-03



RAL R.R. N.Y. - N.H. & H. LINE TAUNTON BRANCH

Attachment 2

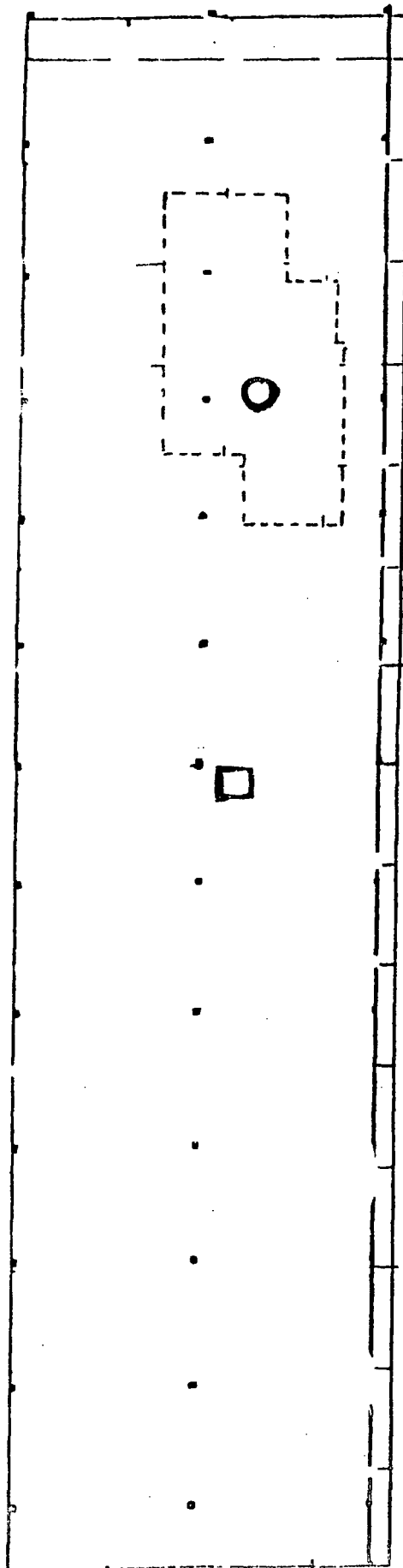
Region I Report 70-33/82-03

Approximate Location of Roof
exhaust ducts

---outline of Fuel
Manufacturing area.

□ Exhaust High Efficiency
Filter

○ Exhaust Fuel Manufacturing
Area



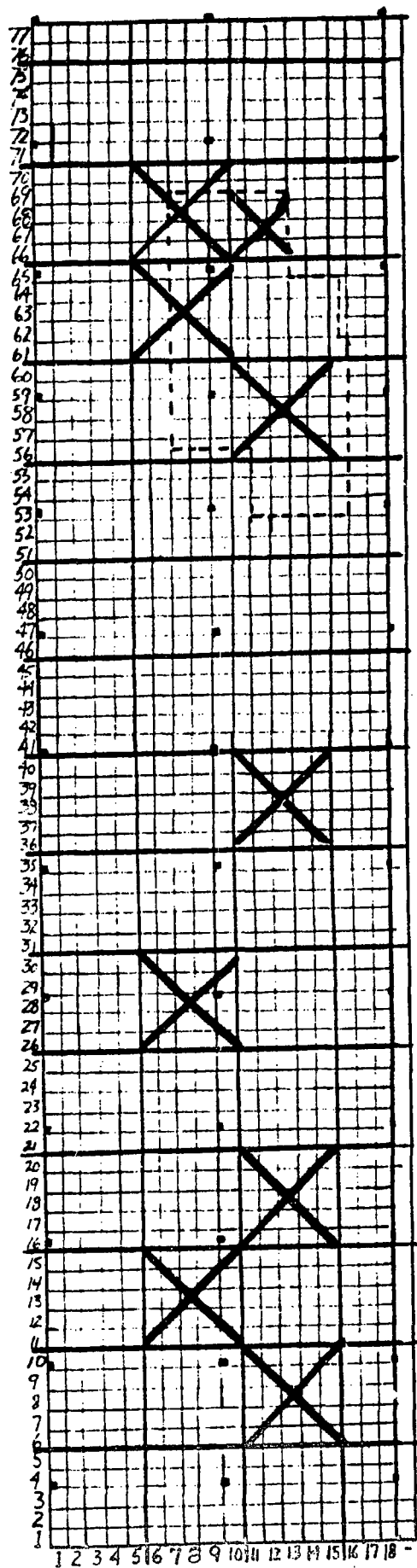
Attachment 3
Region I Report
70-33/82-03

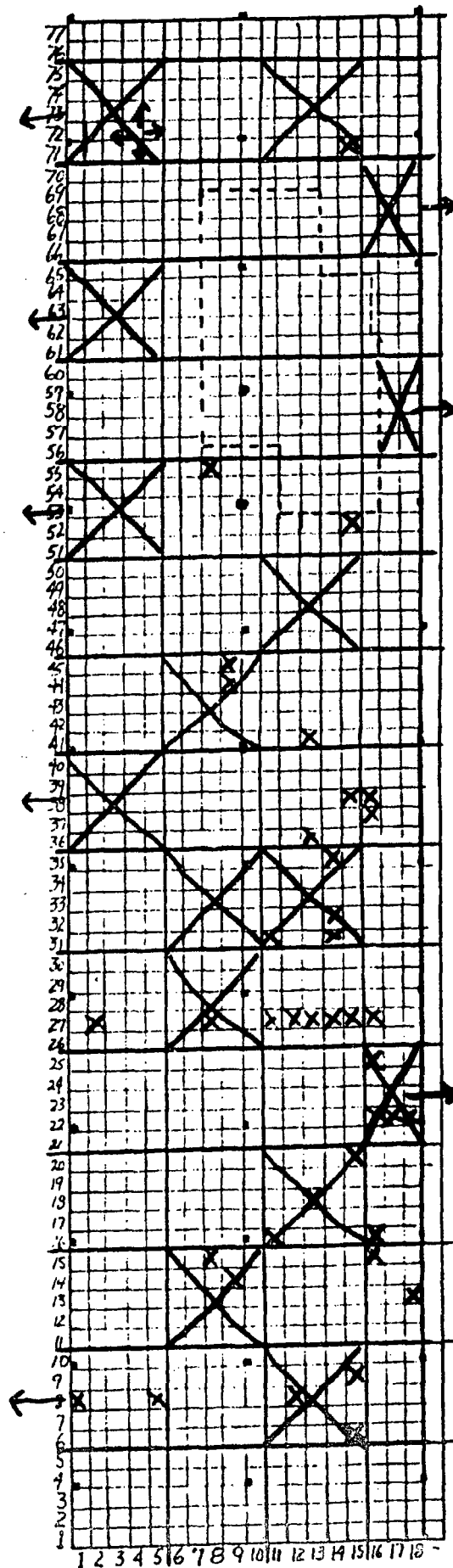
Ceiling/Pipe Areas
Surveyed

---Outline Fuel
Manufacturing Area.

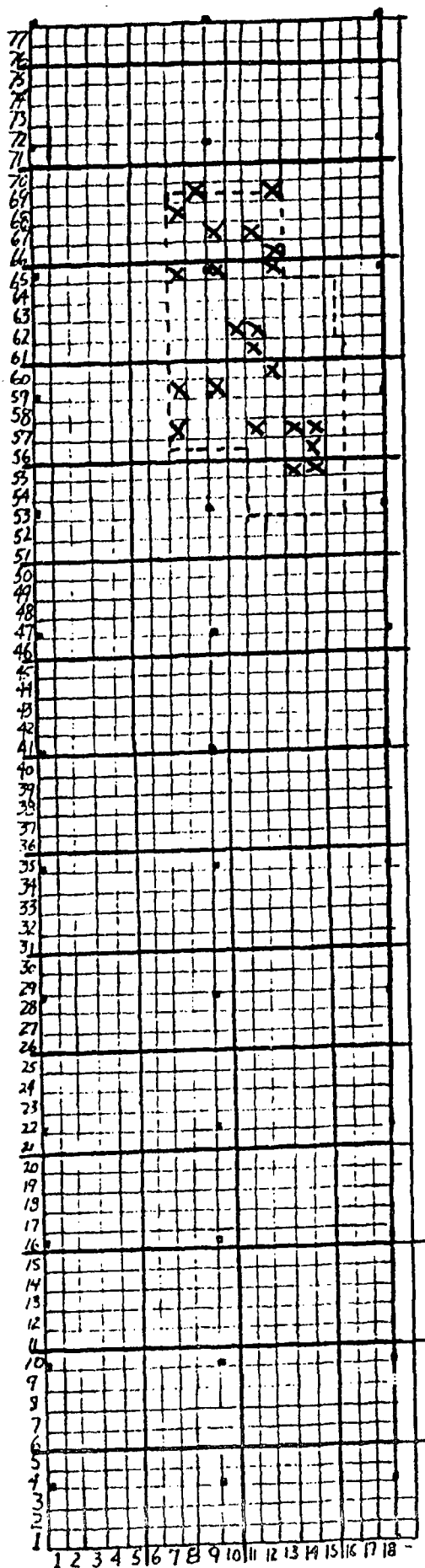
X Area Surveyed

• Columns





Attachment 4
 Region I Report 70-33/82-03
 Floor/Walls/Columns/Holes Surveyed
 General Manufacturing Area
 ---Outline Fuel Manufacturing Area
 X Area Surveyed
 ← Walls Surveyed
 ■ Columns



Attachment 5

Region I Report 70-33/82-03

Floors/Columns/Holes Surveyed

---Outline Fuel Manufacturing Area

X Areas surveyed

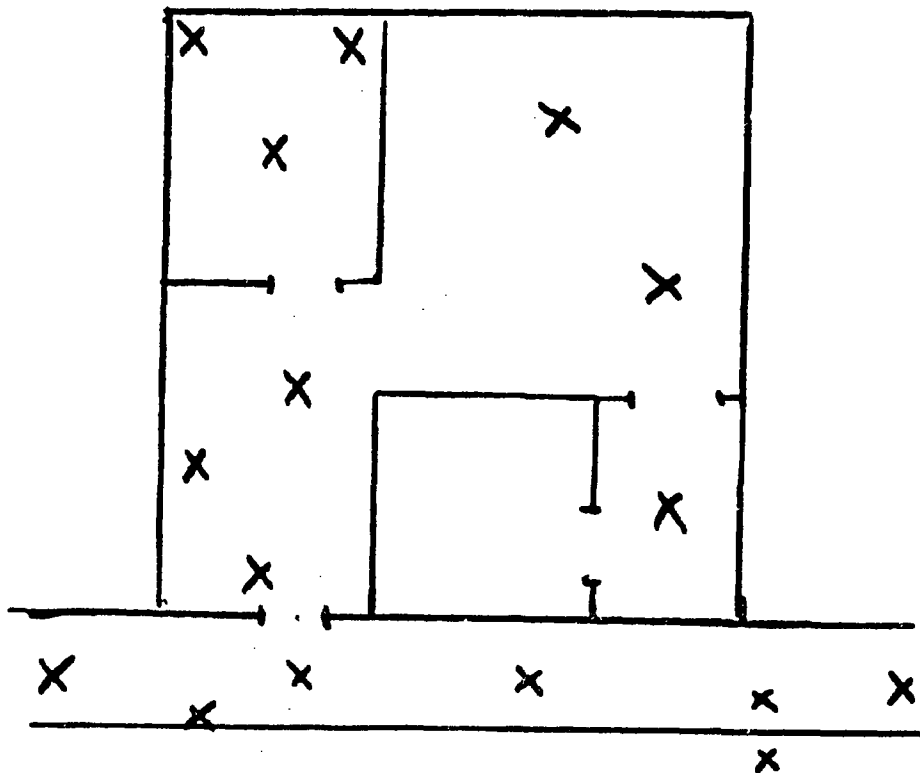
• Columns

Attachment 6
Region I Report 70-33/82-03

Floor Areas Surveyed

HFIR Project Managers
Officer/Hallway

X - Areas Surveyed

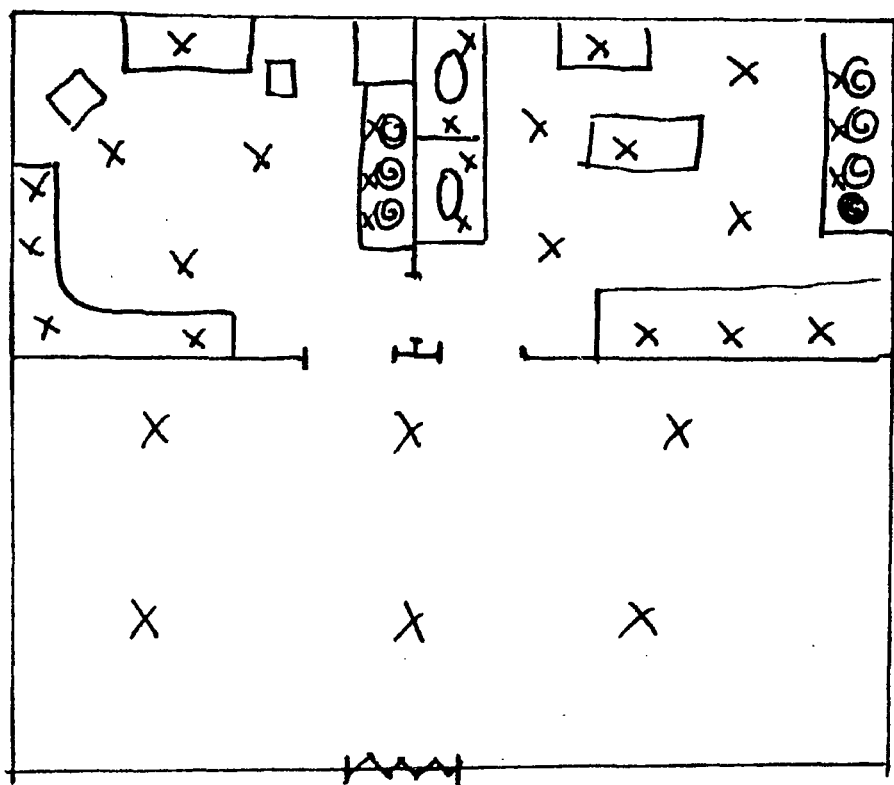


Attachment 7

Region I Report 70-33/82-03

Metallographic Laboratory

X = Areas Surveyed



OCT 12 1982

Docket No. 30-17571

License No. 37-19413-01

Centocor, Incorporated
ATTN: Vincent Zurawski, Jr., Ph. D.
Vice President and Technical Director
244 Great Valley Parkway
Malvern, Pennsylvania 19355

Gentlemen:

Subject: Inspection No. 30-17571/82-01

This refers to the closeout safety inspection conducted by J. Davis and R. Ladun of this office on June 30, 1982, at 3508 University City Science Center facility of activities authorized by NRC License No. 37-19413-01 and to the discussions of our findings held by Mr. Davis with Mr. J. Barnes of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the NRC Region I Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Our inspector examined those activities conducted under your license relating to the subject covered in your letter to the U. S. Nuclear Regulatory Commission, Material Licensing Branch, Division of Fuel Cycle and Material Safety, NMSS, dated July 1, 1982. With regard to this matter, during the inspection on June 30, 1982, the inspector made independent measurements of radiation levels and took wipe samples of floors and equipment located in the laboratories. The wipe samples were analyzed in our Regional Office Laboratory. The results of these independent measurements are in agreement with the survey results attached to the referenced letters. We will forward this information to the NRC's Office of Nuclear Material Safety and Safeguards, Materials Licensing Branch for their use in amending your license.

Within the scope of this inspection, no violations were observed.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). The telephone notification of your intent to request withholding, or any request for an extension of the 10 day period which you believe necessary, should be made to the Supervisor, Files, Mail and Records, USNRC Region I, at (215) 337-5223.

OFFICIAL RECORD COPY

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37-19413-01 PDR

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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION I

Report No. 70-33/81-01

Docket No. 70-33 License No. SNM-23 Safeguards Group 1

Licensee: Texas Instruments, Inc.
34 Forest Street
Attleboro, Massachusetts 02703

Facility Name: Texas Instruments, Inc.

Inspection At: Attleboro, Massachusetts

Inspection Conducted: January 26-30, 1981

Date of Last Material Control and Accounting Inspection: September 12, 1980

Type of Inspection: Unannounced, Material Control and Accounting

Inspectors: Harvey Zibulsky 2-18-81
H. Zibulsky, Chemist date

date

date

Approved by: J. H. Joyner 2-18-81
J. H. Joyner, Chief, Nuclear Material date
Control Support Section, Safeguards Branch

Inspection Summary:

Inspection on January 26-30, 1981 (Report No. 70-33/81-01)

Areas Inspected: Facility Organization, Measurement Control, and Management of Materials Control System.

The inspection involved 27 inspector hours onsite by one NRC inspector and was begun during the regular hours.

Results: The licensee was found to be in compliance with NRC requirements in the areas examined during the inspection.

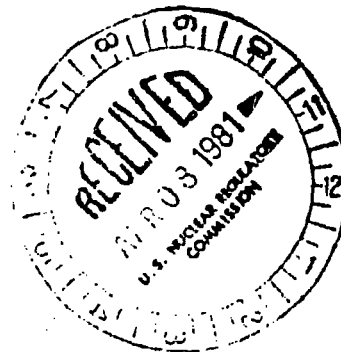


UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

25 FEB 1981

Docket No. 70-33

Texas Instruments Incorporated
ATTN: Mr. William K. Goetz
Manufacturing Manager,
Metal Systems Department
34 Forest Street
Attleboro, Massachusetts 02703



Gentlemen:

Subject: Inspection 70-33/81-01

This refers to the routine inspection conducted by Mr. H. Zibulsky of this office on January 26-30, 1981 of activities authorized by NRC License No. SNM-23 and to the discussions of our findings held by Mr. Zibulsky with Mr. F. Sherman of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of findings of your control and accounting procedures for safeguarding special nuclear materials and your facility security measures for physical protection are deemed to be commercial or financial information within the meaning of 10 CFR 9.5(a)(4) and shall be subject to disclosure only in accordance with the provisions of 10 CFR 9.12; therefore, the enclosed inspection report will not be placed in the Public Document Room and will receive limited distribution.

No reply to this letter is required; however, should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Walter G. Martin, Chief
Safeguards Branch

Enclosure: Office of Inspection and Enforcement Inspection
Report Number 70-33/81-01 (Contains 2.790 Information)

8104150 480

Texas Instruments

2

25 FEB 1981

cc:

W. Quimby, Assistant Vice President and Manager,
Metallurgical Materials Division (w/o cy of encl)

F. L. Sherman, Manager, HFIR Project (w/o cy of encl)

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION I

Report No. 70-33/81-02

Docket No. 70-33

License No. SNM-23

Category UR
Safeguards Group 1

Licensee: Texas Instruments Incorporated (HFIR Facility)
34 Forest Street
Attleboro, Massachusetts 02703

Facility Name: Texas Instruments Incorporated (HFIR Facility)

Inspection At: Attleboro, Massachusetts

Inspection Conducted: February 9-12, 1981

Date of Last Physical Security Inspection: July 28-31, 1980

Type of Inspection: Routine, Unannounced Physical Security

Inspectors: Lisa M. McKeown
Lisa M. McKeown, Physical Protection
Inspector

March 11, 1981
date signed

Approved by: James W. Devlin
James W. Devlin, Chief, Physical
Protection Section

3/12/81
date signed

Inspection Summary:

Inspection on February 9-12, 1981 (Inspection Report No. 70-33/81-02)

Areas Inspected: Routine, unannounced physical security inspection of the following areas: Security Plan; Security Program Audit; Security Organization; Physical Barriers; Access Controls; Keys, Locks and Combinations; Detection Aids; Response Controls; Central Alarm and Communications Systems; Testing and Maintenance; SNM Protection and Records and Reports. The inspection involved 30 inspector-hours onsite by one regional based inspector. The inspection was begun during regular duty hours; 4 inspector hours were accomplished during off-shift periods.

Results: No apparent items of noncompliance were identified in any of the thirteen areas examined.

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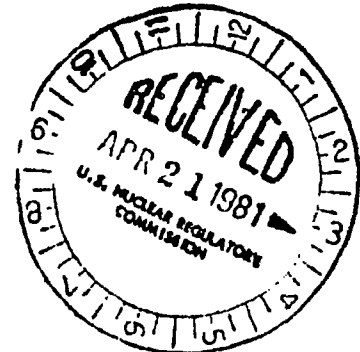


UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

T, C
13 MAR 1981

Docket No. 70-33

Texas Instruments Incorporated
ATTN: Mr. William K. Goetz
Manufacturing Manager
Metal Systems Department
34 Forest Street
Attleboro, Massachusetts 02703



Gentlemen:

Subject: Inspection No. 70-33/81-02

This refers to the routine safeguards inspection conducted by Miss Lisa McKeown of this office on February 9-12, 1981 at the HFIR Facility, Attleboro, Massachusetts, of activities authorized by NRC License No. SNM-23 and to the discussions of our findings held by Miss Lisa McKeown with Mr. Fred Sherman and other members of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of findings of your control and accounting procedures for safeguarding special nuclear materials and your facility security measures for physical protection are deemed to be commercial or financial information within the meaning of 10 CFR 9.5(a)(4) and shall be subject to disclosure only in accordance with the provisions of 10 CFR 9.12; therefore, the enclosed inspection report will not be placed in the Public Document Room and will receive limited distribution.

No reply to this letter is required; however, should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

James H. Joyner, Chief
Technical Inspection Branch

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C

Texas Instruments

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13 MAR 1981

Enclosure: Office of Inspection and Enforcement Inspection
Report Number 70-33/81-02 (Contains 2.790(d) Information)

cc (w report cover sheet only)
W. Quimby, Assistant Vice President and Manager,
Metallurgical Materials Division
F. L. Sherman, Manager, HFIR Project

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION I

Report No. 70-33/81-03

Docket No. 70-33 License No. SNM-23 Safeguards Group I

Licensee: Texas Instruments, Inc.
34 Forest Street
Attleboro, Massachusetts 02703

Facility Name: Texas Instruments, Inc.

Inspection At: Attleboro, Massachusetts

Inspection Conducted: February 24-27, 1981

Date of Last Material Control and Accounting Inspection Visit: January 30, 1981

Type of Inspection: Unannounced Material Control and Accounting

Inspectors: *P. Bissett* 3/20/81
P. Bissett, Auditor date
W. Woltner 3/20/81
W. Woltner, Auditor date

Approved by: *J. H. Joyner* 3-20-81
J. H. Joyner, Acting Chief, Material Control and Accounting Section, Technical Inspection Branch date

Inspection Summary:

Inspection on February 24-27, 1981 (Report No. 70-33/81-03)

Areas Inspected: Facility Operation and Physical Inventory.
The inspection involved 54 inspector hours onsite by two NRC inspectors and was begun during regular hours.

Results: The licensee was found to be in compliance with NRC requirements in the areas examined during the inspection.

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

23 MAR 1981

Docket No. 70-33

Texas Instruments Incorporated
ATTN: Mr. William K. Goetz
Manufacturing Manager,
Metal Systems Department
34 Forest Street
Attleboro, Massachusetts 02703



Gentlemen:

Subject: Inspection 70-33/81-03

This refers to the routine inspection conducted by Mr. P. Bissett of this office on February 24-27, 1981 of activities authorized by NRC License No. SNM-23 and to the discussions of our findings held by Mr. E. Woltner with Messrs. F. Sherman and R. Schwensfeier of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of findings of your control and accounting procedures for safeguarding special nuclear materials and your facility security measures for physical protection are deemed to be commercial or financial information within the meaning of 10 CFR 9.5(a)(4) and shall be subject to disclosure only in accordance with the provisions of 10 CFR 9.12; therefore, the enclosed inspection report will not be placed in the Public Document Room and will receive limited distribution.

No reply to this letter is required; however, should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

James H. Joyner, Chief, Technical
Inspection Branch, Division of
Engineering and Technical Inspection

Enclosure: Office of Inspection and Enforcement Inspection
Report Number 70-33/81-03 (Contains 2.790 Info)

Texa's Instruments Incorporated

2 23 MAR 1981

cc:

W. Quimby, Assistant Vice President and Manager,
Metallurgical Materials Division (w report cover sheet only)
F. L. Sherman, Manager, HFIR Project (w report cover sheet only)