

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

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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. Schensfeir, 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
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  $U_3O_8$  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  $U_3O_8$  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.