

U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 70-33/83-01

Docket No. 70-33

License No. SNM-23 Priority 1 Category UR

Licensee: Texas Instruments, Incorporated
34 Forest Street
Attleboro, Massachusetts 02703

Facility Name: HFIR Project

Inspection At: Attleboro, Massachusetts

Inspection Conducted: January 31 - February 2, 1983

Inspectors: J. Roth
J. Roth, Project Inspector

3/1/83
date

J. Roth for
G. C. Smith, Security Inspector

3/1/83
date

Approved by: A. T. Gody
A. T. Gody, Chief, Safeguards and Fuel
Facilities Section, Nuclear Materials
and Safeguards Branch, DETP

3/2/83
date

Inspection Summary:

Inspection on January 31 - February 2, 1983 (Report No. 70-33/83-01)

Areas Inspected: Special, announced, closeout inspection of facilities formerly engaged in the manufacture of reactor fuel elements including: review of the licensee's survey report and independent measurements in Buildings 3, 4, and 10; and review of the licensee's environmental survey report concerning a 10 CFR 20 burial site located between Buildings 11 and 12. The inspection involved 43 direct inspection hours by two NRC region-based inspectors.

Results: No violations were identified. Measured fixed and removable contamination levels were comparable with the licensee's survey results and were within acceptable limits specified in Annex C to the facility license.

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Details

1. Persons Contacted

- * W. K. Goetz, Manufacturing Manager, Metal Systems Department
- * R. J. Schwensfeir, Manager, Nuclear Safety and Materials
- * W. H. Daft, Health Physics Technician
- * R. Churchill, Contracts Manager

*Denotes those present at the exit interview.

2. Background

During the years 1952 through 1956 small portions of Buildings 3 and 4 and during subsequent years 1956 through 1968, major portions of Building 10 of the Texas Instruments Incorporated, Attleboro, Massachusetts, site were engaged in the manufacture of nuclear reactor fuel for the U. S. Navy and commercial power and research reactors, along with various components of natural and depleted uranium. With the exception of the HFIR project, these operations were concluded in 1966 through 1968.

The building areas used for the concluded operations were then decontaminated, surveyed for radioactivity, and released for general use between 1966 and 1968. Since that time, the areas have been used for manufacturing with non-radioactive materials.

The HFIR project area was previously released for unrestricted use following a closeout survey conducted by NRC from August 31 through September 2, 1982 (see Inspection Report 70-33/82-03).

Since the licensee could not locate documentation verifying that Buildings 3, 4, and the remainder of Building 10 had been successfully decontaminated between 1966 and 1968, verification surveys of the effected areas were performed by the licensee; and a report was submitted to the NRC by letter dated November 2, 1982.

3. Areas Surveyed

Surveys were limited to 67 of 214 grid blocks, outside the HFIR area, located in Building 10 (see Figure 1); two of four grid blocks located in Building 3 (see Figure 2); and 9 of 31 grid blocks located in Building 4 (see Figure 3). All surveys were conducted on floor areas with the exception of the former fuel vault ceiling, north and west inside wall and east outside wall (grid blocks 6-19 and 6-20). In addition, the floor of the second floor corrosion laboratory and the concrete pads outside the HFIR area emergency and rollup doors were also surveyed.

4. Methodology and Instruments

a. Methodology

Direct alpha, beta-gamma, and gamma radiation measurements were made at a minimum of four locations within each grid block. In addition, at least one wipe for removable alpha and beta-gamma contamination were taken in each surveyed grid block.

b. Instruments

The following instruments were used for direct measurements:

- (1) Eberline Geiger Counter, Model E-120, Serial No. 1268, calibrated December 14, 1982.
- *(2) Eberline scintillation type alpha counter, Model PAC-1SA, Serial No. 720, calibrated August 25, 1982.
- (3) Ludlum Micro R Meter, Model 12S, Serial No. 15482, calibrated December 14, 1982.

*Determined to be 47.7% efficient in counting against a Th-230 certified standard of 12,570 dpm.

All wipes were taken to Region I and were counted for one minute in a TENNELEC LB 1000 series low background alpha, beta gas flow counting system having an alpha background of 0.55 cpm and a beta background of 2.7 cpm with an alpha efficiency of 21.9% and a beta efficiency of 25.7% as of February 8, 1982.

5. Independent Measurements

Nine hundred thirty-eight individual, direct alpha, beta-gamma and gamma radiation measurements were taken in the facility areas identified in paragraph 3. Direct alpha measurements did not exceed 175 dpm/100cm² (92.6% ≤ 50 dpm) except for Building 4 floor location 400-3 (350 dpm) as shown in Figure 3. Direct gamma measurements did not exceed 10 microR per hour above background (6 microR per hour) except off the north edge of the concrete pad located outside the HFIR area rollup door (700 microR per hour on contact with the soil). Direct beta-gamma measurements did not exceed 500 dpm except for Building 10 floor grid floor location 5/21 (2400 dpm maximum, 1140 dpm average) as shown in Figure 1. This area corresponds with the highest area identified by the licensee. A total of 81 wipes for removable alpha and beta contamination were taken. All wipes for removable alpha and beta contamination were less than 10 dpm/100cm² alpha except Building 4 floor grid 401-8 (11.2 dpm) and Building 10 floor grids 6/20 (20.3 dpm) and 1/10 (11.2 dpm); removable beta contamination was less than 20 dpm/100cm² except Building 10 floor grids 1/8 (20.6 dpm) and 8/7 (24.5 dpm). Annex C criteria for direct alpha and beta-gamma radiation are 15,000 dpm/100 cm² maximum fixed, 5000 dpm/100 cm² average fixed and 1000 dpm/100 cm² removable.

6. Conclusion

Fixed and removable contamination levels, inside the licensee's facilities, 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).

7. Environmental Program

During the course of this inspection, the inspector received a copy of the licensee's evaluation of the 10 CFR Part 20 burial site located between Buildings 11 and 12. This report will be reviewed for adequacy and content by NRC:NMSS and Region I subsequent to this inspection (83-01-01).

8. Exit Interview

The inspector met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on February 2, 1983. The inspector summarized the purpose, scope, and findings of the inspection. Since an area of elevated radiation level was identified outside Building 10 (paragraph 5), the inspector requested that the licensee determine the extent of area contamination. In addition, the licensee was requested to conduct an area radiation survey on all sides of Building 10 to assure that any additional elevated radiation areas are identified. The licensee notified the inspector by telephone on February 8, 1982, that the identified area of elevated radiation, located off the north edge of the rollup door concrete pad, was restricted to an area about one foot by two feet in size. Actions will be taken to remove the contaminated soil for burial as soon as weather conditions permit (83-01-02). The licensee stated that a radiation survey of areas outside Building 10 will be conducted (83-01-03).

Figure 1

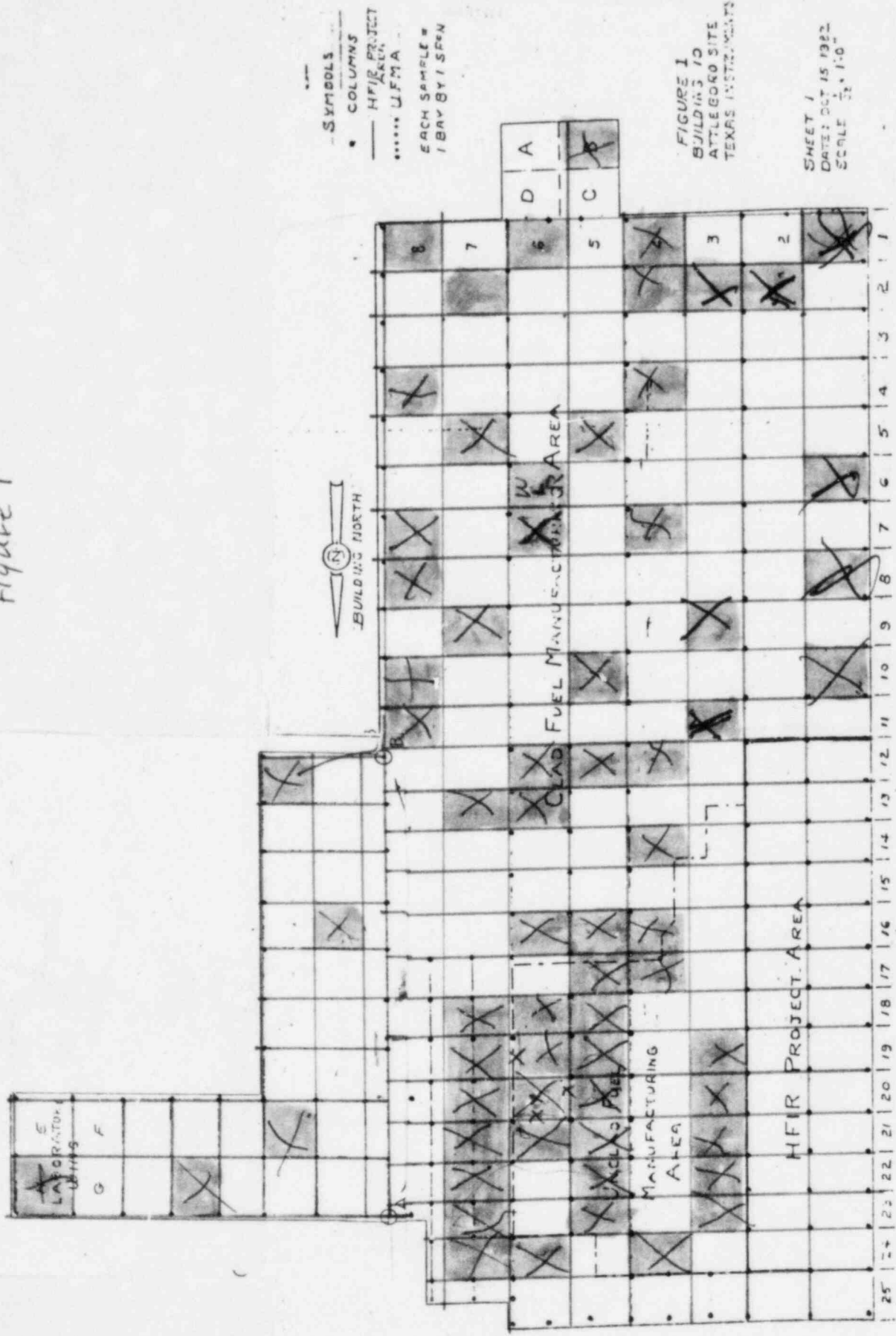


Figure 2

SYMBOLS
 O COLUMNS
 — RADIOACTIVE
 MAT. MFG AREA

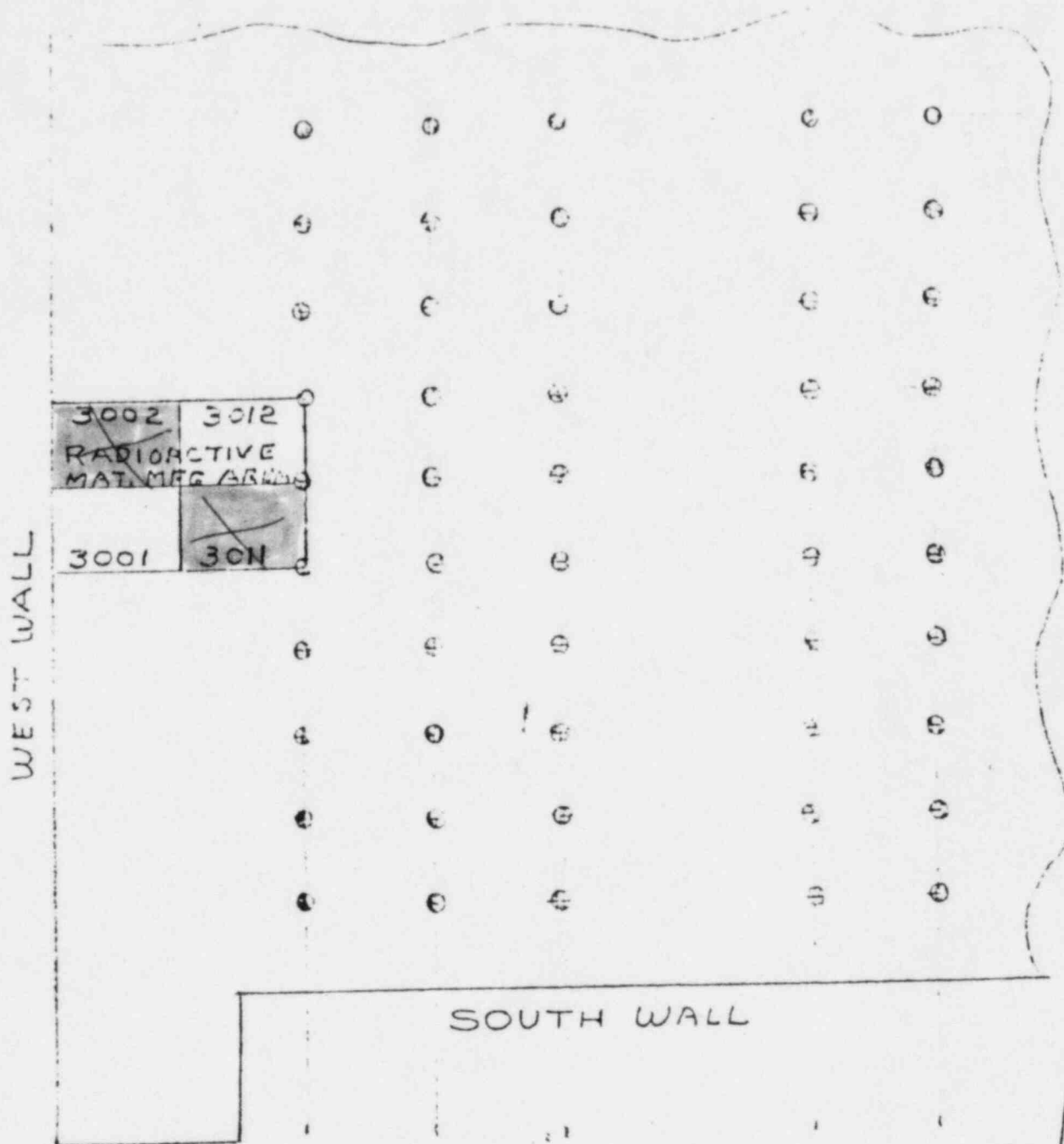


FIGURE 2
 BUILDING 3
 ATTLEBORO SITE
 TEXAS INSTRUMENTS

SHEET 1 OF 1
 DATE: NOV. 2, 1932
 SCALE 1" = 40'-0"

BLDG
 NORTH



