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PRELIMINARY SURVEY OF JOSLYN STAINLESS STEEL COMPANY FORT WAYNE, INDIANA

Work performed
by the
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Formerly Utilized Sites--
Remedial Action Program

JOSLYN STAINLESS STEEL COMPANY
Fort Wayne, Indiana

At the request of the Department of Energy (DOE, then ERDA), a preliminary survey was performed at the Joslyn Stainless Steel Company in Fort Wayne, Indiana (see Fig. 1), on October 23, 1976, to assess the radiological status of those facilities utilized under MED/AEC contract during the period 1944 through 1949. Edwin E. Hodgess, Jr., Vice President of Operations, provided information on Atomic Energy Commission (AEC) operations at this site and identified those parts of the plant involved in the process. A large part of this information was obtained by Hodgess from Paul Lauletta, a former Joslyn employee directly involved in the MED/AEC project.

The project involved the conversion of uranium billets into metal rods. The primary operations involved were heating, hot rolling, quenching, straightening, cooling, grinding, abrasive cutting, waste burning, and threading. Areas involved, designated by letters A through J, are shown on the attached plant layout (Fig. 2). The use made of each area and the sequence of operations are shown on Fig. 3. The billets were received by rail, unloaded at an unloading dock and transported by cart and overhead crane to the storage area. Movement of the billets from storage through the remainder of the process was accomplished by rail car, conveyor, and overhead trolley. The floors in the process area were dirt, concrete, and steel. All ash and residue from the burn area (Fig. 3, section I) were recovered by AEC for uranium accountability.

Present Use of Facilities

The grounds, buildings, and some equipment used during the uranium operations are presently being utilized by Joslyn. The furnaces were removed at the conclusion of the AEC contract. The equipment used in cutting, grinding, straightening, and threading is gone, and new concrete floors now cover these areas. The uranium billet storage area is presently used as a roll shop, and the 36-cm rolling mill is still in operation. The 46-cm mill was sold to AMEX Speciality Metal Corporation, Coldwater, Michigan, and the 23-cm mill was brokered through the T. B. Hudson Company and was believed to have been shipped to Sonora, Mexico.

Results of Preliminary Survey

The present survey was conducted on October 23, 1976, by H. W. Dickson of the Oak Ridge National Laboratory and W. T. Thornton of the Department of Energy-Oak Ridge Operations Office (then ERDA). A complete walk-through survey was performed with numerous radiation measurements made in each of the areas A through J involved in the uranium operations (see Fig. 2). Measurements were made of direct alpha, direct beta-gamma, transferable alpha, transferable beta-gamma, and external gamma-ray exposure rate. In general, there was no surface contamination; measurements made were indistinguishable from instrument background. A few isolated spots showed traces of alpha and beta-gamma contamination. The maximum alpha reading observed was 300 dpm/100 cm^2 and was found on the wall of the straightener area F. The maximum beta-gamma reading detected was 0.1 mrad/hr and located at an isolated spot in area B, now used as the roll shop. No transferable contamination was detected. The average external gamma radiation level ranged from 6-8 μR/hr and compares favorably with the natural radiation background for the area.

The last documented radiological survey, prior to the October 23, 1976, survey, of the Joslyn facilities was performed by A. R. Piccot of the AEC Health and Safety Laboratory (HASL) on August 1, 1949. The 1949 survey was carried out after all uranium operations had ceased and apparently before cleanup was complete. The HASL survey (1949) reported beta-gamma radiation levels as high as 20 mrad/hr (see attached report). All efforts to contact Mr. Piccot concerning the existence of any later survey have been unsuccessful. However, since accountability procedures in effect at the time of the operation required that all uranium scrap, oxides, residues, and wastes be returned to AEC, it is highly unlikely that quantities of radioactivity sufficient to present a potential health hazard would exist under new concrete surfaces or structures.

Because of the foregoing premise and since no radioactivity of significance was detected during the October 23, 1976, survey, it was concluded that no present or potential radiation-related health hazard exists due to MED/AEC operations and that no further DOE survey is required at the Fort Wayne facilities of Joslyn Stainless Steel.

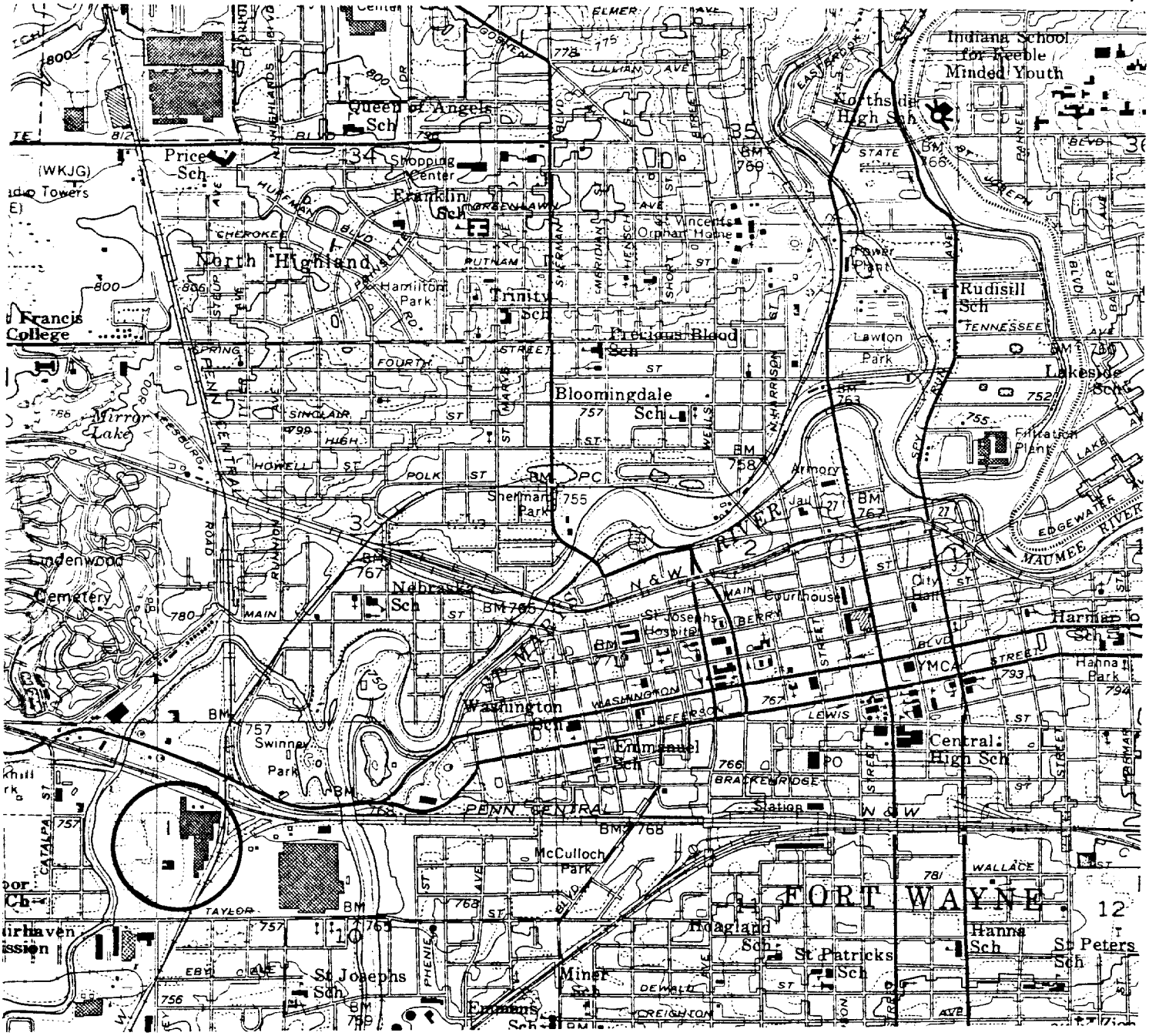
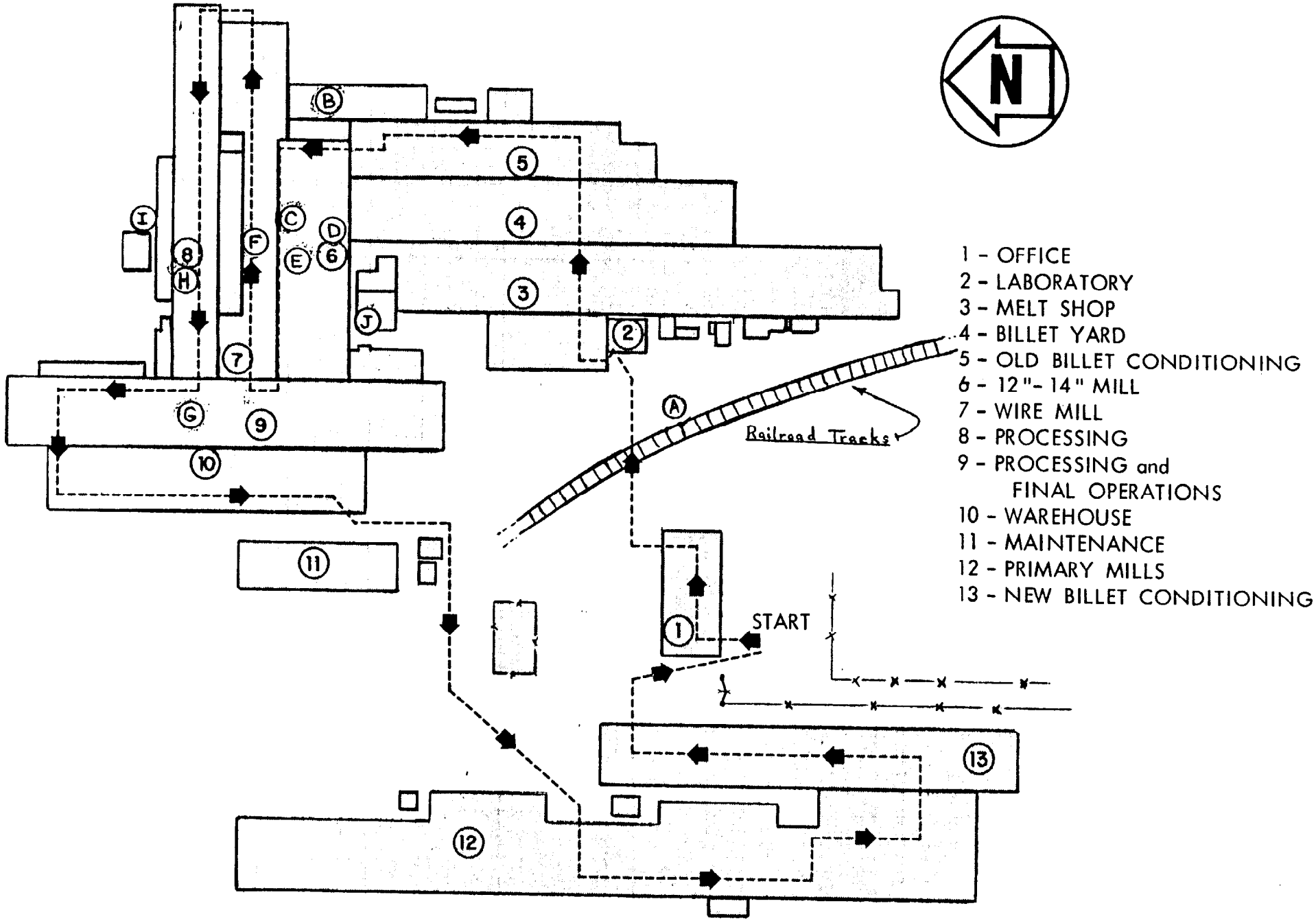


Fig. 1. Location of Joslyn Stainless Steel Company in Fort Wayne, Indiana.

JOSLYN STAINLESS STEELS



The alphabetical designation represents the sequence or material flow of the operation.

A. Railroad siding, billet receiving area: transfer to Area B was along a path which is now covered by Buildings 3, 4, and 5.

B. U billet storage - presently used as roll shop.

C. Furnace area: furnaces were removed at conclusion of AEC contract.

D. 18" mill used to roll larger billets: this mill has been sold to AMEX Speciality Metal Corporation, Coldwater, Michigan.

E. 14" mill used for rolling smaller billets: still in operation.

9" mill also was used for smaller U billets; this mill was sold, brokered through T. B. Hudson Company and thought to have been shipped to Sonora, Mexico.

F. Straightener area: equipment is gone and a new concrete floor now covers area.

G. Abrasive cutting area: equipment is gone and a new concrete floor covers area.

H. Production grinding area: equipment is gone and a new concrete floor covers area.

I. Burn area: all ash and residue recovered by AEC for uranium accountability.

J. Lathe turning area: lathe used to put screw threads on each U rod is gone; rods were packaged for shipment in this area.

Fig. 3. Uranium operation areas at the Joslyn Stainless Steel Company in Fort Wayne, Indiana.

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The Files

August 22, 1949

A. R. Piccot, Radiation Section

RESIDUAL CONTAMINATION SURVEY AT JOSLYN STEEL CO.

REFER TO SYMBOL: DH:ARP

On August 1, 1949 the writer visited the Joslyn Mfg. & Supply Co. rolling mills at Fort Wayne Indiana. Radiation measurements were made with an IDL and a Zeuto on contaminated floors and machinery involved in previous uranium rolling, grinding & machining operations. All work on uranium had ceased except for the removal of drums containing scraps and clean up material which were to be shipped out the following day. Most of the machines were back in operation on other materials. All AEC personnel expected to leave the following day.

Receiving and Storage Area:

Billets were received by boxcar and unloaded at the unloading dock next to the tracks, picked up by overhead crane, carried across the building to within 10 or 15' of the wire cage compound; dropped on carts, wheeled into compound and stored until needed.

Contamination at the unloading dock and along the path taken by the billets from boxcar to compound was very slight with typical readings of 500, 300,300 alpha d/m until the floor at the entrance to and in front of the compound was reached where readings were 2000, 8000, 800. The large building containing the track and receiving dock was 11 bays long by 4 bays wide and contained the rough turner. Except for the vicinity of the rough turner described later, fifteen spot checks in other parts of this building indicated negligible activity (less 300).

Floor readings inside the compound varied from 15,000 to 20,000 with a general background in the center of the room of 0.5 mr/hr. The compound still contained barrels of reclaimed scrap and other material which was to be shipped out the following day along with several others stacked just outside the compound. The scale in the compound gave a reading of 10,000 d/m on the platform. A metal drying pan on the floor outside of the compound gave an inside contamination reading of 20,000 to 30,000 d/m. The field office next to the compound gave floor readings of about 300 d/m.

Heat Treatment Area:

The billets were removed from the compound to the heating furnaces, a distance of some 70', by means of a rail car and stored on racks on each side of a bank of furnaces. They were then heated individually

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in 8 small resistance type electric heated furnaces to a temperature of 1050° with a natural gas atmosphere. After a 30 minute soaking at this temperature, the billets were carried to the rolls by means of the rail car or an overhead trolley.

The floor from the entrance of the compound to the rail car averaged 1000 d/m with readings of 2000 and 4000 directly over the rail which is recessed into the concrete floor. Readings between the rails from the loading point to furnaces gave following: 600, 200, 200, 2000 in front of the wooden storage rack, 1500 between rack and first furnace, 1500 in front of the furnace, 2500 in front of the second rack, 2000 at the end of the track. The highest IDL contact reading between the track was 0.3 mr/hr. The dirt floor along the right side of the track opposite the furnaces and racks gave readings of 1200, 800, 1000 alpha d/m with a maximum of 0.4 mrep/hr in contact.

The wooden platform and dirt floor in front of the first rack averaged 1000 α d/m and 0.2 mrep/hr. Gross pieces on the rack averaged 500 alpha d/m or less. The wooden catwalks in front of the eight furnaces and the platform in front of the second rack gave zeuto readings from 5000 to 10,000 and IDL contact readings of 0.5 to 1 mrep/hr.

The top of the furnaces indicated contamination of from 10,000 to 25,000 α d/m and 1 to 2.5 mrep/hr. The IDL with the probe stuck into the furnace registered from 5 to 12 mrep/hr. These furnaces were designed for AEC and are in standby.

disposition

Rolling and Quench Area:

The mill rough and finishing rolls are set up immediately adjacent to each other. After rolling, the rods were placed on a roll conveyor and moved for a distance of approximately 80' outside the building where they were stamped for identification. After stamping, the rods were removed from the conveyor and placed over a cooling pit on cross bars for 10 minutes, quenched in a water bosch tank, allowed to cool and removed by jeep to the next operation or to the freight car for shipping.

The mill surroundings are very irregular with dirt, concrete and steel floors, conveyors and trenches and stored material in the vicinity of the mill. A concrete slab, 30' from rolls (path of hot billets) gave zeuto readings of 800 to 3000 α d/m. Steel flooring 20' behind the rolls gave

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no detectable contamination and looked clean. In general, steel floorings away from the rolls had only slight contamination. In the immediate vicinity of the rolls (3 or 4' radius) contamination on the steel and cracks between sections varied from 500 to 4,500 α d/m. The screwdown and gearbox housing when dust had settled indicated contamination from 1500 to 2000 α d/m. Spots under the rolls and in inaccessible cracks where oxide scale had fallen gave readings as high as 7 or 8 mrep/hr. One foot out from the rolls the background was about 0.5 mr/hr (probably from material in the pits under the rolls). A hurried check on rolls while turning showed no significant alpha. A pile of steel guides used in the uranium rolling (pile 20' from rolls) indicated as high as 15,000 α d/m and 4 mr/hr in contact. The trench under the conveyor to the quench tank was oil soaked and gave readings of 3 or 4 mrep/hr. The quench tank area was cluttered with stored material and the dirt was wet from splashing. Contamination was detectable within a 15' radius and readings from 0.5 to 1 mrep/hr at one foot high and 2 mr in contact with dirt were observed.

Cropping on Cutamatic:

After quenching, the rods are bundled (six to a bundle) and are carried to the cut-off machine, called cutamatic, which is located in the cold finishing department. The rough ends were cropped while a heavy flow of coolant was used over the cutting tool and rod end to minimize sparking hazard.

The machine is surrounded by a concrete floor with detectable contamination 20' from the machine. Contamination on the floor next to the machine varied from 2,000 to 10,000 α d/m, and 0.5 to 2 mrep/hr. The floor under the rack which supported the rods had contamination as high as 20,000 α d/m and 10 to off scale on the IDL. Contamination on the outside of the housing near the cutter was as high as 20,000 α d/m and 0.2 to 1 mrep/hr with 30,000 α d/m in the bottom of the coolant reservoir and 20 mrep/hr or more on the IDL. Background 3' high in front of the rack was 0.5 to 2 mr/hr with 1 to 3 mrep/hr in back of the rack. Oxide contamination was visible on the floor under the rack and apparently had not been cleaned. Other cracks and catch basins on the machine gave 10 to off-scale readings on the IDL. In order to clean these remote parts, the machine would probably have to be dismantled.

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The concrete floor in front of the machine indicated 3000 d/m and steel gratings on the floor gave 10 to off-scale readings on the IDL, due to material which had fallen in trenches under the gratings. Contamination on the wood rack varied from 2000 to 3000 d/m. A spare grinding wheel next to the machine read 2 to 3 mrep/hr. in contact and 5000 to 8000 d/m. The machine was being prepared for use on other materials on the following day.

Threading Machine:

The threading was done on a Pratt & Whitney 15" lathe with a continuous flow of coolant over the cutting point.

The lathe and surroundings were only moderately contaminated with the floor in front of the lathe giving 1100 d/m and lathe parts less than 300 d/m. The supporting wood rack had negligible contamination except for 3 guide grooves which indicated from 3000 to 5000 d/m.

Other Areas:

No detectable contamination was observed in the inspection department. The scrap area behind the factory contained contaminated materials such as drying pans, broken cutomatic wheels, wood, etc. Readings up to 10 mrep/hr were observed with the IDL in contact with some of these materials.

The purpose of this survey was to obtain a record of the contamination and radiation levels and, therefore, no recommendations or conclusions are necessary in this memorandum.