

~~pull file~~
~~file~~
NAR



WOM
4045

GENERAL STEEL INDUSTRIES, INC.

GRANITE CITY, ILL.

September 7, 1962

Mr. James Mason, Chief
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D.C.

Dear Sir:

In conformity with state and federal regulations an area radiation survey has been made of the Radiographic Exposure Facility at the Granite City, Illinois plant of this corporation.

A copy of the survey made by the Nuclear Consultants Corp. is enclosed.

Yours very truly,



L. A. Kleber
Vice President-Manufacturing

LAK:js

Enclosure

ACKNOWLEDGED

A/H

Nuclear

Consultants

Corp.

Consultants to Industry on Radioisotopes

9842 Manchester Road
1717 Victory Boulevard
17907 Detroit Avenue

St. Louis 19, Missouri
Glendale 1, California
Cleveland 7, Ohio

314-Woodland 2-2162
213-CHapman 5-3965
216-LAkewood 1-2222

Reply To:

AREA RADIATION SURVEY
OF THE
RADIOGRAPHIC EXPOSURE
FACILITY

at

GENERAL STEEL INDUSTRIES
GRANITE CITY, ILLINOIS

14 August 1962

ABSTRACT

On August 1, 1962 a radiation survey was performed of the Radiographic Exposure Facility at the Granite City, Illinois plant of General Steel Industries. This survey was performed during exposure of 2 Co-60 sources from 2 Budd Company Unitron Model 110AB units, which were arranged in several different typical operating positions.

The results of this survey show a high reading on the external walls of 1.2 mr/hr at 1 meter above the floor at the wall nearest the exposure location. The average reading, including background, was 0.15 mr/hr. Most readings did not exceed the background level of 0.05 mr/hr.

The survey of the "operations" room inside the radiographic exposure facility was 1.35 mr/hr at floor level directly at the door. The average reading, including background, was 0.30 mr/hr. Background levels of 0.05 mr/hr were found in this room. This room is entirely contained in the restricted area and is used by monitored personnel only.

GENERAL

In compliance with the State of Illinois and Federal regulations, an area radiation survey was requested on the Radiographic Exposure Facility of General Steel Industries of Granite City, Illinois. On June 24 and August 1, 1962, a physicist from

Nuclear Consultants Corporation performed surveys, the results of which follow:

- I. Instrumentation. A Precision Radiation Instruments, Inc., Model 107c, Serial No. 607H geiger counter was used for the radiation survey. The ranges for this instrument are 0.04, 0.2, 2.0 and 20 mr/hr. This instrument has been calibrated with Co-60. Also, a NUCOR CS-40A "Cutie-Pie" survey meter was used to cross-check when possible, but no levels were found which exceeded the range of the geiger counter.

- II. Facility and Source Description. This facility is located on the ground level of the plant. It is composed of concrete block walls 24 inches thick (minimum) and approximately 10 feet high with 3 strands of barbed wire at the top. These walls form an enclosure which is posted and always kept locked. Only qualified personnel, as named in the AEC license, are permitted access to this area. Such personnel are routinely monitored for exposure to external ionizing radiation. Additional shielding is afforded individuals inside the exposure area in the form of 4' x 4' x 6" steel armour plates, located strategically inside the facility. A sketch of this facility is attached.

The radiographic sources used in this area are 2 Budd Co. Unitron Model 110AB rollout cameras. These

cameras, though portable, are used only inside the exposure facility described above. Each camera contains a nominal 300 millicuries of Co-60.

III. Operation. The Unitron 110AB rollout cameras are operated remotely by means of a 25 foot extension control from behind the armour plate shielding. The source positioning tubes are located in proper exposure position prior to unlocking the Unitron cameras. Such cameras are then unlocked, after which the radiographer retires to a location behind the armour plate shielding from which location the sources are "run-out" into exposure position. He then retires to the operations room where he waits until the exposure is completed. At this time, still behind the armour plate, he proceeds to retract the sources into the cameras. The cameras are then locked until the next use.

Prior to any entry into the exposure area, the individual entering must monitor the area, and the cameras, with a survey meter to assure that all sources are contained within their shields. Additionally, no exposure is made without turning on the red warning lights located on each corner of the facility. For use in emergency, a phone is located inside the operations room. Since the outer door is locked from the inside during

exposures, no inadvertent entry to the area is possible.

VI. Radiation Survey. Following are the results of the radiation survey performed on this facility.

A. Exterior Surfaces, Unrestricted Area.

1. Exterior readings in storage areas and passageway.
 - 1.1 On the surface of the floor at the outside walls the average level was 0.08 mr/hr. A maximum level of 0.12 mr/hr was found immediately outside the entrance door.
 - 1.2 At 1 meter from the floor at the outside walls the average level was 0.15 mr/hr. The maximum level of 1.2 mr/hr was found immediately adjacent to the source location inside the facility.
 - 1.3 At 2 meters from the floor at the outside wall the average level was 0.23 mr/hr. The maximum level of 1.2 mr/hr was again immediately adjacent to the source location inside the facility.
 - 1.4 Background in this area was an average of 0.05 mr/hr.

The above reported levels could be reduced to 1/4

if the Partial Occupancy factor were applied to this unrestricted area.

B. Operations Room, Restricted Area.

2. Readings inside enclosure in Operations Room.

2.1 At the surface of the floor the average level was 0.31 mr/hr. A maximum level of 1.35 mr/hr was found at the door leading into the exposure area.

2.2 At 1 meter from the floor the average level was 0.26 mr/hr. The maximum level of 1.15 mr/hr was found at the door leading into the exposure area.

2.3 At 2 meters from the floor the average level was 0.33 mr/hr. The maximum level of 0.85 mr/hr was found at the door leading into the exposure area.

2.4 Background level in this room was found to be 0.05 mr/hr.

The above reported levels are found inside the restricted area which is accessible only to monitored personnel. An occupation factor of 1/2 has been found to apply for this area due to operations scheduling.

CONCLUSIONS

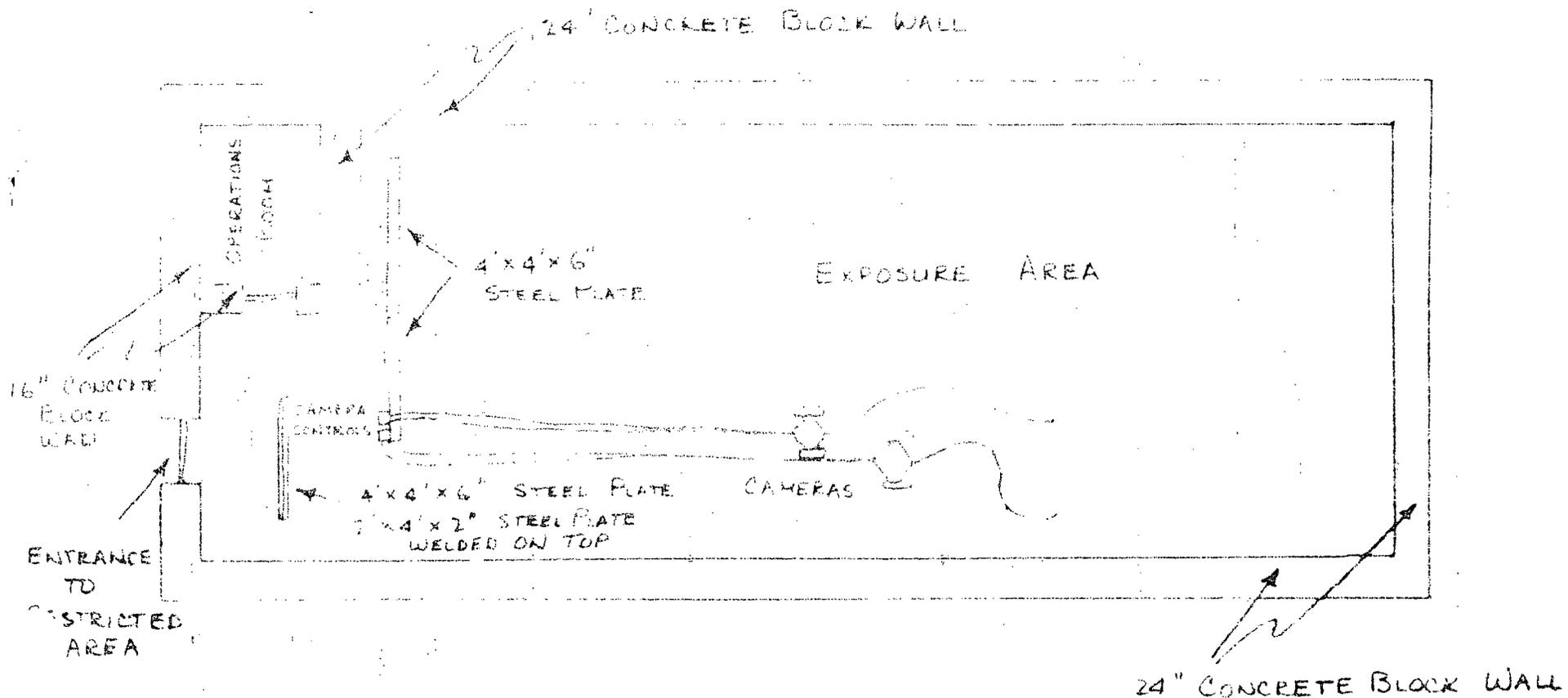
From the above survey the following conclusions may be drawn:

- I. The existing facility is suitable for use for the radiographic procedures outlined in the AEC licensing request of March 7, 1962 (AEC 313) and subsequently approved on AEC license #12-3271-1. Such use will not result in exposure to non-occupational personnel in excess of the limits specified in Title 10, Code of Federal Regulations, Part 20.

- II. Normal usage of the Operations Room located in the restricted area should not result in exposure to radiographers in excess of the permissible limits specified in Title 10, Code of Federal Regulations, Part 20 for occupationally exposed personnel. Indeed, if present occupancy factors continue, these individuals should not receive whole body exposures in excess of approximately 1/16 of the permissible limits during a normal 40 hour work week.

This report is respectfully submitted.

SKETCH OF THE
RADIOGRAPHIC FACILITY
GENERAL STEEL INDUSTRIES
GRANITE CITY, ILL.



SHOWS ADDITIONAL SHIELDING
ADDED DURING JUNE-JULY 1962.
NOT DRAWN TO SCALE.

D. DARR
8-15-62