From: DanMcKeel2@aol.com [mailto:DanMcKeel2@aol.com]
Sent: Saturday, March 17, 2012 12:35 AM
To: NIOSH Docket Office (CDC)
Cc: danmckeel2@aol.com
Subject: Docket 140 (GSI) submission

NIOSH Docket 140
General Steel Industries

Attachment <McKeel5ppt2.pdf> 5.3MB

Dear Docket Office:

Please accept this PDF file of a Powerpoint presentation I made, in person, at the TBD-6000 work group in Cincinnati on March 15, 2012. The topics are germane to revising Appendix BB and consideration of SEC-00105. These issues are central to the David Allen/DCAS August 2011 and January 2012 white papers dealing with GSI portable sources and Betatron operations, and reviews of these four documents by SC&A. It is important that this presentation be processed and posted soon. The TBD-6000 work group has scheduled another meeting on 3/28/12 and this presentation also is highly relevant to those upcoming deliberations. Thank you for your consideration of my request.

-- Dan McKeel 3/16/12

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GSI Petitioner's Presentation

March 15, 2012, TBD-6000

Work Group Meeting

- Daniel W. McKeel, Jr., M.D. -

Path Forward For GSI

- David Allen white paper: **October 20, 2010** **disallows use** of 80 Curie Co-60 NDT source
- Proposed new exposure models, based on GSI information from outside sources, to revise Appendix BB Rev 0 (**June 2007**)
- 13 SC&A Findings on Appendix BB Rev 0 *and* 5 of 6 SC&A Findings on SEC-00105 NIOSH evaluation report **October 2008** to be addressed

Path Forward Work Documents

- Dr. Ziemer e-mail outlines ten new NIOSH GSI exposure models (**5/16/2011**)
- First 4 models in David Allen-DCAS **Aug. 2011** white paper on GSI portable sources
- Last 6 models in David Allen's **Jan. 2012** white paper on GSI Betatron operations
- The five (5) SEC issues go unaddressed

Petitioner Concerns - 1

- Old Betatron model is grossly inadequate; Old and New buildings and x-ray units *are not* the same
- New Betatron model uses 1971 data for 80 curie Co-60 source that is not allowed under EEOICPA to validate film badge readings from 1964-1966
- OCAS-IG-003 not adhered to: Old Betatron, GSI owned 10 to 20 curie Ir-192 source, (2) 250 KVP portable industrial x-ray units doses not defined
- **No radon model** for GSI extensive underground campus wide tunnel and conveyor belt networks

GSI Ir-192 Source - affidavit 1

From: *jim burgess <illumbar6@sbcglobal.net>*
Date: *November 1, 2006 5:53:05 PM CST*
To: *John Ramspott <jwramspott@sbcglobal.net>, danmckeel2@aol.com*
Subject: Fwd: Operations Document reply
The large castings were processed only in the old betatron except for the pipes which were x-rayed using Iridium anywhere necessary, but not routine except in primarily in the end of 10 building and sometimes in building number 9. The only Co60in my time was the small "pill" in six building west end up against the foundry core truck aisle on the west. (emphasis added, end quote)

GSI Ir-192 Source - affidavit 2

(begin quote)

Dr. Dan-Just a reminder that the Iridium info about the (GSI) 10-20 Curie Iridium and one-quarter Curie Cobalt-60 (sources) came from Vic Height, Mountain Grove, Mo. Vic started in the fall of 1963, at GSI, worked in Magnaflux, then moved up to Isotopes. He periodically worked in 6 building with Iridium and Cobalt, shooting corner shots on rail truck frames. He also worked steady midnights with Tom Crane at the old betatron while they were going to school. Vick stated that Iridium was the weaker source, penetration wise, and that it would take 2-4 hours, using Cobalt to penetrate 2 inches of steel. Vic later worked at Magnaflux Co. and worked all over the world with radiation. Terry Dutko

(end quote)

Dying Man Declaration-1
Iridium-192 GSI Source

The attorney son of GSI Radiographer "R.W." (deceased) filed this formal affidavit on November 25, 2006:

"8. My job duty was to X-ray castings with The Betatron. I used 250 KVP Industrial Radiographic Equipment and also x-rayed castings, using Cobalt 60 and Iridium 192. The latter unit was in the Betatron room, was mobile and sat on the floor."

GSI Iridium-192 Affidavit #3

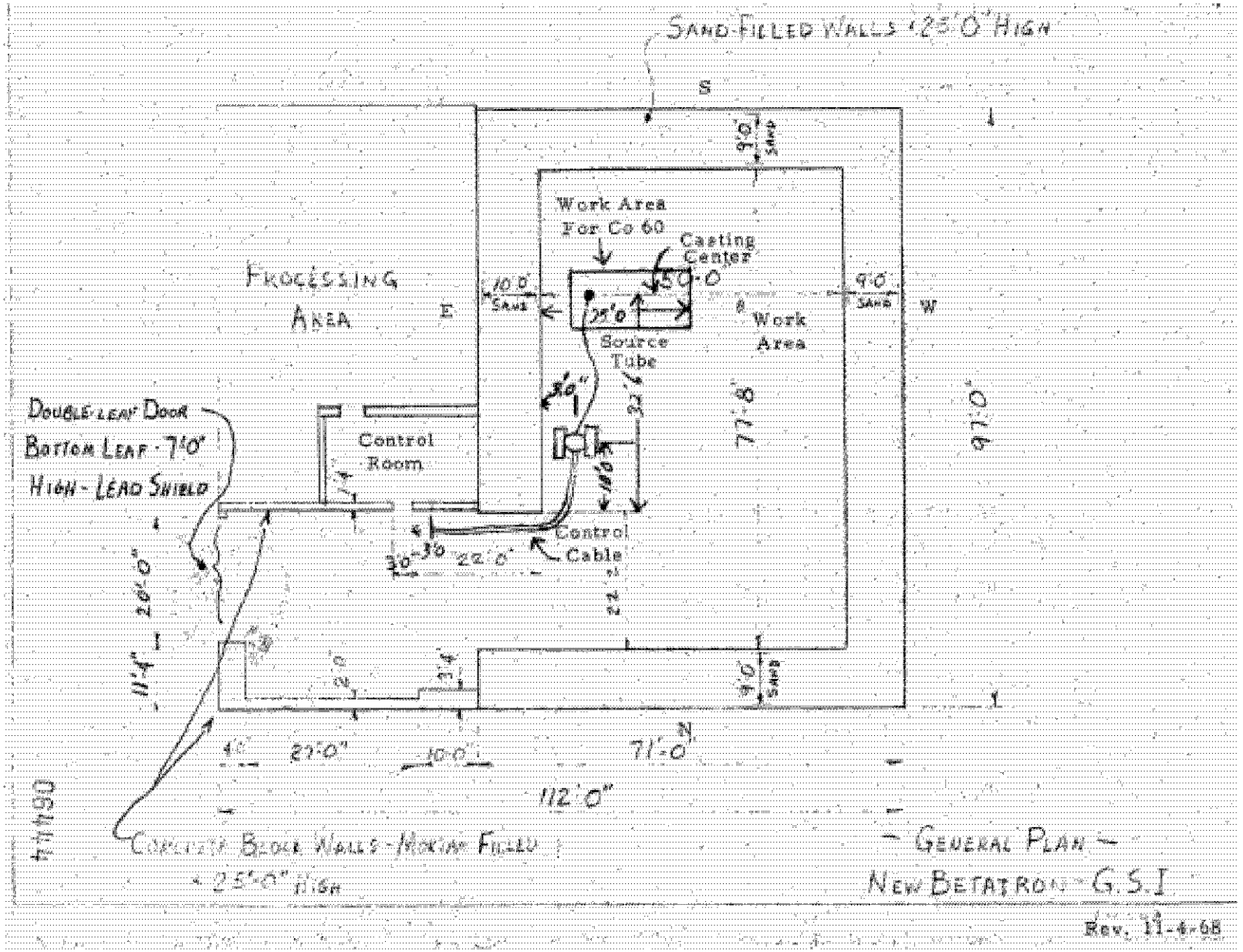
Dying Man Declaration-2

The attorney son of GSI Radiographer “R.W.” (deceased) filed this formal affidavit on November 25, 2006:

“Before I had ever heard of the concept of Activation, I explained to my son that after the Betatron was turned off after a “shot” I could still get a radioactive meter reading at the site of the shot. The reading was most apparent from the cone of the Betatron itself... This was a concern because in setting up the shot my back was between the cone and casting... one to two ft. from cone.”

Petitioner Concerns - 2

- Modeling of the New Betatron bldg. errs by including a lead shielded double leaf door that GSI Betatron workers state was not there in 1964-66
- DOE/ORNL 1992 and McKeel 2006 photos show a double leaf NBB door, no lead shield and show a ribbon roll up door at the entry of tunnel break area into Bldg. 10


SAND-FILLED WALLS 25'0" HIGH
S
9'0" SAND
Work Area For Co 60
Casting Center
50'0
PROCESSING AREA
E
10'0" SAND
125'0
Source Tube
Work Area
W
9'0" SAND
DOUBLE LEAF DOOR
BOTTOM LEAF 7'0" HIGH - LEAD SHIELD
Control Room
30'0"
32'7"
77'-8"
91'0"
11'0"
Control Cable
3'0"
22'0"
20'0"
11'4"
2'0"
3'4"
9'0" SAND
N
4'0"
27'0"
10'0"
71'-0"
112'0"
CONCRETE BLOCK WALLS - IRON FILLED
25'0" HIGH
GENERAL PLAN
NEW BETATRON G.S.I
Rev. 11-4-68

Double Leaf Metal Door (no lead shield) 2006 McKeel Photo

LEGEND. View from the Old Betatron railroad track tunnel looking out. Photo by Dan McKeel 2006. Double leaf metal door has exposed vertical struts that are not covered by lead shields. Workers confirm no lead shield.

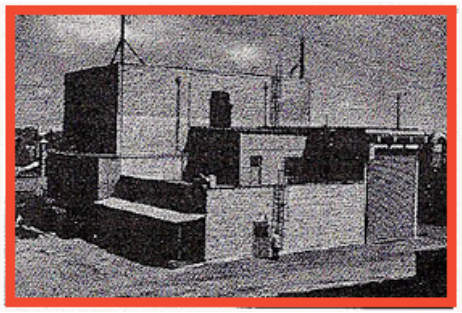
Red Ribbon Roll Up Door at Entry of New Betatron Tunnel
2006 Dan McKeel Photo

Workers testify this type of door at Old & New Betatrons 1964-1966

Allis-Chalmers Manual Rollup Door

6 The Completed Laboratory

View of the completed laboratory shows the penthouse above the control room and adjacent to the upper wall of the bay. It is constructed of corrugated asbestos cement siding fastened to structural steel framing. Power supply transformers, set on a concrete slab, are housed in a wire enclosure outside the auxiliary rooms; the enclosure is covered by a corrugated asbestos-cement roof. This location is adjacent to the room containing the betatron capacitor racks and switchgear. A steel roll-up door closes the rail tunnel.



Allis-Chalmers BETATRON Building

Testimony 3/13/12 that this ribbon steel door was just recently replaced this year

Concern: No Pre-June/July 1962 Bldg. 6 Ra-226 SC&A Modeling

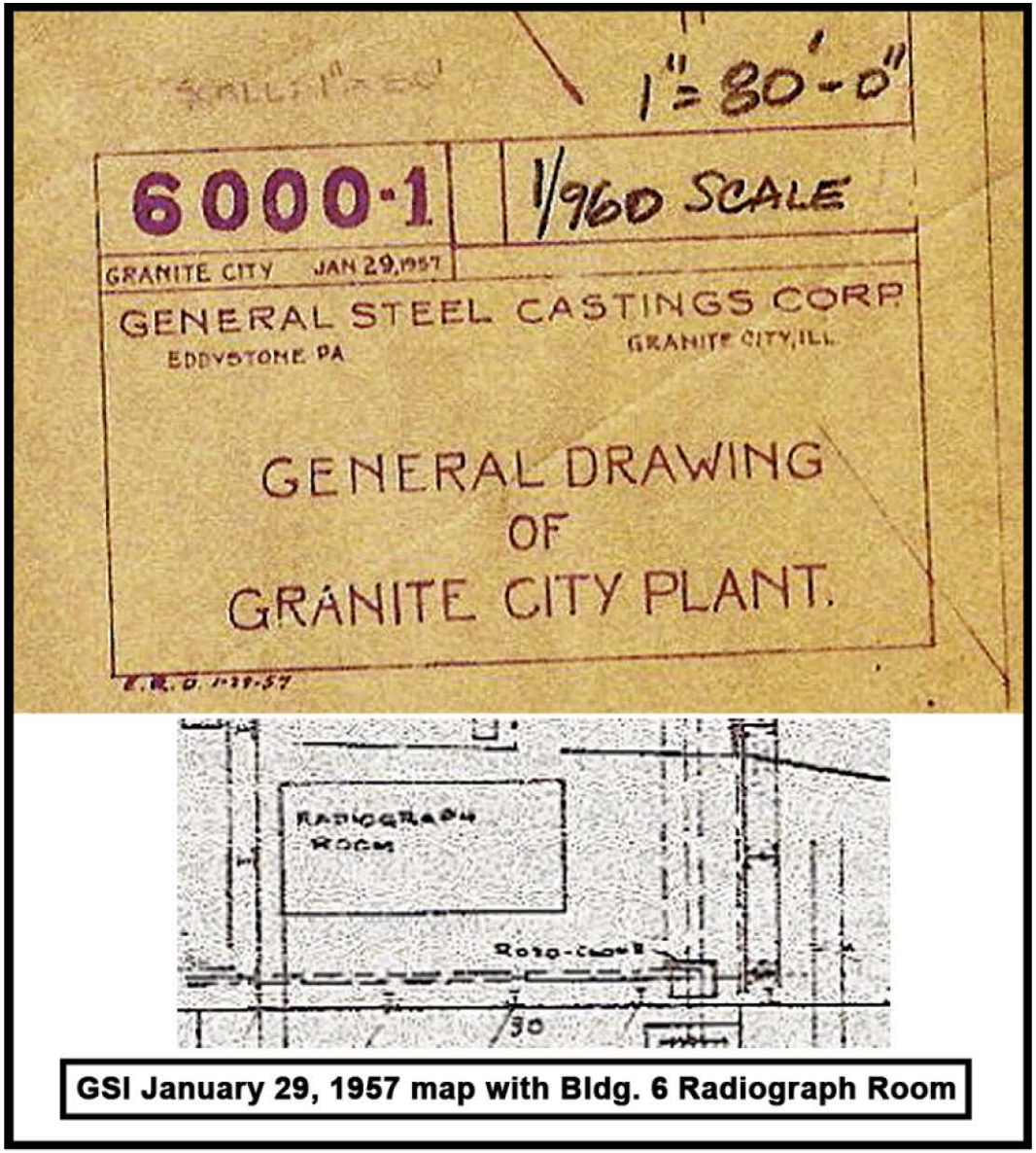
Effective Date:
10/20/2011 Revision No. 0 – Draft Document Description: White Paper: Update on the Use of Sealed Radioactive Sources at GSI Page No. Page 19 of 25
Appendix B MCNP SIMULATIONS OF EXPOSURES FROM 226RA IN NO. 6 BUILDING
Prepared by Robert Anigstein and Richard Olsher S. Cohen & Associates

- We simulated the exposures and dose rates from 226Ra in the radiographic facility in No. 6 Building at GSI using the MCNP5 radiation transport code. The model of the radiographic room was based on a sketch in the GSI application for an AEC byproduct material license (NRC 2009e, p. 31), which is replicated in Figure 4.

Bldg. 6 Radiograph Room 1957

- A new GSI map obtained by John Ramspott conclusively proves the GSI bldg. 6 inner radiography concrete block structure existed on **January 29, 1957**
- Worker testimony establishes that Ra-226 sources were used in this facility for NDT inspection of RR trucks “even earlier than the AEC work,” which means prior to 1953

The GSI Building 6 Radiograph Room Map 1/29/57



GSI January 29, 1957 map with Bldg. 6 Radiograph Room

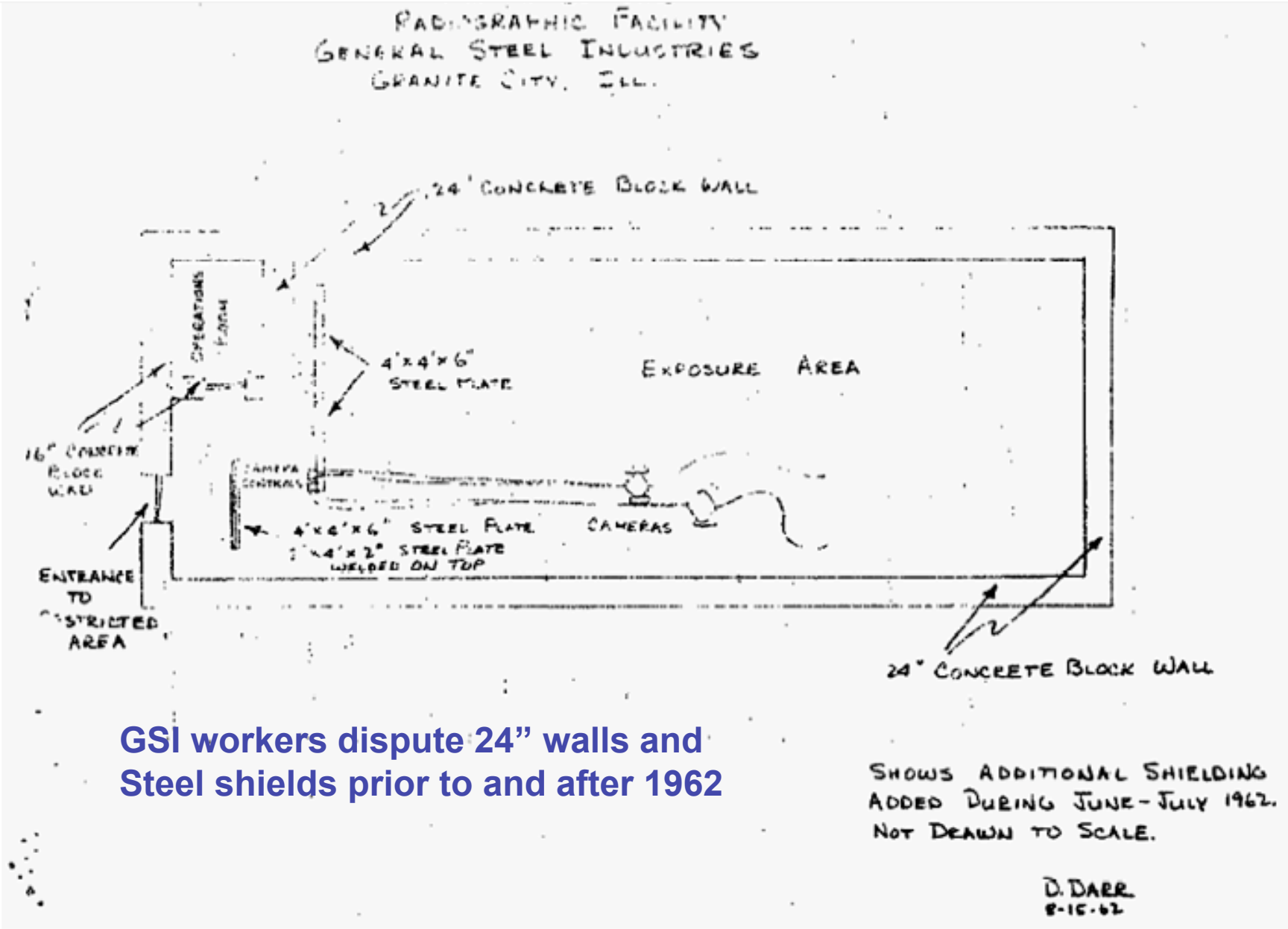
Concern About Konneker 1962 Bldg. 6 Survey

LEGEND. Gondola/cab far left hangs below crane. Catwalk above and hanging hook (arrow) blocks measured Co-60 radiation.

NCC radiologic survey Radiographic Facility

Left: Mass of the Bldg. 6 crane could attenuate Co-60 dose to crane operator and Konneker measured dose on structures above the crane.

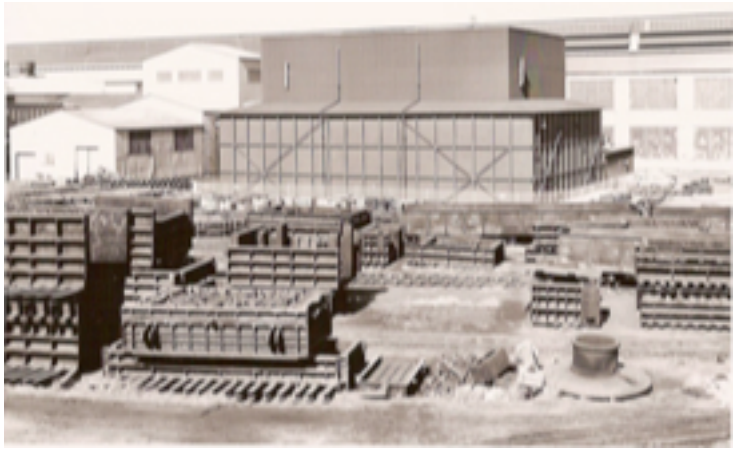
1. **Allen 1971 Co-60/MCNPx 1.8 vs 0.2 mR/hr GSI Betatron data = a 9-fold significant difference.**
2. **Question**: ***Why did NIOSH or SC&A not model the Bldg. 6 Co-60 source NCC data w/ MCNPx?***



GSI workers dispute 24" walls and Steel shields prior to and after 1962

Legend added: D. Darr signature clear with annotation "Shows Additional Shielding Added During June-July 1962."

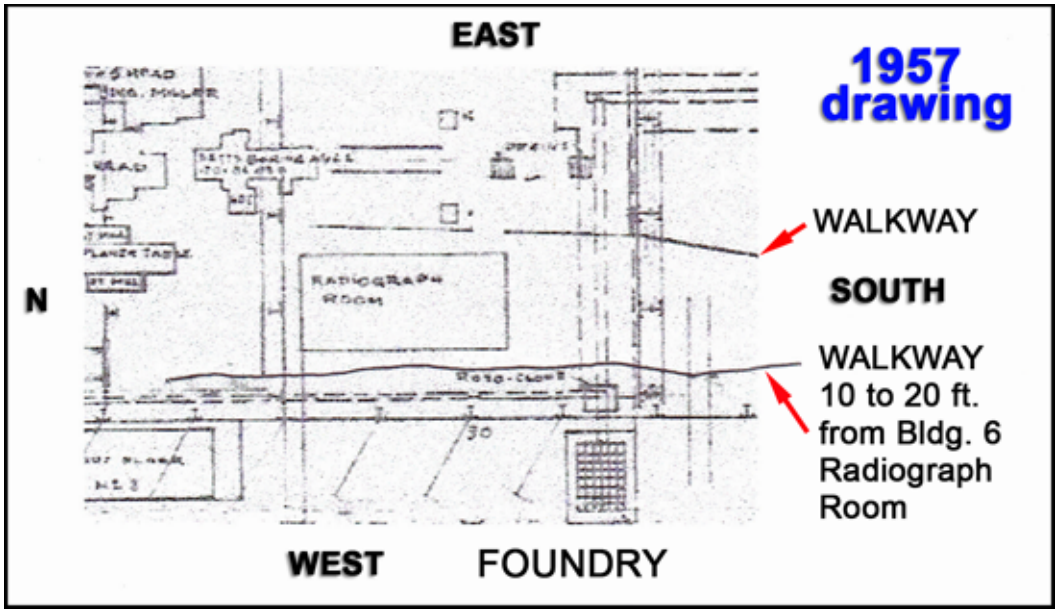
Underestimated Exposure Paths



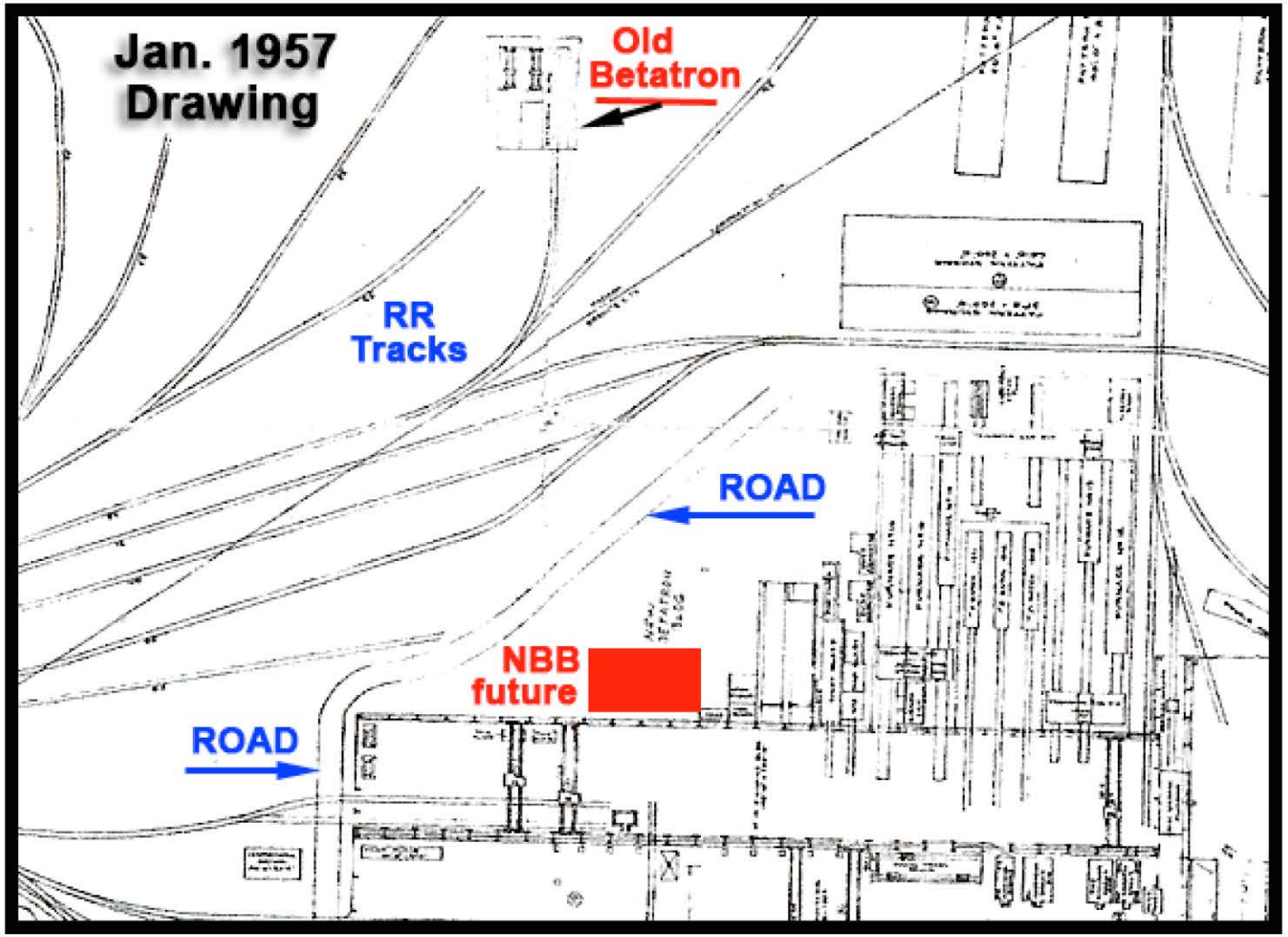
In the area between Betatron buildings.

Left. Photo of the GSI New Betatron building and the crowded area between it and the Old Betatron Bldg. This area was busy. A main road used by most workers ran between the buildings.
Many unbadged workers

Bottom. Walkways near Bldg. 6 Radio-graph Room were used by many GSI workers on way to and from foundry. Estimated 300 GSI employees worked in this area.



Road & Track Traffic Between Betatrons



LEGEND. Old & Future New Betatron buildings 1957 are spaced 300 feet apart in busy area
Radiation fields extend 100 feet away from buildings based on OBB Sign

Landauer Control Room Badges

- NIOSH and SC&A state Landauer GSI film badge reports include data on 114 "**control room badges**" that Allen uses to limit doses
- Two GSI badge handlers **refute** this fact
- A New Betatron building drawing shows two locations where film badges were racked away from the console control room.

Badged Betatron "Employees"

(begin quote)

All betatron employees wore badges, operators, supervisors, film readers, photographers, darkroom employees, clerks, etc. I recall there were a few extra blank badges for visitors. This was rare that they were used. Film badges were changed every Monday morning. There was never a control room badge that was not worn by a person. (end quote)

This affidavit was recently obtained from the first clerk who handled GSI film badges on startup of the New Betatron operation in 1964. It is clear that not only the Betatron operators and isotope workers were badged.

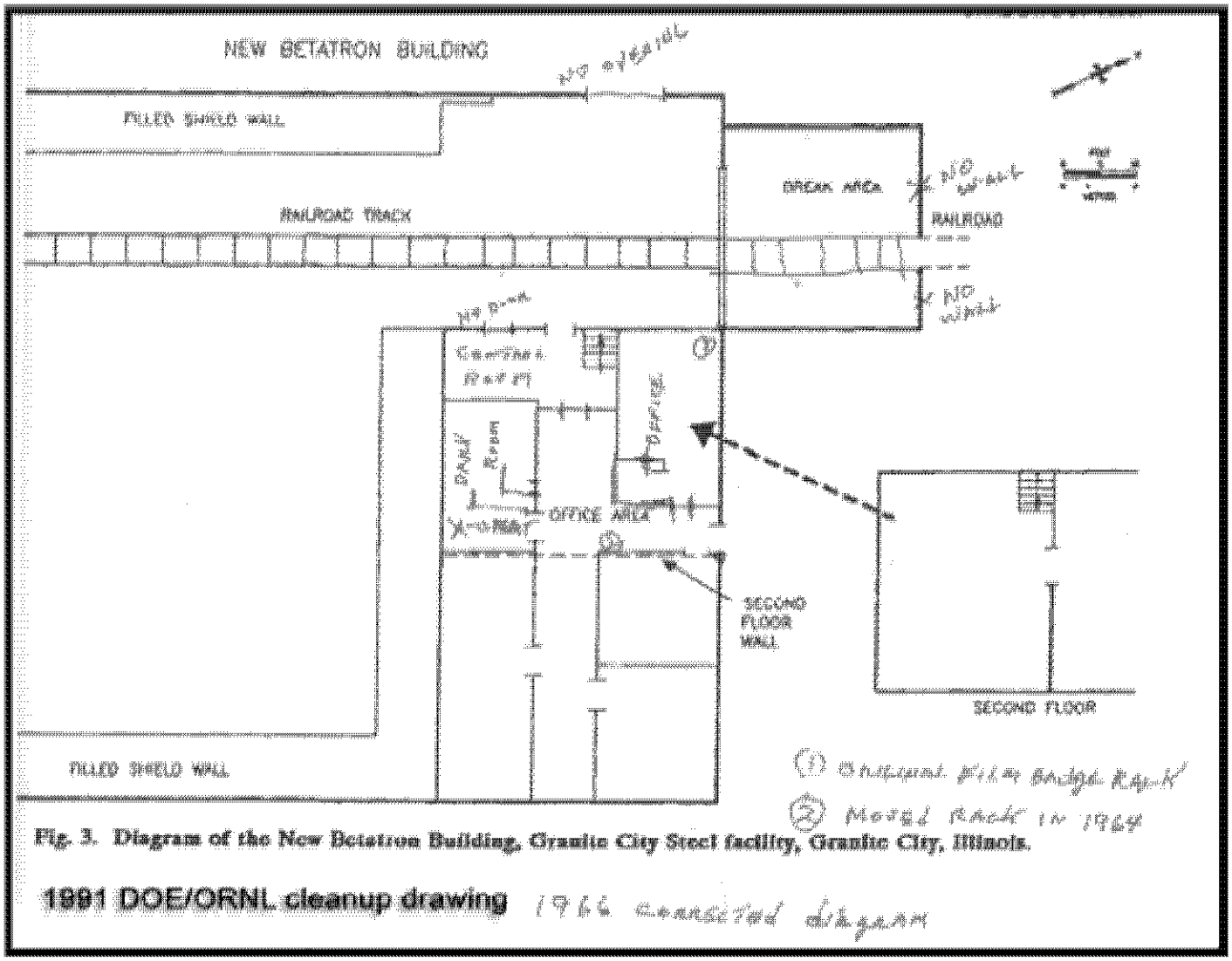


Fig. 3. Diagram of the New Betatron Building, Granite City Steel facility, Granite City, Illinois.

LEGEND. New Betatron building drawing by ORNL/ DOE 1991 during the GSI cleanup. Map has been annotated in red to show the true situation that existed 1964-1966 with GSI Radiographer film badges stored in locations (1) and (2)away from the Betatron operating console area marked "control room" on this diagram. Source JTD 3/12.

Petitioner Concerns - Badges

- A new affidavit attests that GSI badge handlers sometimes destroyed film badges they believed to be spurious. The affiant believes this fact casts doubt on the validity of the entire GSI film badge program
- Further doubt is cast because radiographers wore badges part time, and GSI submitted control room badges that did not exist.

Pedigree of GSI Badge Data is Seriously Flawed & Incomplete

[32] p. 21 of 39, Section... Pedigree of General Steel Data mentions "… *data quality, credibility, reliability, representativeness, and sufficiency.*"

a) NIOSH-Landauer GSI film badge data 1964-66 are not quality data as the measurements are confined to periods Betatron workers (3% of work force) spent in the Betatron facilities, credible (no feedback from supervisors so workers did not trust their supervisors or management about the badge readings), reliable (no evaluations of this factor), representative (89 of 3000 workers out of a single job class in 1964 were badged) and data was lost or destroyed for other Betatron and isotope only 1953-63 workers, who as a class were the only GSI workers who were monitored individually part of their work period. (end quote)

2008 & 2012 Models Disagree

COMPUTER MODELED ANNUAL PHOTON DOSE DURING GSI COVERED PERIOD 1953-1966 (Rem/YR)

DATA SOURCE	2008 BETATRON	2012 BETATRON
NIOSH	**1.0-6.3** (App BB) **ND**[3] (SEC ER)	**0.2-.62 var.**
SC&A mcnpx	**12.4 - 13.6**	**1.35**

DATA SOURCE	2007-2008 OTHERS	2012 LAYOUT
NIOSH	**1.73** (App BB) **0.417** [note 1]	**1.02-2.03**
SC&A mcnpx	[see note 2]	**9.20**

Note 1: Annual dose assigned to only 1 of 3 non-Betatron worker exposure scenarios in SEC-00105 SEC evaluation report.

Note 2: SC&A review of Appendix BB, 4/21/08 Betatron doses bounded layout men and Co-60 operators which in turn bounded chainmen and all other workers. No actual values given for this large subset of the GSI work force.

[3] ND = not done; no annual dose values given in SEC ER

Conclusion & Summary

- NIOSH and SC&A 2012 MCNPx models disagree with each other and with film badge data and are based on many erroneous assumptions
- Compared to 2007 and 2008 model data, SC&A Betatron operator doses show a **90% decrease** while Layout doses sharply **increase** compared to all NIOSH estimates for non-Betatron workers
- The TBD-6000 work group should vote today to recommend approving SEC-105 to the full Board

Petitioner Contact Information

Respectfully submitted

March 15, 2012

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