Dragon, Karen E. (CDC/NIOSH/EID)

From: DanMcKeel2@aol.com
Sent: Monday, May 21, 2012 4:25 PM
To: NIOSH Docket Office (CDC)
Cc: danmckeel2@aol.com
Subject: Docket 140 GSI: PETITIONER DOCUMENTS 3-8
Attachments: McKeel_ADD3.pdf+.zip

Dear NIOSH Docket 140 (GSI) Office:

Attachment: DOCUMENT 3: <McKeel_ADD3.pdf> (288 KB)
Attachment: DOCUMENT 4: <MCNPx_memo_3.22.12.pdf> (73 KB)
Attachment: DOCUMENT 5: <McKeel_Comment_Allen2_ADFD3.pdf> (477 KB)
Attachment: DOCUMENT 6: <McKeel_Part2_Allen_ADD-3.pdf> (411 KB)
→ Attachment: DOCUMENT 7: <McKeel_Comment_3.28.12.pdf> (76 KB)
Attachment: DOCUMENT 8: <DWM_GSI_email_Katz_4.26.12.pdf> (36 KB)

Please accept this submission to GSI Docket 140 for posting on the DCAS website. There are 6 small PDF files representing 6 separate communications from myself to the TBD-6000 work group and full Board.

Descriptions:
MCKEEL PETITIONER DOCUMENT 3. FILE: McKeel_ADD3.pdf (288 KB), dated March 19, 2012. Covers unresolved SC&A "SEC Issues" 5 and 6 as well as more realistic and time period-accurate surrogate concrete induced radioisotope activation data by the GSI Betatrons.

MCKEEL PETITIONER DOCUMENT 4. FILE: MCNPx_memo_3.22.12.pdf (76 KB); McKeel Email dated 3/22/12 to Ted Katz to distribute to TBD-6000 work group, DCAS and SC&A containing John Ramspott information about MCNPx with Dan McKeel comments.

MCKEEL PETITIONER DOCUMENT 5. FILE: McKeel_Comment_Allen2_ADFD3.pdf (480 KB) dated 3/23/12. 2 page initial reaction to mistaken calculations in David Allen's Addendum 3 action items white paper following the 3/15/12 TBD-6000 work group meeting.

MCKEEL PETITIONER DOCUMENT 6. FILE: McKeel_Part2_Allen_ADD-3.pdf (411 KB) dated 3/26/12. A critically important document showing that layout worker photon and neutron external radiation doses should be increased based on new knowledge they worked immediately outside the GSI new Betatron shooting room shielded only by a thin steel ribbon door that offered scant protection to them.

MCKEEL PETITIONER DOCUMENT 7. FILE: McKeel_Comment_3.28.12.pdf (80 KB) dated 3/28/12. McKeel read into the record of the 3.28.12 TBD-6000 work group meeting. Very important rebuttal to the DCAS and SC&A presentations at the same meeting.

MCKEEL PETITIONER DOCUMENT 8: FILE (PDF of email): DWM_GSI_email_Katz_4.26.12.pdf (40 KB) dated 4/26/12. McKeel added comments about the TBD-6000 work group 2 Yes (Ziemer, Munn), 1 No (Josie Beach, 1st ten years of covered period) recommendation on 3/28/12 to support NIOSH and to deny the GSI SEC-00105 petition for the entire covered period of 1953-June 1966.

Sincerely,

-- Dan McKeel May 21, 2012

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McKeel Petitioner Comments on NIOSH Allen August 2011 and January 2012 Path Forward For GSI White Papers and Addenda to Them

A general comment is that my time to present today is limited and the work group has an extensive agenda. Although these remarks focus on the two Allen NIOSH Path Forward white papers, I raise SEC Issues as well to save time.

A. Regarding Allen Addendum 3:

1. McKeel agrees with SC&A that the New Betatron model is still not correct:

(a) The modeled New Betatron tunnel door was NOT double leaf minus lead shielding. It was a thinner ribbon steel roll up door, the exact physical characteristics of which, including the thickness and type of steel, are not known. There was no lead shield. *Petitioner 3/15 data was ignored.*

(b) Allen did not model badge position 2 for the GSI New Betatron film badge rack when it was moved farther away from the Betatron source during 1964-66. *Again, petitioner 3/15 data was ignored.*

(c) The GSI-Landauer program 2084 film badge data has not been analyzed thoroughly and accurately, nor has it been presented in entirety to the TBD-6000 work group or the Petitioner. McKeel's most recent white paper to the Board on 3/27/12 showed evidence of a exposure of 300 mrem that newly appeared on a worker record between 4/25 and 5/29/66 of the covered period. McKeel interprets this as a previously unreported overexposure incident that was apparent from a detailed temporal analysis of film badge records that NIOSH has possessed for several years. The replicated record showed 33 records on one page. There were 21 instances of Cumulative photon dose "M" and 12 instances of photon doses ranging between 10 and 2470 mrem with several 20 mrem and a 40 mrem dose. No sheets had any beta or neutron doses recorded.

(d) McKeel introduced a new real world New Betatron Layout worker shooting scenario attested to by former GSI Betatron employees

and contained in one of his four recent communications to the TBD-6000 work group following the 3/15/12 work group meeting. That is, layout men worked on castings that required a quick turnaround—"hot," rushed or urgent NDT jobs—in the rail tunnel just outside of the thin roll up steel door while shooting was ongoing. Two workers who are known to the work group and SC&A offered this new affidavit information.

The SEC issue regarding GSI film badges is the pedigree of these data:

(a) Limited to males (one gender),

(b) Limited to one job class (Betatron employees) that itself is heterogeneous including clerks and photography technicians),

(c) Available for only 3 years (1964-66) out of a 13 year covered period,

(d) No measurements of beta dose or neutrons;

(e) Available on only 89 individuals out of a work force of 3000 to 4000 persons.

There is no reasonable scientific basis to construe these very limited badge data as being representative of the work force. Nor should they be extrapolated to cover all workers during the entire 13 year covered period of 1953-1966.

These very limited film badge data are not even bounding for *Betatron employees* who wore them only part time. Badges were not worn, for example, by Betatron employees doing layout in the New Betatron tunnel on urgent "hot" or rushed casting jobs. Those unbadged layout employees would be expected to have the highest exposures of any employees. These doses have not yet been modeled by NIOSH or SC&A during the Path Forward time period from October 2010 until today.

2. Petitioner challenges the validation of a 25 Mev New Betatron source using a post-1968 GSI cobalt-60 source (54 not 80 curies, beam geometry very different, Co-60 source does not model neutrons that were 15% of

the Betatron output) and GSI work force measured data from 1971 outside the covered period. (see item #3)

3. **Petitioner objects to NIOSH and SC&A passing off Betatron residual radiation, that was measured, as "magnetic interference"** (their unproven construct), by a paid CDC/NIOSH consultant. In fact, because set up workers were exposed at a distance of 1 to 2 feet rather than 6 feet from the Betatron nose cone, while the machine power was turned off, the inverse square lay indicates a dose of 60 mR rather than 5 mR should be assigned. NIOSH has ignored more recent testimony, replicated in the McKeel post 3/15/12 white papers, that they measured residual radiation emanating from the donut tube within seconds after removing it from an Allis-Chalmers Betatron from the same period as the GSI Betatrons.

4. SC&A in 2008 modeled an 80 Curie source at GSI. Dr. [redacted] recently pointed out correctly that the Allen Co-60 model assumed the source was 80 Curie when in actuality it was 54 Curies in 1971. This nuance was not factored into the 2008 model of the same GSI source term.

   Path Forward documents have stated GSI obtained the 80 Curie GSI source after 1966, a point that at least 6 GSI workers dispute, testifying the large source was present during the 1964-66 time period. Petitioner believes NIOSH should model the Co-60 80 Curie source to comply with OCAS-IG-003 guidance.

   This is an SEC Issue because the NIOSH Path Forward white papers have not modeled this very important source term.

5. **No direct, measured monitoring data exists for either operating Betatron for any portion of the covered 1953-1966 time period**. This includes air monitoring or neutron flux, plausible coworker data or surrogate data. There are no valid computer models for this because there is no real data to validate the models. *MCNPx alone is not sufficient.*

6. **No new Old Betatron model** was introduced by NIOSH and Mr. Allen in either recent white paper for the Path Forward GSI initiative.

(a) This facility was built 10 years earlier than the New Betatron building by a different contractor using different materials

(b) The New Betatron building was a short distance away from a heavily populated work area in building 10; the Old Betatron was located in a field 300 feet away from the New Betatron facility.

(c) The Old Betatron building had different physical characteristics that are not completely defined. Engineering drawings do not exist for either Betatron facility—only sketches that are not to scale and are not accompanied by any certified list of construction materials.
Most importantly

(d) All of the MCW AEC contracted uranium NDT work between 1953 and 1963, including the peak production year of 1962, was done in the Old Betatron facility. The New Betatron building was not built until 1963.

(e) **This is also an SEC issue**: Based on Path Forward progress to date after 18 months, NIOSH has not been able to develop and validate an updated Old Betatron exposure model using the production code of MCNPx together with real world, measured data.

7. **NIOSH has not modeled the two GSI radium-226 sources correctly**. The sources were used inside the 6 building Radiography facility pre-1962 as well as in other GSI buildings as testified to by workers. Petitioners have shown at the 3/15/12 work group meeting that "Radiograph Room" bldg. 6 facility existed as indicated on a January 29, 1957 GSI plant engineering drawing. **This is also an SEC issue.**

8. **The GSI owned Iridium-192 NDT source was not modeled at all in the Path Forward white papers**. In the 3/15 meeting Petitioners reviewed 5

pieces of evidence that such a source was used (to inspect pipe welds in buildings 9 and 19 and rail/transit car trucks in the 6 Bldg. radiography facility, the way it was used, and the nominal "when new" size (10 to 20 Curies). Nothing is known of exactly when it was used; the best estimate from testimony is late 1950s and possibly into the early 1960s before St. Louis Testing Company entered the picture with their own Ir-192 and Co-60 sources. Radioactive Ir-192 has a half-life 73.83 days. Therefore knowing the exact Curies when the source was brand new, and the time passed since use, are both critical for accurate modeling of this source. None of those factors are known for the GSI owned Ir-192 source or for the St. Louis Testing Ir-192 source for that matter. To my knowledge, the St. Louis Testing Company Ir-192 and Co-60 source license was never obtained and examined by NIOSH or by SC&A.

9. **NIOSH has not modeled the two GSI portable 250 KVP x-ray machines correctly.** No doses to these sources were assigned in the Allen NIOSH August 2011 Path Forward white paper on portable GSI sources. NIOSH knows practically nothing of where the units were used, what they were used for (what were the NDT inspection targets, how frequently were they used, and by what workers. What were the exposure conditions (dose rate, time). These units were not equipped with safety interlocks. OCAS-IG-003 mandates doses from these sources must be determined.

This is an SEC Issue because NIOSH has not demonstrated it can model these two sources with sufficient accuracy.

10. **The petitioners challenge the NIOSH dose model for the two small (nominally 500 mCi) Co-60 sources used in the 6 Building Radiography building at GSI**. These data are based on NCC measured data from 1962 during and before the date (June/July 1962) that indicated was when added steel plate and concrete shielding was added

to the Building 6 radiography facility. One set of NCC measurements, according to NRC FOIA 2010-0012 documents, was obtained in January 1962 before the shielding was added and the other set were made during the period the extra shielding was being installed. The petitioner offered an analysis of the geometry of the Building 6 overhead crane and catwalk which suggests it might have blocked some of the C0-60 source radiation from below, The accuracy of the NCC Bldg 6 Radiography facility measured data was not checked using MCNPx, which seems to the Petitioner to be an obvious thing to do. (a) the NCC data accuracy could be established on a firmer scientific basis, and (b) the NCC measured data could serve to validate the MCNPx model.

This is an SEC Issue: NIOSH cannot assign doses from the small 0.5 Curie C0-60 sources because complete information is not known how these sources were used and because workers testify that some of the enumerated safety procedures the GSI 1962 AEC license application stated to be in place were not followed according to worker testimony.

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