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

From: DanMcKeel2@aol.com
Sent: Tuesday, July 10, 2012 6:11 PM
To: NIOSH Docket Office (CDC); NIOSH Docket Office (CDC)
Cc: danmckeel2@aol.com
Subject: Submission to Dockets 140 and 194
Attachments: DWM_ABRWH_6.20.12-ADD2.pdf

Dear NIOSH Docket officer,

Attachment: <DWM_ABRWH_6.20.12-ADD2.pdf> 679 Kb

Please accept this cover letter and the attached PDF file for posting to both Dockets 140 (GSI) and 194 (NIOSH Ten Year Review). The comment has direct relevance to both dockets. The remarks are specifically relevant to the June 20, 2012, ABRWH two hour deliberation session on the SEC-00105 petition for the General Steel Industries (GSI) AWE site. I concentrate on various factual errors and omissions made by the TBD-6000 work group, NIOSH and SC&A during this 6/20/12 session. As well, I relate these occurrences to SEC issues by Randy Rabinowitz during the NIOSH Ten Year Review.

Thank you for considering my submission.

-- Daniel W. McKeel, Jr., July 10, 2012

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Dan McKeel Oral Comments to ABRWH on GSI SEC-105
June 20, 2012, Santa Fe, NM, Meeting; Further Written Comments
On TBD-6000 Work Group, SC&A and NIOSH Presentations

(begin oral presentation)

1. I was allotted just ten minutes by Dr. Melius; a historical ABRWH precedent.

2. Rebuttal is to **51 slides** just presented. My 25 page written remarks sent to you yesterday primarily address David Allen's NIOSH presentation and who voted which way on 3/15 and 6/14/12 in the TBD-6000 work group, to place this information on the record.

3. John Mauro of SC&A on October 12, 2010, gave a speech on an SEC for General Steel Industries for the 1st 10 yrs to the TBD-6000 work group. He said and I quote:

"The first basket is the showstopper. If we can't -- if the Board -- the Work Group and the Board struggles with the idea that we've got 10 years of people working in radiographic operations, no film badge data and no radiologic protection, occupational records, programs where we could track people who might've been injured, might've received overexposure, if that's the case." "... Pre-film badge. I'm saying right now, the critical path on whether this goes down as an SEC or not is going to be how the pre-1962 time period is going to be dealt with for the issues that I just described."

What happened between then and now?

4. NIOSH was given a 2nd chance to re-do all its DR methods under the David Allen Path Forward for GSI. A major reason was that GSI film Badge data diverged too much from NIOSH and SC&A MCNP and Attila 2008 modeled external doses for Betatron operators and other workers based on Layout worker doses.

5. Over the past 21 months SC&A and NIOSH shared development of a MCNPX model for one Betatron only, despite having no real Betatron measured data, at GSI or in the literature, to validate the model. The petitioners reject the notion that Co-60 source data in 1971 can be used to validate external Betatron radiation doses 1953-1966. Doses from the Old Betatron were not bounded with sufficient accuracy. **Old and New Betatron facilities are NOT equivalent.**

• As my Table on page 23 shows, the SC&A and NIOSH 2012 rework MCNPX models do not agree with each other by better than 2-fold. A model and validation data should agree ± 10 to 20%.

• The 2012 Betatron dose is 90% lower than in 2008 and the Layout worker dose increases dramatically between 2008 and 2012. This shows that computer models are not reliable and do not agree with each other or with the GSI radiographer Landauer film badge data.

6. NIOSH failed to develop models for GSI and St. Louis Testing Co. 50 Ci Iridium-192 sources, for the 80 Ci Co-60 source that workers say was at GSI 1964-66, and for the two 250 KVP x-ray units, that bound those external doses with sufficient accuracy for all uses, locations, and job categories during the operational period as required in OCAS-IG-003.

7. On 3/15/12, Dr. Ziemer and Wanda Munn voted to uphold the NIOSH recommendation to deny GSI SEC-105 1953-66; Josie Beach voted to approve an SEC for 1953-63, stating evidence used by her colleagues was "too skimpy."

Here is what that "too skimpy" evidence was:

(a) **1953-1957**: a GSI magazine grainy photo of a belt object on one radiographer that and McKeel now believe is a GSI ID badge, not a film badge (the FB retraction by them was sent to all Board members and to NIOSH).

(b) GSI 1962 license application: GSI management letter to AEC stating: "*During this period (1953-62) the exposure limits published by AEC at the applicable time were followed. They were never exceeded and averaged under 25%.*" YET NO SUCH FB DATA HAS BEEN LOCATED TO BACK THIS UP. The letter was not corroborated by GSI workers, who thought much of the GSI AEC license information was untrue.

(c) One (1) GSI worker has summary FB report 1957-61, but **no FB actual data reports back this up**. The FB vendor is not known.

8. The **GSI measured data in totality** consists of the following:

(a) NCC 1962 Bldg. 6 Co-60 0.3 Ci sources survey (part of AEC license application);
(b) 1971 80 Ci Co-60 source, survey of New Betatron Bldg.;
(c) Film badge data on 108 radiographers 1964-1973 of 3000 member work force;
(d) Uranium dust dose from a small vacuum in Old Betatron Bldg. by ORNL in 1989.

9. TBD-6000 WG on 6/14/12 then **voted 3 to 1** to recommend the full Board **defers SEC vote** on June 20; Task SC&A to **review use of Surrogate Data** at GSI during both the operational and residual periods. Yes votes: Ziemer, Beach, Poston; No vote: Munn.

• Petitioners believe that computer models not validated by real data from the source or site being evaluated should be viewed as surrogate data.

10. **Missing real (measured) data at GSI**:

a) 97% of GSI work force not monitored by film badges but should have been;
b) 100% of work force no internal monitoring of any kind;
b) No air or breathing zone or urine uranium bioassay intake data;
c) No direct dose measurements from any source for photons, beta or neutrons; all values are calculations, or computer simulations of radiation dose, or are inappropriately used surrogate data. The exceptions such as radiographer FB are listed above as real data.

CONCLUDE: Since 2005, when DCAS Director Elliott wrote and said that GSI was a "unique" facility with "no data at all," **the co-petitioner has believed that GSI merited an 83.14 SEC for the full operational period to the present**. I equate "sufficient accuracy" with "beyond reasonable doubt of accuracy" rather than (claimant favorable) "plausible bounding," a term that truly defies scientific definition. I believe that qualitative data, that NIOSH, SC&A and two TBD-6000 members have recently accepted uncritically as being valid, such as computer modeled values, letters, summary reports, and pictures, should not be allowed to substitute for FB and other rigorous, quantitative, physical measurement data that should define the core SEC term "sufficient accuracy." Real monitoring data do not exist for 97% of the SEC-00105 class.

• **Appendix BB** Rev 0 (June 2007) needs to be revised as soon as possible.

I want to thank the Board for its time today. (end of oral presentation)

Further Comments On Meeting Discussion and Correction of Factual Errors and Misstatements: ADDENDUM 2 to McKeel Written Remarks

-- Conduct of the GSI SEC Session --

1. Dr. Ziemer did not inquire whether the SEC-105 petitioner ( ) and co-petitioner were on the phone line until the end of the two hour GSI SEC session.

2. Dr. Ziemer referred to as the other co-petitioner, which is wrong. She filed the petition originally as and thus was the Petitioner of record on SEC-00105.

3. Drs. Melius and Ziemer were apparently aware that had sent the Board a letter. They put nothing on the record about the *content* of the letter, which is ATTACHMENT A to this report.

4. The ABRWH program gives the names and degrees of Board member, SC&A, and NIOSH presenters, but lists only "Petitioners:" (blank). This is rude and unnecessary censorship. I believe that SEC petitions are public documents, seeking public funds, and the names of SEC Petitioners should be exempted from redaction and omission. Site claimants should certainly know who is representing their financial interests in a federal compensation program. SEC deliberations are legal issues because the Board is governed by Executive Orders and at least two Acts of Congress (EEOICPA, FACA).

5. Dr. Melius' allocation of time to presenters in the two hour GSI session was very unfair to the Petitioners. Time allotments from my notes were approximately as follows: Dr. Ziemer 18 minutes, David Allen (DCAS) 32 minutes, and Dr. Anigstein (SC&A) 31 minutes compared to Dan McKeel's strict 10 minute time limit. They were allowed to go through 51 slides with no time limits. In fact, Dr. Melius felt compelled to ask Dr. Anigstein to "wrap up" his presentation when time was running short. There was very little new information presented by the other three presenters. Only 13 minutes were used for Board Q&A at the end of the first three presentations before McKeel was allowed to speak as co-petitioner. He finished within the time allotted to address the Board. No questions from the Board were asked of Dr. McKeel. However, Dr. Anigstein was allowed to make yet another final defense of his MCNPX dosimetry models after McKeel concluded his remarks. SC&A was tasked to review TBD-6000 surrogate data use at GSI.

6. There was no indication during the discussions that the first 3 presenters had read my 25 page comment submitted to all members of the Board on June 19. The transcript will reflect that fact. Dr. Melius' earlier assertions to me by email that everyone on the Board was thoroughly familiar with my comments and technical writings and contributed

material, such that 10 minutes to address this Board was "ample," appeared not to be the case.

7. I shared the consternation of the **Weldon Spring SEC petitioner** that the work group chair and the main SC&A scientist were absent for the third meeting where a full Board vote seemed likely. Frankly, allowing such a situation to develop is indeed difficult to understand. And, as Ms. observed, the occurrence is not claimant favorable.
   • Weldon Spring site (WSS) SEC comment: The DOE Mass Balance reports were referred to (there were several that didn't agree 100%, for example, about RU) on uranium shipments within the DOE complex to/from WSS. It is important to note that some entries referred to "Mallinckrodt" and it was unclear whether those entries referred to MCW-Destrehan plant in downtown St. Louis or to the Weldon Spring site in St. Charles County farther West of the city. These distinctions could not always be resolved because the dates of various shipments were not available in the Mass Balance reports. And also, even DOE admitted that large amounts of uranium transfers could not be accounted for overall. So source term calculations at WSS specifically, apart from MCW downtown, based on the DOE Mass Balance references were approximate at best.

8. I also find it distressing with respect to the GSI SEC presentation, that 4 Board members missed hearing the 2 hour presentation. That is 4/13 = 31% of the Board members who are not TBD-6000 work group members and who might vote in September. This is a real problem in my view, because the 6.20.12 meeting transcript might not be released for 45 days. And reading a transcript can't give one a full sense of the proceedings. For many reasons, there is no substitute for being present in person.

9. It seems to me that progress on implementing the NIOSH 10 Year Review recommendations is very, very slow. I would think these actions items would have a much higher priority. There appeared to be a lack of knowledge at NIOSH about the exact implementation steps that were underway, including task assignments.

10. In the morning Board work session on June 19, Chairman Melius stated there were "no SECs" scheduled for the September 2012 Denver meeting. Yet it was pretty clear the Board would defer action on the GSI SEC-00105 on 6/20, and that SEC-105 *would be* presented to the Board for a vote in September. This intention was made clear the next day. And when Lavon Rutherford on 4/26/12, during the Board conference call meeting, had presented a list of SECs that would be discussed during this June 2012 meeting, he had not mentioned the GSI SEC that was definitely on the agenda. I am puzzled by this.

11. I was struck again during the Winchester Engineering SEC discussion how inconsistent that NIOSH is with respect to attempting to bound certain types of radionuclides, in this case thorium ores. This site was recommended for an SEC unanimously even though there was lots of external uranium monitoring data and some intake data: 7 air samples, 25 uranium dust samples, 1952-59 "spot" radon samples.
    • By contrast, in the case of Dow SEC-00079 and the residual period, there was lots of thorium stored onsite, some being from AEC operations not distinguishable from the commercial thorium alloys, as confirmed by the Pangea Dow IL inventory reports from

2003 to 2007. Yet there was zero film badge or air or breathing zone, or urinary bioassay data from the Madison site itself. NIOSH used very scanty surrogate film badge data, from a few workers for a few days only, from the Bay City, MI, Dow site to bound the thorium doses for Dow IL site. A single Board member dissented. I protested strongly that this violated the Board and NIOSH OCAS-IG-004 surrogate data criteria. For the Winchester SEC on 6/19/12, there was no attempt to assess the thorium source term or to bound it using surrogate data. Yet Mallinckrodt Uranium Division employed thousands of tons of Belgian Congo pitchblende ore that was 70% enriched in U-238 when it was first mined. This was an obvious site to obtain surrogate source data for Winchester Engineering uranium, for which there was said to be "little process data for pitchblende" on 6/19, and no attempt was made by NIOSH to use MCW data judged from the discussion.

12. Chair of the DR subcommittee Mark Griffon reported that SC&A and NIOSH would be undertaking **technical meetings** to pare down the backlog in DR reviews, and that they would issue a report of findings to the work group about their deliberations.

- My first comment: Such technical calls can discuss crucial topics. I am uncertain as to whether there is or is not an official policy about transcripts or minutes for such calls. Are these mandated by FACA or Board policy, and is a standard protocol followed for all such "technical issues calls" by NIOSH and SC&A for all Board work groups? In particular, are those summaries made routinely available to the public as PA-cleared documents? If not, they should be to promote transparency to the fullest extent possible. Those details are highly interesting to some of us. It also appears the public is not informed about the dates of these technical calls; is that true? Are SEC petitioners always so informed by policy? Publishing verbatim transcripts would clear up lots of the uncertainty that surrounds such "off-line" NIOSH and SC&A negotiations as to why matrices often simply state that "intractable" issues seemingly become suddenly "tractable."
- Second comment: The issue of the Board, via SC&A, doing **blinded DR reviews**, that is part of the Board mission as I understand it, seems to have been pushed to the farthest back burner. Chairman Griffon and DCAS Director Hinnefeld both answered "I don't know" when Board Chair Melius asked them about where blind reviews stand. I note also that a highlighted gap between SC&A being ahead of the DR subcommittee on doing DR case reviews is very troublesome. I have been attempting without success for almost *two years* to bring to the front burner 2 of 5 GSI completed DRs in which DR reported NIOSH methodology problems so severe that, in fact, SC&A once questioned the entire body of GSI DRs in one issues matrix that has never been resolved. Mr. Katz has repeatedly told me the two SC&A reviewed DR cases in question have yet to come before the DR subcommittee. My observation, echoing what Chairman Griffon was intimating, was *these are the very types of cases the subcommittee should be concentrating on reviewing and resolving why the SC&A assessment of NIOSH DR methodology was so harsh.*
- Third Comment: There was discussion whether the DR subcommittee should supplement its "First 100 Cases" report to the HHS Secretary. The FACA statute mandates that each advisory committee should issue an Annual Report, which would be another vehicle where important interim DR subcommittee and other Board progress and

problems could be highlighted. I understand that such a report may already be being issued and I am not aware of it.

-- Factual Errors and Omissions --

Dr. Paul Ziemer (ABRWH)

Dr. Ziemer moderated the SEC discussion on 6/20/12 by first reviewing the SEC-00105 milestone dates, and then made summary remarks using 10 slides following the NIOSH and SC&A presentations.

1. The names of members who voted Yes or No to the motion to support NIOSH's denial of an SEC at the 3/28/12 TBD-6000 work group meeting were not stated. Nor did he give the names of members who voted Yes or No to the two motions to recommend that the full Board defer a vote on SEC-00105 in order to assess appropriate use of Board surrogate criteria at the 6/14/12 TBD-6000 work group meeting. My two written comments (**REF 1**) to the full Board on 6/19/12 had a Table (slide 28) that provided work group member names and which way they voted on the three motions, for the record. I addressed David Allen's 6/20/12 slide presentation.

REFERENCE 1. McKeel, DW Jr. Primary (23 pages) and Addendum (6 pages) submissions to the ABRWH on June 19, 2012: Cited filename: **Allen_GSIsec_6.20.12pptDM.pdf** (**Slide 28**); on Allen June 20, 2012 presentation slides: Cited filename: **NIOSH_revise6.14_ADDdm.pdf.**

2. Dr. Ziemer made brief mention that GSI workers believe (*and 11 of them made sworn affidavits to this effect: 5 for a GSI Ir-192 source in the 1950s; 6 about using or seeing an GSI 80 Ci Co-60 source in 1964-66*) that GSI owned an Ir-192 NDT source and used an 80 Curie Co-60 source prior to 1968 when such a source was licensed by the AEC. Dr. Zeimer on 6/20/12 dismissed this extensive eye witness worker testimony by stating "I don't see how this could happen, they (the sources) would have to be licensed." I believe this comment is gratuitous and misleading, given that at earlier TBD-6000 work group meetings Dr. Zeimer had gone on record as knowing about instances where radiation sources were used at several DOE/AWE facilities before they were licensed. Also, before Dan McKeel obtained the NRC FOIA 2010-0012 records, NIOSH, the Board and SC&A had no knowledge of the second GSI small Co-60 source, the twin GSI Ra-226 sources, or the second GSI 250 KVP portable industrial x-ray source. I also previously introduced to the TBD6K work group a document that stated **"this facility (GSI) was licensed for cobalt and iridium"** (emphasis added). The work group chair, Dr. Ziemer, and SC&A challenged this statement by noting the words appeared in a 1968 AEC license renewal. My rebuttal was the words "was licensed" could indicate earlier licensing and the license was simply not yet found. Again, several GSI radiation source term licenses were not discovered until McKeel obtained NRC FOIA 2010-0012. I would call this a serious omission of highly pertinent facts about SEC-00105 source terms. *The petitioners and workers went to considerable effort to put the aforementioned 11 affidavits on the GSI Docket 140 official record.*

3. The wording of the tasking of SC&A by Dr. Ziemer that the full Board approved on 6/20/12 did not reflect my SEC co-petitioner full concern. TBD-6000 work group member Josie Beach made the original motions to defer on 6/14/12. Board member John Poston seconded both

Beach motions to defer. **The Dan McKeel concern about misuse of surrogate data (SD) that led to the Beach motion and SC&A tasking was much broader than just the use of TBD-6000 slug facility**. Ignored by Dr. Ziemer's 6/20/12 SC&A tasking motion with Board approval was that MCNPX computer models, and all models that lack validating real measured site data as in the GSI case, are surrogate data themselves. Back extrapolation of FB data from 1964-73 to the rest of the operational AEC contract period and to the rest of the residual period from 1974-1993 are also SD considerations in my view. I want a formal **policy ruling** on this matter. (see comments on this aspect (Attachment B). I advocate that ***SC&A should conduct a comprehensive review of ALL surrogate data use at GSI***, given the almost total lack of real measured data of any kind, including film badge monitoring on only 3% of the work force in one job category for part of the time. I note that SC&A did conduct such comprehensive SD analyses at Dow Madison (83.13 SEC-00079) and Texas City Chemicals [TCC] (83.13 SEC-00088) that both had approved SECs, on which I was also co-petitioner. In fact, SC&A first applied draft Board SD criteria to TCC as a test case. This was a seminal event in the history of the ABRWH.

4. Dr. Ziemer made the second part of his remarks after NIOSH and SC&A had concluded their presentations. His stated intent was "to summarize the findings -- change a little bit." I thought this discussion was rushed and failed to give a clear delineation of why the work group voted 2 to 1 to uphold NIOSH's recommendation to deny SEC-00105. Dr. Zeimer seemed to stated the work group voted to sustain NIOSH to deny SEC-00105 for only 1953-62. It seemed he was painting a not completely accurate picture of uniform agreement—lots of FB data, models all agree, skin dose addressed in models, etc.—between the work group, SC&A and NIOSH on all important SEC issues.

He glossed through such major SC&A findings such as DR not based on best science, and why 4 issues were now designated as Appendix BB and the rest were closed. All petitioner concerns were finessed such as the non representative nature of the very limited FB data set (97% of work force never badged) to one job, 3 of 13 operation period years, and worn part time.

He closed by saying the work group on 6/14/12 voted to defer having the full Board vote so that SC&A could examine TBD-6000 slug production facility data as appropriate surrogate data based on Board SD criteria.

See more about Dr. Ziemer's presentation on page 15 in section 8.

David Allen (DCAS/NIOSH)

David Allen, DCAS/NIOSH DR team leader, spoke next using 28 Powerpoint slides to reinforce his oral remarks. Those slides were posted on the DCAS website. I converted the PDF file to editable text, and made detailed replies to almost every bullet point. My 25 page comment was distributed to all Board members by Ted Katz, DFO, on June 19, 2012 with the assistance of Josh Kinman, NIOSH SEC Counselor. As Mr. Allen gave his oral presentation to the full Board on 6/20/12, I noted the following concerns that affect the quality and accuracy of the transcript:

1. Mr. Allen stated the source term at GSI was "pieces of uranium." This is misleading as well as inexact information. The record reflects that MCW supplied uranium ingots, dingots, Betatron slices (of ingots/dingots), and thin billets for rolling. The Board should know those crucial details.

2. Mr. Allen also stated that inhalation was primarily of "uranium oxides" but failed to mention that both ingots and dingots had shaggy irregular outer crusts of magnesium fluoride with trace radioactive components that represented "bomb" remnants that later had to removed by machining in a lathe at the MCW Uranium Division facilities.

3. Mr. Allen stated that NRC FOIA (2010-0012) obtained information/data on "*exposures prior to 1962*."

My 6/19/12 comment emphasized there were no extant film badge reports or radiological survey data for the Betatron or any other source at GSI prior to 1962. The NRC FOIA material contained a letter from that stated a radiation monitoring program had been in effect for a long time and that AEC exposure limits had not been exceeded, and in fact were 25% of the AEC exposure limit. However, as I pointed out, **NIOSH never found any FB data or the badge vendor for 1953-1962**; hence, from a policy point of view, *such data did not exist to contribute to dose reconstructions with sufficient accuracy*. GSI management made many statements about annual written tests for radiographers and workplace safety rules that many GSI workers denied were ever put into place. Ignoring workplace safety was rife in the 1950s throughout AWE and DOE nuclear weapons facilities. Management was often more concerned with liability, maintaining secrecy about their work practices, and maintaining the bottom line more than with, to them, costly and resource wasteful safety practices, even though the dangers at their worksite were well known. Memoranda to this effect were introduced during the first Mallinckrodt SEC-0012 deliberations that led to the Board approving an SEC that NIOSH had recommended denying.

4. Mr. Allen's presentation emphasized uranium activation over uranium fission, whereas in reality both occurred. There was the known spontaneous fission of U-238 and the Betatron-induced fission of U-238, a process the petitioners documented with two key literature references [**REFS 2 and 3**]. Betatron-induced fission of natural uranium dingots such as those from MCW Uranium Division is not covered in TBD-6000 Rev 0 or Rev 1. REF 3 also covers Betatron photofission Mev thresholds in thorium-232; never completed section 7.2 Thorium (reserved) of TBD-6000 Rev 0 was omitted altogether in Rev 1 issued in 2011 for reasons that entirely escape Dan McKeel. There is some information that thorium impurities existed in the crust of MCW dingots of the type supplied to GSI for uranium NDT inspections under its AEC contract.

• *The parent TBD-6000 document is thus not complete as to all types of uranium or uranium exposure scenarios* as Board member Munn had stated on 6/14/12 to the TBD-6000 work group, or Mr. Allen stated in his presentation to the full Board on 6/20/12. Another example of incompleteness is the EA Weakley paper that co-SEC petitioner McKeel and Mr. brought to the attention of the full Board [**REF 4**]. **This is a 60 page long detailed report ot MCW Uranium alloy dingot use in the Hanford DOE site nuclear reactors**. It highlights the variable performance of individual dingots in the reactors that reflects variability in chemical composition and physical properties in the dingot production process at the Mallinckrodt plant that supplied Uranium dingots to GSI for NDT inspections with the 24-25 Mev Betatrons.

REFERENCE 2. Schmitt RA, Sugarman N. Letters to the Editor. Uranium photofission yields. *Physical Reviews* 89, pages 1155- 1156, 1953

Uranium Photofission Yields*

ROMAN A. SCHMITT† AND NATHAN SUGARMAN
Institute for Nuclear Studies, University of Chicago, Chicago, Illinois
(Received January 9, 1953)

MANY investigations of high energy fission, both with particles and x-rays, have been reported.[1-8] One striking feature of these studies is the decrease in the peak-to-trough yield ratio of the yield-mass curve as the energy of the bombarding particle increases, resulting in the one hump yield-mass curve as the energy of the particle enters the hundred Mev range. This paper reports the results of the radiochemical study of the photofission of natural uranium at the University of Chicago Betatron.[9] The study was made, in the main, at 48 Mev maximum energy, with a beam intensity of 300 roentgens per minute, 1 meter from the target. Measurements were made on the yields of 28 fission-product nuclides. Some experiments at 22 and 100 Mev were performed on the yields of selected peak and trough nuclides. Experiments were performed on the contribution of neutrons to the observed fission rate; it was found that this effect could not have appreciably affected the results.

-- page 1155

NOTE: Of great importance is the statement ***"Measurements were made on the yields of 28 fission-product nuclides."*** NIOSH needed to bound with sufficient accuracy external exposures to all GSI SEC-00105 Class members from the full range of 28 known Betatron-induced uranium radio-nuclides. NIOSH was unable, or chose not to, show this was done by their methods during dose reconstruction in TBD-6000 Rev 0 or 1, Appendix BB, SEC-00105 evaluation report, or the January 2012 Betatron Exposures white paper by David Allen.

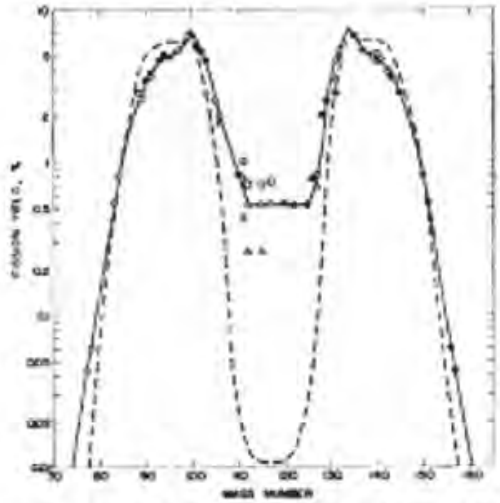


FIG. 1. Photofission yields of uranium at 22 Mev, 48 Mev, and 100 Mev. Dashed curve is that of thermal-neutron fission of U^{235}, solid curve for 48-Mev x-rays. △, 22 Mev; ○, 48 Mev; ●, 48 Mev reflected yields; □, 100 Mev. The yield of Mo^{99} at 22 Mev and 100 Mev is normalized to 6.0 percent.

Page 1156, open circles are the 22 Mev U-238 photofission data

REFERENCE 3. Schmitt RA, Duffield RB. Low-energy activation functions for photofission of U^{238} and Th^{232}. *Physical Review* 105, pages 1277-1284, 1957.

R. A. Schmitt* and R. B. Duffield*
University of Illinois, Urbana, Illinois

Received 13 November 1956; published in the issue dated February 1957

Activation functions for symmetric and asymmetric photofission of U^{238} and Th^{232} have been determined over the energy range 4.5 Mev to 10 Mev. For both elements, the fission yield varied exponentially with betatron energy over the lowest energies covered and the data show the difficulty in establishing experimentally the existence of a threshold for photofission. The symmetric (Cd^{117}) photofission yield relative to the asymmetric (Ba^{139}) yield in U^{238} showed a local maximum of 0.05% at 6-Mev betatron energy, while the corresponding symmetric yield in Th^{232} rose steadily from <0.0003% at 6.5 Mev to 0.1% at 12-Mev betatron energy.

URL: http://link.aps.org/doi/10.1103/PhysRev.105.1277
DOI: 10.1103/PhysRev.105.1277

REFERENCE 4. Weakley, EA. Status of alloyed dingot program, January1963. Available at URL: http://www.osti.gov/bridge/servlets/purl/10175105-cU2tX0/native/10175105.pdf as 4MB PDF file. Report No. HW7319 is written on every page of this Declassified OSTI document.

Abstract of EA Weakley 1963

This report summarizes and highlights the more importan milestones, development programs, performance and characteristics, and properties of dingot uranium and its use in the Hanford reactors from 1955 to the present. For the benefit of those unfamiliar with the terms ingot and dingot uranium as used in this report, ingot uranium refers to the metal made at the Fernald Plant of the National Lead Company by remelting under vacuum a mixed charge of solid scrap, briquetted scrap, and derby metal (the product of the UF{sub 4} bomb reduction), while dingot metal refers to the metal made by Mallinckrodt Chemical Works by reduction of UF{sub 4} to metal which is used directly (after suitable forming into convenient size for rolling), without the intermediate vacuum remelting step.

5. Error: **Mr. Allen on 6/20/12 stated to the full Board that the MCW AEC contract uranium work was done in the Old Betatron only**. There was only one 24 Mev Betatron at GSI during 1953 to 1962, and that was the "government owned" Old Allis-Chalmers Betatron electron accelerator that was installed by the Army Corps of Engineers in 1951/52. The New Betatron came on site at the GSI Illinois plant in 1963 after being moved from the GSI Eddystone Division shutdown in Pennsylvania. **NIOSH has no records—no shot logs, no NDT x-ray records, etc.—of either GSI Betatron that would allow them to know which Betatron was used for the MCW AEC uranium work in 1963-66**. This is all well documented. It goes to the fact that NIOSH, by statute and by OCAS-IG-003, needed to bound the external photon, beta and neutron doses from the Old Betatron, which it did not do. NIOSH in one sentence of the most recent David Allen Betatron white paper merely stated that Old Betatron doses were bounded by the New Betatron doses. *This brief and too casual statement is insufficient to establish bounding dose with sufficient accuracy for the Old Betatron.* The assertion, in order to

be considered valid, has to be *scientifically defensible* and it is not and has not been so defended in any rigorous way by NIOSH scientists, including Mr. Allen.

6. Error: David Allen and Dr. Ziemer speaking for Mr. Allen on 3/15 and 3/28 during the TBD-6000 work group March 2012 meetings, openly defended the use of an 80 Ci **Co-60 source** survey, that GSI was said to have conducted in NRC FOIA 2010-0012 documents, to validate the NIOSH New Betatron building model. **It should be noted that the actual survey data records and log sheets have not been located.** NRC license application reporting is thus *secondary information*, not raw radiation survey instrument reading data.

• The petitioners make several rebuttal comments: (a) the scatter pattern of the non-collimated Co-60 source is vastly different from the highly directed Betatron beam, (b) the 24 and 25 Mev Betatrons produced neutrons that are not associated with Co-60 gamma sources, (c) the photon energy spectra from an 80 Ci Co-60 source and a 25 Mev Betatron are vastly different, to name just a few significant source differences. These differences that are obvious and highly determinative to Dr. McKeel have basically been ignored by two members of the TBD-6000 work group (Dr. Ziemer, Ms. Munn) and by the GSI DCAS team (David Allen, Dr. Neton).

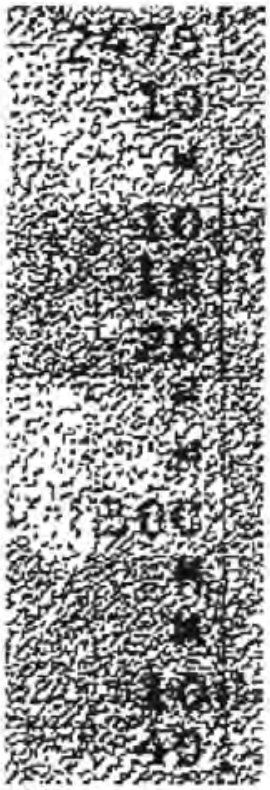
7. Error: David Allen stated that NIOSH had modeled two racked badge "locations" plural, whereas in reality NIOSH chose to only model one of two known different film badge rack locations with the New Betatron facility at GSI. This is not careful or thorough science. Modeling the second rack location to prove which dose value was the most claimant favorable would have been trivial, but it should have been carried out and factored into assigned dose.

8. **Dan McKeel challenges NIOSH and SC&A's repeated statements that the GSI Landauer film badge dataset has 99.7% of readings that are 10 mrem/week or less**. This "fact" has never been confirmed by any member of the Board to be correct. **The full Board needs to be given an opportunity to examine the full Landauer-GSI film badge dataset for 1953-1973 themselves.** The Board needs to directly **verify** the NIOSH statements apart from the SC&A reviews. These complete FB data have been denied to the petitioner, and there is no way he can review the full unredacted FB dataset that NIOSH and SC&A refer to.

9. Dan McKeel has reported to the TBD-6000 work group data shows 4 readings from a single page of a GSI radiography clerk's complete Landauer FB record that were voluntarily shared with Dr. McKeel. These data had all the names except those of the clerk redacted. Nevertheless the line item records and all doses were visible.

On the next page (12) is shown a part of the June 9, 1965, Cumulative dose total column that has 5 of 32 records showing values ranging from 20 to 2470 mrem. A concentration of doses that exceed the 99.7% "M" and "10 mrem" usual or vast majority of GSI radiographer film badge readings is compelling from a statistical point of view.

Co-petitioner McKeel is also aware from the limited Landauer annual summary reports he obtained 13 months before NIOSH contracted with Landauer to obtain their more extensive weekly dataset of cumulative reading in the 7 to 30 REM range. The highest GSI FB dose was said to have eventually been retracted by SC&A, however, the same very high dose was initially reported to Dan McKeel more than a year earlier than the SC&A analysis, by Landauer, that the very high reading occurred in one quarter and must have represented a radiation exposure incident. Now we know it did and know many of the details of that incident.



<-2470 These raw data are from one page of a weekly RS Landauer report. The column shown is part of a data sheet that contained 32 rows of Cumulative photon exposure data (in mrem). GSI did not issue FB that measured neutrons or beta dose.

• Of particular note relative to the "99.7% 10 mrem or below" statement that NIOSH and SC&A frequently make to characterize these data, is that in this tiny sample of the full dataset, there appear four reading that are higher than 10 mrem (n=8) or "M" (n=19):
<-20 they are 20 mrem (n=1), 40 mrem (n=2), 300 mrem (n=1) and 2470 mrem (n=1).

• From a statistical analysis point of view, it is highly unlikely that 5 values that exceed 10 mrem would appear in any sample of just 32
<-300 records if the whole dataset of approximately 6000 FB records only contained 0.3% values greater than 10 mrem. **5/32 = 15.6%.**

• The complete FB dataset needs to be viewed by the full Board membership before making a recommendation vote on SEC-105.

<-40 Highlighted doses in yellow are mrem

This person testified in an affidavit that he sent and received FB from Landauer, and that not infrequent "high" (not further defined) FB badge readings were shown to his supervisors who in turn discussed the high readings with the affected GSI workers. NIOSH and the TBD-6000 work group who voted to deny SEC-00105 seemingly chose to ignore this important worker testimony. Dan McKeel had a chance to review the complete Landauer FB records of a GSI Betatron operator, and these records also showed higher readings. **This second worker, in fact, received credit on his NIOSH reworked DR of a 10 REM dose that was documented by his pencil dosimeter**. All those pencil dosimeter records at GSI also were either lost or destroyed.

9. David Allen on 6/20/12 admitted to the full Board that (quote) ***"NIOSH has not determined Ra-226 inside Bldg. 6 but SC&A has, ... everyone agrees doses can be bound."*** I was astonished by this public confirmation of what I have been protesting for a long time, that *SC&A has been performing work that should have been done by NIOSH in the first place.* Ted Katz and Board member Munn vigorously defended SC&A on 3/15/12 at the TBD work group meeting, saying that SC&A's role was "evaluation." I disagreed that creating a model was the same as evaluating NIOSH's work. The transcript is very illuminating on this point that goes to the core mission that SC&A fulfills in the EEOICPA DR and SEC processes. Chairman Ziemer has at time acknowledged there is a grey "overlap" zone on this issue.

10. Error: David Allen on 6/20 stated that for the Ra-226 source dose determinations that NIOSH had made, they employed in part (quote) **"source utilization"** data from the NRC 2010-0012 material. But there was no such source utilization data in those reports. By this, I mean detailed evidence of individual "shots," what were the targets, how many NDT examinations were carried out over the 13 year operational period, what were the times and exposures delivered, etc. So I believe this statement is basically not true—the words sound good, however, there is no real meaning behind them that reflects the availability of scientifically defensible real

site data that would allow NIOSH to bound Ra-226 doses with sufficient accuracy, the gold standard criteria for SECs. Even the actual Ra-226 source strength is not known for given years because all source calibration and leak test records at GSI have also been either lost or destroyed.

11. Mr. Allen made another statement that I found to be scientifically indefensible with regard to the two industrial 250 KVP x-ray units at GSI. Basically, NIOSH has zero measured GSI data on the output of these machines, where they were used, how frequently they were employed, exactly where the "portable" units were used throughout the plant, calibration curves, photographs of them at GSI, etc. Mr. Allen stated NIOSH made a (quote) **"qualitative assessment"** of these two sources. The co-petitioner again asserts that such methodology is inadequate and scientifically indefensible to bound doses with sufficient accuracy. No SD data was offered for these two sources, which must be bound according the NIOSH DR guidance provided by Dr. Neton's OCAS-IG-003 document and by the EEOICPA Act itself.

12. Serious error: The amount of dust at GSI in the two Betatron facilities 1966-1973 during active use is grossly underestimated. Workers testify that inches of dust covered the floor and elsewhere. That dust was constantly stirred up by machines and worker activities. GSI facilities were busy production facilities seen during 1966 to 1973 after AEC MCW uranium NDT operations had ceased. Tracks from machine wheels are evident on the Betatron shooting room floors in plant photographs that Mr. has shared with the Board, starting with his 400 page GSI Work Book in 2006. He gave hard copies of this valuable resource, that his wife helped to compile and assemble at great personal cost and effort, to all Board members and many SC&A and DCAS/NIOSH staff. Of historical interest, this data-laden treasure trove of GSI documentary evidence has not been referenced by NIOSH in the SRDB, nor has NIOSH or SC&A reference material, including GSI photographs, been attributed to it in any technical report I am aware of. I would be happy to be proven wrong on this point.

Serious omission: **Mr. Allen omitted mentioning to the full Board that the ORNL vacuum machine dust sample was collected in 1989** at the end of the residual contamination period. He also neglected to mention that ORNL/DOE only did a radiologic sample and cleanup of the two Betatron buildings in 1993. None of the other GSI buildings in the uranium transport path from loading dock to the Betatron facilities were radiologically surveyed or cleanup up by any outside entity, including by DOE, ever. **So it is incorrect to say all of the uranium dust at GSI had been cleaned up to mark the end of the residual period**. The remaining plant buildings were still standing at the start of 2012, and have just recently been demolished. I am certain those buildings, especially 6 through 10, would have had uranium dust contamination had they been radiologically surveyed adequately in 1993 or earlier or later. DOE elected to do a limited cleanup in 1993 based on very limited survey data their contractor had collected. The motto would be: If you don't look for it, you certainly won't find it!

13. Mr. Allen's presentation had numerous gratuitous, scientifically questionable remarks. An example was (quote) **"uranium does not give a great deal of radiation,"** which while true, say, when compared to an atomic bomb, does give a sufficient amount of radiation, that by federal Law under EEOICPA, NIOSH must reconstruct bounding doses for all members of the GSI work force that numbered 3000 workers and has to date produced **1056 total** claims and **951 claims for Part B** for the compensation program and **284** dose reconstructions sent to NIOSH with **252 or 88.7% completed** (see below: Board member Munn's remarks on this point).

Numbers of individuals and cases paid at GSI based on a final DR decision of compensability thus far is **65** (DOL website data 6/24/12).

Dr. Robert Anigstein

1. Error: Dr. Anigstein on 6/20/12 mentioned a (quote) **"1989 to 1993 FUSRAP cleanup, all wastes gone by 1993 taken off site."** Not all uranium wastes were gone by 1993, just those from the Old Betatron building where a tiny amount of residual dust in a vacuum cleaner was found. (*Please refer to Allen point 12, above*) To emphasize that Congress thought DOE was doing an inadequate FUSRAP job of remediation, in 1997 it transferred FUSRAP remediation efforts from DOE to the US Army Corps of Engineers, and relegated DOE to a long term record archiving role in the FUSRAP. This arrangement continues today.

2. Dr. Anigstein on 6/20/12 showed a photograph of a large power shovel to illustrate a Betatron shot. Site expert [redacted] points out this photo is very atypical, and that in all only 4 such castings were worked on at GSI. The more typical Betatron external steel target castings were Army tank turrets made from GSI armor plate.

3. Dr. Anigstein makes the same error that David Allen about "oxides" being the main inhaled product from MCW uranium. That might be the case for U-238 billets and the cut surfaces of Betatron Uranium slices. However, it was not true for MCW uranium ingots and dingots that were deliberately sent by MCW for GSI Betatron NDT inspection with their (bomb reside) "crusts on," by the Uranium Division. The crust contained trace radioactive contaminants that differed from oxides of the underlying nearly pure uranium metal.

4. Major errors and omissions: With respect to external seal sources on 6/20..12, in addressing the full Board, Dr. Anigstein noted that (quote) **"SC&A performed independent assessments of exposures, scenarios changed over the years: 1953-62 bounding scenario, 1953-54 based on AEC dose limits, 1952-62 MCNPX simulations for neutrons Betatron bounding."** This statement was simultaneously misleading and confusing fir several reasons:

(a) the scientific hard data used for 1953-62 bounding was obscured;

(b) the 1953-54 bounding was based on a letter from a GSI management person (not from film badge records or any hard data), such "trust me, I promise" self reported data is notoriously suspect. Dr. Anigstein has implied that it beyond belief that a company official should lie. Well, the Mallinckrodt SEC-00012-1 deliberations proved that wasn't true. And voluminous GSI worker testimony exists to the contrary;

(c) 1955-62 MCNPX simulations are not the same as real measured data and can't be valid (see Rabinowitz analysis, Attachment B).

The long analysis of one worker's FB summary from NCC, not badge raw data, showed he received (quoting Dr. Anigstein) "9.2 REM dose in 4.5 years." That would be 9,200 mrem divided by 234 weeks or an average of 39.3 mrem per week. That is far above the "M" or 10 mrem that "vast majority" (99.7% to be exact) of Landauer showed, according to both SC&A and David Allen (DCAS/NIOSH). How could this striking discrepancy be overlooked by both SC&A and NIOSH, who have referenced this single worker FB data repeatedly as being somehow, and magically, statistically representative of the entire 3,000+ person GSI work force for 18 quarters? This worker, who is well known by name to the co-petitioner, did not begin his

work as a weekend, part time radiographer until 1957 when he returned from military service. He is the same individual who testified twice that he used a GSI owned Iridium-192 NDT source between approximately 1957-60. This man **WAS NOT BADGED BEFORE 1957** because he worked in the GSI chemistry lab and not as a radiographer.

5. Regarding Dr. Anigstein's exposition of the GSI worker black and white GSI magazine photo who had (quote) **"...a belt object that looked very much like a film badge"** to which Dr. Anigstein had juxtaposed a somewhat similar looking Tracerlab film badge he obtained from the Internet. Dr. Anigstein went on to state that he did not know if the belt object was a Tracerlab FB, (quote) it **"is plausible"** to identify the belt object as a *Tracerlab FB*, The co-petitioner counters most vigorously, "No, it is NOT plausible" because:

(a) The petitioners and site expert who first provided this photograph, have formally retracted their initial impression that the belt object on WG was a film badge. McKeel and now believe the belt object is NOT a FB but rather is a GSI ID badge based on viewing many more GSI photos and seeing similar objects worn by GSI management who are known not to have been issued film badges.

(b) Dr. Anigstein sought a second FB vendor at GSI for the 1953-1962 period and never found one. He neglected to tell the full Board these very important facts on 6/20/12.

6. Dr. Melius had to break in during Dr. Anigstein's 6/20/12 presentation and ask him to please "wrap up" because his talk was going on too long.

7. Major assumption error: SC&A modeled uranium-238 activation products for only 24 hours after a shot and found the doses were less than 1% of total delivered dose. The errors are:

a) Some steel activation products, there are many more than SC&A (and NIOSH) used in their calculations, have half lives far longer than 24 hrs. This is an arbitrary and not claimant favorable, not honest limiting assumption. The bounding dose calculation should be based on the longest half life and the highest delivered dose.

b) GSI used many types of steel that became activated. Workers and Mr. have carefully explained on several occasions dating back to October 2007, that GSI employed multiple types of steel (one GSI Metallurgist Betatron supervisor listed them). They emphasized the high nickel content of the x-ray film cassettes that were reused over and over by Betatron radiographers and photo film processor technicians who had to load and unload the film cassettes. SC&A and NIOSH have failed to calculate the skin and external photon and neutron doses from the activated nickel steel x-ray film cassettes used in the GSI Betatron facilities 1953-June 1966 (and beyond to plant closing in late 1973).

8. Dr. Ziemer offered his second commentary following Dr. Anigstein's talk. He did a short summary of what we had learned today: (a) (quote) **"Sources changed 1953 to March 1962"**; (b) he mentioned two Ra-226 sources; (c) the evidence about a GSI owned Ir-192 source and the 80 Ci Co-60 GSI source being present in 1964-66 according to some worker testimony (quote) **"was conflicting."** He said the Ir-192 and large Co-60 sources **"(quote) needed licenses."** *I have already commented that Dr. Zeimer had at TBD-6000 work group meetings explained on the record how such a late licensing could occur, and did occur in his own personal experience.* Please refer to pages 6 and 7 for added comments on Dr. Ziemer's presentation.

At 12:10 PM MT he opened the floor to Board member questions:

Other Board Members. Their input was very limited, The statements below capture most of what transpired. There were no other speakers besides the following:

1. Wanda Munn: The Board member asked what percentage of GSI claims had been dose reconstructed? She said she thought "all of them" had been. Actually, 252 of 284 or 88.7% GSI cases have completed DR as of June 24, 2012. Of those completed 65 cases/individuals have been paid (25.8%), well below the pay rate for other similar sized AWE sites or the now often quoted "30%" overall pay rate NIOSH and DOL use for their budgets. The petitioner contends this low pay rate at GSI is due to serious dose and work week underestimated figures that have been used from Appendix BB Rev 0 (June 2007) and TBD-6000 Rev 0 (2006) for DR done to date.
Dr. Ziemer commented that NIOSH had circulated some statistics. These data were figures that Dan McKeel had asked Lavon Rutherford to provide on the numbers of people that would be covered for GSI classes (he has done this in the past for all SECs):

a) **Operational period**: 1953-57 (n=68 claims); 1958-63 (n=88 claims); 1964-June 1966 (n=108 claims); TOTAL CLAIMS 1953-June 1966 = **264 claims**;

b) **Residual contamination period**: July 1, 1966 to 1973 (n=94); 1974-1992 (n=37 claims); TOTAL CLAIMS July 1, 1966 - 1992 = **131 claims**;

c) **Grand total 1953-1992 eligible for SEC-00105 class**: **395 claims**

2. Board member Brad Clawson: He noted there was no film badge data for GSI until 1963 except for a summary by 1 person, all true statements. He said (quote) **"it amazed me that most information today was statements like 'we think" and we really don't have any data."** Mr. Clawson said he had experience with a 90 Curie Co-60 gamma source that was used to image 6 foot thick concrete walls. He noted (quote) **"the scatter is pretty extreme."** David Allen chimed in, **"it was after 1966, again,"** once more not acknowledging the GSI affidavits of the six (6) GSI radiographers who testified they used a large 80 Ci C0-60 source at GSI between 1964 and 1966. Their testimony has been repeatedly ignored.

3. Board member and TBD-6000 work group chair Dr. Ziemer comment: (quote) "the work week at GSI was longer than 40 hours." Actually, Appendix BB Rev 0 (Jun e2007) placed the average work week at GSI at 46 hours. **The SC&A sponsored Satellite conference to a NIOSH worker town hall meeting later that day held in October 2007 established a consensus average work week at GSI that NIOSH now accepts as 3250 hours**. These crucial facts were overlooked.

4. New Board member Kotelchuck stated that "Material in the SC&A and FUSRAP 1989 reports had (quote) **"very little hard data." He observed there was "good film badge data," however, no one who had presented had pointed out what I did soon thereafter that 97% of the GSI work force in the SEC Class was never badged. The FB data only applies to 3 of 13 years for one job out of many, part time, in one tiny portion of the immense GSI building complex, that is the two Betatron facilities.** He noted (quote) **"the Old Betatron Building contains contamination but not the New Betatron -- that concerns me."** Dr. Kotelchuck then added (quote) **"to be cautious about assumptions by professionals --some issues and concerns -- take one person's word, worker versus professional."**

5. Dr. Anigstein's response to Board member Kotelchuck: (quote) **"Models were all verified."** [McKeel: not true, see my presentation that soon followed this exchange] Note the co-petitioner wondered why Dr. Anigstein answered this question rather than David Allen and DCAS. Not only does SC&A do NIOSH's work, it intervenes and sometime answers questions that are properly, in my opinion, NIOSH's to answer. Dr. Anigstein repeated his oft repeated mantra: (quote) **"GSI administration always monitored, had no reason to lie."** Then added: **"AEC wanted to verify... Not under state supervision"** [McKeel Note: *that may not be true, for a new law was introduced in IL in 1957 that required all radiation devices to be reported to the State*]. Dr. Anigstein made another point about **"Ra-226 explicitly forbidden by many states"** He further observed that **"FUSRAP was in use 10 years earlier 1952 until 1964;"** Dan McKeel didn't fully understand the point of the remark. Then Dr. Anigstein added **"only 2.5 years for Old Betatron Building -- uranium (work done) in Old Betatron Building assumed."** [McKeel comment: NIOSH must assume both Betatron facilities were used for MCW AEC contract work for uranium NDT from 1963 to June 1966 because NIOSH lacks records to allocate uranium work between the two.

• McKeel question to himself, not being allowed to speak: then why did NIOSH chose and SC&A approve to model just the New Betatron Building --doesn't make sense?

6. Board member Munn: The Board member was obviously unhappy with Dr. Kotelchuck's former remarks about who to believe in disputes. She said in part (quote) **"...disturbing this body has heard the professional information is suspect too many times. Bad science to take this -- I take umbrage. Not correct. Nothing inferred." It was now 12:24 PM by my watch and Dan McKeel had not yet been allowed to or invited to speak. The scheduled GSI session was to end at 12:30 PM and Dan McKeel's 10 minutes was in jeopardy.**

DAN MCKEEL WAS THEN ALLOWED TO ADDRESS THE BOARD FOR 10 MINUTES STARTING AT ABOUT 12:12 PM MOUNTAIN TIME

Following the McKeel presentation:

8. Board Chair Melius: Mentioned someone had received a letter from "the petitioner" but didn't mention the name or the content of the letter or what would be done with it.

9. Board member Fields on the phone: Stated he appreciated the first three presenters and the GSI SEC co-petitioner's information.

10. The GSI SEC session was scheduled to end at 12:30 PM and adjourned at 12:32 PM Mountain Time.

Respectfully submitted:

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Attachment A

[Text of letter to the Board]

June 12, 2012

To The Advisory Board on Radiation and Worker Health.

First of all, I would like to thank the Advisory Board for their time, patience, and consideration.

After several years of research and hard work by Dr. Dan McKeel, the TBD Work Group and many others that have devoted their time and expertise to the GSI claimants and to my SEC-00105 petition, it appears that the time has come for ABRWH to make a recommendation to the DHHS for final recommendation on the SEC. I am disappointed that all Appendix BB issues are not resolved as the vote approaches.

It is quite clear that the BOARD lacks sufficient dose reconstruction information to bound internal and external radiation doses at General Steel Industries with sufficient accuracy.

A recent recommendation to deny the SEC for part of the covered period of 1953 to 1957 by Wanda Munn and Paul Ziemer based on a letter submitted by GSI is simply unreliable. There isn't any proof of film badge data that confirms his letter. New data recently submitted by . clearly supports that.

Film badging was not available in those early years and after all this debate over the last several years, that is one thing that cannot be disputed according to evidence presented and recorded. No monitoring data of any kind was available for 97% of the SEC class at GSI for the entire period 1953-1992.

Dose reconstruction is a theory and it appears to be a very bad one. Direct measurements of uranium, Betatron, and cobolt-60 radiation effects by means of film badging for all 3000 exposed workers, urine bioassays for uranium, and air and dust samplings throughout the entire covered and residual periods would be required to make accurate dose reconstruction for all GSI workers in the SEC class. Otherwise it is a guessing game...at the expense of the GSI employees' health. This was a death sentence to many of these people.

It isn't the worker's fault that the badges weren't available or even in existence. I do not believe that they should suffer more than they already have due to the dangerous conditions that they were unknowingly exposed to.

I have only seen documentation of one case of film badge recording at GSI from 1953-1963. From 1964-1966, 89 were recorded, and a mere 19 cases from 1967-1973. It alarms me to think that any GSI claimants could lose their claim based on these small numbers.

Records show that radiographers are the only recorded class of GSI worker that wore badges that is documented.

My main concern is for the surviving GSI employee claimants. These people are experiencing little quality of life, enormous amount of pain, and mounting medical bills. Had they been given adequate training or some kind of disclosure to sign that warned them of the dangers of overexposure to radiation, I don't believe that any one of them would have reported back to work the following day. Unfortunately for the GSI employees', disclosures and adequate training were not offered.

Once again, I would like to thank all of the professional experts, groups, and individuals involved that have devoted their time to this SEC Petition I appreciate your devotedness to promote fairness to all of the affected GSI employee claimants.
In closing I would like to ask that you take all recent documentation submitted by the TBD Work Group into consideration before you make your recommendation to the DHHS.

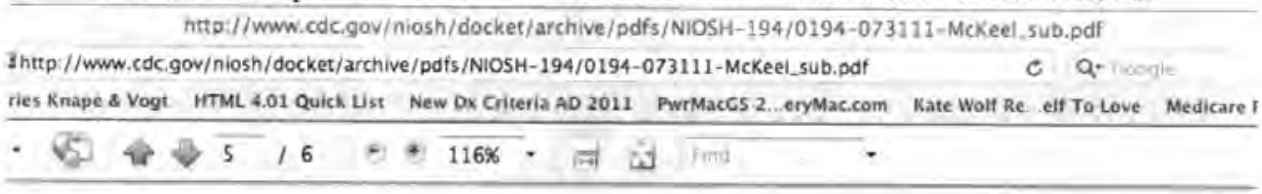
Sincerely,

Attachment B

Primary source reference: Randy Rabinowitz, Radiation Dose Reconstruction Program, NIOSH Ten Year Phase 1 Report, Special Exposure Cohort, 44 pages, 2011.

The implementation status of recommendations related to the NIOSH Ten Year Program Review was referenced repeatedly during the June 2012 ABRWH meeting in Sante Fe, NM. The following excerpts by Randy Rabinowitz on Special Exposure Cohorts and the tension between science and policy decisions related to Board, SC&A and NIOSH deliberations related to GSI SEC-00105 are particularly germane to this comment. The comments are pertinent to the recommendation to the HHS Secretary from the Board, in Denver, at the September ABRWH meeting on GSI SEC-00105.

1. I have made a previous brief comment on the Rabinowitz SEC section as follows:



> 3. *The appropriateness and the consistency of decisions regarding petitions to add groups of claimants to the Special Exposure Cohort established under the statute (Special Exposure Cohort).* Author: Randy Rabinowitz, CDC/NIOSH contractor. (/niosh/docket/review/docket194C/default.html)
>
> General Comment: NIOSH and the Board have both been inconsistent in handling SECs. For Dow Madison, for example, Board Chair Melius moved it out of the SEC Issues work group without having a recommendation vote to the full Board. Surrogate data criteria were applied by SC&A at TCC for SEC-00088 as a test case before the criteria were ratified by the full Board. SEC processing times vary wildly by site.

The following are excerpts from the Phase 1 Rabinowitz Ten Year Review article on SECS:

2. The following excerpt addresses professional bias among DCAS health physicists:

> 3. NIOSH should recognize that scientific expertise can be used to mask professional bias and take steps to minimize that effect. All professionals have some form of unconscious biases. Because DCAS is staffed overwhelmingly with health physicists, the biases of that profession dominate NIOSH's evaluations. Broader participation of other disciplines in SEC decision would likely bring with it a broader range of policy perspectives.

3. The comment on the next page (21) addresses NIOSH's opposition to embracing "sufficient accuracy" in favor of "personal judgments." This is evident for SEC-00105. The passage is an indictment of NIOSH transparency and openness to "outsiders" such as SEC co-petitioner Dan McKeel. NIOSH has ignored his valid suggestions on many occasions.

3. (Rabinowitz excerpt #2, continued...)

NIOSH's regulations place primary emphasis on the case-by-case exercise of expert judgment by its scientists. In response to its proposed SEC regulations, for example, several commentators suggested that NIOSH adopt a regulatory time limit on how long dose reconstruction should take. If dose reconstruction were not complete after a certain period of time, comments suggested, then NIOSH should recommend a SEC. NIOSH rejected this suggestion because a time limit would "eliminate flexibility" and "could delay compensation for claimants." 69 Fed. Reg. 30765. Other comments suggested that NIOSH define "plausible circumstances" as the term is used in the regulations. Again, NIOSH declined, citing the need for "expert judgment." 69 Fed. Reg. 30770. [14] NIOSH was also asked to more clearly define when it could estimate dose with "sufficient accuracy." Again, it declined, citing as one of two reasons its "expert judgment" in making claimant friendly assumptions about dose. NIOSH opined that the provisions of EEOICPA relating to dose reconstruction and those relating to SEC petitions "address different but complementary circumstances." 69 Fed. Reg. 30769. In each of these instances, NIOSH was asked to provide transparent and objective criteria for how it would exercise its discretion in evaluating petitions and in each of these instances it declined to do so.

4. (Rabinowitz excerpt #3)

incapable of resolving trans-scientific issues."[22] SEC questions are similar to trans-scientific issues for several reasons. First, when exposure data are missing or unreliable, science cannot verify what past exposures might have been. Science can inform the development of analytic models, but the models nevertheless represent predictions – based in science but not scientifically verifiable --about past exposures. Indeed, the protracted discussions between SC&A and NIOSH over the interpretation of data and development of models illustrate the uncertain nature of the exercise.

This excerpt makes the very important point that science cannot verify what past exposures *might have been*. Also, models represent *not scientifically verifiable predictions*. They are <u>not real data</u> that can provide sufficiently accurate bounding doses, despite NIOSH, SC&A and certain Board member statements to the contrary at the March and June GSI related meetings. The co-petitioner contends MCNPX models should be viewed as imperfect surrogate data. Given the biases of SC&A health physicists and physicists, and their alliance with equally biased DCAS NIOSH health physicists, I am deeply concerned that an SC&A review of its own models is doomed to a predictable and biased result; *that the models are appropriate uses of surrogate data using the Board criteria* that do not state this is the case. I hope I am mistaken.

5. (Rabinowitz excerpt #4, page 22) addresses the role of scientific uncertainty in SEC decision making. This passage perfectly captures what has happened with GSI SEC-00105.

emphasizes getting the radiation science "right." Institutionally, it seems to believe that if it applies equal scientific rigor to each petition, its evaluation has been fair and uniform and that with additional time it can develop models which will answer radiation dose questions. This is so regardless of how much uncertainty its models introduce into the dose reconstruction process.

The entire Rabinowitz 10 year review excerpt #4 follows on page 22.

C. The Role of Scientific Uncertainty

In implementing the SEC program, NIOSH has not adequately addressed the role scientific uncertainty plays in its evaluations. The concept of scientific uncertainty, as used in this report, refers to factual uncertainty which the scientific community has not been able to resolve and, therefore, must be resolved for administrative purposes partially on policy grounds.[16] NIOSH policy emphasizes getting the radiation science "right." Institutionally, it seems to believe that if it applies equal scientific rigor to each petition, its evaluation has been fair and uniform and that with additional time it can develop models which will answer radiation dose questions. This is so regardless of how much uncertainty its models introduce into the dose reconstruction process. Sometimes data is adequate and science can provide quantitative estimates of dose. But, when the data is limited or its reliability questionable, science (as used here meaning verifiable) does not provide a basis for dose reconstruction. Science can inform the appropriate choice of models or estimating techniques, but, the question of what data is "sufficiently accurate" to make compensatory decisions is essentially a policy choice. NIOSH chose not to give added meaning to the phrase "with sufficient accuracy" when adopting the SEC regulations. 69 Fed. Reg. 30769. That failure meant that NIOSH did not adopt policies to adequately address, on a uniform and consistent basis, the role of scientific uncertainty in SEC decision making. Instead, NIOSH has implemented the SEC process as a predominately scientific exercise guided by the opinions of its analysts. Doing so has had at least three significant consequences for the SEC program: (1) policy decisions, shrouded in scientific complexity, are made by scientists; (2) decisions across SECs are not based on objective criteria and are, therefore, potentially inconsistent; and (3) SEC petition evaluation is delayed awaiting "scientific" estimates of past exposures. [17]

6. (Rabinowitz excerpt #5) Science and data only go so far in SEC decision making and determinations of "sufficient accuracy," the as yet undefined term. Policy judgments are involved as well.

Where resolution of a SEC petition turns on ascertaining scientific facts, this emphasis on getting the science right seems reasonable. Unfortunately, science cannot answer the questions raised by many SEC petitions for several reasons. In many instances, NIOSH cannot determine what the facts are because no monitoring was performed at the time of radiation exposure or if it was, it is too sparse or unreliable to give a reasonable snapshot of occupational exposure for a class of workers. There are no experiments NIOSH could conduct which will tell it what exposures were 60 years ago in facilities which either no longer exist or whose processes have been substantially modified. Even when NIOSH can determine the radiation dose "facts," these facts provide only part of the answer to the broader policy judgment of what data are adequate (or in the statutory phrasing "sufficiently accurate") for dose reconstruction.

7. (Rabinowitz excerpt #6) A final note on "sufficient accuracy" by Randy Rabinowitz. Decision factor (1) goes directly to Board member Munn's page 17 comment at the GSI SEC session on June 20th. Factor (2) use of extensive reliance on models to bridge data gaps, is clearly evident at GSI where *NIOSH made two different sets of DR methods in four years.*

implement statutory deadlines and other changes included in Congress' 2004 amendments to EEOICPA. 70 Fed. Reg. 75949 (Dec. 22, 2005). NIOSH published a final amendment to the SEC regulations on July 10, 2007. 72 Fed. Reg. 37455.

Several policy choices made by NIOSH in adopting the regulations have the practical effect of elevating scientific consideration of claims above the goals of uniform and timely consideration of SEC petitions. These include the decisions (1) to defer to the expert judgment of scientists; (2) to encourage the development of an extensive reliance on analytic models to bridge data gaps and (3) to fail to give independent meaning to the statutory phrase *"with sufficient accuracy."*