

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

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**From:** NIOSH Docket Office (CDC)  
**Sent:** Monday, July 20, 2015 7:51 AM  
**To:** Dragon, Karen E. (CDC/NIOSH/EID)  
**Subject:** FW: McKeel Critique of Allen/DCAS GSI paper dated 7/10/15  
**Attachments:** McKeel\_Critique\_ToAllen\_71015.pdf

**From:** Daniel McKeel  
**Sent:** Sunday, July 19, 2015 8:36 AM  
**To:** pl.ziemer@ ; Ziemer, Paul (CDC/NIOSH/DCAS); Katz, Ted (CDC/NIOSH/OD); NIOSH Docket Office (CDC); Allen, David (CDC/NIOSH/DCAS); Neton, Jim (CDC/NIOSH/DCAS); Hinnefeld, Stuart L. (CDC/NIOSH/DCAS); jmauro@scainc.com; Josie\_J\_Beach@rl.gov; j-poston@tamu.edu; wimunn@aol.com  
**Cc:** patriciajeske27' ; jwramspott' danmckeel2@ Kinman, Josh (CDC/NIOSH/DCAS)  
**Subject:** McKeel Critique of Allen/DCAS GSI paper dated 7/10/15

Greetings to the TBD-6000 WG members and to NIOSH Public Docket 140 (GSI),

Please consider the attached rebuttal and constructive critique to David Allen's GSI Path Forward white paper dated 7/10/15. I was supplied with copies of the PA cleared paper on July 16th.

Ted Katz, please distribute this paper to all current ABRWH members.

NIOSH Docket office: Please consider posting this paper to Public Docket 140 (General Steel Industries) on the DCAS website. A suggested title is:

"Submission by Daniel W. McKeel, Jr., MD: Critique of the David Allen (DCAS NIOSH) "Discussion of Remaining Issues to Sanford Cohen & Associates Review of Battelle TBD-6000 Appendix BB (*General Steel Industries, Rev. 1*) Response Paper" dated 7/10/2015.

Thank you for your consideration.

Sincerely yours,

-- Dan McKeel July 19, 2015

Daniel W. McKeel, Jr., M.D.  
GSI, Dow IL & TCC SEC co-petitioner  
SINEW cofounder  
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**Submission by Daniel W. McKeel, Jr., M.D.  
General Steel Industries SEC-105 Co-petitioner  
To NIOSH Docket 140 and to the TBD-6000  
Work Group of the ABRWH (7/19/2015)**

**A Critique of the  
David Allen (DCAS NIOSH)  
“Discussion of Remaining Issues to  
Sanford Cohen & Associates Review of  
Battelle TBD-6000 Appendix BB  
(General Steel Industries, Rev. 1)  
Response Paper”  
Dated 7/10/2015**

This paper is a critique of David Allen’s DCAS NIOSH response to the four open issues raised by SC&A in its 12/10/14 memo regarding GSI Appendix BB Rev 1. Nine SC&A findings were part of the 12/10 memo and another SC&A follow on memo issued 1/26/15 added a 10<sup>th</sup> Finding.

Ten SC&A Findings were discussed by the TBD-6000 work group (WG) at their latest meeting on February 5, 2015. Six were considered closed. I received copies of this latest David Allen DCAS NIOSH paper on 7/16/15.

My comments on SC&A open issues/Findings 2, 10, 5 and 6 follow in the order these issues were discussed in the Allen 7/10/15 response paper.

**MCKEEL SPECIFIC FINDINGS COMMENTS**

**Finding 2 -- Betatron Operator Beta Doses**

(a) Finding 2, page 2: The language Allen uses is too vague for a scientific communication. An example is: *“In 2013, NIOSH and SC&A exchanged files...”* leaves open what type of files were exchanged? Were they MCNPX data files, or an Excel spreadsheet, and if so what version of MCNPX was used? For what purpose were the files exchanged? Which agency and persons initiated the file exchanges and performed the data analyses at DCAS and SC&A?

(b) Finding 2, page 2: Allen fails to defend or justify why the “timeline and values using 1953 as an example” were selected by DCAS. These values are from the

first full year of the operational period, at the Old Betatron facility 10 years before the second GSI Betatron was brought to Granite City from Eddystone and placed in a new Betatron Building that differed structurally in many ways from the Old Betatron building constructed by the Chicago District of USACE. DCAS NIOSH has zero MCW purchase orders, Betatron shot records or maintenance records, or film badge data, or Betatron operator affidavits from 1953 - zero measured data of any kind. So, why would DCAS select purely fictional data from an computer model that possessed no measured beta or neutron or photon doses that NIOSH itself accepts.

Jim Neton, who reviewed the Allen 7/10/15 paper, and DCAS had previously rejected Dan McKeel's NYO-4699 papers with HASL (AEC) measured 22 Mev photon, neutron and operator film badge data, and facility drawings, at three U.S. Betatron particle accelerator sites for use at GSI.

(c) Allen fails to justify or attempt to explain the failure of both NIOSH and SC&A to agree on Betatron beta skin doses to the operators hands and forearms during the almost 7 years it took to issue Rev 1 of Appendix BB on 6/6/14. Thirteen additional months have elapsed before the Allen 7/10/15 response paper to SC&A appeared. Betatrons accelerate electrons which leak into the beam as well as bombard the internal target that produces x-rays. Knowing this basic fact about betatron particle accelerators, about which hundreds if not thousands of scientific papers have been written, it is difficult for the GSI SEC-105 physician/co-petitioner to understand why this final assignment of beta skin doses is taking so much time to resolve.

(d) On page 3, why is there such a gross 10-fold discrepancy between the uranium and steel hand and arm doses? Allen needs to justify and explain this order of magnitude difference in detail. Especially given the fact that adequately defining betatron operator skin doses were ignored so long, including in Rev 1 of Appendix BB. How can this inaction be justified scientifically?

(e) On page 3, what was the basis for adjusting the steel beta dose from continuous to intermittent? The assumption should be restated here. How was the specific intermittent dose factor derived? Allen states that "NIOSH further indicated their intention to adjust the beta dose to account for intermittent irradiation of castings." But SC&A did not ratify doing so would be claimant favorable. NIOSH, in fact, by adjusting the dose to entirely arbitrary unjustified assumptions, is making a claimant adverse decision (one of many made between 2007 and 2015).

**(f) Page 4, Table 1 - Betatron Operator Annual Beta Doses raises multiple questions, as follows:**

[1] NIOSH has no uranium AEC-MCW purchase order source term data for the years October 1952-April 1958. What assumptions did NIOSH use to derive the values they list for Hands and Forearms Uranium and Steel and for Whole body skin

during that time period. Petitioners argue that back extrapolation is not warranted and cannot be justified scientifically.

[2] NIOSH continues to ignore the fact that the GSI did not do production uranium NDT runs during October through December 1952. According to AEC operational reports Dan McKeel obtained through FOIA, during November and December of 1952 GSI did "R&D work with MCW uranium billets to improve image quality of NDT inspections using a uranium shield designed and built by MCW." It is scientifically incorrect and unjustified to equate betatron R&D work to improve x-ray film image quality with production NDT inspection on MCW-AEC uranium ingots (and dingots) that took place during April 1958 through June 1966 according to extant MCW-AEC purchase orders made to GSI in Granite City, IL. NIOSH has never modeled betatron exposures to operators (x-ray photons, beta or neutrons) using the Old GSI A-C Betatron 1952, including use of the experimental R&D uranium shield furnished by MCW in 1952.

[3] How could the peak years for Uranium Hand and Arms beta dose be 1953-1957 for which NIOSH has zero uranium source term data at GSI? There is absolutely no evidence that *more* uranium was processed at GSI 1953-57 compared to 1958, for example. Such peak beta dose values cannot logically be derived by simple back extrapolation. Mr. Allen and Dr. Neton and DCAS need to explain these derived numbers. Or, DCAS needs to admit the doses cannot be bounded, which is the GSI petitioner team view.

[4] DCAS/NIOSH has zero direct information on the tonnage or number or varietal mix of types of steel castings at GSI for any year of the operational or residual contamination periods at GSI. Why, then, is a slight incremental increasing trend noted for steel beta dose to hands and forearms during 1953-1965? Some beta must derive from Betatron photoactivation of steel. Where are those dose calculations?

McKeel conclusion about Table 1 Beta doses: The 1952 data is invalid. The 1953-1957 data has no factual basis and cannot be justified with scientifically defensible assumptions. It is illogical and unreasonable and not plausible to make 1953-57 uranium skin, forearm and body beta doses the peak values.

## **Finding 10 -- Betatron Operator Gamma Dose**

[1] Page 3 of 9. Allen makes an unwarranted assertion that is not supported by the facts as I know them. He states "***Since most of the accounts in the betatron building indicate they were always rushed to get the next shot started.***" Mr. Allen needs to cite the particular interviews by date and transcript page. In fact, he is merely speculating and adjusting the facts to the point he is making, to support

lowering the dose by 50% assuming that betatron operators always have their hands in the air before them. How could he possibly know this to be true?

[2] Page 4 of 9. The most concerning aspect of this SC&A Finding is that basal cell skin cancers are common human cancers and are frequently compensated when they occur in part B EEOICPA claimants. The fourth paragraph that extends to page 5 indicates "***The applicable Tables in Appendix BB will be changed from 1.3 rem photon dose to 10.225 rad...***" He should state the version of Appendix BB, which I assume means the values in Rev 1 (6/6/14) will be changed in Rev. 2 of Appendix BB, a release date for which has not yet been determined. At the present time 196 GSI denied claims are being reconsidered under PER-057 and 16 more under PER-058, with 100 part B GSI denied claims targeted for "rework" dose reconstructions at NIOSH due to the PER POC being  $\geq 50\%$ . Because of the sharp increase in air kerma from Rev 1 (from 26 mrem to 204.5 mrad per week), it can be anticipated that a new PER will have to be issued based on Appendix BB Rev 2. Some claimants will be forced to wait more months to years. All of these deliberations should have been decided in 2012 prior to the Board's final vote on SEC-015 12/11/12. Clearly, the changes should have been incorporated into Rev 1 of Appendix BB.

[3] Page 4 of 9. Mr. Allen again refers to "betatron" singular, which was the case only during 1952 through 1963 at GSI before the Eddystone, PA castings division of GSI closed and moved its operations to Granite City, IL. After that, there were two 24-25 Mev A-C Betatron x-ray units at GSI. The operations performed by the GSI betatrons need to be distinguished as "Old Betatron" and "New Betatron," always in every situation addressed in technical papers.

### **Finding 5 -- Adding Betatron Operator Dose to Radium Radiography Dose**

[1] Page 5 of 9, first paragraph. Neither SC&A nor DCAS NIOSH have a rational basis for deciding what percentage of the time any of many GSI radiographers used Ra-226, or performed as Old A-C Betatron operators from 1952 through the end of the radium era agreed arbitrarily to be on 12/31/1962. Thus, the time assignments are completely arbitrary. The radiographers also used two industrial 250 Kvp portable x-ray machines for NDT work, and some did Magnaflux and ultrasound as well. DOL and NIOSH do not have a complete verifiable listing of the people who were GSI radiographers and which specific radiographic jobs they performed for specific amounts of time.

[2] Page 5, paragraph 2, Allen states "***operators indicated 15 minutes between shots...***" To make this statement credible, Mr. Allen needs to cite specific worker testimony among the several GSI radiographers who offered testimony in interviews or affidavits or both regarding this important matter —

, etc. Their testimony varied

about the time for the shots and set up time and other factors. Almost all of this testimony was by radiographers during the **1963-1966 post radium era**.

[3] The time percentages assigned by SC&A and DCAS NIOSH for Betatron/radium-226 radium operators are purely arbitrary. The assumptions cannot be supported. The most claimant favorable split should be assigned to assign the radiographers the highest possible doses. NIOSH continues it betatron operator, claimant adverse external dose assignments.

[4] NIOSH for *years* ignored Dan McKeel's and the GSI SEC petitioner team admonitions that GSI radiographers 1952-1962 used both Betatron and radium-226 and 250 Kvp and perhaps other sources in their work at GSI. It is highly claimant adverse and therefore discouraging this Finding is still undergoing dispute resolution after so many years.

### **Finding 6 -- Layout Man Beta Dose**

[1] Page 5 of 9. David Allen perpetuates the "layout man" terminological erroneous construct. There is no "layout man" job category at GSI. No person can be identified who worked solely as a Layout man." The term should be dropped.

[2] Page 6 of 9. "Layout man" is a surrogate term for GSI workers who were not radiographers or administrative personnel. Such "other workers" were assigned a much lower (~10-fold) overall external photon dose compared to Betatron operators in Appendix BB Rev 0 (June 25, 2007) that has been used for 90% or more of completed NIOSH dose. Appendix BB Rev 0 by David Allen and Samuel Glover totally ignored Betatron and Other worker beta and neutron doses.

[3] It is another distressing and major oversight that DCAS and SC&A are listing points of agreement and disagreement for a brand new competing models that both are jointly developing. My often repeated objection is that SC&A is not contracted to do NIOSH work, which I believe is to develop a model that SC&A critiques for scientific validity. This may be termed "evaluation." I do not believe that SC&A developing a model that NIOSH adopts and uses is "evaluation" at all.

[4] Stating the bulleted list under paragraph 1 on page 5 are "agreement ... parameters" is a misnomer. Allen actually points out that SC&A differ in the values of assigned fractional values for long and short shots, the time a layout man is exposed, and that intermittent irradiation used by NIOSH alone. These are points of *disagreement*, not of agreement.

[5] The second bullet list of "differences in the parameters used" that vary wildly. For example, NIOSH assumes layout man works on a short shot for 15 minutes while SC&A assumes 75 minutes. The problem is, Mr. Allen fails to state any specific scientific or testimonial justification for making either assumption. I believe

these assumptions are worthless from a strictly scientific view. There is no hard data to support them.

Then follows on Pages an expanded discussion on each of the different model assumptions. In all these expanded discussions, there is no hard science offered. The back and forths are mere speculations. DCAS and SC&A are making invalid unjustified assumptions and mentioning worker testimony that is not validated by providing specific affidavit, transcript, of interview transcript pages. For example, on Page 7 of 9, item 2. 10% long shots versus 36%. Allen sates "**Based on statements by workers, it has been assumed that 10% of the shots in the betatron were long shots.**" The same questions arise: 1. Which Betatron?, 2. What workers? 3. Where is this testimony recorded? Etc.

Mr. Allen presents uninformed speculation rather than facts to support his views. This is reflected in comments he makes about relative numbers of defects in thick and thin castings. This discussion is irrelevant, since NIOSH and SC&A do not have any GSI shot logs to identify what types of castings were shot for how long with what radiation sources during different GSI operation time periods.

On page 7 of 9, under item 3. Single large Casting, Mr. Allen cites further undocumented off-record e-mails sent to him by SC&A that apparently were apart from a formal technical phone call meeting. I strongly protest because such e-mails are not further identified or put into the record as an Appendix to Mr. Allen's white paper. In refereed scientific journals, such unsubstantiated "personal communications" are frowned upon by editors or are disallowed. Mr. Allen should document these extracurricular e-mails from SC&A which he allegedly received and factored into his arguments in the 7/10/15 path forward for GSI Appendix BB Rev 1 four open issues paper.

Points 4. (15 minute exposure to short shot versus 75 minutes) and 5. (Two betatrons on site) on Page 8 of 9 are scantily developed and do not add scientific validity to the discussion. No further comment by Dan McKeel.

Page 8 of 9, last paragraph Mr. Allen outlines Path Forward for Layout Man Beta Dose (finding 6). He reviews the 6 parameters on which agreement needs to be reached between DCAS and SC&A to resolve the finding.

1. Fraction of short and long shots.
2. Whether a single large casting dose is to be included.
3. Fraction of time worked on "hot shots" – related to #2 above. If it is assumed that a single large casting represents some of the time, that fraction is necessary.

4. Whether the alternating castings is a reasonable bounding scenario.
5. Two betatrons – whether the scenario should include 3 castings alternating between 2 betatrons and the layout man.
6. Work time after short shots (15 minutes or 75 minutes).

On Page 9 of 9 Allen reviews the 5 parameters that need to be resolved in a Path Forward statement about SC&A findings 2, 5 and 10.

1. Using 8 hours per shift of exposure for uranium work in the betatron building (Finding 2)
2. Using intermittent irradiation equation for beta dose calculation for betatron operator (Finding 2)
3. Fraction of time a betatron operator stands with his hands behind his back or to his sides (NIOSH recommends 0.5) (Finding 10)
4. Fraction of betatron operator dose to be added to radium dose (Finding 5)
5. Biasing of betatron dose fraction toward uranium work (Finding 5)

**FINAL MCKEEL COMMENT:**

- More than 8 years have elapsed after GSI Appendix BB Rev 0 was first issued and 13 months after Appendix BB Rev 1 was issued on June 6, 2014.
- In the final analysis, David Allen and DCAS on July 10, 2015 proposed a Path Forward for 4 GSI Appendix BB Rev 1 open issues before the TBD-6000 WG on 2/5/15, and concluded his paper by listing eleven (11) parameters upon which SC&A and DCAS NIOSH need to reach agreement in the future. Their respective positions are far apart on most of these findings, and a path forward based on sound scientific hard data appears not to be possible to me. What is left is guesstimating and speculative, scientifically indefensible assumptions. NIOSH cannot bound these doses with sufficient accuracy.

Respectfully submitted,

*Dan McKeel July 19, 2015*

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