

FURTHER REVIEW OF FILM BADGE DOSIMETRY REPORTS FOR GSI

prepared by
Robert Anigstein
S. Cohen & Associates
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SC&A has performed a further review of the film badge dosimetry reports for General Steel Industries (GSI) obtained from Landauer, the vendor who supplied and processed the film badge dosimeters. This review is a continuation of our response to a request by the Advisory Board's Work Group on TBD 6000/6001, Appendix BB. During a work group meeting held at the Cincinnati Airport Marriot Hotel on November 10, 2008, SC&A was asked to confirm the statement by an SEC co-petitioner that there were "three individuals [at GSI] with cumulative doses in the 6,000, 7,000 and 30,000 mrem ranges."

In "Review of Film Badge Dosimetry Reports for GSI," dated January 13, 2009, we reported our review of the records from the week starting January 6, 1964, the first weekly report that was furnished, through the week of June 27, 1966.

Subsequent to that study, in which I had reviewed the reports for each week during the covered period, I performed a somewhat more cursory review of the reports for the period of July 1966 through December 1977, which follows the end of AEC operations at GSI. My initial examination of these records was prompted by the account of one worker who reported that he had received a potentially high exposure while performing radiography with a ^{60}Co source with a nominal activity of 80 Ci. Although this incident occurred after the covered period, I thought it might shed light on the general nature of industrial radiography at GSI. In perusing the radiation exposures of this worker (who, as it turned out, had no recorded exposures during the period in question), I observed abnormally high readings for several other workers.

In the present review, I examined reports at intervals of 6 months, noting any cumulative doses in excess of 100 mrem. When I found such a cumulative dose, I then located the weekly report in which such a dose was first recorded. There were a few such occurrences. In a small number of instances, the initial weekly report was followed by an amended report for the same week, but issued a few months later, that lists the same value with the notation *DS*, which is Landauer's code for dose subtracted. The weekly reports processed after the issuance of the amended reports list the cumulative doses to these workers as either *M* (minimal) or a dose well below 100 mrem.

Each of the dose subtractions was made by Landauer following requests from GSI. According to copies of correspondence furnished by Landauer to SC&A, the request to correct an exposure came from the GSI Radiation Officer, and was accompanied by a memo to the Radiation Officer from another worker (not the one to whom the film badge was issued) which stated: "While working the week of . . . I wore [another worker's] film badge by mistake the badge fell off in

the shooting room and was exposed.” Spot checks of a number of film badge reports for the period in question do not list any records under the name of the worker who wrote the memo.

The request to correct another exposure record was in a letter to Landauer from the worker. In it, he wrote:

Sometime during the evening of Friday . . . my film badge was accidentally lost in the exposure room of the G.S.I. Betatron. The badge was not found until [the following] Monday morning.

These occurrences are consistent with statements made by two former GSI betatron operators who spoke during a GSI worker outreach meeting held by NIOSH on August 22, 2006 in Collinsville, IL. One said:

Now, what I'm trying to convey, gentlemen, is there came a point in time that the operators unfortunately became wary of the reliability and accuracy of film badges that we wore. And as I reported with the dosimeter, the standard joke of -- of the operators were simply well, my film badge came unclipped from my pocket, landed close to the shot, and after two or three shots I realized what happened.

He was followed by a second operator, who observed:

And as you guys know certain workers we didn't care for or we had problems with we would purposely take their -- their badges, set them up on a casting, and load them up thinking we would get them . . . canned, get them away from us.

The highest readings that were found during the present review are consistent with the range of high readings cited by the SEC co-petitioner. As we just determined, some of the highest of these readings do not correspond to actual doses received by workers. The remaining readings during this period, as well as the weekly readings greater than 100 mrem during the period of AEC operations, presented in our report of January 13, 2009, may be the result of actual incidents in which a worker was in fact exposed to an unshielded radioactive source or to a betatron or to a high-voltage x-ray machine. However, it is also possible that, in addition to the documented instances, some of these readings are the result other cases in which film badges that were not being worn were accidentally or deliberately exposed. Because these doses did not exceed the maximum dose of 12 rem in any one year, which was the occupational radiation exposure limit at that time, it is possible that GSI did not consider any corrective action to be warranted.

It would thus seem likely that the high film badge exposures cited by the SEC co-petitioner were recorded during the post-operational period at GSI, and that some of these three exposures do not represent actual doses to individual workers. Furthermore, a typical weekly badge report at the end of 1969 lists 34 workers, which is consistent with the “about 30” workers cited by the co-petitioner. Thus, it is reasonable to conclude that he obtained reports for the post-AEC period and is referring to the high, uncorrected exposures discussed above.