

# **Response: Rocky Flats Plant Health Surveillance Document Review**

**White Paper  
Rev. 1**

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**National Institute for Occupational  
Safety and Health**

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J. S. Bogard, E. M. Brackett, Mutty Sharfi, and Dan Stempfley  
Oak Ridge Associated Universities Team

Reviewed by Dr. James W. Neton and LaVon B. Rutherford, CHP  
Division of Compensation Analysis and Support

## **PURPOSE AND BACKGROUND**

This is an assessment and response to petitioner allegations that Rocky Flats Plant (RFP) dosimetry records cannot be relied upon for dose reconstruction. The petitioner refers to a 2006 Oak Ridge Institute for Science and Education (ORISE) document, *Health Surveillance of Rocky Flats Radiation Workers*, and notes that the document Summary indicates that approximately 10% of these former workers were found to have received internal exposures higher than reported in Health Physics records (Site Research Database (SRDB) 126999, pdf p. 5). The Division of Compensation Analysis and Support (DCAS) directed the Oak Ridge Associated Universities Team (ORAUT) to review this surveillance document and provide a response concerning this issue.

ORAUT identified a 2004 document, *Final Report – Former Radiation Worker Surveillance at Rocky Flats*, that expands on the allegation currently under review. This document states:

*The physical review of health physics files from 1952 through 1976, in conjunction with the file reviewers' a priori knowledge of plant operations, led to the discovery that the health physics files did not always reflect an individual's complete exposure status...*

*...Approximately ten percent of the 1,164 participants for whom a dose assessment was performed were determined to have some unrecorded internal dose, and approximately five percent of the participants had a significant unrecorded dose. A significant dose, for the purpose of this report, was a dose value of 20 rem or more. One percent of the participants had an unrecorded internal dose that exceeded 100 rem. The most noteworthy case was a mid-level manager in a major plutonium processing building in the 1950's, whose TEDE of over 500 rem places him seventh on high-to-low TEDE list for participants. The records in his Rocky Flats health physics file and in his medical file are mute regarding the plutonium contamination incident he described in his interview. (SRDB 121677, pdf pp. 24-25)*

The issue of dose refinement as a result of worker recall programs is discussed in SEC-00030, Rocky Flats Plant Evaluation Report, Section 7.5.1.6, *Worker Recall Monitoring Program*, which specifically mentions the Former Radiation Worker Medical Surveillance Program at Rocky Flats. The discussion states:

*Bioassay results from recall programs can help refine estimates of dose from internally-deposited radioactive materials. However, the ability of NIOSH to perform dose reconstructions is not predicated on the continuance of such programs. When these data are available, NIOSH will consider them in dose reconstructions, but monitoring and other data collected from the period during which the worker was employed, together with NIOSH's procedures for the assignment of unmonitored doses, are sufficient to conduct dose reconstruction. (SEC-00030, RFP ER, Rev. 0 Final, 04-07-06, pdf p. 71)*

## **OBSERVATIONS**

For radiological dose reconstructions performed under the Energy Employees Occupational Illness Compensation Program Act (EEOICPA) program, internal dose is calculated based on an individual's bioassay results (for the most part, using different models based on all available/related information, as compared to what would have been used/available at the time by the site); the site's dose of record is not used.

Two points need to be made about differences in calculated dose using different methods at different historical times under different programs:

1. The apparent difference in dose from the early years (i.e., dose assessed by the site) compared to later years (i.e., dose assessed in follow-up efforts described in the ORISE Health Surveillance and RFP Worker Surveillance documents) primarily results from the historical difference in Minimum Detectable Activity (MDA) for bioassay samples; more-recent samples have lower MDAs due to the increased precision of modern equipment. Lower MDAs result in better accountability of internal exposure and better quantification of intake activities compared to early site assessments. Whereas the site's early-years monitoring efforts with higher detection limits might result in "<MDA" recorded values and no dose assignment, later-year assessments performed with more-sensitive instruments might result in the assignment of doses. More specifically, the ORISE Health Surveillance report is taking original site-calculated doses and comparing them to recalculated external and internal dose based on new bioassay data from the medical monitoring program as well as data from the Neutron Dose Reconstruction Project (NDRP). The report finding that the internal exposures are higher than reported in the HP record reflects the lesser sensitivity of the historical detection limits. When workers were re-sampled during the medical monitoring program, the sensitivity of the more-recent bioassay was much better. Therefore, it is not surprising that intakes that were not detected by the site during the time of intake were detected with more contemporary analysis methods decades later, thus resulting in assignment of more doses or higher doses.
2. There are two additional differences between doses assigned by either the historical site program or the follow-up ORISE Health Surveillance program as compared to EEOICPA dose reconstructions. First, the EEOICPA program assigns missed dose, which accounts for any limitations in analytical measurements by calculating the maximum dose that could have gone undetected. Second, the EEOICPA program can assign dose based on EEOICPA-developed co-worker studies, which can be used to account for unmonitored dose by assessing and assigning a calculated dose based on co-located personnel data. Therefore, the EEOICPA dose reconstructions result in two additional dose assignments that are not covered by either of the aforementioned assessments.

## **CONCLUSION**

The potential undetected intakes at RFP discussed in the ORISE Health Surveillance Report result from the use of more-sensitive instruments in later years. The surveillance report does not indicate that the RFP internal monitoring program was inaccurate and thus the information not usable. The EEOICPA dose reconstruction processes assess reliable and usable data to account for all potential exposures and determine bounding intakes – including unmonitored exposures - through the use of missed-dose and possibly co-worker dose assignments, which are not considered in the historical or follow-up dose assessments. Therefore, the conclusion is that all potential dose is accounted for, and the findings of the Health Surveillance Report do not impact the ability to reconstruct dose with sufficient accuracy under the NIOSH EEOICPA radiological dose reconstruction program.