

Joslyn Manufacturing and Supply Co.

Use of Surrogate Data

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Introduction

- Joslyn is listed as an Atomic Weapons Employer for the Atomic Energy Commission (AEC) from March 1943 to 1952
- Joslyn has been added to the Special Exposure Cohort for the period March 1943 through July 1948
- This discussion focuses on the justification of the use of TBD-6000 as surrogate data for the determination of intakes of uranium during the period August 1948 through December 1952

Hierarchy of Data

- No individual monitoring data was collected at Joslyn for uranium
- Air monitoring data collected on a limited set of machining operations in 1951 by the Atomic Energy Commission's (AEC) Health and Safety Laboratory (HASL)
- A second, very comprehensive data set was collected by HASL in 1952 that provided an in depth measurement and exposure assessment of intakes for a large of occupations at Joslyn
 - Time Weighted Average (TWA) values were developed as part of the HASL report

Hierarchy of Data - continued

- NIOSH determined that the data from the 1951 and 1952 measurements meet the analytical and methodological requirements for dose reconstruction
- NIOSH used these data collected at the facility and compared it to the well reviewed TBD-6000 rolling and machining operator categories and found that the TBD-6000 data provided a claimant favorable but realistic approach to dose reconstruction of internal dose at Joslyn

Exclusivity Constraints

- While HASL collected data in 1951 and particularly 1952, NIOSH has utilized TBD-6000 to better describe the full range of conditions and assumptions that may have been observed beyond the single TWA study in 1952 for the period beginning August 1948.
- TBD-6000* provides a peer reviewed surrogate data set of thousands of measurements conducted by HASL at numerous facilities beginning in 1948

*Harris, WB and I Kingsley. 1959. "The Industrial Hygiene of Uranium Fabrication." A.M.A. Archives of Industrial Health, Vol 19, May 1959. pp 76-101.

Exclusivity Constraints - continued

- Comparison of the rolling operator category shows that use of the TBD-6000 data is clearly claimant favorable for all but one rolling operation, the 9" finishing mill
- The full distribution of the rolling operator (GM=1,606 pCi/m³, gsd=5) provides complete coverage of all data measured at Joslyn
- Furthermore, changes in operations beginning with August 1948 substantially limited the use of the 9" finishing mill
 - Supported by documentation and testimony by a worker who worked in the rolling mill beginning in 1948

Site or Process Similarities

- TBD-6000 provides a comparison of data across a number of facilities that conducted exactly the same rolling and machining operations that Joslyn performed
- Review of the site data from 1951 and 1952 show that the sites data compare well to the data in TBD-6000 and that the use of the full distribution of data in TBD-6000 provides a realistic exposure assessment for operations at Joslyn back to August 1, 1948

Site or Process Similarities - continued

- No operation changes in the equipment or ventilation are known to have occurred after August 1948
- NIOSH concluded the data obtained by HASL in 1951 and 1952 could be represented by the exposure conditions in TBD-6000 as early as August 1, 1948 based on (in part):
 - Beginning with August 1948, Joslyn was operated with AEC oversight which provided increased certainty that the air monitoring data from other facilities is appropriate
 - Operations reduced and became better defined and specific
 - Operation specifics, documentation, and worker testimony provides evidence that the operations are similar in nature and scope to those described by the TBD-6000 data set

Site or Process Similarities - continued

- Beginning in August 1948, the reduction in production levels to smaller rolling operations in support of specific research projects were less likely to have required simultaneous rollings
- Beginning in August 1948, many of the operations the specifically called for rolling on the 18-inch mill
 - This removed the highest source of exposure (the 9” rolling mill) at Joslyn during many of the days of operation
 - Provides additional evidence that multiple mills were not used simultaneously during this time period

Temporal Considerations

- Temporal considerations for Joslyn were given extensive weight when determining the feasibility of dose reconstruction and the comparability of surrogate data
- Joslyn only used electrically heated furnaces to pre-heat the billets, unlike other later-constructed facilities that may have used lead or salt bath coatings.
- NIOSH confirmed that the TBD-6000 data set extended to cover the Simonds Saw and Steel initial studies with rolling furnace heated uranium and provides further evidence of the applicability of TBD-6000 back to 1948.

Plausibility

- Full distribution of intakes from the rolling operator and machining operator categories used at Joslyn (GM, GSD=5)
- Site data suggests that the rolling mill operations were bounding, but limitations in site data support a claimant favorable approach to include the higher machining operator from TBD-6000 when appropriate
- Data based on facilities from the same time period for the same types of operations conducted at Joslyn and whose full distribution provides a claimant favorable, realistic approach for determining intakes of uranium at Joslyn from August 1, 1948 through December 31, 1952.

Conclusion

- NIOSH carefully reviewed the operations conducted at Joslyn and data availability during the period August 1948 through December 1952
- The use of surrogate data for uranium intakes from the Rolling and Machining Operator categories from TBD-6000 was evaluated by NIOSH against the Advisory Board's *Criteria for the Use of Surrogate Data* by NIOSH
- NIOSH believes that the use of this data was found to be justified and that it provides a scientifically valid, claimant favorable, and plausible doses from intakes of uranium at Joslyn during this period