

Proposed re-formulation of the DOL request for assistance in identifying toxicological hazards from radiological substances (February 2019)

In reviewing some of the radioactive substances found at DOE sites, the Site Exposure Matrices only link uranium with the non-cancerous condition of acute tubular necrosis. DEEOIC asks the Board to conduct research of peer-reviewed, human studies to ascertain whether there are additional non-cancer diagnoses that the literature links to exposure to radioactive substances such as uranium, plutonium, polonium, thorium and americium. While all are technically heavy metals, Pu, Po and Am have no stable isotopes. Health effects may be based upon the non-cancer effects of radiation (high LET alpha radiation, in particular), chemical toxicity, or a combination thereof [1, 2]. A related set of issues pertains to non-cancer effects, especially circulatory diseases observed in the Life Span Study of atomic bomb survivors in association with low LET radiation exposure [3, 4]. Evidence of such non-cancer effects in nuclear worker cohorts or other occupational groups would be of interest.[5] The Board could offer advice on the results of its analysis, including any recommendations for additional links for use by DEEOIC as part of an update to SEM or as policy guidance.

References

[1] ATSDR Plutonium Toxicological Profile (2010)

<https://www.atsdr.cdc.gov/ToxProfiles/tp143.pdf>

[2] UNSCEAR Annex D (2017) Uranium

See “Chemical versus radiological toxicity”, p. 390 et seq

http://www.unscear.org/docs/publications/2016/UNSCEAR_2016_Annex-D-CORR.pdf

[3, 4] Life Span Study <https://journals.sagepub.com/doi/full/10.1177/0146645316629318>

<https://www.rjournal.org/doi/full/10.1667/RR14347.1>

[5] UNSCEAR 2006 Annex B

http://www.unscear.org/docs/publications/2006/UNSCEAR_2006_Annex-B.pdf

See Table 11 “Findings on Circulatory Diseases in Studies of Radiation Workers”