

Issues with using Radiological Exposures as a Company Performance Measure in a low Dose Environment

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Abstract

Collective and maximum individual doses are two measures commonly used as an indicator for measuring Company performance. There is often an expectation for year on year improvements by optimisation of exposures through improved working methods and modernisation of facilities. Eventually a level of exposure can be reached that is no longer easy to measure which makes meaningful trend analysis difficult. The paper discusses the issues that arose at AWE where the majority of exposures are close the limit of detection for the TLD system used. It details the investigation that was carried out when recorded doses were observed to unexpectedly increase significantly.

The paper shows the significant effect of a small change in the background radiation levels that are subtracted for each individual dose measurement. Also discussed is the effect of using TLD dosimeter readers that have undergone recent maintenance and are therefore assessing slightly increased exposures. Compounding the apparent increase in gamma dose a slight change in the manufacturing process for the plastic neutron film in the neutron dosimeters also gave an increased neutron exposure measurement which is detailed.

The paper concludes with describing the changes that have been made to better ensure reproducibility of the exposure measurements so that any improvements in Company performance can be shown. It also questions the use of Collective Dose as a performance measure which is commonly misused across the industry.

KEYWORDS: Dose, Performance Measure, Background, Detection Limit

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