THE SMOPIE Project: Case studies with industrial partners

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1. Summary

An important part of the SMOPIE project was the study of monitoring methods and strategies used in real workplaces. A total of five case studies in different workplaces were undertaken in close co-operation with industrial partners. The main conclusions from these studies, which were used in formulating the recommendations of the SMOPIE report, are listed below.

2. Categorisation of workplaces

A strict categorisation of exposure conditions is not considered helpful. Instead, it is more useful to focus on the common characteristics, as summarised below.

- All the workplaces studied have multiple sources of dust; these arise from the process, processing machinery and the actions of workers.

- Total containment is not practicable, and airborne dust is almost always present in the workplace.

- The level of airborne dust (and hence inhalation doses) over time is always changing. Sometimes this is predictable (e.g. due to known dusty operations), but often it is not.

- Dust levels are not uniform within the workplace. Variations should be expected and can be substantial, especially at fixed workstations such as product bagging.

- Working patterns are rarely constant. Most workers multi-task and frequently move around the workplace during the working day.

3. Monitoring strategies

- To implement ALARA in practice requires an assessment of internal dose and information on how this dose arises. Different monitoring techniques provide different information; a combination of monitoring methods is required to provide all the necessary information.
Air sampling, rather than biological sampling (or whole body counting) is the best way of assessing doses and providing ALARA information.

Sampling errors are generally overlooked. From the case studies, a single air sample may vary significantly from the true annual average air concentration, as follows:

- Sampling over 1 or more working days: a factor of 3 or more
- Sampling over 1 hour or less: a factor of 10 or more

Personal air sampling provides the best estimate of individual (or group) worker doses.

Static air sampling can be used to check that doses are low, but any results should be assumed to be underestimates, and a comparison using personal air samplers should always be considered.

Real-time dust monitoring should generally not be used as a means of determining dose. It is also only suitable for airborne dust with a predictable activity concentration (Bq/g). However, in suitable workplaces, it is capable of providing more ALARA information than any other technique.

A full description of the case studies can be found at: www.nrg-nl.com (search “SMOPIE”).