

## Personal Monitoring

### Introduction

Personal dosimeters (e.g. whole-body dose monitors and/or extremity monitors) record the radiation dose received by the wearer, and must therefore be worn correctly at all times when working with radioactive materials or with equipment producing ionising radiation such as X-rays. Such monitoring ensures that Radiation Workers do not exceed the relevant dose limits and that all exposures are **as low as reasonably achievable (ALARA)**.

If a personal dosimeter is issued, it must be treated carefully and not interfered with. In particular, care must be taken to ensure that it is not inadvertently exposed by being left adjacent to a source of ionising radiation when not being worn; any such accidental exposure must be reported to the Radiation Safety Unit. Film badges must always be correctly positioned in the holder provided and must be removed from laboratory coats before these are laundered. Badges must be kept away from sharp items, direct heat, and luminous watch dials. Persons using extremity dosimeters should ensure that the dosimeter is not inadvertently discarded after removal of surgical gloves.

*The RPS should deal with the provision of dosimeters within his/her School.* The Radiation Safety Unit will give advice as required. However, it should be emphasized that there is no point in providing film badges for workers using low energy beta emitters (e.g. tritium) and usually, wrist or finger monitoring is more appropriate for high-energy beta use (e.g. 32P).

Personal dosimeters are issued for such periods of time as considered appropriate by the Radiation Safety Unit (generally 4 or 8 weeks), taking into consideration both the type of dosimeter and the nature and frequency of the work being monitored. **All dosimeters must be returned promptly to the dosimetry service at the end of each period.**

### Monitoring of Classified Workers

Classified Radiation Workers are required by law to have their radiation doses monitored. For those exposed to external radiation fields this will normally be with personal dosimeters such as whole-body dose monitors and/or extremity monitors (e.g. film badges or thermoluminescent devices (TLDs)). Where the use of personal dosimeters is inappropriate (e.g. in work with low energy beta emitters), an assessment of dose will be made by other methods such as environmental or biological monitoring.

If a dosimeter issued to a Classified person becomes lost or damaged, an investigation to estimate the actual dose received during the monitoring period will be required. In the absence of sufficient information a dose pro-rata to the annual dose limit will be recorded.

### Monitoring of non-Classified Workers

Personal dosimeters may be issued to non-classified Radiation Workers (particularly new workers) to demonstrate that classification is not required, by monitoring both the technique and the working environment. Such monitoring will not necessarily need to be continued once an adequate estimate of the risks has been obtained.

A whole-body film badge will normally be issued to any worker regularly handling 40 MBq or more of a gamma, or high-energy beta emitter. A finger badge should be issued to anyone who regularly manipulates more than 1 MBq of concentrated high energy beta emitters such as 32P.

### Accidental over exposure

If an accident or any other incident occurs which is likely to result in a person being exposed to ionising radiation in excess of three-tenths of the relevant dose limit, it will be necessary to arrange for an immediate dose assessment, where applicable by examination of the personal dosimeter, or by other means such as examination of biological specimens or computation of dose received from measurements of dose rates, contamination levels, exposure time and distance etc. The

circumstances leading to the accident will have to be fully investigated so that appropriate action can be taken both to deal with the current situation and to prevent future occurrences.

### **Biological Monitoring**

Biological monitoring involves measuring radioactivity in blood or urine samples, to calculate the residual activity in the body. It is normally necessary only if very large activities of unsealed sources are being handled, and if there is a significant risk of intake of radioactivity or excessive skin contamination, or following an accident. Note, however, that users of **radioiodine** should regularly monitor their thyroid gland to check for possible intake of vaporised iodine.

In cases of accidental intake and/or contamination the RPS and the RPA must be notified immediately as it may be possible to enhance the rate of elimination from the body.

### **Dosimetry Records**

Records of radiation doses received by Classified Workers have to be kept for 50 years from the last entry. Records of dose assessments made following an accident or other incident must also be kept for 50 years. North West Medical Physics at Christie Hospital acts as the university's Approved Dosimetry Service. Classified Workers will be sent a copy of their termination dose record on ceasing employment with the University.

**Contact your Radiation Protection Supervisor (RPS) for the Personal Monitoring Registration form required for registering workers who are using either film badges.**