Frequently Asked Questions

WHAT IS MY DOSE LIMIT?

Federal regulations (10 Code of Federal Regulations, Part 835), establish the acceptable limits from internal and external workplace exposures as 5,000 millirem (mrem) per year. DOE requirements for protecting individuals from ionizing radiation set an administrative control level, or limit, of 100 mrem/year for non-radiological workers and members of the public visiting DOE sites (DOE Order 458.1). The Hanford administrative control level for radiological workers is 500 mrem/year.

WHAT IS THE DIFFERENCE BETWEEN INTERNAL DOSE AND EXTERNAL DOSE?

Internal doses occur when radioactive material enters the body through inhalation (breathing), ingestion (swallowing), the skin (absorption), or an open wound. External doses occur when the body is exposed to a penetrating radiation field from an external source.

HOW ARE INTERNAL DOSES CALCULATED?

The method for calculating doses requires that the total internal dose for an intake be calculated for a 50-year period. The dose being reported to you is the total dose over that 50-year period. The dose that is being reported will be sent to your company’s dosimetry point of contact, who will then notify you. This dose will also be included in the annual dose report that is sent to you and reports all doses you received during the year.

WHAT HAPPENS TO RADIOACTIVE MATERIAL IN THE BODY?

Depending upon the type of intake, the material behaves differently in the body. The physical and chemical form of the material determines how it will be taken up, retained, and excreted. Some materials that may be ingested will pass through the digestive system with very little absorption.

For inhalation intakes, some material is rapidly removed from the lungs to the digestive track and excreted in feces (similar to an ingestion intake), while some of the material may be retained in the lungs, distributed by the blood to cells, and slowly excreted over a period of time.

IS AN INTERNAL EXPOSURE WORSE THAN AN EXTERNAL EXPOSURE?

From a dose perspective, if you receive a 10 mrem dose from either external or internal sources, it is still a 10 mrem dose. An internal exposure can be worse than an external exposure from the standpoint of the ability of the worker, contractor or DOE to limit or control the ongoing dose. Unlike an external exposure, which can be limited or controlled once detected (by reducing the time of exposure, increasing the distance between the worker and the radioactive material, or increasing shielding) an internal exposure will continue to provide a dose while the radioactive material is in the body.

Internal doses can be harmful if taken up by your cells, tissues or organs. The effect of an internal dose is related to the amount of material retained inside the body, where it goes and what type of radiation it emits.
Bioassays are measurements of radioactivity in the human body, and can include whole body counts, chest counts, wound counts, urinalysis, and fecal sample analysis. A combination of tests may be performed depending upon the radionuclides and how or where you were potentially exposed.

Provide bioassay samples as requested and attend all wound, whole body, or chest count appointments. For in-home sample collection, it's important to ensure your company has your current home address to ensure the kit is delivered to you.

Results of wound, chest, and whole body counts are available upon completion of the count. Urine and fecal samples are sent to an independent laboratory for analysis. It can take up to six weeks for results to be sent to your company's dosimetry point of contact, who will then notify you of the results.

Your company's dosimetry point of contact will let you know which bioassays are best for your particular situation. Your Dosimetry Operations group will schedule the specified bioassays for you.

If the results of the bioassay indicate a potential occupational intake, further evaluation may be required. The results of the evaluation will be shared with you by your company’s dosimetry point of contact, who can answer questions and address concerns you may have. Any exposure level will be documented in your personal radiation history file. If there is no intake, you'll be notified via letter.

There’s debate about just how much radiation exposure is safe. Government agencies have established limits based on extensive scientific research and recommendations from national and international organizations. At very low exposures, the estimated risks are very small. In order to limit personal exposure, we have robust monitoring systems and take action when low levels of radiation are detected.

Worker safety and health is the number one priority of the Department of Energy and Hanford contractors. Contamination from nuclear materials production work in the past poses the potential for exposure to radiological hazards in some areas of the Hanford Site.

**Exposure could result from:**
- Being in an area where contamination has spread
- Having hazardous material on your body absorbed through the skin
- Inhaling contaminants
- Having on open wound on your body while in a contamination area

A key safety focus for the Department of Energy (DOE) is to protect personnel from radiation by maintaining worker exposures below levels set by the federal government. DOE and its contractors strive to keep exposures to levels that are as low as reasonably achievable (a.k.a., ALARA).

Workers in areas of potential exposure are protected with personal protection equipment and closely monitored with an array of systems that measure the ambient air, the work area and personal exposure. If the monitoring systems detect radiation, workers may be asked to undergo a bioassay, an analytical test to determine if any exposure has occurred. You may also request a bioassay.

**CONTACTS:**
- CHPRC Dosimetry: 373-5812
- MSA Dosimetry: 373-1295
- WRPS Dosimetry: 373-0552

If your organization or company is not listed above, contact MSA Dosimetry.