

# Understanding Your Annual Radiation Exposure Report

The Radiological Protection Department of Savannah River Nuclear Solutions, LLC, has provided this information to help you understand your Annual Radiation Exposure Report. If you have questions concerning your Annual Radiation Exposure Report, contact your Radiological Protection manager.

Savannah River Nuclear Solutions, LLC, provides radiological protection services and oversight at the Savannah River Site (SRS). These services include radiation dose measurements for persons who enter areas where they may be exposed to radiation or radioactive material. The results are periodically reported to monitored individuals.

The results listed are based on a radiation dose system developed by the International Commission on Radiation Protection. The system uses the terms “effective dose,” “equivalent dose” and units of rem. You may be more familiar with the term “millirem” (mrem), which is 1/1000 of a rem.

Every attempt has been made to make your annual report complete and accurate. In the report, a zero means you were monitored and no dose was measured. If “NM” appears, it means “not monitored” for that type of exposure.

If you have concerns or questions about the information provided, you are encouraged to talk to your Radiological Protection manager, who can answer many of your questions and obtain any additional information that you might need.

## Occupational Exposure

You may receive radiation exposure as a result of your occupation. The source of the radiation can be from outside of your body (external exposure) and from radioactive materials taken into your body (internal exposure).

At SRS, radiation dose from external sources is measured by dosimeters (TLDs). Bioassay samples, personal air samples (PAS), whole body counts, and chest counts are used to determine the dose from radioactive materials inside your body. Radioactive materials may remain inside the body for an extended period after an intake occurs. The length of time depends on the particular type of radioactive material. In your report, doses are listed by type (external, internal from tritium and internal from other radionuclides) to give you additional insight.

If you have worked at other sites, you may have received additional occupational radiation exposure. Offsite occupational exposures that have been reported to SRS are also included in your report.

The total effective dose is the best number to use to evaluate your radiation dose for the past year. Federal limits for occupational radiation exposure have been established for your protection.

### Annual Dose Guidelines

*values in rem/year*

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#### Total Effective Dose

Federal Limit	5.0
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#### Equivalent Dose to Skin and Extremities

Federal Limit	50.0
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#### Equivalent Dose to the Lens of the Eye

Federal Limit	15.0
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## Other Exposures

For comparison with the occupational exposures identified in your report, the National Council on Radiation Protection and Measurements now estimates that the average radiation dose per person in the U.S. is about 0.620 rem per year. Of the 0.620 rem average per year, approximately half comes from natural sources, and the other half comes from man-made sources.

Natural sources of radiation exposure are radon in the air, cosmic rays and the Earth’s crust. Man-made sources include medical procedures, consumer products, industrial and occupational. Of these natural background sources, radon in the air accounts for most of the average radiation dose, while medical procedures such as diagnostic x-rays and nuclear medicine imaging account for most of the man-made radiation exposure.

## Definitions of Terms

Some of the terms used in your annual radiation exposure report may be unfamiliar to you and several of the definitions were modified in 2010. Definitions of some of these terms are provided here for your information. If you have questions about these or other terms in your report, you are encouraged to talk to your Radiological Protection manager.

### **Radiation**

Energy released from an atom. The most significant types of radiation encountered at SRS are alpha particles, beta particles, gamma rays, x-rays, and neutrons.

### **Radioactive**

A term to indicate when an isotope of an element is unstable and the atoms emit radiation to reach a more stable state

### **Radionuclides**

A general term for radioactive isotopes when considering more than one element

### **Tritium**

A radioactive isotope of hydrogen

### **Dose**

A general term for the amount of radiation a person has received

### **Equivalent Dose**

The dose modified to account for the type of radiation and its potential effect on the body. Neutrons and alpha particles cause more damage in tissue than gamma rays or beta particles and are weighted more heavily. The equivalent dose is reported in units of rem.

### **Effective Dose**

The weighted equivalent dose for the whole body. It takes into account variations in dose and sensitivity to radiation for the different parts (or organs) of the body. It gives the best single measure of a person's radiation exposure. It is reported in units of rem.

### **Total Effective Dose**

The effective dose from all occupational sources for the year

### **Lifetime Occupational Dose**

The cumulative total effective dose you have received while at work. This includes current exposures at SRS, plus exposures from all previous employment.

### **Internal Dose**

The committed effective dose (CED) due to radioactive materials deposited in your body during the year. The CED includes all the dose you will receive from an intake over the next 50 years.

### **Equivalent Dose to the Lens of the Eye**

The dose that your eye received during the year. People with radionuclides in their body may receive an effective dose but little eye dose.

### **Equivalent Dose to the Skin**

The dose that your skin received during the year. People with radionuclides in their body may receive an effective dose but little skin dose.

### **Equivalent Dose to the Extremities**

The maximum dose received by any one of your extremities during the year. An extremity is a hand or arm below the elbow or a foot or leg below the knee. When these extremity locations are not directly monitored, the value assigned is equal to the Equivalent Dose to the Skin from the whole body TLD.