

# Applications of Nuclear Science and Technology in Modern Society

## Typical Examples of Applications

### Medicine

One-third of patients in U.S. hospitals receive treatments or tests involving nuclear medicine.

Radioactive materials reduce need for prostate surgery.

Radioisotopes are used to test drugs, as part of development and licensing process.

Radiation is used to sterilize surgical instruments and medical supplies.

### Industry

Radioisotope gauges help control thickness of paper and sheet metal and fluid levels.

Radiation is used to toughen plastics and electronic components.

Radiography is used to check welds and find defects in castings.

Radioisotopes are used to measure wear and corrosion and trace fluid flow.

### Consumer

### Products

Radiation is used to toughen rubber for tires.

Photocopiers use small amounts of radiation to prevent paper from sticking together.

Cosmetics, hair products and contact lens solutions are sterilized with radiation.

Radioisotope gauges help control manufacturing processes to improve quality control.

### Scientific

### Research

Radioisotopes are essential to biomedical research on AIDS, cancer, Alzheimer's disease.

Exploration of deep space would be impossible without small nuclear powered generators.

Radionuclides are essential for genetic research and determining the structure of DNA.

Human, animal, and plant physiology measurements use radioactive tracers.

### Agriculture

Radioisotopes are used to reduce post-harvest losses by suppressing sprouting.

Radiation is used to preserve seeds and food products.

Radioisotopes help researchers as they develop disease-resistant plants and animals.

Radioisotope methods are used in hydrology to study and predict water supply.

Radiation techniques in pest control reduce the use of toxic chemicals.

### Law Enforcement

### & Public Safety

Radiation is used to scan luggage and in detectors for explosives.

Public Safety Small radioisotope sources enable smoke detectors to function.

Radiation is used to decontaminate mail suspected to have anthrax.

### Environmental

### Protection

Radioisotope techniques are essential to climatological investigations related to global warming.

Solid wastes and sewage can be treated with radiation techniques instead of toxic chemicals.

The chronology of contaminated river and lake sediments is studied using radioisotope techniques.

Radionuclides help in the investigation of plant and sea assimilation of greenhouse gases.

### Energy

Nuclear power generates electricity in a non-polluting, environmentally benign manner.

Nuclear technologies help provide information to increase efficiency of other energy technologies.

