Nuclear Technology Creates Careers

American Nuclear Society

An invisible public servant

Scientists in the 1940s harnessed the atom, our invisible servant, and soon put it to work improving our everyday lives. The atom helps doctors diagnose illnesses and helps archaeologists find the age of ancient artifacts. The atom also is used in treating wood, automobile tires, and cloth (such as wash and wear pants) to make them last longer.

The harnessed atom has created jobs in such areas as agriculture, medicine, space exploration, architect/engineering, industry/manufacturing, government, geology (including mining), ecology, and education.

Electricity produced by nuclear fission—splitting the atom—is one of its greatest uses. A reliable source of electricity is needed to give us light, help to groom and feed us, and to keep our homes and businesses running. Nuclear power plants supply about 20 percent of America's clean, dependable energy.

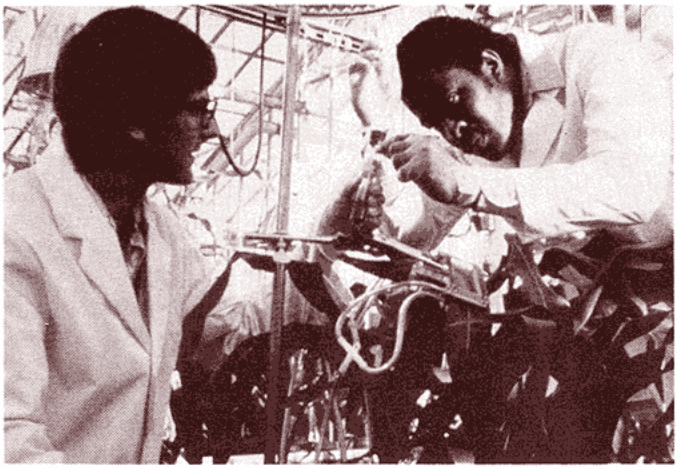
Reactor operators and engineers are involved in control room operations of nuclear plants.

A challenge to meet

If you have imagination, initiative, and the desire to succeed, you could join the many achievers who have used the atom to solve world-wide problems. The atom has been used to:

Technicians perform laboratory tests and chemical analyses using radioisotopes.

- Diagnose and treat illnesses.
- Kill bacteria and preserve food without chemicals and refrigeration.
- Process sludge for fertilizer and soil conditioner.
- Locate underground natural resources and tell a dry hole from a gusher.
- Make smoke detectors, non-stick frypans, and ice cream.
- Grow stronger crops.
- Solve crimes.
- Explore and work in space, to power satellites and provide future electrical needs for laboratories with people on board.
- Design instruments, techniques, and equipment. Measure air pollution.
- Prove works of art were really done by a certain artist.



In agriculture, scientists work with radioisotopes to reduce pests and improve crop yields.

Researchers, welders, economists, computer technologists, archaeologists, nuclear engineers, radiologists, and health physicists are just a few of the people who can have jobs related to the atom.

The right stuff

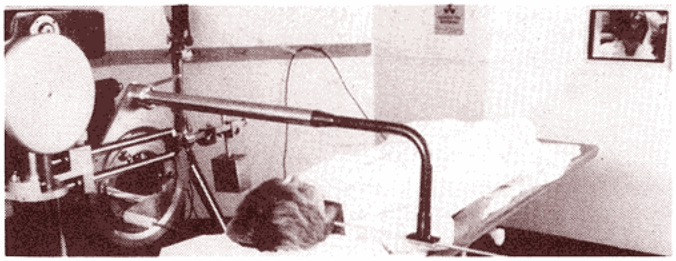
Opportunities are there for everyone. Education and training needed for a career in nuclear science depend on what you'll be doing. Skilled and semi-skilled workers, such as craftworkers, often are trained on the job. There, they build or repair systems, or make parts designed by engineers and scientists.

Here are some brief looks at other jobs related to uses of the atom within four job categories:

Technicians help engineers and scientists run equipment, set up experiments, collect data, and write reports. For example, health physics technicians check radiation levels and train workers to use protective equipment. Instrumentation technicians install and test electronic equipment. X-ray technicians work with patients in hospitals.

To be a technician you should enjoy teamwork and working with equipment. You also should be able to organize information that can be measured and check its accuracy. If this sounds challenging to you, a two-year college degree and some on-the-job training will have you well on your way to a career as a technician.

Technologists help turn engineering ideas into plans to solve technical problems. For example, gamma facilities operators use gamma radiation to kill germs in food and medical supplies that must be sterilized. Nuclear medical technologists do nuclear medicine tests in hospitals. Reactor operators run the controls at a nuclear plant to produce electricity.



Nuclear medicine technologists give patients radiation therapy as prescribed by a radiologist.

Two to four years of college are generally needed for this job category. (Reactor operators also must earn a license from the Nuclear Regulatory Commission.) If you like to work with details and to solve problems, this may be the career path for you.

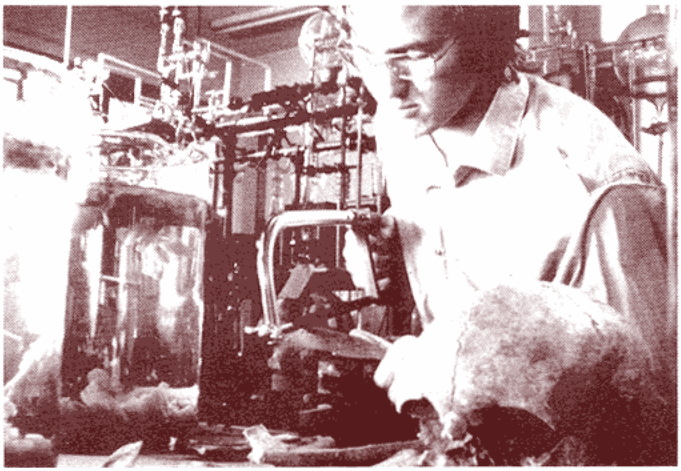
Engineers turn scientific discoveries into useful products or systems. Curiosity and the ability to visualize and reason abstractly are important qualities for the engineer. In nuclear-related jobs, engineers may work indoors or outside. They may travel, be involved in sales, government regulation, communications, design work, teaching, checking the effects of various activities on the local environment, or developing new ways to manage waste disposal. They may work in electronics, human factors (finding ways to improve how jobs are done), and many other areas. Four years of college are needed, and a graduate degree is desirable.

Scientists investigate "why" things happen by doing experiments, and forming and testing their theories. They must have at least four years of college. A specialized graduate degree is almost always required.

Paleontologists and archaeologists study the age of rocks and

artifacts (such as pottery and art masterpieces) by using radioactive elements. Research scientists work on projects such as a current one that involves treating the HIV virus (which leads to AIDS) with radiation. The irradiated virus will then be tested as a vaccine to prevent the AIDS disease from developing in persons already infected. Computer scientists, crop scientists, chemists, nuclear physicists, and all other scientists working with nuclear technology should have patience, a strong sense of curiosity, and, in general, be interested in helping others.

Strong backgrounds in science and math are required for engineers and scientists. Technologist and technician jobs also need at least some math and science education. In addition, persons in all these jobs need communication and business skills. It's important to be able to explain your ideas, research, and projects to managers, and to people not involved in nuclear science and technology work.



Archaeologists work with radioisotopes to find the age of items such as skeletons.

A path to the top

In general, salaries in nuclear-related work are better than average. In 1991, nuclear engineers with a bachelor's degree started at an average yearly salary of about $35,000. Nuclear engineers with a master's degree started at around $37,000. Salaries for engineers and scientists depend on such things as education, experience, location, and employer.

Technicians and technologists are paid according to their skills and experience. In 1991, science or engineering technicians and technologists earned on the average about $23,000. Skilled craftworkers (in technical and maintenance jobs) normally are union members. Their hourly pay reflects this, and the special skills or knowledge needed in their jobs.

Employment in civilian nuclear activities is estimated at approximately 300,000 persons. Many future job openings will be in nuclear engineering. This is due mainly to the large number of nuclear scientists and engineers nearing retirement age.

Openings in medical and industrial areas involving use of the atom will depend on the area concerned. In many locations, health physicists and radiologists are heavily in demand.

Advancement opportunities are excellent. For example, one person started as an electrical engineer, and now is president and chief executive officer of a large eastern utility. There are politicians and medical doctors who have nuclear engineering degrees.

By the end of this century, there will be a national shortage of 400,000 scientists and 275,000 engineers overall. At the same time, the nation's workforce will consist of 85% minorities including all women. There is a very real need for more young people to consider science and energy careers.

Some help to get there

Students interested in nuclear science and technology careers can get financial aid and scholarships. Some groups that give such support are:

- American Nuclear Society, 555 N. Kensington Ave., La Grange Park, IL 60526; 708/352-6611. ANS gives awards and scholarships based on financial need, achievement, and study in special nuclear fields.
- Institute of Nuclear Power Operations, Training and Education Division, 1100 Circle 75 Parkway, Suite 1500, Atlanta, GA 30339; 404/953-3600. INPO has an educational assistance program funded by the nuclear utility industry.

- The program offers scholarships in engineering and health physics fields.
- Society of Nuclear Medicine, 136 Madison Ave., New York, NY 10016-6760; 212/889-0717. The society funds research grants for students doing nuclear medicine-related projects.
- Society of Women Engineers, United Engineering Center, Room 305, 345 E. 47 St., New York, NY 10017; 212/705-7855. SWE offers undergraduate scholarships for women entering the engineering field.

With each decade, resources lessen...new diseases surface...and new problems are added to those left from past generations. Nuclear technology can be used to help solve many of these problems; and skilled men and women are needed to help with the tasks that lie ahead.

When you choose a career involving the nuclear sciences, you can look forward to a promising future in an exciting and growing field.