



HEALTH
PHYSICS
SOCIETY

WHAT IS AN HP?

POSITION STATEMENT OF THE HEALTH PHYSICS SOCIETY*

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Health physics, also referred to as the science of radiation protection, is the profession devoted to protecting people and their environment from potential radiation hazards, while making it possible to enjoy the beneficial uses of radiation. Health physicists normally require a four-year bachelor's degree and qualifying experience that demonstrates a professional knowledge of the theory and application of radiation protection principles and closely related sciences.

The Health Physics Society (HPS)* has adopted the above position defining health physics and the qualifications to be a health physicist. This position statement—"What Is an HP?"—provides detail on the definition of the health physics profession¹ and highlights careers in health physics and related job requirements, including both education and experience.

Health physics is the profession devoted to protecting people and their environment from potential radiation hazards, while making it possible to enjoy the beneficial uses of radiation. Health physicists may be scientists, engineers, or physicists who specialize in radiation biology, applying scientific understanding of the physical interaction of radiation with the body and environment to maintain protection from the potential hazards of ionizing and nonionizing radiation. Health physicists may work in a variety of fields, including research, industry, education, medical facilities, nuclear power, military, environmental protection, enforcement of government regulations, and decontamination and decommissioning—the combination of education and experience for health physicists depends on the specific field in which the health physicist is engaged.

Due to the broad employment fields and the multidisciplinary nature of the work, health physics involves an understanding of many disciplines, such as physics, biology, biophysics, engineering (radiological, nuclear,

¹ For more information on health physics and radiation protection, visit the Health Physics Society (www.hps.org), National Council for Radiation Protection and Measurements (<http://www.ncrponline.org/>), or International Commission on Radiological Protection (<http://www.icrp.org/>) websites.

civil, mechanical, and/or electrical), chemistry, genetics, ecology, geology, environmental sciences, metallurgy, medicine, pharmaceutical sciences, physiology, and toxicology. Career fields in health physics², as discussed above, are necessarily multidisciplinary in nature. Although health physicists typically concentrate in one of the many career fields, a professional health physicist typically performs duties in several areas and across several disciplines. For example, in research, health physicists investigate principles by which radiation interacts with matter and living systems (radiation biology, epidemiology, etc.) to develop radiation protection standards for personnel and safe working methods.

Health physicists also study environmental levels of radioactivity and the effects of radiation on biological systems, such as assessing the environmental impact of released radionuclides. This information is used in many ways, ranging from designing radiation detection instrumentation to establishing radiation protection standards. Decommissioning health physics is a growing area of health physics that involves radiological survey design and execution, proper selection of radiation instrumentation for field applications, and environmental dose modeling and statistics to demonstrate that the release criteria for the project were met.

Applied health physicists draw upon their technical knowledge and varied experience to advise and make recommendations to management regarding methods and equipment for use in radiological work. Health physicists also assist engineers and scientists in designing facilities and new radiation control programs—e.g., performing radiation shielding calculations and routinely performing dosimetry measurements and calculations, such as internal dose calculations from the intake of radionuclides.

Power reactor health physicists are responsible for all phases of radiation protection at a reactor site, including radiological engineering, radiological surveys, and internal and external dosimetry as part of the nuclear plant's radiation protection program.

Medical health physicists work in hospitals, clinics, and major medical centers that use radiation sources for diagnosis and therapy including x-ray machines, particle accelerators, lasers, and many types of radioactive materials. Medical health physicists ensure proper and safe working conditions for patients and medical staff as well as ensuring safe condition for visitors and the general public.

Health physicists working in education develop and instruct training programs for future health physicists. Health physics education programs include courses in health physics, engineering, radiological science, chemistry, physics, biology, mathematics, and calculus. Training for health physics technicians is also available from schools that offer two-year associate degrees.

Health physicists who work in regulatory enforcement must have knowledge and experience concerning all types of radiation hazards to establish guidelines for adequate radiation protection.

² Refer to careers in health physics at <http://hps.org/publicinformation/hpcareers.html>

The US Office of Personnel Management (OPM) Health Physics Series (1306) offers guidance on Individual Occupational Requirements for health physicists:

Basic Requirements:

- A. Degree: natural science or engineering that included at least 30 semester hours in health physics, engineering, radiological science, chemistry, physics, biology, mathematics, and/or calculus.
or
- B. Combination of education and experience: courses as shown in A above, plus appropriate experience or other education; or certification as a health physicist by the American Board of Health Physics, plus appropriate experience and other education that provided an understanding of sciences applicable to health physics comparable to that described in paragraph A.

This HPS position statement recommends the following additional educational and experience requirements for health physicists. At a minimum, a four-year bachelor's degree is normally required to qualify as a health physicist. Specifically, 30 semester credit hours offered in fulfillment of a standard four-year professional curriculum leading to a bachelor's degree in science or engineering at an accredited college or university from the following courses: health physics, physics, chemistry, biology, radiation biology, physiology, ecology, calculus, engineering, public health/industrial hygiene, toxicology, and radiological science. To qualify, the bachelor's degree coursework must involve the study of natural and man-made radiation sources, the distribution of radioactivity in the environment, radiation detection and measurement, radiation shielding, exposure pathways, and the effects of radiation on the human body.

Qualifying experience involves the establishment of radiation dose limits, implementation of radiation controls, the justification of radiation exposures, and the optimization of protection practices. This experience must demonstrate a professional knowledge of the theory and application of radiation protection principles and closely related sciences such as industrial hygiene and engineering controls. Such work must have involved experience in all of the following areas: inspecting workplaces that use radioactive materials; monitoring radiation levels; assessing environmental levels of radioactivity; evaluating the effects of radiation on biological systems; acquisition and analysis of quantitative and qualitative data; selection and recommendation of appropriate controls, including management, medical, engineering, education or training, and personal protective equipment; and establishing and enforcing radiation protection standards and regulations.

Certification from the American Board of Health Physics is acceptable to be qualified as a health physicist.

*The Health Physics Society is a nonprofit scientific professional organization whose mission is excellence in the science and practice of radiation safety. Since its formation in 1956, the Society has represented the largest radiation safety society in the world, with a membership that includes scientists, safety professionals, physicists, engineers, attorneys, and other professionals from academia, industry, medical institutions, state and federal government, the national laboratories, the military, and other organizations. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. Society members are involved in understanding, evaluating, and controlling the potential risks from radiation relative to the benefits. Official position statements are prepared and adopted in accordance with standard policies and procedures of the Society. The Society may be contacted at 950 Herndon Parkway, Suite 450, Herndon, VA 20170; phone: 703-790-1745; fax: 703-790-2672; email: HPS@BurkInc.com.