



## Texas Radiation Advisory Board

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Chair

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June 8, 2004

Mr. Tony Garrant  
Acting State Classification Officer  
Office of the State Auditor  
P.O. Box 12067  
Austin, TX 78711-2067

Dear Mr. Garrant:

I am writing to forward to you the recommendations of the Texas Radiation Advisory Board (TRAB) as it pertains to establishing a Health Physicist Classification. The TRAB, as directed by statute, makes recommendation about radiation issues to state departments that have responsibilities in those areas.

TRAB has recommended to the Governor and the Texas Health and Human Services Commission, that the state establish a Health Physicist Classification in order to aid in recruiting and retaining a qualified workforce of radiation specialists. These individuals are employed in the Texas Department of Health and the Texas Commission on Environmental Quality and any other agency that requires radiation safety staff.

Currently, the Texas Department of Health has experienced a 51% turnover rate (2000-2004) of radiation staff employed as Environmental Specialists. Clearly, this classification and compensation level is not attracting and retaining the necessary expertise. Lack of a qualified staff can jeopardize the radiation safety of this state as well as Homeland Security with respect to control of radioactive materials, terrorist threats and other radiation emergencies.

I understand the Health and Human Services Commission has forwarded you a request to establish a more appropriate job classification — the need for which was also brought to the attention of the Governor's office during December 2003. At that time, representatives of the Texas Department of Health and the Governor's office staff agreed to work toward this new classification as one of the long-term solutions to the difficulties the state is having in maintaining this radiation workforce. I am enclosing the suggested language for the positions, for your reference.

Please contact me if you have questions or need further information. The TRAB believes it is in the best interest of the state to establish the Health Physicist Classification. We encourage your favorable decision when you make your recommendations about the operation and improvement of the Classification Plan to the Governor and the Legislature.

Very truly yours,  
Original signed by:

Michael S. Ford, C.H.P.  
Chair

Salary Group B13

## **HEALTH PHYSICIST I**

### GENERAL DESCRIPTION

Performs complex health physics work. Work involves evaluating, inspecting, surveying, or investigating entities to ensure compliance with radiation control, health and safety, and environmental laws. Measures emissions from different types of radiation and radioactive materials; determines and predicts the movement of radioactivity through the environment; and evaluates plans and facilities for radiologically safe equipment, processes, and environments. Performs as member of radiological emergency response team. May train others. Works under general direction with moderate latitude for the use of initiative and independent judgment.

### EXAMPLES OF WORK PERFORMED

Independently performs and/or coordinates complex and comprehensive scientific and technical review of radiation safety plans and facilities.

Prepares authorizations and permits upon determination that proposed operations meet regulatory limits for radiation exposure to the public and environment.

Ensures compliance with applicable radiation control laws and regulations for protection of the public and environmental against harmful effects of radiation.

Evaluates radiation safety and operating manuals.

Analyzes shielding designs of radiation facilities.

Evaluates and monitors releases of radiological emissions to the environment.

Evaluates radiation safety training of individuals and radiation safety courses and instructors.

Participates as a member of radiological emergency response team.

Assists in development of guidelines, rules, policies, and procedures based upon health physics knowledge and radiation control functions and statutory authority.

May provide testimony in legal proceedings on complex health physics issues related to radioactive materials and/or radiation producing devices.

Performs calibration of radiation detection equipment. Process and calibrates detection devices used in environmental surveillance.

Performs radiological and environmental surveillance of facilities and the environment.

May train others.

May assign and/or supervise the work of others.

May be exposed to radiation and may be required to handle source of radiation safely.

Performs related work as assigned.

## GENERAL QUALIFICATION GUIDELINES

### **Experience and Education**

Experience in health physics and radiation sciences and/or nuclear engineering. Graduation from an accredited four-year college or university with major course work in health physics, nuclear or environmental engineering, environmental or natural sciences, or related field is generally preferred. Experience and education may be substituted for one another.

### **Knowledge, Skills, and Abilities**

Knowledge of radiation control, health physics, and related environmental policies, procedures, and practices; function, design, and operation of equipment used in radiation detection, measurement, or environmental monitoring.

Skill in the use of radiation detection, monitoring, and measuring instruments; in the collection of soil, water, air, and other environmental samples; and in radiological computer applications.

Ability to interpret and use radiation shielding designs and radiological and statistical data; to communicate technical information at an appropriate level; to detect and evaluate radiation hazards.

Salary Group B14

## **HEALTH PHYSICIST II**

### GENERAL DESCRIPTION

Performs advanced technical health physics duties. Work involves conducting advanced inspections, investigations or surveys to ensure compliance with health and safety, and environmental laws; and evaluating applications requests for public health and safety, and environmental impact. Measures emissions from different types of radiation and radioactive materials; determines and predicts the movement of radioactivity through the environment; and evaluates plans and facilities for radiologically safe equipment, processes, and environments. Performs as member of radiological emergency response team. May train others. Works under limited direction with considerable latitude for the use of initiative and independent judgment.

### EXAMPLES OF WORK PERFORMED

Independently performs and/or coordinates advanced and comprehensive scientific and technical review of radiation safety plans and facilities, including financial security estimates for decommissioning, sealed radioactive source and device approvals, evaluation of shielding and operating procedures.

Prepares authorizations and permits upon determination that proposed operations meet regulatory limits for radiation exposure to the public and environment, including those for use of radioactive material, x-ray and nonionizing radiation devices, and mammography.

Provides oversight of industrial radiography certification process, including preparation of technical radiation safety examinations and training manuals.

Plans and conducts advanced inspections and investigations of installed x-ray equipment, nonionizing radiation devices, and facilities where radioactive materials are used or stored. May also perform advanced/or highly advanced inspections and investigations.

Ensures compliance with applicable radiation control laws and regulations for protection of the public and environmental against harmful effects of radiation.

Evaluates advanced radiation safety and operating manuals.

Analyzes advanced shielding designs of radiation facilities.

Conducts advanced evaluations of and monitors releases of radiological emissions to the environment.

Evaluates design of devices containing radioactive materials.

Evaluates radiation safety of individuals and radiation safety courses and instructors.

Participates as a member of radiological emergency response team.

Assists in development of advanced guidelines, rules, policies, procedures based upon health physics knowledge and radiation control functions and statutory authority. Develops, recommends, and implements policies, procedures, and guidelines.

May provide testimony in legal proceedings on advanced health physics issues related to radioactive materials and/or radiation producing devices.

Performs calibration of radiation detection equipment. Process and calibrates detection devices used in environmental surveillance.

May perform peer review of inspection reports or permitting actions for quality assurance.

Conducts quality assurance on radiological instrument calibration, reviews and updates local radiological emergency plans and conducts, plans and coordinates emergency exercises and drills for local emergency responders.

May schedule and coordinate public involvement activities. Prepares cases for legal actions including licensing and enforcement hearings; prepares and provides testimony in administrative hearings and court cases on health physics issues.

Consults and coordinates with representatives of other state and federal radiation control, security, and emergency agencies, special interest groups, the public, or department personnel on radiation and environmental issues.

Prepares and approves correspondence, technical reports, environmental assessments, impact statements, or programmatic assessments.

May assign and/or supervise the work of others.

May be exposed to radiation and may be required to handle source of radiation safely.

Performs related work as assigned.

## GENERAL QUALIFICATION GUIDELINES

### **Experience and Education**

Experience in health physics and radiation sciences and/or nuclear engineering. Graduation from an accredited four-year college or university with major course work in health physics, nuclear or environmental engineering, environmental or natural sciences, or related field is generally preferred. Experience and education may be substituted for one another.

### **Knowledge, Skills, and Abilities**

Knowledge of radiation control, radiological health, and environmental laws and regulations, and of relevant radiation safety practices and techniques.

Skill in the use of radiation detection, monitoring, and measuring instruments; in the collection of soil, water, air, and other environmental samples; and in radiological computer applications, including computer-aided radiological evaluation and dose modeling techniques; and in the use of research techniques.

Ability to train others; to communicate effectively; to interpret laws and regulations; to apply health physics and other scientific principles; and to detect and evaluate radiation and public health hazards.

Salary Group B15

### **HEALTH PHYSICIST III**

#### GENERAL DESCRIPTION

Performs highly advanced health physics and radiation control work. Work involves conducting highly advanced inspections, surveying or investigating facilities using sources of radiation to ensure compliance with radiation safety and environmental laws. Conducts highly advanced evaluations for proposed facilities, sources and devices, and operating procedures for radiological and environmental impacts, including public health and safety. Develops of emergency response procedures for radiological emergencies. Measures emissions from different types of radiation and radioactive materials; determines and predicts the movement of radioactivity through the environment; and evaluates plans and facilities for radiologically safe equipment, processes, and environments. Performs as member of radiological emergency response team. May train others. May supervise the work of others. Works under minimal supervision with considerable latitude for the use of initiative and independent judgment.

#### EXAMPLES OF WORK PERFORMED

Performs and coordinates independent advanced and highly advanced scientific and technical review of plans and facilities and production of draft permits for applications for and renewals and amendments of radioactive material licenses, including financial security estimates for decommissioning, sealed radioactive source and device approvals, and registrations of technologically advanced x-ray and laser facilities, including evaluation of shielding and operating procedures.

Prepares authorizations and permits upon determination that proposed highly advanced operations meet regulatory limits for radiation exposure to the public and environment.

Oversees or reviews, analyzes, and coordinates the conduct of advanced and highly advanced inspections, field surveys, radiological and environmental assessments, or investigations to ensure compliance with applicable state and federal radiation control, environmental, and public health laws, rules, regulations, and policies and procedures. Plans and conducts highly advanced inspections and investigations of installed x-ray equipment, nonionizing radiation devices, and facilities where radioactive materials are used or stored.

Ensures compliance with applicable radiation control laws and regulations for protection of the public and environmental against harmful effects of radiation.

Evaluates highly advanced radiation safety and operating manuals.

Analyzes highly advanced shielding designs of radiation facilities.

Evaluates and monitors releases of radiological emissions to the environment.

Evaluates design of devices containing radioactive materials.

Evaluates radiation safety of individuals and radiation safety courses and instructors.

May provide testimony in legal proceedings on highly advanced health physics issues related to radioactive materials and/or radiation producing devices.

Designs highly advanced monitoring programs and performs routine and special radiological environmental surveillance.

Performs and provides oversight of calibration of radiation detection equipment. Process and calibrates detection devices used in environmental surveillance. Conducts quality assurance on radiological instrument calibrations.

Performs risk assessments based on quantitative relationships between radiation exposure and biological damage.

Develops, designs, directs, monitors or completes coordination of radiation safety programs, issues, and mitigation.

Performs emergency response planning and implementation activities for radiological emergency events at nuclear power plants, radioactive waste facilities, and/or nuclear weapons facilities, or radiological emergencies involving transportation or terrorist activities. Conducts, plans and coordinates emergency exercises and drills for local emergency responders. Coordinates actual emergency response procedures in and response to radiological accidents, incidents and acts of terrorism involving radioactive materials.

Reviews, evaluates, monitors, or approves scientific projects, consultant work or special programs involving radiological health or health physics. Evaluates and provides radiation exposure assessments and risk assessments on various uses of radiation; provides technical assistance to public, regulated community, and staff concerning risk from sources of radiation. May prepare scopes of work or requests for proposals for radiological health or environmental studies.

Evaluates radiological or environmental impact of facilities, products, or transportation activities.

Plans, develops, recommends, and implements policies, procedures, and guidelines.

Develops radiation rules, regulations, and guidance documents and public involvement procedures; researches and reviews environmental and radiological health documentation in the development of radiation control rules, guides, inspection, surveillance, investigation, and enforcement protocols, risk assessments and/or radiation safety examinations.

Provides oversight of industrial radiography certification process, including preparation of technical radiation safety examinations and training manuals. Evaluates statistical data in psychometric evaluation of radiation safety examinations; interprets results.

Performs peer review of inspection reports, permitting actions, or other highly technical reports for quality assurance and to assure compliance with radiation control, public health and safety, and environmental laws and rules.

Prepares and approves correspondence, technical reports, environmental assessments, impact statements, or programmatic assessments.

Coordinates with department staff, state or federal regulatory agencies and contracted professionals in radiological mitigation efforts or completes mitigation requirements.

Represents the agency regarding sensitive radiation control or radiological health issues.

Consults and coordinates with representatives of other state and federal radiation control, security, and emergency agencies, special interest groups, the public, or department personnel on radiation and environmental issues.

Participates as a member of radiological emergency response team.

May schedule and coordinate public involvement activities. Prepares cases for legal actions including licensing and enforcement hearings; prepares and provides testimony in administrative hearings and court cases on health physics issues.

May train others.

May assign and/or supervise the work of others.

May be exposed to radiation and may be required to handle source of radiation safely.

Performs related work as assigned.

## GENERAL QUALIFICATION GUIDELINES

### **Experience and Education**

Experience in health physics and radiation sciences and/or nuclear engineering. Graduation from an accredited four-year college or university with major course work in health physics, nuclear or environmental engineering, environmental or natural sciences, or related field is generally preferred. Experience and education may be substituted for one another.

### **Knowledge, Skills, and Abilities**

Knowledge of radiation control, radiological health, and environmental laws and regulations, and of relevant radiation safety practices and techniques.

Skill in the use of radiological laboratory and survey equipment; in radiological computer applications, including computer-aided evaluation and dose modeling techniques; and in the use of research techniques.

Ability to train others; to plan, assign, and/or supervise the work of others; to communicate effectively; to interpret laws and regulations; to apply health physics and other scientific principles; to detect and evaluation radiation hazards.

Salary Group B16

## **HEALTH PHYSICIST IV**

### GENERAL DESCRIPTION

Performs highly advanced and/or managerial health physics or health physics oversight work. Work involves planning and coordinating complex to highly advanced inspections, investigations, radioactive material and radiation machine application reviews, radiological emergency response, and radiological surveys. Evaluates uses of radiation for compliance with state laws and regulations and impact on public health and safety and the environment. Measures emissions from different types of radiation and radioactive materials; determines and predicts the movement of radioactivity through the environment; and evaluates plans and facilities for radiologically safe equipment, processes, and environments. May train others. May plan, assign, and/or supervise the work of others. Works under limited direction with extensive latitude for the use of initiative and independent professional judgment.

### EXAMPLES OF WORK PERFORMED

Independently performs and/or coordinates, manages, and/or provides oversight for highly advanced and comprehensive scientific and technical review of radiation safety plans and facilities, including shielding design and radioactive source and device design. Oversees the processing of radiation control permits and licenses, sealed radioactive source and device approvals, and financial security estimates for decommissioning.

Prepares or manages the preparation of authorizations and permits upon determination that proposed operations meet regulatory limits for radiation exposure to the public and environment.

Oversees or reviews, analyzes, and coordinates the conduct of complex and advanced inspections, field surveys, radiological and environmental assessments, or investigations to ensure compliance with applicable state and federal radiation control, environmental, and public health laws, rules, regulations, and policies and procedures.

Ensures compliance with applicable radiation control laws and regulations for protection of the public and environmental against harmful effects of radiation.

Participates as a member of radiological emergency response team.

Manages the development of highly advanced guidelines, rules, policies, procedures based upon health physics knowledge and radiation control functions and statutory authority.

May provide testimony in legal proceedings on complex health physics issues related to radioactive materials and/or radiation producing devices.

Performs or manages the performance of radiological and environmental surveillance of facilities and the environment. Evaluates and monitors releases of radiological emissions to the environment.

Performs risk assessments based on quantitative relationships between radiation exposure and biological damage. Evaluates radiological or environmental impact of facilities, products, or transportation activities.

Develops, designs, directs, monitors or completes coordination of radiation safety programs, issues, and mitigation. Plans, develops, recommends, and implements policies, procedures, and guidelines. Provides guidance on radiation rules, regulations, and public involvement procedures.

Oversees emergency response planning and implementation activities for radiological emergency events at nuclear power plants, radioactive waste facilities, and/or nuclear weapons facilities; or radiological emergencies involving transportation or terrorist activities. Reviews or manages the review of local emergency response plans and assists in their development; coordinates conduct of drills and exercises in conjunction with local officials.

Reviews, evaluates, monitors, or approves scientific projects, consultant work or special programs involving radiological health or health physics. May prepare scopes of work or requests for proposals for radiological health or environmental studies. Coordinates with department staff, state or federal regulatory agencies and contracted professionals in radiological mitigation efforts or completes mitigation requirements.

Consults and coordinates with representatives of other state and federal radiation control, security, and emergency agencies, special interest groups, the public, or department personnel on radiation and environmental issues. Represents the agency regarding sensitive radiation control issues.

Prepares and approves correspondence, technical reports, environmental assessments, impact statements, or programmatic assessments.

May schedule and coordinate public involvement activities.

May train others or manage the training of others.

May assign and/or supervise the work of others.

May be exposed to radiation and may be required to handle source of radiation safely.

Performs related work as assigned.

## GENERAL QUALIFICATION GUIDELINES

### **Experience and Education**

Experience in health physics and radiation sciences. Graduation from an accredited four-year college or university with major course work in health physics, nuclear or environmental engineering, environmental or natural sciences, or related field is generally preferred. Experience and education may be substituted for one another.

### **Knowledge, Skills, and Abilities**

Knowledge of radiation control functions and health physics, and related environmental policies, laws, procedures, and practices.

Knowledge of function, design, and operation of equipment used in radiation detection, measurement, and environmental monitoring.

Skill in the use of radiation detection, monitoring, and measuring instruments and techniques; and in radiological computer applications.

Ability to interpret and use facility designs and radiological and statistical data; to communicate technical information at an appropriate level; to detect and evaluate radiation hazards; and to evaluate radiation safety equipment, processes, and environments.

Ability to communicate effectively; to plan, design, and coordinate radiation control projects; and to plan, assign, and/or supervise the work of others.

**Texas Department of Health  
Bureau of Radiation Control  
Staff Retention, Training and Education**

## **Current Issues**

### **Regulatory Program:**

- Texas' radiation regulatory program is comprehensive and effective in protecting the public by ensuring the safety of diagnostic x-ray machines, including mammography and computed tomography, and therapeutic particle accelerators and lasers. There is no federal program that could protect the public if TDH discontinued the program.
- Texas is one of only three states that has an agreement with the U.S. Nuclear Regulatory Commission (NRC) that relinquishes authority to the state to regulate byproduct materials, uranium recovery and low-level radioactive waste (LLRW) disposal. There are currently 33 Agreement States. TDH is the lead radiation control agency in Texas, regulating all radioactive materials except the disposal of LLRW and disposal of naturally occurring radioactive material. In addition, TDH has regulated x-ray sources since the 1950's and was the first state to develop laser rules in the early 1970's.
- It is critical that Texas maintain an adequate radiation protection program compatible with programs of the federal government. If the NRC removed the Agreement status, licensee fees would quadruple.

### **Training:**

- Staff in the radioactive materials program were historically provided five specialized training courses by the NRC or contractors at no cost to the state. NRC discontinued funding of training courses in 1996. TDH is limited in its ability to pay for tuition and travel to the required training courses.

### **Salary:**

- Noncompetitive salaries further complicate the issues of retaining current staff and attracting new staff to replace retiring personnel. Currently, TDH is unsuccessful in hiring trained staff and has had a shortage of funds to train those without the specific skills needed. To compound this, the TDH has over 45 health physicists and senior management personnel that have retired or can retire in the near future. This will result in a loss of more than 650 years of radiation health physics experience.

## Potential Short Term Solutions

The Texas Department of Health is exploring short-term solutions that may improve staff recruitment and retention, including an internal option of classification changes for technical staff in the Bureau of Radiation Control.

## Potential Long Term Solutions

In order to maintain a quality program in Texas for the regulation of radiation sources in the future, additional funding resources are required for salaries, training and staff development. TDH would prepare an exceptional item request for the next Legislative Appropriation Request to provide funding, which would be recovered from increased fees, for:

- Creation of a new “Health Physicist\*” Classification through the State Classifications office with a career ladder similar to the level of the new Engineer classification.
- Implementation of a comprehensive intern program to attract bachelor’s and master’s level health physics students to careers in the state regulatory program.
- Provision of job-specific training for health physics staff.
- Implementation of a succession plan to assure that individuals have the knowledge and skills to advance to higher level positions as senior staff retire.

\*Health Physicists, specialists in radiation safety, have specific scientific and engineering skills in a number of disciplines as they apply to interactions of radiation with matter and the safe handling of sources of radiation. Their work assures the security of nuclear sources and prevention of terrorist use of radioactive materials. Health physics is a professional field that cuts across the basic physical, life, and earth sciences, as well as such applied areas as toxicology, industrial hygiene, medicine, public health, and engineering. The health physicist, therefore, must be competent in a wide spectrum of disciplines that bridge the fields between man and the physical, chemical, biological, and even social components of the environment, as well as a quantitative understanding of group phenomena. This requires specific health physics competency in an individual who will confidently approach a variety of challenges and devise solutions to problems.