

HB

150

SFIN

FILE

FISCAL NOTE

STATE OF ALASKA
2006 LEGISLATIVE SESSION

Fiscal Note Number: 2
Bill Version: CSHB 150(FIN)
(H) Publish Date: 2/27/06

Revision Date/Time (Note if correction): _____ Dept. Affected: _____
Title Licensing Radiological Technicians RDU Corp. Bus & Prof Licensing (117)
Component Corp. Bus & Prof Licensing
Sponsor Anderson
Requester Finance Component No. 2360

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Personal Services	28.7	28.7	28.7	28.7	28.7	28.7
Travel	0.0	0.0	0.0	0.0	0.0	0.0
Contractual	6.0	6.0	6.0	6.0	6.0	6.0
Supplies	1.0	1.0	1.0	1.0	1.0	1.0
Equipment	6.0	0.0	0.0	0.0	0.0	0.0
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	41.7	35.7	35.7	35.7	35.7	35.7

CAPITAL EXPENDITURES						
CHANGE IN REVENUES (1156)	77.4	0.0	71.4	0.0	71.4	0.0

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
1156 Receipt Supported Services	41.7	35.7	35.7	35.7	35.7	35.7
TOTAL	41.7	35.7	35.7	35.7	35.7	35.7

Estimate of any current year (FY2006) cost: 0.0
Check this box (X) if funding for this bill is included in the Governor's FY 2007 budget proposal:

POSITIONS

Full-time						
Part-time	1	1	1	1	1	1
Temporary						

ANALYSIS: (Attach a separate page if necessary)

This legislation establishes licensure for occupations relating to radiological technology. The division was advised that approximately 380 to 400 individuals will seek licensure under this bill. This fiscal note is based on the assumption there will be at least 400 licensees.

An explanation of the costs shown above is attached

Prepared by Jennifer Stricker, Chief Phone (907) 465-2144
Division Corporations and Licensing Date/Time 2/24/06 11:57 AM
Approved by William C Noll, Commissioner Date 2/24/2006
Agency Commerce, Community and Economic Development

FISCAL NOTE #2

STATE OF ALASKA
2006 LEGISLATIVE SESSION

BILL NO. CSHB 150(FIN)

ANALYSIS CONTINUATION

CSHB 150(FIN): An Act requiring licensure of occupations relating to radiological technology,

Total PERSONAL SERVICES: \$28.7

- Occupational Licensing Examiner position, PPT, Range 13

This fiscal note provides funding for half of an Occupational Licensing Examiner position to provide support to this licensing program. This fiscal note identifies funding for half of a position and a corresponding position count.

Total TRAVEL: \$0

Total CONTRACTUAL SERVICES: \$6.0

- Printing, postage, communication, and advertising costs, \$3.0
- Regulations-related costs to establish education criteria and standards, and other requirements; including AAG time, \$3.0

Information has been received that licensure examinations are available from The American Registry of Radiological Technologists. The division will seek to make arrangements with this organization for use of the licensing examinations.

Total SUPPLIES: \$1.0

To fund daily operating supplies of the program

Total EQUIPMENT (one-time costs): \$8.0

TOTAL FISCAL NOTE: \$41.7

REVENUE: Revenue will be generated by individuals who seek license under this bill. Based on 400 licensees, each licensee can be expected to pay direct costs of approximately \$194.00 (\$77.4 biennial costs divided by 400); in addition to indirect costs of approximately \$100.00 per person, for an approximate initial licensing fee of \$294.00 biennially. Licensing fees will be adjusted at the first renewal based on actual costs and actual numbers of licensees.

HB 150

was referred to the
Senate Finance
Committee

Hearing(s) were held

The bill did not move
from Committee

SENATE FINANCE COMMITTEE
5 / 7 / 2006 COMMITTEE ACTION

Bill Number	HB 150		
Amendment			
Motion	to report from Committee		
<u>Motion by</u>	Dyson		
<u>Objection by</u>	Hoffman		
Removed			
<u>Second Objection by</u>			
<u>Committee Member</u>	<u>Y</u>	<u>Vote</u>	<u>N</u>
Senator Bunde	✓		
Senator Dyson	✓		
Senator Hoffman			✓
Senator Olson			✓
Senator Stedman			✓
Co-Chair Wilken			✓
Co-Chair Green			✓
<u>Tally</u>			
Yea		2	
Nay		5	
Absent			
<u>MOTION</u>	Failed		

Alaska State Legislature

House of Representatives



Official Business

State Capitol
Juneau, AK 99801-1182

SPONSOR STATEMENT SCSCSHB 150 (L&C)

BY: Representative Tom Anderson

"An Act requiring licensure of occupations relating to radiologic technology, radiation therapy, and nuclear medicine technology; and providing for an effective date."

The Radiologic Health Science professionals in the State of Alaska are dedicated to the preservation of life and health as well as the prevention and treatment of disease. The use of x-rays and other medical imaging disciplines is the most acceptable method for discovering and treating many conditions that might not otherwise be observed until it is too late for treatment.

The unregulated practice of Radiologic Technology, Nuclear Medicine Technology and Radiation Therapy by unqualified individuals represents a serious health risk to the citizens of Alaska. The Alaska Society of Radiologic Technologists has consistently supported the enactment of state standards for the education and credentialing of Radiologic Technologists, Radiation Therapists and Nuclear Medicine Technologists as a means of protecting Alaskans from the harmful effects of excessive and unnecessary exposure to medical radiation.

Any radiology procedure is only as effective as the person performing it. An underexposed chest x-ray cannot reveal pneumonia or a malignant lesion, just as an inadequate mammography technique cannot detect breast cancer. No matter what the procedure, the Radiologic Technologist's knowledge of anatomy, careful application of radiation and skillful operation of sophisticated medical equipment are the keys to its success. Patients have long benefited from Alaska's wisely implemented Radiology equipment performance standards but those benefits can easily be negated by under trained operators of the equipment. To be clinically useful, diagnostic imaging exams must be accurate. To stop invasive cancers, radiation therapy treatments must be precise.

To ensure that the citizens of the State of Alaska receive maximum protection practicable from the harmful effects of excessive and improper exposure to ionizing radiation, licensure must be passed to establish standards.

Establishing state standards will ensure that Alaskans will have access to safe and high quality radiologic care. Licensure for Radiologic Technologists, Radiation Therapists and Nuclear Medicine Technologists will establish radiation protection measures as well as education and credentialing standards that will ensure the competency of persons operating medical equipment emitting radiation.

I urge your support of this important piece of legislation.

24-LS0470/M

ALASKA STATE HOUSE OF REPRESENTATIVES

Labor & Commerce Committee, Chair

Administrative Regulation Review, Chair

Judiciary Committee, Vice-Chair

Health, Education and Social Services



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Representative Tom Anderson

Licensure Provisions of SCSCSHB 150(L&C)

	Full Radiographer	Limited Radiologic Imager
License Requirements	<ul style="list-style-type: none"> • 18 years of age • Graduated from secondary school • Have graduated from a program approved by the department • Met the examination requirement • Pay the required fees <p><i>(Page 3, Lines 10-25)</i></p>	<ul style="list-style-type: none"> • 18 years of age • Graduated from secondary school • Have graduated from a program approved by the department <i>or</i> have two years of clinical experience in limited radiologic imaging • Met the examination requirement • Pay the required fees • May perform imaging only under the supervision of a fully licensed radiographer or licensed practitioner • May perform peripheral bone densitometry under direct supervision; May perform central bone densitometry if credentialed by an organization recognized by the department • May not perform contrast media, fluoroscopic procedures, mammography, tomography, etc. <p><i>(Page 4, Lines 22-30 - Page 5, Lines 1-14)</i></p>
Licensure Exemptions	<ul style="list-style-type: none"> • Licensed Practitioners • Licensed under another provision of state law for the use of radiation for diagnostic or therapeutic purposes • A student in a medical, dental, osteopathic, chiropractic, podiatric, radiological technologist, radiation therapy, nuclear medicine, physician assistant, or nurse practitioner school program under the direct supervision of a licensed practitioner or full radiographer • In the regular medical service of 	Same as the full radiographer. These exemptions apply to both licensures.

	<p>the United States military or United States Public Health Service (Page 2, Lines 3-25)</p>	
Training Program Requirements	<ul style="list-style-type: none"> The program is affiliated with at least one hospital that provides a clinical component The curriculum meets the standard approved by the Joint Review Committee on Education in Radiologic Technology A recognized national voluntary accrediting organization has reviewed the program's application to the department and submitted review comments back to the department (Page 3, Lines 26-31 – Page 4, Lines 1-12) 	<ul style="list-style-type: none"> The program must include didactic and clinical instruction in axial-appendicular skeleton radiography, chest and abdomen radiography, equipment maintenance and operation, radiation safety and production, image production and evaluation, radiographic anatomy and positioning procedures <i>or</i> any training program sponsored by a medical facility supervised and instructed by a licensed practitioner or fully licensed radiographer There is no minimum coursework hour requirement (Page 5, lines 15-29)
Clinical Experience	<ul style="list-style-type: none"> There is no specific clinical experience requirement or provision for licensure except that an approved program must include a clinical component as part of its curriculum (Page 4, Lines 1-3) 	<ul style="list-style-type: none"> Although clinical experience is not required for limited licensure, two years of clinical experience may substitute for formal training (Page 4, lines 27-30)
Examination Provisions	<p>An applicant can select one of three options:</p> <ul style="list-style-type: none"> Pass an examination approved by the department Provide proof of certification by the American Registry of Radiologic Technologists Provide proof of licensure from another jurisdiction (Page 4, Lines 13-21) 	<ul style="list-style-type: none"> There is one examination instrument which the department is directed to make as widely available as possible The examination will be developed by the department in cooperation with the Alaska State Medical Board, the AK Society of Radiologic Technologists, the Office of Radiologic Health, and a member of the American College of Radiology The minimum passing score is 75% (Page 5, line 30-31 – Page 6, Lines 1-11)
Temporary Permit Options	<ul style="list-style-type: none"> If within one year of completing a program or after taking an exam and waiting for results the department may issue a temporary permit valid for two years If the applicant provides proof of certification from a recognized national credentialing body the department may issue a temporary permit valid for one year (Page 6, Lines 12-31 – Page 7, Lines 1-9) 	<p>An applicant having either two years of clinical experience or having enrolled in a training program is eligible for a temporary permit valid for two years from the date of issuance (Page 6, Lines 13-31)</p>
Effective Date	<p>July 1, 2008*</p> <p>*With temporary permit provisions, a license will not be required until 2010 (Page 12, Line 6)</p>	<p>July 1, 2008*</p> <p>*With temporary permit provisions, a license will not be required until 2010 (Page 12, Line 6)</p>

STATE OF ALASKA

DEPARTMENT of HEALTH & SOCIAL SERVICES
DIVISION of PUBLIC HEALTH

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February 13, 2006

The Honorable Tom Anderson
Alaska House of Representatives
State Capitol, Room 408
Juneau, AK 99801

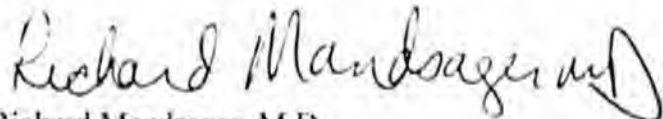
Dear Representative Anderson:

Your office has asked for my opinion of House Bill 150, your proposal to license radiographers and other professionals who operate radiology equipment in Alaska. As I have testified in the past, I continue to support efforts by the Legislature to strike a balance between better protecting the public – and radiographers themselves – from exposure to harmful X-rays while not overburdening small providers who offer critical health care throughout the state. The newest version of HB150 appears to do a good job protecting small doctor's offices and rural clinics, which, under the initial version, might have had to halt radiology services while the tech completed training. Now the bill allows such employees to continue work while enrolled in a training program. Your latest version also continues to recognize limited radiological imagers who have years of experience in the field by allowing them the opportunity to pass a competency exam without enrolling in required training.

I understand the bill is scheduled for discussion today in the House Finance Committee. Because of a scheduling conflict, I won't be able to attend. The Division of Public Health will continue to be represented at hearings on this bill by Clyde Pearce, Manager of the Radiological Health Program in our Section of Laboratories.

Thank you for the opportunity to comment on House Bill 150.

Sincerely,



Richard Mandsager, M.D.
Director
Division of Public Health

UNIVERSITY OF CALIFORNIA, BERKELEY



Public Affairs, (510) 642-3734

NEWS RELEASE, 11/16/99

Radiation expert warns of danger from overuse of medical X-rays, claiming they're responsible for many cancer and heart disease deaths

By Robert Sanders, Public Affairs

- **BERKELEY--** A noted University of California, Berkeley, expert on the health effects of radiation has concluded that a large proportion of deaths today from cancer and heart disease are due in part to past exposure to medical radiation.

John W. Gofman, professor emeritus of molecular and cell biology at UC Berkeley, conducted an intensive analysis comparing death rates in each of the country's nine census divisions with the average number of physicians per 100,000 people in these divisions.

The analysis turned up a major surprise. While death rates from almost all causes went down with increasing physician density, death rates rose with physician density in two categories: cancer and ischemic heart disease, also known as coronary heart disease.

Gofman, who for decades has warned of the dangers of low-level radiation, concluded that the cause is medical X-rays, including fluoroscopy and computed tomography or CT scans. The analysis and conclusions are published this week in a 700-page monograph by the book division of the Committee for Nuclear Responsibility, Inc., a non-profit, public interest association Gofman founded in 1971.

"This is a serious public health problem," Gofman said. "We're talking about the two biggest causes of death in this country - cancer and heart disease - which together amount to 45 percent of all deaths. Medical X-rays are a major cause of these deaths."

Gofman does not discount the role of other factors in these diseases, including diet and smoking, but maintains that more than half the deaths from cancer and heart disease would not have occurred but for medical X-rays.

He also acknowledges the value of X-rays in diagnosis and to monitor medical treatment. Nevertheless, he urges physicians to be careful of unnecessarily high doses of X-rays, and to advise patients of the pros and cons of X-rays, much as they alert patients to the possible side effects of drugs.

"My findings are not going to cause patients to reject the obvious benefits of medical X-rays," Gofman said. "People are smart. Very soon, patients may insist on seeing some evidence that they will receive the lowest possible X-ray doses."

He also urges radiologists to reduce radiation doses delivered in standard procedures, and in his

study lists examples of how some hospitals and doctors have done this.

"These findings point to a safe and painless way to achieve big reductions in mortality from our two biggest killers, cancer and coronary heart disease," he said. "Reduce X-ray dosages, since the benefits of an X-ray can be obtained at much lower levels.

"When X-ray doses for mammograms were reduced tenfold, women began receiving the benefits with only one-tenth the former risk of getting cancer," added Gofman, who in 1995 published a study that ascribed 75 percent of breast cancer cases to past exposure from medical radiation. "But for many, many other X-ray procedures, the effort to achieve a tenfold reduction in dosage has not been made yet."

The problem, he argues, is an almost casual use of X-rays in the past. Through the 1940s, X-ray dosages often were 50 to 100 times those used today. Even as recently as the 1960s, mammograms sometimes delivered more than 100 times today's maximum allowed radiation dose. X-rays also were widely used for procedures doctors now know were unnecessary, such as routine X-rays during pediatric well-baby exams.

Though radiation doses have declined in many medical procedures, a proliferation of new uses of diagnostic and interventional radiation threatens to keep cumulative doses high, and thereby contribute to a higher mortality from heart disease and cancer, he said. What makes the situation even more alarming is that few physicians monitor the cumulative doses their patients get.

"There is the assumption that, at these doses, radiation doesn't make a significant contribution," he said. "But X-rays are very potent mutagens, even at low doses. It's a disaster that people still believe the 'safe dose myth,' that low doses are harmless."

Gofman, 81, has had a distinguished career in several fields, ranging from nuclear physics and lipoprotein research - he was the first to show that high levels of low-density lipoproteins, or LDLs, were a risk factor for atherosclerosis - to the health effects of radiation.

He began his recent analysis by using a huge census database that lists cause of death per age group within the country's nine census divisions, covering the entire population from 1940 to 1990.

He wanted to compare the death rates with estimates of the amount of medical radiation received on average by the population, but no such data exists. He therefore used a surrogate statistic: the number of physicians per 100,000 population, amassed over the years by the American Medical Association. He reasoned that since physicians prescribe X-rays, the number prescribed should be roughly proportional to the number of doctors serving the population.

Using regression analysis, he found that age-adjusted death rates for all types of cancer combined, and for ischemic heart disease by itself, rose with the number of physicians per 100,000 population in the census divisions. Conversely, all other diseases, when lumped together, showed a drop in the death rate as physician density rose. This held true in all age ranges.

Gofman argues that the correlation implies that death rates for cancer and heart disease have gone up as the number of medical procedures requiring radiation has gone up. Specifically, the study concludes that over 50 percent of the death rate from cancer today, and over 60 percent of today's

death rate from ischemic heart disease, are induced by X-rays in combination with other factors.

"Prior to 1940, no medical exam was considered complete without X-ray procedures, generally including fluoroscopy where the X-ray beam stays on," he said. "In fact, X-ray exposure began even in the womb for many people who are now age 30 and over, because until 1970, about one birth in every 14 was preceded by pelvic X-rays of the mother shortly before delivery, to measure the birth canal."

He discounts other explanations for the correlation, such as urbanization, differences in autopsy rates, different rates of reporting cancer deaths, and the possibility that chemotherapy for cancer could have caused some of the ischemic heart disease.

Though it is not surprising that cancer rates go up with the number of medical X-rays, Gofman was surprised to find a similar situation with ischemic heart disease, even though he was aware of studies that suggest atherosclerotic plaques in the arteries can be stimulated by chemical mutagens.

"It has been known for decades that high doses of radiation injure or kill the heart and blood vessels," Gofman said. "This study is about low and moderate doses accumulated over time. Each dose, no matter how low, produces mutations, so by the time you're 50, all of these events have added to the mutation load in your cells."

Fluoroscopies in particular are a major source of radiation today, he said, because the beam stays on during the procedure, such as threading a catheter or endoscope. The total dose can easily be reduced, he said, by using the fluoroscope only periodically, not continually.

"This makes good sense for doctors and their patients," he said. "We must reduce the amount of radiation patients get, and measure it to make sure we're right."

The study was funded by numerous small gifts from individuals and private foundations.

###

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States With Licensure or Certification Laws

U.S. States with Licensure/Certification Laws or Regulations and Year of Implementation

Arizona-1977	Montana-1977
Arkansas-1999	Nebraska-1987
California-1969	New Jersey-1968
Connecticut-1993	New Mexico-1983
Delaware-1989	New York-1965
Florida-1979	North Dakota-2003
Hawaii-1974	Ohio-1995
Illinois-1990	Oregon-1979
Indiana-1982	Rhode Island-1994
Iowa-1987	South Carolina-1999
Kansas-2004	Texas-1987
Kentucky-1978	Utah-1989
Louisiana-1984	Vermont-1984
Maine-1984	Virginia-1997
Maryland-1992	Washington-1991
Massachusetts-1987	West Virginia-1977
Mississippi-1996	Wyoming-1985

States With Partial Licensure Laws and/or Other Forms of Regulation

- **Colorado** – Laws for mammography and limited (non-ARRT registered) licensure only.
- **Michigan** – Laws for mammography only.
- **Nevada** – Laws for mammography only.
- **Pennsylvania** – Technologists who have not passed the ARRT or other board-approved examination must pass a state examination to perform patient examinations in physician, osteopathic physician, podiatrist, chiropractic or dentist offices.
- **Minnesota** – Operator of any x-ray equipment for human use must be either a registered radiologic technologist through the ARRT, a licensed person from another state (and are then given an x-ray operator equivalent standing) or have passed one of Minnesota's state approved exams.
- **Tennessee** – Technologists who have not passed the ARRT or other board-approved examination must pass a state examination to perform patient examinations in physician, osteopathic physician, podiatrist, chiropractic or dentist offices.
- **Wisconsin** – Requires that all CT technologists and radiation therapists be ARRT certified.

States without Licensure Laws or With Legislative Proposals Being Considered

Alabama	Missouri
Alaska	New Hampshire
District of Columbia	North Carolina
Georgia	Oklahoma
Idaho	South Dakota



Questions and Answers About Licensure

Q *How does the unregulated practice of radiologic technology harm or endanger the public?*

A As physics and radiation biology textbooks attest, there is no threshold level for damage to healthy tissue due to ionizing radiation. In other words, there is no dose so small that it cannot potentially cause biological damage.

Q *What about alternatives to licensure such as a proficiency examination or certification by a professional association?*

A The problem with some alternatives to licensure is that they are voluntary and many health care workers will choose not to comply. State licensure programs are the most effective way to control the practice of uncredentialed individuals. As a result, licensure offers the public the best protection from unnecessary exposure to ionizing radiation and the highest quality radiologic patient care.

Q *How will the public benefit from licensure of radiologic technologists?*

A The public benefits by receiving care from properly educated and credentialed professionals who have met all of the requirements to practice radiologic technology.

Q *How do we ensure the competencies of radiologic technologists?*

A No one can be 100 percent sure of the competencies of any professional, whether in medicine, law or radiologic technology. However, steps to ensure the competence of individual practitioners can be taken. Accredited educational programs and state licensure programs are the main mechanisms for ensuring the competence of radiologic technologists. The curriculum for educational programs in radiologic technology is competency based, meaning students must meet performance objectives. The national certification examination also is a criterion-referenced, performance-based examination that has demonstrated high validity and reliability.

Q *Do the benefits of licensure justify the costs?*

A As with any endeavor, licensure requires a cost vs. benefit analysis. This is especially important in light of rising health care costs. Many states that have already implemented licensure programs saved the cost of developing an examination by contracting with the American Registry of Radiologic Technologists to use the national certification examination as their state licensing examination. Also, many states use license fees to fund their licensure program. Overall, the impact on state budgets and the health care economy are minimal.

Q *How will licensure affect the job market? Will it drive wages up, forcing employers to cut costs or raise patient fees?*

A As with any other profession or occupation, the primary objective of licensing radiologic technologists is not to create a favorable supply/demand arrangement. Rather, the objective is to restrict practice to individuals who meet certain standards and improve the quality of patient care. In California and New York, states with long-standing licensure laws, there have been no appreciable increases in average salaries for radiologic technologists since the laws passed.

Q *Won't licensure lead to fragmented care and higher health care costs, in effect creating an obstacle to health care delivery?*

A The major objective of licensure is to solve the problem of uncredentialed practitioners performing radiologic examinations on human beings. Related objectives are to reduce unnecessary radiation exposure and reduce costs associated with repeat examinations. Far from creating obstacles, properly educated and credentialed practitioners streamline health care and ensure the highest possible quality of care.



**U.S. Department
of Labor**
**Bureau of Labor
Statistics**

Occupational Outlook Handbook

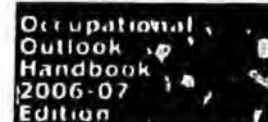
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Radiologic Technologists and Technicians

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- [Working Conditions](#)
- [Training, Other Qualifications, and Advancement](#)
- [Employment](#)
- [Job Outlook](#)
- [Earnings](#)
- [Related Occupations](#)
- [Sources of Additional Information](#)

SIGNIFICANT POINTS

- Job opportunities are expected to be favorable; some employers report difficulty hiring sufficient numbers of radiologic technologists and technicians.
- Formal training programs in radiography range in length from 1 to 4 years and lead to a certificate, an associate degree, or a bachelor's degree.
- Although hospitals will remain the primary employer, a greater number of new jobs will be found in physicians' offices and diagnostic imaging centers.

NATURE OF THE WORK

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Radiologic technologists and technicians take x rays and administer nonradioactive materials into patients' bloodstreams for diagnostic purposes. Some specialize in diagnostic imaging technologies, such as computerized tomography (CT) and magnetic resonance imaging (MRI).

In addition to radiologic technologists and technicians, others who conduct diagnostic imaging procedures include cardiovascular technologists and technicians, diagnostic medical sonographers, and nuclear medicine technologists. (Each is discussed elsewhere in the *Handbook*.)

Occupations:

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Radiologic technologists and technicians, also referred to as *radiographers*, produce x-ray films (radiographs) of parts of the human body for use in diagnosing medical problems. They prepare patients for radiologic examinations by explaining the procedure, removing articles such as jewelry, through which x rays cannot pass, and positioning patients so that the parts of the body can be appropriately radiographed. To prevent unnecessary exposure to radiation, these workers surround the exposed area with radiation protection devices, such as lead shields, or limit the size of the x-ray beam. Radiographers position radiographic equipment at the correct angle and height over the appropriate area of a patient's body. Using instruments similar to a measuring tape, they may measure the thickness of the section to be radiographed and set controls on the x-ray machine to produce radiographs of the appropriate density, detail, and contrast. They place the x-ray film under the part of the patient's body to be examined and make the exposure. They then remove the film and develop it.

Experienced radiographers may perform more complex imaging procedures. For fluoroscopies, radiographers prepare a solution of contrast medium for the patient to drink, allowing the radiologist (a physician who interprets radiographs) to see soft tissues in the body. Some radiographers, called *CT technologists*, operate CT scanners to produce cross-sectional images of patients. Radiographers who operate machines that use strong magnets and radio waves, rather than radiation, to create an image are called *MRI technologists*.

Radiologic technologists and technicians must follow physicians' orders precisely and conform to regulations concerning the use of radiation to protect themselves, their patients, and their coworkers from unnecessary exposure.

In addition to preparing patients and operating equipment, radiologic technologists and technicians keep patient records and adjust and maintain equipment. They also may prepare work schedules, evaluate purchases of equipment, or manage a radiology department.

WORKING CONDITIONS

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Most full-time radiologic technologists and technicians work about 40 hours a week. They may, however, have evening, weekend, or on-call hours. Opportunities for part-time and shift work also are available.

Physical stamina is important, because technologists and technicians are on their feet for long periods and may lift or turn disabled patients. Technologists and technicians work at diagnostic machines,

but also may perform some procedures at patients' bedsides. Some travel to patients in large vans equipped with sophisticated diagnostic equipment.

Although radiation hazards exist in this occupation, they are minimized by the use of lead aprons, gloves, and other shielding devices, as well as by instruments monitoring exposure to radiation. Technologists and technicians wear badges measuring radiation levels in the radiation area, and detailed records are kept on their cumulative lifetime dose.

TRAINING, OTHER QUALIFICATIONS, AND ADVANCEMENT

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Preparation for this profession is offered in hospitals, colleges and universities, vocational-technical institutes, and the U.S. Armed Forces. Hospitals, which employ most radiologic technologists and technicians, prefer to hire those with formal training.

Formal training programs in radiography range in length from 1 to 4 years and lead to a certificate, an associate degree, or a bachelor's degree. Two-year associate degree programs are most prevalent.

Some 1-year certificate programs are available for experienced radiographers or individuals from other health occupations, such as medical technologists and registered nurses, who want to change fields or specialize in CT or MRI. A bachelor's or master's degree in one of the radiologic technologies is desirable for supervisory, administrative, or teaching positions.

The Joint Review Committee on Education in Radiologic Technology accredits most formal training programs for the field. The committee accredited 606 radiography programs in 2005. Radiography programs require, at a minimum, a high school diploma or the equivalent. High school courses in mathematics, physics, chemistry, and biology are helpful. The programs provide both classroom and clinical instruction in anatomy and physiology, patient care procedures, radiation physics, radiation protection, principles of imaging, medical terminology, positioning of patients, medical ethics, radiobiology, and pathology.

Federal legislation protects the public from the hazards of unnecessary exposure to medical and dental radiation by ensuring that operators of radiologic equipment are properly trained. Under this legislation, the Federal Government sets voluntary standards that the States may use for accrediting training programs and certifying individuals who engage in medical or dental radiography.

In 2005, 38 States certified radiologic technologists and technicians.

Certification, which is voluntary, is offered by the American Registry of Radiologic Technologists. To be eligible for certification, technologists generally must graduate from an accredited program and pass an examination. Many employers prefer to hire certified radiographers. To be recertified, radiographers must complete 24 hours of continuing education every two years.

Radiologic technologists and technicians should be sensitive to patients' physical and psychological needs. They must pay attention to detail, follow instructions, and work as part of a team. In addition, operating complicated equipment requires mechanical ability and manual dexterity.

With experience and additional training, staff technologists may become specialists, performing CT scanning, angiography, and magnetic resonance imaging. Experienced technologists also may be promoted to supervisor, chief radiologic technologist, and, ultimately, department administrator or director. Depending on the institution, courses or a master's degree in business or health administration may be necessary for the director's position. Some technologists progress by leaving the occupation to become instructors or directors in radiologic technology programs; others take jobs as sales representatives or instructors with equipment manufacturers.

EMPLOYMENT

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Radiologic technologists and technicians held about 182,000 jobs in 2004. More than half of all jobs were in hospitals. Most of the rest were in offices of physicians; medical and diagnostic laboratories, including diagnostic imaging centers; and outpatient care centers.

JOB OUTLOOK

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Job opportunities are expected to be favorable. Some employers report difficulty hiring sufficient numbers of radiologic technologists and technicians. Imbalances between the demand for, and supply of, radiologic technologists and technicians should spur efforts to attract and retain qualified workers, such as improved compensation and working conditions. Radiologic technologists who also are experienced in more complex diagnostic imaging procedures, such as CT and MRI, will have better employment opportunities, brought about as employers seek to control costs by using multiskilled employees.

Employment of radiologic technologists and technicians is expected to **grow faster than the average** for all occupations through

2014, as the population grows and ages, increasing the demand for diagnostic imaging. Although healthcare providers are enthusiastic about the clinical benefits of new technologies, the extent to which they are adopted depends largely on cost and reimbursement considerations. For example, digital imaging technology can improve the quality of the images and the efficiency of the procedure, but remains expensive. Some promising new technologies may not come into widespread use because they are too expensive and third-party payers may not be willing to pay for their use.

Hospitals will remain the principal employer of radiologic technologists and technicians. However, a greater number of new jobs will be found in offices of physicians and diagnostic imaging centers. Health facilities such as these are expected to grow rapidly through 2014, due to the strong shift toward outpatient care, encouraged by third-party payers and made possible by technological advances that permit more procedures to be performed outside the hospital. Some job openings also will arise from the need to replace technologists and technicians who leave the occupation.

EARNINGS

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Median annual earnings of radiologic technologists and technicians were \$43,350 in May 2004. The middle 50 percent earned between \$36,170 and \$52,430. The lowest 10 percent earned less than \$30,020, and the highest 10 percent earned more than \$60,210. Median annual earnings in the industries employing the largest numbers of radiologic technologists and technicians in May 2004 were:

Medical and diagnostic laboratories	\$46,720
General medical and surgical hospitals	43,960
Offices of physicians	40,290

RELATED OCCUPATIONS

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Radiologic technologists and technicians operate sophisticated equipment to help physicians, dentists, and other health practitioners diagnose and treat patients. Workers in related occupations include **cardiovascular technologists and technicians, clinical laboratory technologists and technicians, diagnostic medical sonographers, nuclear medicine technologists, radiation therapists, and respiratory therapists.**

**SOURCES OF
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INFORMATION**[\[About this section\]](#)[▲ Back to Top](#)**DISCLAIMER:**

Links to non-BLS Internet sites are provided for your convenience and do not constitute an endorsement.

For career information, send a stamped, self-addressed business-size envelope with your request to:

- American Society of Radiologic Technologists, 15000 Central Ave. S.E., Albuquerque, NM 87123-3917. Internet: <http://www.asrt.org>

For the current list of accredited education programs in radiography, write to:

- Joint Review Committee on Education in Radiologic Technology, 20 N. Wacker Dr., Suite 2850, Chicago, IL 60606-3182. Internet: <http://www.jrcert.org>

For information on certification, contact:

- American Registry of Radiologic Technologists, 1255 Northland Dr., St. Paul, MN 55120-1155. Internet: <http://www.arrt.org>

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Suggested citation: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2006-07 Edition*, Radiologic Technologists and Technicians, on the Internet at <http://www.bls.gov/oco/ocos105.htm> (visited January 30, 2006).

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United States Office of Personnel
Management

Operating Manual



Qualification Standards for General Schedule Positions

Individual Occupational Requirements for

GS-647: Diagnostic Radiologic Technologist Series

The text below is extracted verbatim from Section IV-B of the Operating Manual for Qualification Standards for General Schedule Positions (p. IV-B-105), but contains minor edits to conform to web-page requirements.

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Technical and Medical Support Positions."

NOTE: Public Law 97-35 requires that persons who administer radiologic procedures meet the credentialing standards in 42 CFR Part 75. Essentially, they must (1) have successfully completed an educational program that meets or exceeds the standards described in that regulation, and is accredited by an organization recognized by the Department of Education, and (2) be certified as radiographers in their field. The following meet these requirements:

- (1) Persons employed by the Federal Government as radiologic personnel prior to the effective date of the regulation (January 13, 1986) who show evidence of current or fully satisfactory performance or certification of such from a licensed practitioner such as a doctor of medicine, osteopathy, dentistry, podiatry, or chiropractic who prescribes radiologic procedures to others.
- (2) Persons first employed by the Federal Government as radiologic personnel after the effective date of the regulation who
 - (a) received training from institutions in a State or foreign jurisdiction that did not accredit training in that particular field at the time of graduation, or
 - (b) practiced in a State or foreign jurisdiction that did not license that particular field or did not allow special eligibility to take a licensure examination for those who did

not graduate from an accredited educational program, provided that such persons show evidence of training, experience, and competence as determined by OPM or the employing agency.

All applicants, however, must meet the requirements below.

Specialized Experience (for positions at GS-4 and above): Experience in the operation of diagnostic radiology equipment under the direction of radiologists or other medical officers to produce radiographic studies used in medical diagnosis and treatment.

OR

Education and Training: Qualifying educational programs for radiography and radiation therapy technology are available in accredited colleges, universities, hospitals, medical schools, or postsecondary technical or vocational schools. Education or training from programs based in hospitals must have been from those hospitals that were accredited at the time of the education or training by the Joint Commission on Accreditation of Hospitals or by the American Osteopathic Association.

For GS-3: Successful completion of (a) 1 year of study with at least 6 semester hours in any combination of the following: anatomy, biology, mathematics, chemistry, radiation physics, physiology, pathology, medical terminology, or related courses, or (b) a course for medical technicians, hospital corpsmen, medical service specialists, or hospital training obtained in a training program given by the Armed Forces or the U.S. Maritime Service under close medical and professional supervision.

For GS-4: Successful completion of a full-time training course of at least 12 months' duration in a post-high school radiography program.

For GS-5: Successful completion of a full-time training course of at least 24 months' duration in a post-high school radiography program.

Successful completion of a course for medical radiologic technicians in the Armed Forces is qualifying on a month-for-month basis up to the 1 year of specialized experience required for GS-5.

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Page created 22 March 1999

ANSWERS TO THE MOST COMMONLY ASKED QUESTIONS ABOUT HB150

Will HB 150 create a hardship for small businesses and limit access of care to patients in rural Alaska?

HB 150 will not change the way that small businesses and rural clinics operate. The individuals who currently perform x-ray procedures at these sites will be able to continue to do so. The clinics will have no interruption in services while their staff receives training. Some of the individuals who are currently performing x-ray exams may have had enough education and experience to qualify for an exemption from additional education. Those individuals who need additional education will be able to receive the education online at either the clinic site or from their homes. They will be allowed to continue working while they obtain the necessary education to qualify them for a limited scope license.

A national survey that queried the states that had licensure experienced:

- NO** shortage of medical radiographers
- NO** increase in radiographer's salaries
- NO** reduced access to health care at facilities that had to cut back or restrict access
- NO** facility closure due to licensure

How costly are the educational requirements?

Two examples of affordable education:

- 1.) University of Alaska Anchorage - Limited Radiologic Imager program for \$109 per credit hour (9 credit hour program). Can accommodate 30 students per year.
- 2.) Glacier Valley Medical Education - online course for \$229.
 - a.) Program is open for registration at any time.
 - b.) Ideal for facilities that are operating on a limited budget.
 - c.) Twelve other states recognize this course as a qualification for obtaining the state's limited license.

How would an individual demonstrate experience sufficient in the opinion of the department to waive the program?

- 1.) Passing a limited examination established by the department.
- 2.) Clinical review of film examples by an individual who possesses a full certificate license and designated by the department.

How can training be provided to people in the bush without making it an extreme hardship?

With computer and the internet, villagers will obtain the education necessary to meet the qualifications for the limited radiologic imager license.

How will limited scope obtain CE?

Continuing education credits for limited imager licensees will not be required.

Continuing to meet established competencies (proficiencies) on a biennium basis will be required for renewal of licenses.

Will Healthcare costs increase with licensure?

Studies in California, which has had a licensure program for a number of years, found that healthcare costs did not increase when licensure was required.

Will Radiologic Technologists salaries increase with passage of HB150?

The American Society of Radiologic Technologists studied radiologic technologists' salaries in Arkansas and South Carolina (states that have recently passes licensure laws). Following the implementation of state laws there was no additional increase in salary above the national norm.

How will licensing guarantee that a person taking x-rays is better qualified to perform their job duties?

Applying the question to healthcare in general would lead to the question about whether patients are safer because physicians, nurses or physician assistants must be licensed. If licensing is ineffective then there is no basis for licensing any healthcare group.

- 1.) Licensing is a measurement of quality and establishes standards for a profession.
- 2.) Licensing will guarantee that a person performing a job has met the educational requirements for the profession.
- 3.) Protects the public from unnecessary radiation exposure.

STATE OF ALASKA

DEPARTMENT of HEALTH & SOCIAL SERVICES
DIVISION of PUBLIC HEALTH

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February 13, 2006

The Honorable Tom Anderson
Alaska House of Representatives
State Capitol, Room 408
Juneau, AK 99801

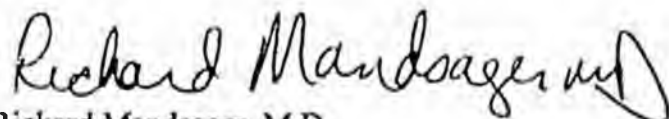
Dear Representative Anderson:

Your office has asked for my opinion on House Bill 150, your proposal to license radiographers and other professionals who operate radiology equipment in Alaska. As I have testified in the past, I continue to support efforts by the Legislature to strike a balance between better protecting the public – and radiographers themselves – from exposure to harmful X-rays while not overburdening small providers who offer critical health care throughout the state. The newest version of HB150 appears to do a good job protecting small doctor's offices and rural clinics, which, under the initial version, might have had to halt radiology services while the tech completed training. Now the bill allows such employees to continue work while enrolled in a training program. Your latest version also continues to recognize limited radiological imagers who have years of experience in the field by allowing them the opportunity to pass a competency exam without enrolling in required training.

I understand the bill is scheduled for discussion today in the House Finance Committee. Because of a scheduling conflict, I won't be able to attend. The Division of Public Health will continue to be represented at hearings on this bill by Clyde Pearce, Manager of the Radiological Health Program in our Section of Laboratories.

Thank you for the opportunity to comment on House Bill 150.

Sincerely,



Richard Mandsager, M.D.
Director
Division of Public Health