PLEASE EXPEDITE L+L = 20757
40-08860

FORM NRC-2
(7-77)
10 CFR 40

Approved by GAO
R0203

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE

11210

Pursuant to the regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby made for a license to receive, possess, use, transfer, deliver or import into the United States, source material for the activity or activities described.

1. (Check one)
- [x] (a) New license
- [ ] (b) Amendment to License No. _____
- [ ] (c) Renewal of License No. _____
- [ ] (d) Previous License No. _____

2. NAME OF APPLICANT
IONICS, Inc.

3. PRINCIPAL BUSINESS ADDRESS
Route 519 & 50
Bridgeville, PA 15017

4. STATE THE ADDRESS(ES) AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED
Ionics' Plant, Routes 519 & 50, Bridgeville, PA 15017

5. NAME OF PERSON TO BE CONTACTED CONCERNING THIS APPLICATION
Robert G. Gallaghar, CHP

6. TELEPHONE NO. OF INDIVIDUAL NAMED IN ITEM 5
412-563-2242

7. DESCRIBE PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED
Fabrication of Steel Covered depleted Uranium Shielding

8. STATE THE TYPE OR TYPES, CHEMICAL FORM OR FORMS, AND QUANTITIES OF SOURCE MATERIAL YOU PROPOSE TO RECEIVE, POSSESS, USE, OR TRANSFER UNDER THE LICENSE

(a) TYPE	(b) CHEMICAL FORM	(c) PHYSICAL FORM (*Including % U or Th.*)	(d) MAXIMUM AMOUNT AT ANY ONE TIME (*kilograms*)
NATURAL URANIUM			
URANIUM DEPLETED IN THE U-235 ISOTOPE	dU Metal	100% dU	2000 lbs.
THORIUM (ISOTOPE)			

(e) MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME (*kilograms*)
2000 lbs.

9. DESCRIBE THE CHEMICAL, PHYSICAL, METALLURGICAL, OR NUCLEAR PROCESS OR PROCESSES IN WHICH THE SOURCE MATERIAL WILL BE USED, INDICATING THE MAXIMUM AMOUNT OF SOURCE MATERIAL INVOLVED IN EACH PROCESS AT ANY ONE TIME, AND PROVIDING A THOROUGH EVALUATION OF THE POTENTIAL RADIATION HAZARDS ASSOCIATED WITH EACH STEP OF THOSE PROCESSES

Three cylindrical pieces of depleted uranium are to be encased in lead, carbon and stainless steel. No machinery or other metallurgical work will be done on the dU metal. The partially encapsulated dU pieces will be sent to Jelco Manufacturing, Inc. Westerville, Ohio to have lead added and returned to Ionics, Inc.

See Attachment 1

10. LIST THE NAMES AND ATTACH A RESUME OF THE TECHNICAL QUALIFICATIONS INCLUDING TRAINING AND EXPERIENCE OF APPLICANT'S SUPERVISORY PERSONNEL AND THE PERSON RESPONSIBLE FOR THE RADIATION SAFETY PROGRAM (IF OF APPLICANT IF AN INDIVIDUAL).

Robert G. Gallaghar, CHP, PE, CIH

RECEIVED BY LFMB
Date 9/17/84
Log Sept-11
By
Orig
Action Compl. 9/18/84

11. DESCRIBE THE EQUIPMENT AND FACILITIES WHICH WILL BE USED TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE OR PROPERTY AND RELATE THE USE OF THE EQUIPMENT AND FACILITIES TO THE OPERATIONS LISTED IN ITEM 9. INCLUDE RADIATION DETECTION INSTRUMENTS AND RELATED EQUIPMENT (including film badges, dosimeters, counters, air sampling, and other survey equipment) as appropriate. The description of radiation detection instruments should include the instrument characteristics such as type of radiation detected, window thickness, and the range(s) of each instrument).

See Attachment #2

63524 60-28

(b) METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN (a) ABOVE, INCLUDING AIR SAMPLING EQUIPMENT (for film badges, specify method of calibrating and processing, or name supplier).

See Attachment #2

Applicant
Fee Application
Check Rec'd 9/17/84
Received By

8411120428 841023
NMS LIC40
SUB-1148 PDR

MLIO 02873 10 SEP 1984

"OFFICIAL RECORD COPY"

11(c) VENTILATION EQUIPMENT WHICH WILL BE USED IN OPERATIONS WHICH PRODUCE DUST, FUMES, MISTS, OR GASES, INCLUDING PLAN VIEW SHOWING TYPE AND LOCATION OF HOOD AND FILTERS, MINIMUM VELOCITIES MAINTAINED AT HOOD OPENINGS AND PROCEDURES FOR TESTING SUCH EQUIPMENT

No metallurgical work will be done on the dU that would produce air contamination, thus no ventilation equipment will be needed. Air Sampling will be done during welding operation. Samples will be .lpha counted to verify dU (over)

12. DESCRIBE PROPOSED PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE AND PROPERTY AND RELATE THESE PROCEDURES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE (a) SAFETY FEATURES AND PROCEDURES TO AVOID NONNUCLEAR ACCIDENTS, SUCH AS FIRE, EXPLOSION, ETC., IN SOURCE MATERIAL STORAGE AND PROCESSING AREAS

See Attachment #3

(b) EMERGENCY PROCEDURES IN THE EVENT OF ACCIDENTS WHICH MIGHT INVOLVE SOURCE MATERIAL

See Attachment #3

(c) DETAILED DESCRIPTION OF RADIATION SURVEY PROGRAM AND PROCEDURES

See Attachment #3

13. WASTE PRODUCTS: *If none will be generated, state "None" opposite (a), below. If waste products will be generated, check here* [ ] *and explain on a supplemental sheet:*

(a) Quantity and type of radioactive waste that will be generated. NONE

(b) Detailed procedures for waste disposal.

14. IF PRODUCTS FOR DISTRIBUTION TO THE GENERAL PUBLIC UNDER AN EXEMPTION CONTAINED IN 10 CFR 40 ARE TO BE MANUFACTURED, USE A SUPPLEMENTAL SHEET TO FURNISH A DETAILED DESCRIPTION OF THE PRODUCT, INCLUDING:

(a) PERCENT SOURCE MATERIAL IN THE PRODUCT AND ITS LOCATION IN THE PRODUCT.

(b) PHYSICAL DESCRIPTION OF THE PRODUCT INCLUDING CHARACTERISTICS, IF ANY, THAT WILL PREVENT INHALATION OR INGESTION OF SOURCE MATERIAL THAT MIGHT BE SEPARATED FROM THE PRODUCT.

(c) BETA AND BETA PLUS GAMMA RADIATION LEVELS (*Specify instrument used, date of calibration and calibration technique used*) AT THE SURFACE OF THE PRODUCT AND AT 12 INCHES.

(d) METHOD OF ASSURING THAT SOURCE MATERIAL CANNOT BE DISASSOCIATED FROM THE MANUFACTURED PRODUCT.

CERTIFICATE

(*This item must be completed by applicant*)

15. *The applicant, and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 40, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

Ionics, Inc.
(Applicant named in Item 2)

C. J. McCurdy

Dated 12/21/83

BY: C. J. McCurdy
(Print or type name under signature)

General Manager
(Title of certifying official authorized to act on behalf of the applicant)

WARNING: 18 U.S.C. Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

☆ U.S. GOVERNMENT PRINTING OFFICE 1966—O-205-054

ATTACHMENT 1 of FORM NRC-2 8/84

Ionics, Inc., Bridgeville, PA 15017

ITEM 9 Description of Metallurgical Process and Risk Analyses

IONICS, Inc. will receive 3 cylindrical pieces of dU which we will encapsulate in lead and steel (carbon and stainless) and return to our customer. Two pieces will weigh about 800 lbs., one will weigh 120 lbs. No machinery or other metallurgical processes will be done by us or our sub-contractor Jelco Manufacturing, Inc. who will cast lead into the pieces after we have partially encapsulated them in steel.

Upon receipt of the dU at our facilities, the shipment will be surveyed by a health physicist from Applied Health Physics, Inc. (AHP) who will also serve as Radiation Safety Officer (RSO) on this project. His survey will comply with 10CFR20.205. Alpha and gamma measurements will be made on the containers and dU as well as smear samples will be taken to evaluate radioactive contamination risks.

The RSO will supervise the transfer of the dU to storage and work areas. Appropriate radiation warning signs will be posted and action taken to safeguard these source materials during all phases of our work. Air samples and smears will be taken to verify that radioactive contamination control measures are effective.

After partially encapsulating the 3 dU cylinders in steel, they will be repackaged, monitored and shipped to [illegible]ant in Westerville, Ohio in accordance with applicable regulations (US-NRC and US-DOT). An application for an NRC source materials license has been filed with NRC Region III. Jelco will receive and survey the shipment, and follow identical procedures for compliance with health, safety and source material control. After casting the required lead into the dU cylinders they will be packaged,

monitored and returned to us in accordance with applicable regulations. We will then complete the steel encapsulation, repackage, monitor, and return the completed items to our customer, following NRC and DOT regulations. Documentation of health physics data and shipping manifests will be retained for future verification and/or inspection.

Ionics, Inc., Bridgeville, PA 15017

RADIOLOGICAL SAFETY-QUALITY ASSURANCE GUIDELINES

The following items must be checked by the Company's Radiological Safety Officer (RSO) and/or health physics consultant at the frequency suggested relative to the receipt, encapsulation and shipment of source materials (depleted uranium metal).

A. PERSONNEL

1. Safety Orientation of all who work with depleted uranium (dU), who frequent areas in which source materials are used, stored or transferred.

   References: 10CFR19.12; 10CFR20.206; NRC Form 3; PA State Regulation 433.

   Frequency: Initially pre-placement; annually or prior to change in type, amount, use that might affect the degree of radiation risk.

2. Personnel Monitoring (film badges, rings)

   a. Personnel monitoring devices will be issued by RSO to all persons who work with any sources of ionizing radiation or frequent areas where exposure to any such person may be in excess of 10 mR per week.

      References: NRC 10CFR20.202 PA 433 Sec. D.9

      Frequency: Monthly (if required)

   b. Records of results of personnel monitoring are to be checked and initialed by RSO upon receipt each month; reviewed quarterly and summarized annually.

      References: 10CFR20.401 and 20.407
      PA 433 Sec. C.11 and Sec. D.15

   c. Exposure Investigation must be without delay by the RSO who will attempt to find cause for unusual exposure of personnel monitoring devices document by employee's written report to be reviewed by RSO

together with employee's supervisor, and recommendation made to avoid reoccurance.

Reference: 10CFR20

3. Notice to Employees Form NRC-3 and PA "Notice to Employees" shall be posted by the RSO at a location where those employees involved with radiation equipment and/or radioactive material will be able to read the document. Indicate where they can review copies of NRC regulations (10CFR), PA Code 433; current copies of NRC license, PA registration including documents referenced in these license amendments; operating procedures and any notices of violation. Check postings at least quarterly. Summarize the contents of this notice to each new employee and have him/her sign the back of forms prior to beginning routine work. Reread and have forms signed by all radiation workers annually.

References: NRC 10CFR19.11 and 19.12 PA 433 Sec. D.2 (d)

4. Personnel Protection The RSO shall personally supervise issuing, the fitting and maintenance of all respirators, safety devices, protective clothing, and equipment as required. Although unlikely, should respiratory protection become necessary (per 10CFR20.103) then the RSO must comply with all provisions of 20.103 (c).

Reference: NRC 10CFR20.103

Frequency: Initially as required, spot check at least weekly.

B. CONTROL OF RADIOACTIVE MATERIALS AND RADIATION PRODUCING EQUIPMENT

1. Procurement RSO shall be notified of all requests for purchase, receipt, sale, transfer or disposal of any radioactive materials or any electrical equipment which is known to, or suspected of being capable of producing ionizing radiation. RSO shall immediately

check and monitor all incoming shipments of source materials (per 10CFR20.205) and notify all shippers and receivers. Provide all companies copies of current PA registration and NRC license. Copies of purchase orders, bills of lading, and manifests shall be filed with the RSO.

References: NRC 10CFR 20.205, 20.311, 20.401 and 40.51
PA Code 433

2. Posting and Labeling RSO shall monitor all shipments (in and/or out of Ionics) to assure compliance with US-NRC and US-DOT regulations relation to proper labeling of contents, posting of areas and placarding of vehicles. The RSO must monitor all incoming shipments of source materials without delay and document results of survey for removable surface contamination, external radiation, proper labels and shipping papers.

References: 10CFR 20.230, 20.205 PA 433 Sec. D.11
US-DOT 49CFR 172.403, 173.443

Frequency: Check monthly all storage and manufacturing areas.

3. Radiation Survey

a. Routine radiological surveys are to be performed by RSO of all areas where radioactive materials are received, stored, used, and/or transferred for shipment. Documentation of all surveys shall be kept on file by the RSO.

References: NRC 10CFR 20.205, 20.207, 20.401; 10CFR 30.44; 10CFR 40.63 PA 433 Sec. D.10

Frequency: At least monthly.

b. The RSO shall make certain that exposure to employees and the public shall be as low as reasonably achievable (ALARA) and that licensed radioactive materials are transferred or disposed of in accordance with applicable regulations and the

conditions of the company's licenses.

References: NRC 10CFR 20.101, 20.103, 20.104, 20.105, and 20.106; 10CFR 40.51, 40.65
PA 433 Sec. D.3 thru D.7

c. Emergency Survey RSO shall monitor without delay an area, source or container suspected of causing or threatening to cause a radiation risk. Results of such surveys shall be recorded and official notification made in accordance with NRC regulations and state regulations.

References: NRC 10CFR 20.205(2)(b)(v)(2), 20.403, 20.405
PA 433 Sec. D.16 and D.17

4. Inventory of Radiation Source RSO shall make a physical inventory of all radioisotope sources quarterly.

a. Concentration of sources materials (wt.%) shall be determined by analysis.

b. The location and amounts of source materials shall be logged and up-dated quarterly by the RSO.

References: NRC 10CFR 20 and 10 CFR 40

5. Health Physics Instrument, Procurement, Calibration, and Maintenance shall be under the supervision of the RSO. It is his/her responsibility to maintain a sufficient number of portable radiation survey instruments in working condition to monitor accurately (± 10%) alpha, beta and gamma radiation and to collect air particulate samples of breathing zones, general work areas and the environment.

a. Portable survey meters shall be calibrated every 90 days or before use following any repair. Air sampling equipment shall be calibrated as recommended by the RSO or HP consultant, but at least semi-annually.

Reference: NRC 10CFR 20

7. Training The RSO or the HP consultant shall provide radiation safety orientation for all employees whose jobs may involve working with materials containing depleted uranium, other licensed radioactive materials or radiation producing equipment. He will present factual information concerning the nature of the radiation risks and methods of assuring that the identification and control of radiation risks are effective. The RSO will also inform employees of the availability of sources of additional pertinent information including the following:

   a. NRC Regulations Title 10CFR 19, 20, and 40.

   b. Pennsylvania Health Department Regulations Code 433 Sec. D.2 (b)(1) and (2).

C. RECORDS

1. Radiation Records and Files shall be maintained by the RSO in accurate orderly manner, readily available for inspection by authorized federal, state, and company officials. Among those files and records maintained by the RSO shall be the following:

   a. Personnel Radiation Monitoring:

      (1) Film badge reports.
      (2) Bioassay records (urine, breath, etc.)

   b. Radioisotope Inventory:

      (1) Shipping and receiving records.
      (2) Analyses of incoming materials, process, waste and product samples.
      (3) Source materials.

   c. Radiation Survey Reports and Records of Investigation of:

      (1) Any unusual incident
      (2) Accidents
      (3) Emergency situations (actual or suspected)

d. Instrument Calibrations:

(1) Portable survey meters
(2) Air sampling equipment

e. Training Records:

(1) Attendance records, employee indoctrination, safety orientation.
(2) RSO training
(3) Management briefing training.

f. Inspection Records:

(1) US-NRC
(2) Pennsylvania Health Department
(3) Other (e.g. insurance carriers)

g. NRC Licenses and PA Registrations including:

(1) All documents incorporated into a license by reference and amendments.
(2) Operating procedures.
(3) Notices of violations and responses thereto.

h. File Copies (Up-To-Date) of Regulations:

(1) US-NRC Title 10-CFR-19
US-NRC Title 10-CFR-20
US-NRC Title 10-CFR-30
US-NRC Title 10-CFR-40
US-NRC Title 10-CFR-71
(2) US-DOT Title 49-CFR-197 through 199
(3) Pennsylvania Health Department Code 433

i. Radiation Safety Procedures (1) Manual

References: NRC 10CFR 19, 20, and 40 PA 433 Sec. D.15

ATTACHMENT 3 of FORM NRC-2 8/84

Ionics, Inc., Bridgeville, PA 15017

ITEM 12 (a) RE: Safety Features and Procedures to Avoid Non-Nuclear Accidents such as fire, explosive, etc. While at Ionics, the source material will be received, stored and worked on in fire resistant and sprinkler protected areas. Once encase in steel, the dU will be an inconsequential risk in the event of fire, explosion, etc. at Ionics or Jelco Manufacturing's facilities.

(b) Emergency Procedures will be in accordance with specific instructions from the project RSO and will include contacting AHP's Hot Line (24 hours) for emergency assistance. See attached Emergency Notification Form.

(c) See Attachment 2.

CURRICULUM VITAE

ROBERT G. GALLAGHAR
17 Park Avenue
East Greenbush, New York 12061
(518) 477-7974

SUMMARY OF QUALIFICATIONS AND EXPERIENCE

Bob Gallaghar is regarded as an authority on loss prevention. He combines more than twenty years of senior and top management experience with about thirty years of professional work in radiological safety (health physics), occupational and environmental protection. Bob has founded several corporations, technical associations and a library on atomic energy. He has been an officer and director of six companies, several technical societies, a chamber of commerce and taught graduate courses at three universities.

More than 300 organizations in the United States, Canada and Europe have been his clients, including du Pont, IBM, Mayo Clinic, GE, AT&T, as well as federal and state agencies. He has been very successful as an expert witness with outstanding knowledge and experience in the management of radiation accidents and problems involving radioactive contamination. He lectures in the United States and Canada on hospital safety, medical malpractice prevention, decontamination, management of hazardous wastes and the use of the systems approach to loss prevention.

Bob is a registered professional engineer and certified by four professional boards. He has had over two dozen articles published in technical journals, edited and written many reports on special studies as part of contracts with NIOSH, OSHA, United States Army, US-NRC, New York Dept. of Environmental Conservation and other federal and state agencies. He has appeared on a number of radio and television programs and has been interviewed by newspapers and magazines concerning his work in evaluating radiological accidents and his interest in helping others to develop professional careers in health physics and other loss prevention specialties.

EDUCATION:

Stanford University (4 years)	Biological Sciences (A.B.)
Western Maryland College (1 year)	Biology
Hahnemann Medical College (1 year)	Medicine
Oak Ridge Institute of Nuclear Studies & Oak Ridge National Laboratory (1 year)	Radiological Physics
University of Cincinnati (1 year)	Liberal Arts

PROFESSIONAL CERTIFICATIONS AND HONORS:

CHP, Certified Health Physicist by American Board of Health Physics in 1960, Recertified in August, 1982
CIH, Certified Industrial Hygienist by the American Board of Industrial Hygiene, Recertified in January, 1981
SCP, Certified Safety Professional by Board of Certified Safety Professionals of the Americas
PE, Registered Professional Engineer Massachusetts, #15436 American Nuclear Standards Institute's Management Board
CHCM, Certified Hazard Control Manager by International Hazard Control Management Certification Board
Sigma Xi (life member National Honorary Research Society)

PROFESSIONAL ACTIVITIES:

Health Physics Society Treasurer (2 terms)
President: Northeastern New York Chapter
Western Pennsylvania Chapter
International Radiation Protection Society
American Academy of Industrial Hygiene
American Nuclear Society
American Society of Safety Engineers
President: Pittsburgh Chapter
American Chemical Society
American Society for Nondestructive Testing
Cincinnati Radiation Society, Founder and Chairman
Assistant Professor, Duquesne University and University of Pittsburgh
The Engineering Society of Cincinnati
National Safety Council
National Safety Management Society
New York Academy of Science
New York Athletic Club
Hospital Association of Western Pennsylvania
Kane Memorial Hospital, Pittsburgh, PA - Director
Northeastern New York Safety & Health Council - Director

MILITARY SERVICE:

U.S. Army, active duty: 1942-1945
U.S. Public Health Service 1949-1954; Promoted to Captain, 1979.

EXPERIENCE:

Applied Health Physics, Inc.
Pittsburgh, PA, Albany, NY & Washington, DC (1962 to present)

President and Chairman of the Board of this professional health and safety service firms which he founded in 1962. Directs technical services which the firm furnishes to industries, universities and medical users of radiation as well as other organizations involved in the control of other toxic and hazardous materials. He designed and developed some of the safety equipment and services offered by the company and participates in the company's training programs, audits, surveys, decontamination and waste disposal operations. Conducted comprehensive OSHA-type audits for the New York Department of Environmental Conservation and presented training for hazardous waste compliance inspectors.

Venture, Inc., Bethel Park, PA (1968 to Present)

President and Treasurer of Venture, Inc., a firm engaged in precious metal recovery, commercial real estate and other types of investments.

NL Industries, Inc., Albany, NY (12/79 to 6/80)

Manager, Health, Safety and Security. Reorganized and directed occupational health, safety, environmental protection and security programs for manufacturing operations involving production of depleted uranium armor piercing projectiles, radiation shields and counter-weights for aircraft and missiles. Supervised health physics, medical, industrial hygiene, fire and plant protection personnel. Also managed licenses and permits for domestic manufacturing and export of radioactive materials and waste disposal. Provided safety training and technical consultation services to employees and customers.

Hospital Safety, Inc., Bethel Park, PA (1975 to 1979)

President and Founder of this firm that provided a unique service to self-insured hospitals. HSI's objective was to prevent medical malpractice claims and to meet the hospital inustry's need for experienced and effective means to reduce injuries, illnesses and absenteeism of hospital workers as well as to train hospital employees in proven loss prevention methods.

Nuclear Science & Engineering Corp., Pittsburgh, PA (1960 to 1962)

Assistant Manager and Director of Health Physics Division. Supervised all of NSEC's health and safety activities. Responsible for the planning and direction of the health physics programs for approximately fifty industrial and governmental clients. Supervised such commercial services as bioassay, leak testing, decontamination, instrument repair and calibration. Managed environmental radioactivity monitoring programs at six nuclear power plants.

University of Pittsburgh, Pittsburgh, PA (1960 to 1970)

Originally appointed to the faculty of the Graduate School of Public Health as Adjunct Assistant Professor of Industrial Hygiene with special responsibility for the design and presentation of lectures, laboratory and field programs for the Department of Occupational Health. Later, joined the University's Dept. of Radiation Health as Adjunct Ass't. Professor of Health Physics. Served in a part-time capacity to conduct field studies and supervise certain research projects by graduate students.

Liberty Mutual Insurance Co., Boston, MA (1954 to 1960)

Responsible for Health Physics Services. Assisted policyholders in solving a variety of radiological problems and worked with the insurance industry to evaluate many new uses of radiation and nuclear energy. Trained insurance engineers and industrial hygienists to perform radiological safety surveys. Served as a member of several technical committees of the Nuclear Energy Liability Insurance Association (NELIA) and helped to develop inspection criteria for use in evaluating nuclear energy projects. Gained considerable experience in damage control and decontamination work following radiation accidents. Placed in charge of the Radiation Laboratory and Calibration Facility at Liberty Mutual's Research Center in Hopkington, Massachusetts and conducted research on safety of encapsulated radiosotope sources and decontamination techniques.

Harvard University, Cambridge, MA (1956 to 1960)

Appointed Lecturer on Radiological Health at the Graduate School of Public Health. Liberty Mutual cooperated by permitting Mr. Gallaghar to accept the appointment and to present lecturers and laboratory sessions over a period of several years at Harvard. He also has lectured at Massachusetts Institute of Technology (M.I.T.), the Post Graduate Medical School of New York University (N.Y.U.), University of California (Berkeley) and University of North Carolina.

U.S. Public Health Service
Washington, D.C. Cincinnati, OH (1949 to 1954)

Received commission as Lieutenant J.G. and served as Health Physicist for U.S. Public Health Service. Served on the faculty of the USPHS, Radiological Health Training Branch. Acted as a consultant to hospitals, state and local governments, industrial concerns, and several research and educational institutions. During the nuclear weapons tests in 1951, was assigned to Los Alamos Scientific Laboratory in connection with fallout monitoring from ground zero to 50-75 miles downwind. Official duties ranged from emergency planning to direct supervision of emergency operations following several serious accidents involving radioactive material. Conducted research concerning long-term use of radium and decontamination methods. Promoted to rank of Captain in 1979 as a reserve (inactive) officer.

U.S. Army, Quartermaster Research & Development Laboratories
Philadelphia, PA. (1948)

Employed as a research microbiologist to conduct tests of fungicidal chemicals in paints, plastics and paper using various strains of fungi. Helped to establish test methods and procedures as part of the National Research Council's Committee on Prevention of Tropical Deterioration. Served on the Laboratory Safety Committee. Several technical papers were prepared on the results of this research and published in QM Research Reports, by the Dept. of Defense.

Temporary Employment:

The Ballenger Co., Philadelphia, PA. (1947)
Designed laboratory facilities for Quartermaster Corps, U.S. Army and Naval rocket research lab.

Thomas B. Hunter, San Francisco, CA. (1947)
Worked on design of research laboratory facilities at University of California, Standard Oil Company, and renovation of Hurst mansion of San Simion.

Insurance Company of North America, San Francisco, CA. (1947)
Employed in fire insurance agency service department as trainee.

Radio Corp. of America (RCA), Camden, NJ.
Employed as technician in piezo crystal lab (1942) and as class A-1 electronic tester on TV, FM/AM transmission equipment (1946).

PUBLICATIONS:

"Radiation Emergency Planning and Procedures," by R. G. Gallaghar. Handbook of Management of Radiation Protection Programs, edited by K. L. Miller, published by CRC Press, Inc., Boca Raton, FL. (1983).

"Preparation of an Industry Profile: Study of Ionizing Radiation," edited by J. Birdsong, Centaur Associates, Inc., Washington, D.C. for Occupational Safety and Health Administration, U.S. Dept. of Labor, Washington, D.C. (March 1980). A comprehensive study of U.S. workers potentially exposed to ionizing radiation for the purpose of evaluating the economic impact and safety benefit of proposed reductions in current permissible radiation limits.

"An Economic Study of the Radionuclides Industry." J. Birdsong, editor, Centaur Associates, Inc., Washington, D.C., Feb. 1980. A comprehensive study of the economic acticity of 76 segments of the nuclear industry in the USA during 1967-1978. Mr. Gallaghar provided technical guidance, collected and analyzed data from 800 interviews from about 200 organizations. He reviewed current licensing and regulatory practices of state and federal agencies. This report was published by the US Nuclear Regulatory Commission as NUREG /CR-2048 in July 1981.

Hospital Occupational Health Services Study

Volume I	Environmental Health and Safety Control, HEW Pub. No. (NIOSH) 75-101, July 1974
Volume II	Employee Health & Safety Statistics & Records, HEW Pub. No. (NIOSH) 75-154
Volume III & IV	Organization and Administration of Hospital Employees, HEW Pub. No. (NIOSH) 76-104
Volume V	Occupational Health Services for Hospital Employees, HEW Pub. No. (NIOSH) 76-115, August 1975
Volume VI	Special Information, HEW Pub. No. (NIOSH) 76-116, August 1975
Volume VII	Summary and Conclusions, HEW Pub. No. (NIOSH) 76-115, April 1976

R. G. Gallaghar and Norton Weber edited and contributed a large number of sections in this series of reports of the first comprehensive study of the U. S. hospital industry. This work was done by Applied Health Physics, Inc. for the National Institute for Occupational Health and Safety, Public Health Service, U.S. Department of Health, Education and Welfare in 1974 and 1975.

"Emergency Planning & Procedures" by R. G. Gallaghar, Handbook of Radioactive Nuclides, edited by Y. Wang, Published by Chemical Rubber Co., Cleveland, OH June 1969.

"Surface Contamination," edited by B. R. Fish. Published by Pergamon Press, LTD., Loncon, W.I., 1967.

"Health Physics in Medical Applications," by R. G. Gallaghar and M. L. Martin. Atomics, Vol. 18, No. 1, Jan/Feb 1965.

"Radiation Accidents & Emergencies in Medicine, Research & Industry." Edited by L. H. Lanzl, J. H. Pingel, and J. H. Rust. Published by C. C. Thomas, Springfield, IL 1965.

"Medical Aspects of Radiation Accidents," edited by E. L. Saenger, Published by U. S. Atomic Energy Commission, Sup't. of Documents, U.S. Government Printing Office, Washington, D.C., 1963.

"Testing Radium Capsules for Radon Leakage," by R. G. Gallaghar, R. D. Evans and R. G. McAllister, Am. J. Roetg. Ra. Ther. & Nuclear Medicine, Vol., XC, No. 2, Aug. 1963.

"Thinking About Radioactivity?", by R. G. Gallaghar. Atomics, 1962.

"Radioisotope Hazards Evaluation," by R. G. Gallaghar. The National Insurance Buyer, July 1961.

"In Plant Decontamination Hazards and Procedures," by R. G. Gallaghar. Proceedings of the Nuclear Energy Training Course for Insurance Personnel. Published by Braun-Brumfield, Inc., Ann Arbor, MI, 1958.

Publications, continued:

"Radium Capsules & Their Associated Hazards," R. G. Gallaghar, E. L. Saenger, Am. J. Roetg. Rad. Ther. & Nuclear Med., Vol. 77, No. 3, March 1957.

"Going Into Radiation?", by R. G. Gallaghar. Petroleum Processing, March 1957.

"Long Term Radioactive Exposures, The Kelly Clinic Study," by R. G. Gallaghar, M. R. Zavon, H. N. Doyle. Baltimore Health News, Vol. 33, No. 4, April 1956.

"Radioactive Contamination in a Radium Therapy Clinic," by R. G. Gallaghar, M. R. Zavon, H. N. Doyle. Published in the Public Health Reports, Vol. 70, No. 7, July 1955. This article was reprinted in "Selected Materials on Employee Radiation Hazards and Workmen's Compensation," by the Joint Committee on Atomic Energy of the 86th Congress. Published by the U.S. Gov't Printing Office, Washington, D.C., Feb. 1959.

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"Financial Protection Against Radioactive Contamination: Insurance or Bonds?" by A. K. Gallaghar and R. G. Gallaghar. Presented at symposium Radioactive Waste Disposal, Albany, N.Y., May 8, 1980.

"Depleted Uranium: Its users and essential occupational health, safety and environmental control measures," by R. G. Gallaghar and F. T. Vombaco.

"Financial Impacts of Trials by Media": by R. G. Gallaghar. An analysis of direct and indirect costs incurred by TV expose of the environmental radioactive pollution problems from two manufacturing plants. This article describes the economic and sociological impacts of chronic low level radioactive contamination. It compares the reactions of top management of two international corporations and the results obtained as both companies responded to media reports of environmental risks by "stonewalling" versus "going public with facts." Presented at a symposium "Informing the Public About Radiation and Nuclear Power," Washington, D.C., May 30, 1981.

Publications in Process, continued:

"Loss Prevention Audits: The Diagnosis and treatment of corporate myopis," by R. G. Gallaghar. An analysis of major financial and competitive losses that several multinational giants have experienced recently when environmental, occupational health and safety requirements were ignored. Values of annual audits of CPA's are compared with loss prevention audits by independent CSP's.

"Regulatory Disparities Concerning Acceptable Levels of Residual Radioactive Contamination," By E. E. I.Njoku and R. G. Gallaghar. This paper describes the problem of interpreting current regulatory agency rules and guidelines. It stresses the absolute need for standardized limits in NRC regulated and AEC Agreement states. Presented at the Health Physics Society meeting, Baltimore, MD, June 1983.

"The Development of Radiation Records Systems for Microcomputers Using Data Base Software Packages," by M. Thompson and R. G. Gallaghar for presentation at "Computer Applications in Health Physics." Pasco, WA, Feb. 1984.

"Preparation of an Industry Profile: Health Effects Section. Phase I Study of Radiofrequency and Microwave Radiation." Edited by J. Birdsong, Centaur Associates, Inc., Washington, D.C., March 1982. The Occupational Safety and Health Administration (OSHA) contracted with Centaur Associates to provide current baseline data on U.S. industries in which potential employee exposures to RF/microwave radiation occur. If OSHA elects to develop a regulation to control occupational exposure to nonionizing radiation, these data will be used to analyze the benefits, technological feasibility and economic impact of proposed regulatory controls. R.G. Gallaghar and J. J. Kielman, Ph.D. worked with M.J. Schule and others at Centaur to prepare a preliminary report of this study for OSHA (March 1982).