FORM NRC-313 I (1-79) 10 CFR 30

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

See attached instructions for details.

Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.

1. APPLICATION FOR: *(Check and/or complete as appropriate)*

- [X] a. NEW LICENSE
- [ ] b. AMENDMENT TO: LICENSE NUMBER
- [ ] c. RENEWAL OF: LICENSE NUMBER 03316

2. APPLICANT'S NAME *(Institution, firm, person, etc.)*

General Electric Company

TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
413-494-1110

3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION 30-17435

Donald L. Phipps, Jr. 03120

TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
413-494-5423

4. APPLICANT'S MAILING ADDRESS *(Include Zip Code)*

One Plastics Avenue
Pittsfield, Massachusetts 01201

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED *(Include Zip Code)*

One Plastics Avenue
Pittsfield, Massachusetts 01201

(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)

6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL
(See Items 16 and 17 for required training and experience of each individual named below)

	FULL NAME	TITLE
a.	Keith L. Dodge	Pilot Plant Technician
b.	Donald L. Phipps, Jr.	Specialist-Process Development
c.	Frederick M. Toca	Manager-Environmental Protection

7. RADIATION PROTECTION OFFICER

Paul F. Ast

Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.

8. LICENSED MATERIAL

LINE NO.	A ELEMENT AND MASS NUMBER	B CHEMICAL AND/OR PHYSICAL FORM	C NAME OF MANUFACTURER AND MODEL NUMBER *(If Sealed Source)*	D MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME
(1)	Cs-137	Sealed	Texas Nuclear Model 696-696833	2 x 100 millicuries
(2)				
(3)				
(4)				

Applicant... 369098
Check No... A110(34)
Amount/Fee Category... APPLICATION
Type of Fee...
Date Check Received... MAR 18 1980
Received By... Brown

RECEIVED BY LFMB
Date... Mar 19 1980
Log... Mar P64 N.L.
By... Brown
Orig. To...
Action Compl... 3/19/80

LINE NO.	E DESCRIBE USE OF LICENSED MATERIAL
(1)	See Attachment #1
(2)	
(3)	
(4)	

8006230279 1 SPP

COPIES SENT TO OFF. OF INSPECTION AND ENFORCEMENT 03039

FORM NRC-313 I (1-79)

"OFFICIAL RECORD COPY"

ML18

9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	Two (2) source holders	Texas Nuclear	5195
(2)			
(3)			
(4)			

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	No radiation detection instrumentation is necessary to safely possess and utilize these devices.					
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☐ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY

None required.

☐ b. CALIBRATED BY APPLICANT

Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
☐ (1) FILM BADGE		☐ MONTHLY
☐ (2) THERMOLUMINESCENCE DOSIMETER (TLD)		☐ QUARTERLY
☐ (3) OTHER (Specify): None required, See Attachment #3.		☐ OTHER (Specify):

13. FACILITIES AND EQUIPMENT (Check were appropriate and attach annotated sketch(es) and description(s).

☐ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.
☐ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.
☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.
☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

Not applicable.

14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

See Attachment #4

b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. RADIATION PROTECTION PROGRAM. Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures *(if needed)*, day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.

16. FORMAL TRAINING IN RADIATION SAFETY. Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.

    a. Principles and practices of radiation protection.

    b. Radioactivity measurement standardization and monitoring techniques and instruments.

    c. Mathematics and calculations basic to the use and measurement of radioactivity.

    d. Biological effects of radiation.

17. EXPERIENCE. Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

18. CERTIFICATE

(This item must be completed by applicant)

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 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

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.

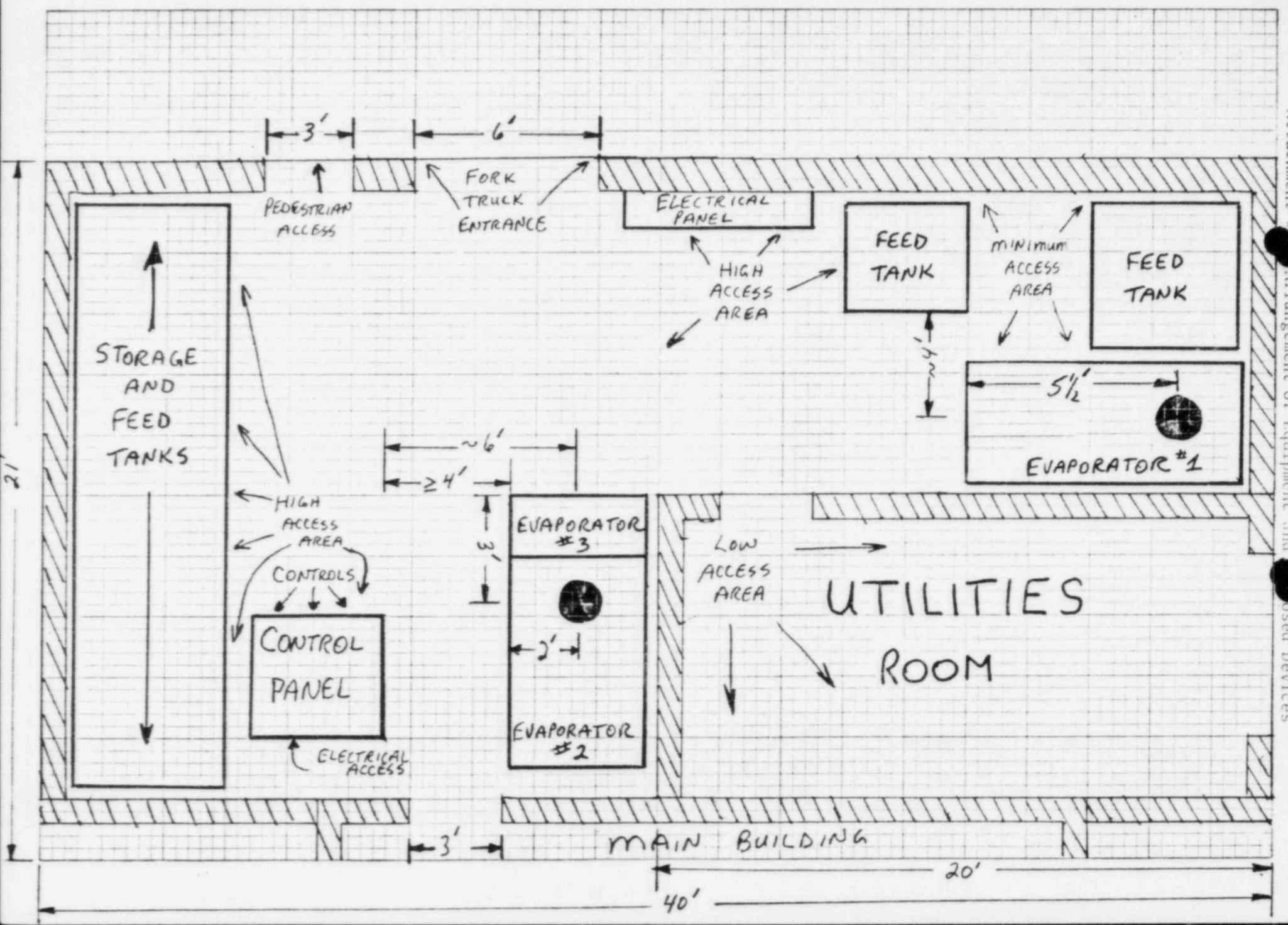
a. LICENSE FEE REQUIRED *(See Section 170.31, 10 CFR 170)*	b. CERTIFYING OFFICIAL *(Signature)* Frederick M. Toca
	c. NAME *(Type or print)* Frederick M. Toca
(1) LICENSE FEE CATEGORY:	d. TITLE Manager-Environmental Protection
(2) LICENSE FEE ENCLOSED: $ 110.00	e. DATE 03039

FORM NRC-313 I (1-79)

ATTACHMENT #1: ITEM 8.E (1) "USE OF LICENSED MATERIAL"

These Cs-137 sources will be used to measure liquid levels inside chemical process equipment, in conjunction with detector elements also supplied by Texas Nuclear. Operating temperatures and pressures are sufficiently low, and the chemicals being used in this process are sufficiently non-aggressive so that there are no severe environmental conditions that can affect the integrity of the source and shielding. All environmental factors have been presented to the manufacturer for evaluation prior to specifying these devices.

A diagram showing the proposed location of the devices is shown in Attachment #2.



Attachment #3 Arrangement of Equipment and Proposed Devices

ATTACHMENT #3: ITEM 12.A (3) "PERSONNEL MONITORING DEVICES"

No additional personnel monitoring devices need be utilized due to the presence of these gauging devices. The source holders are designed such that radiation levels will be less than 5 mR/h one foot from any accessible surface at the maximum source loading for the device with the device in the OFF position. With the shutters open, a collimated beam of radiation exists between the source head and detector traversing the vessel being monitored. It is not likely, when consideration is given to the design of the device, the precautions to be taken itemized below (Attachment #5) and the minimal accessibility, that any individual will receive a radiation exposure in excess of 0.125 rem per calender quarter.

ATTACHMENT #4: ITEM 14.a "WASTE DISPOSAL"

No waste disposal is involved. In the event that the gauge is damaged or its use discontinued, we shall notify Texas Nuclear for removal and return the gauge for repair or disposal of the source material.

ATTACHMENT #5: ITEM 15. "RADIATION PROTECTION PROGRAM"

I. The arrangement of the equipment and location of the proposed Cs-137 devices are shown on Attachment #2. The proposed device on Evaporator #1 is in a minimum access area, with no need for personnel to come within three (3) feet of the device during normal plant operation (one pump within three (3) feet of the device may require some periodic maintenance when the plant is not in operation). The proposed device on Evaporator #2 is two (2) feet from a walkway which is used to enter and leave the area, but approach within three (3) feet could be blocked by barriers, if required. (Maintenance would require closer approach to the device as for Evaporator #1.) Based upon working conditions and physical accessibility, we estimate that six (6) persons would routinely be within three (3) feet of either of these devices three (3) hours per week. The vessels on which the device are to be mounted are too small for entry and contain no internal parts which might require maintenance.

II. Our personnel will be instructed as to the size and location of the beam, the radiation levels in the beam and will be cautioned that unless the shutter is CLOSED these radiation levels are significant. These devices have the capability of producing high level radiation between the source holder and the detector. However, the combination of:

i. during normal operation no individual has access to the vessel. The contained material and operating parameters preclude the access of any major portion of the body to the radiation field. Only authorized personnel are allowed to change the operating parameters and/or authorize access;

ii. personnel are instructed to CLOSE the gauge shutter when the operation is stopped and/or work must be done on any vessel being monitored;

iii. if the operation is to be shut down for any extended period of time or extensive work is to be done on the vessel, the radiation safety officer will be notified to insure that the shutter is locked in the CLOSED position and remains locked during this period of time;

iv. signs displaying "Caution Radiation" and the standard symbol stating that the shutter must be CLOSED and the radiation safety officer notified prior to working on the vessel being monitored will be posted at installation;

v. the general inaccessibility of these devices;

should be sufficient to prevent unauthorized entry to the radiation beam and preclude any unintentional radiation exposure.

III. Texas Nuclear personnel will perform the initial radiation survey and leak testing at the time of installation. Additionally, our personnel

ATTACHMENT #5 - (Cont'd)

III. (Cont'd)

will receive specific training at the time of installation. This training will include construction features of the device, source integrity, beam geometry and intensity and operating details of the device. Any precautionary steps like the addition of shielding, signs, or precautions to be taken will be covered at the time in accordance with Texas Nuclear installation procedures and training.

IV. The source holders will be tested for integrity at least once every three years or as required by NRC. Leak testing will be performed by Texas Nuclear Procedure QT/1K.

V. a. In the event that some catastrophic emergency occurs and these devices may be involved, we will notify Texas Nuclear and await further instructions.

b. Any repair, relocation or removal of the source holders will be done by Texas Nuclear personnel.

ATTACHMENT #6: ITEMS 16 AND 17 "FORMAL TRAINING IN RADIATION SAFETY" AND "EXPERIENCE"

For resumes of the individuals named in Items 6 and 7, see Attachments #7, 8, 9 and 10. As shown in these attachments, Frederick M. Toca and Paul F. Ast have received formal training in radiation safety and/or experience in the use of radioactive sources for gauging devices, while Donald L. Phipps, Jr. and Keith L. Dodge have not. To assure that Mr. Phipps and Mr. Dodge receive proper instruction and training in the safe use of these devices, the manufacturer will furnish us with detailed instructions on the proper precautions to be taken in utilizing these devices. Specific items of design detail, shutter operation, beam geometry, radiation levels and regulatory compliance will be presented by trained personnel of Texas Nuclear at the time these devices are installed.

ATTACHMENT #7: RESUME OF KEITH L. DODGE

Born: June 23, 1949 Pittsfield, Massachusetts

Education: A.S. Berkshire Community College, 1974, Pittsfield, Mass.
Major - Environmental Studies.
(46 hours of Lab Sciences)

Licenses: Mass. Grade III Wastewater Treatment Plant Operator's License.

Work Experience:

3/78 to present - General Electric Company, Plastics Business Division
Chemical Technician - Monomer Processes.

6/72 to 3/78 - General Electric Company, Large Transformer Business Division.
General labor.

5/68 to 6/72* - U.S. Marine Corps - Aviation electrician sergeant of line operations electrical shop.

8/67 to 5/68 - General Electric Company, Large Transformer Business Division.

*Training throughout 4 years in basic nuclear precautions (training concerned with battlefield emergencies and treatment of radioactive injuries).

ATTACHMENT #8: RESUME OF DONALD L. PHIPPS, JR.

Born: November 5, 1939 Bristol, Virginia

Education: BChE, University of Virginia, Charlottesville, Virginia, 1972
Major: Chemical Engineering

MS, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1967
Major - Chemical Engineering (emphasis on medical and biological applications of chemical engineering).

Professional Society, Patents, Awards:

Member - American Institute of Chemical Engineers
Holder of 3 U.S. patents; 3 patents pending
Member - Sigma Xi (elected 1967)

Professional Work Experience:

12/72-date General Electric Company, Plastics Business Division, Mt. Vernon, Indiana and Pittsfield, Massachusetts
Development Engineer until 11/75, Specialist-Process Development since 11/75.

Responsible for development of new processes and/or improvements of existing processes for three different operations within the Plastics Division; development of chemical reaction and physical processes; engineering design, construction, and operation of laboratory and pilot plant processing units.

12/68-6/72 Fiber Industries, Incorporated, R&D Center, Charlotte, N. C.
Development Engineer
Responsible for development of new processes and/or products in the field of melt-spun synthetic fibers.

12/62-11/68* Merck & Company, Inc., Elkton, Virginia and Rahway, N. J.
Process Development/Pilot Plant Engineer

Responsible for development and scale-up of new processes and new products from lab to pilot plant to production and for development of improved processes for existing products. Fields of experience include both biological and chemical processes.

6/62-12/62 U. S. Rubber Co., Research Center, Wayne, New Jersey
Development Engineer

Responsible for product development in the area of ablative insulating materials for rocket motor cases and other applications.

*Interrupted by 9-month leave of absence to attend MIT Graduate School.

ATTACHMENT #9: RESUME OF FREDERICK M. TOCA

Born: March 20, 1941 New Orleans, Louisiana

Education: B.S., Xavier University, New Orleans, Louisiana 1962
Major - Biology
Minor - Medical Technology

MPH, University of Michigan, Ann Arbor, 1968
Major - Industrial Hygiene
Minor - Air Pollution

Ph.D., University of Iowa, Iowa City, Iowa 1972
Major - Preventive Medicine (specializing in Industrial Hygiene)

Awards and Certifications

Public Health Service Grants for both the MPH and Ph.D. degrees
AEC Research Fellow, Argonne National Laboratory, 1971-1972
Diplomate American Academy of Industrial Hygiene (certified in comprehensive practice)
Elected to the Industrial Hygiene Round Table (youngest person ever to be elected to membership)
Certified Medical Technologist (ASCP)
Certified Hazard Control Manager
Appointed OSHA Grants Review Committee by the Ass't. Secretary of Labor

Professional Work Experience

Sept. 1977 General Electric Company, Plastics Business Division, Pittsfield, Mass.
Manager - Environmental Protection

Responsible for the management and coordination of the Division's programs in industrial hygiene, safety, air, water and solid waste management, toxicology and product safety, toxicological evaluation and combustibility technology. Managers of product safety, environmental affairs, combustibility technology and industrial hygiene and safety report directly to the Manager of Environmental Protection. The direct responsibilities of this position include the following:

1. Assure the Division's compliance with all applicable environmental, health and safety and product safety laws, regulations, ordinances, codes, standards, etc.
2. Identify, evaluate and make recommendations for the control of all environmental protection problem areas, i.e., air, water, solid waste and noise.
3. Develop and work with manufacturing managers to implement standards for manufacturing processes and with related measurement, test, and inspection procedures to bring about good environmental practices.

Aug. 1974 to Sept. 1977 Tenneco Chemicals, Inc.
Director - Industrial Hygiene

Responsible for the establishment of a corporate Occupational Health Department to bring the company into compliance with OSHA, FDA, TSCA and other laws and regulations administered by the EPA. This included the establishment and organization of programs in the areas of occupational medicine, toxicology and industrial hygiene as well as the hiring of appropriate professionals to carry out programs in each of these areas.

My direct responsibilities included the administration of the corporate industrial hygiene program for 25 manufacturing facilities and three research facilities; the establishment of an industrial hygiene laboratory; acting as corporate representative on special committees such as MCA, SOCMA, etc.; and coordinating with other corporate departments in the area of product safety management.

Aug. 1972 to Aug. 1974 — Gulf Oil Corporation, Pittsburgh, Pennsylvania
Director, Industrial Hygiene Laboratory

Duties included: established and procured accreditation for the first Gulf Oil Corporation Industrial Hygiene Laboratory. As Laboratory Director, I was responsible for the administration, supervision and coordination of all Industrial Hygiene Laboratory activities, which included the preparation of an annual budget, all personnel management, selection and development of industrial hygiene sampling methods, analytical techniques and quality control procedures, the planning of corporate-wide industrial hygiene sampling studies, and the preparation and distribution of educational materials on toxicity and evaluation of hazardous environments for Gulf employees.

In addition to directing the laboratory at Gulf, I functioned as a Regional Industrial Hygienist. My area of responsibility for industrial hygiene field work included all Gulf facilities in Europe, Africa and specifically designated facilities in the United States. My duties also included responsibility for the review of new processes and facilities, for potential environmental and industrial hygiene problems.

Summer 1971 — George D. Clayton and Associates, Southfield, Michigan
Preceptorial Student (Environmental Consultants)

Duties included: prepararation of proposals for possible contracts, performance of sampling studies for community air pollution and industrial hygiene studies and the writing of reports.

May 1968 — Los Alamos Scientific Laboratory, Los Alamos, New Mexico
Staff Industrial Hygienist

Duties included: responsibility for recognition, evaluation and formulation of recommendations for control of industrial hygiene and air pollution problems for thirty research and technical groups. The work of these thirty groups varied from basic research in chemistry and physics to the building of sattelites, military weapons and research accelerators.

Problems encountered in my work at Los Alamos included possible effects of numerous chemicals, solvents, metals and other toxic substances, as well as the effects of noise, light, heat, radiation and other physical agents. As a member of the health safety team, I participated in the reviews for radiation safety for the design and operation of the Los Alamos Meson Physics facility. This job also included the establishment of a routine radiation monitoring program.

ATTACHMENT #10: RESUME OF PAUL F. AST

For training and experience of Paul F. Ast, Radiation Protection Officer, please see application dated June 14, 1977 for renewal of License No. 20-03316-03.