

NRC Form 313 I (12-81) 10 CFR 30		U.S. NUCLEAR REGULATORY COMMISSION		
APPLICATION FOR BYPRODUCT MATERIAL LICENSE INDUSTRIAL		1. APPLICATION FOR: (Check and/or complete as appropriate)		
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.		<input type="checkbox"/> a. NEW LICENSE		
		<input type="checkbox"/> b. AMENDMENT TO: LICENSE NUMBER		
		<input checked="" type="checkbox"/> c. RENEWAL OF: LICENSE NUMBER 12-00013-05		
2. APPLICANT'S NAME (Institution, firm, person, etc.) Caterpillar Tractor Co. TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION 309-578-8157		3. NAME AND TITLE OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION R.J. Vogel TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION 309-578-6817		
4. APPLICANT'S MAILING ADDRESS (Include Zip Code) (Address to which NRC correspondence, notices, bulletins, etc., should be sent.) Research Dept. Technical Center Peoria, IL 61629		5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED (Include Zip Code) Building HH Mossville, IL 61552		
(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. Sumner R. Hunt		Quality Materials Superintendent		
b. William P. Evans		Staff Engineer		
c. Chester S. Sullivan		Sr. Research Engineer		
7. RADIATION PROTECTION OFFICER Robert J. Vogel		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.	ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source)	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME
(1)	Chromium 51	Salt or Metal Sandwiched Between		100 mCi
(2)		Layers of Cellophane Tape		
(3)				
(4)				
DESCRIBE USE OF LICENSED MATERIAL E				
(1)	Subsurface marking of Hydraulic Hose during manufacture.			
(2)	used to mark defects			
(3)	8506100068 850517 REG3 LIC30 12-00013-05 PDR		License Fee Information on Next Page	
(4)	15553			

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)			
(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)	Survey Meter	Victoreen	444	1		Ten linear ranges from 0-300mR/hr
(2)						to 0-300 R/hr
(3)	Scintillation Detector	Harshaw	Custom Made	3		--
(4)	Tunnel & Rate Meter					

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

<input type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY	<input type="checkbox"/> b. CALIBRATED BY APPLICANT Attach a separate sheet describing method, frequency and standards used for calibrating instruments.
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12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input type="checkbox"/> (1) FILM BADGE <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input checked="" type="checkbox"/> (3) OTHER (Specify): <u>None</u> (See attached sheet.)		<input type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER (Specify): _____

13. FACILITIES AND EQUIPMENT (Check where 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. Ref: License appl. 12-00013-05, 6/4/68

14. WASTE DISPOSAL

- a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED
Peoria Disposal Co. - Disposed of as nonradioactive after 9 months
- 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:

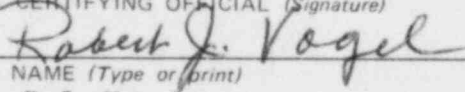
15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, 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) 
	c. NAME (Type or print) R.J. Vogel
(1) LICENSE FEE CATEGORY: \$150.00	d. TITLE Research Engineer
(2) LICENSE FEE ENCLOSED: \$ 150.00	e. DATE

SUPPLEMENT
Form NRC-3131
(1-79)
10 CFR 30

LICENSE NO. 12-00013-05

Item 6 Individual(s) Who Will Use or Directly Supervise the Use of
Licensed Material

d. Charlene M. Hayden

Research Chemist

8/22/83
840
refund

Applicant
Check No.	E04158m
Amount/Fee Category	8/503
Type of Fee	REN
Date Check Rec'd	8/22/83
Received By	cup

RECEIVED BY LFMB	
Date	8/22/83
Log	by 19-11
By	cup
Orig. To	RE/11
Action Compl.	8/22/83

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(1-79)
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Item 11 Calibration of Instruments

1. Survey meter calibration according to NRC License 12-00013-02 Radiographic Operating Procedures, on a quarterly basis and after each instrument servicing or repair.
2. Scintillation detector tunnel system is checked daily by the Process Controlman or operator. A known radioactive hose shall be passed through the detector head to see if the system is functioning properly. This check shall be validated on record sheets provided at the detection unit.

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Item 12 Personnel Monitoring Devices

Exposure to any personnel in excess of those specified in 10 CRR 20.105 is not likely. For this reason, the Hose Manufacturing Facility is not considered a restricted area and film badges will not be necessary.

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Item 15

Radiation Protection Program

Fabrication:

100 ft. rolls of tagged cellophane tape will be fabricated under the direction of licensed personnel in the Research Department, Technical Center, under the control of the Radiation Safety Committee. Each roll will contain a maximum of 1.0 mCi of $^{51}_{24}\text{Cr}$. The activity will be uniformly distributed as a $^{51}_{24}\text{CrCl}_3$ salt along a center line and sandwiched between 2 layers of tape. In the event that 1.0 mCi is exceeded, the roll will be stored in the Radioisotope Laboratories of the Research Department until decay brings the level to the licensed amount.

The $^{51}_{24}\text{CrCl}_3$ solution is dispensed onto the tape from a fountain pen tip. The tip and reservoir are weighed before and after the fabrication of each roll of tape. The solution has a known concentration. The total activity on each roll is then calculated from the solution concentration and the mass of the solution applied to the tape. The application rate of solution from the pen tip is calibrated periodically.

Use:

100 rolls or less will be delivered to licensed personnel of the Hose Manufacturing Facility containing no more than 1.0 mCi $^{51}_{24}\text{Cr}$ per roll. The tape is stored at the Hose Plant in special lead-lined containers which will be kept locked. Tape will be dispensed by the Fabrication Foreman as required. He will personally load and unload the dispensers. No tape shall be used beyond the expiration date of 21 days. The radioactive tape will be applied with the dispensers provided and hand contact with the tape shall be avoided. The Fabrication Foreman shall be responsible for instructing all personnel in the proper methods of handling and applying radioactive tape and to make frequent checks to see that these instructions are being followed.

Accounting:

Records of inventory, use, and disposal will be maintained by the Hose Plant showing receipt, transfer and disposal of all by-product material. Research shall identify each roll of tape by number and expiration date. (Expiration date to be 21 calendar days from day of tape manufacture.) When the new tape is received at the Hose Plant, the Fabrication supervisory personnel will record the numbers of the rolls received by date and acknowledge receipt by signing the log book. Rolls will be dispensed in numerical order. The label on the tape roll will be transferred to the outside of the dispenser. The

roll number and expiration date will be recorded in the log book. The foreman shall daily check the log book, or make on-the-line checks, to verify that all tape is current. In addition, the Process Controlman shall make daily on-the-line checks. The Factory Services Foreman shall follow established procedures for handling storage, transportation and disposal of radioactive scrap hose. Periodic surveys and audits will be conducted by the Radiation Safety Officer to assure proper radiation safety and maintenance of records.

Radiation Protection Officer:

The Radiation Protection Officer will ensure that the procedures of the Radiation Protection Program are followed and that accountability of all radioactive material is maintained.

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Item 16 and 17 Training & Experience of Individuals Named in (4)

W.P. Evans

Training:

1. "Radioisotopes in Industry" lectures, ORINS, April, 1953 (2 weeks)
2. Radioisotope Techniques School, ORINS, July, 1953 (4 weeks)

Experience:

1. Industrial applications of radioisotopes and gamma radiography in Caterpillar Research since 1954.

R.J. Vogel

Training:

1. Radioisotope Techniques School, ORINS, Jan. 1965 (four weeks).
Topics: X-Rays
Radiochemistry
Applied Nuclear Physics
2. MS Thesis - Scintillation Counting
3. University of Wisconsin short course "Industrial Use of Radioisotopes and Activation Analysis", Sept. 1968 (one week)

Experience:

1. Engineer on the Manhattan Project, Columbia University and Oak Ridge, Tennessee, 1942-1946.
2. Industrial applications of radioisotopes and gamma radiography in Caterpillar Research since 1954.

C.S. Sullivan

Training:

1. M.S. Physics (Feb. 1971) and M.S. Nuclear Engineering (Aug. 1975) from University of Illinois. Included one semester course NucE349 "Radiation Protection".
2. Nuclear Power School, Naval Reactors Facility, Idaho Falls, Idaho, Class 7705, Apr. - Sept. 1977 (6 months).

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3. Qualified on S1W Nuclear Plant, Naval Reactors Facility, as:

Engineering Officer of the Watch (EOOW)	2-2-78
Nuclear Plant Engineer (NPE)	6-22-78
Shift Supervisor - Acting (SS-A)	3-21-79

Included "in-rate" training and experience with Radiological Controls (RadCon) in context of nuclear plant operations and training of Engineering Laboratory Technicians (ELT's).

Experience:

1. Engineer with Laser Isotope Separation Project, Gaseous Diffusion Plant, Oak Ridge, Tennessee, Aug. 1975 - Feb. 1977.
2. Operations and training experience on S1W Nuclear Plant, Naval Reactors Facility. NPE and SS-A on operating crews. Special Assignment to Operations Assistant on plant administrative staff for S1W Rad Con and liaison with NRF Rad Con Manager. Apr. 1978 - July 1979.

S.R. Hunt

Training:

1. B.A. Chemistry from Duane College and M.S. Engineering Mechanics from Columbia University.
2. Licensed Professional Engineer in the State of Illinois.
3. Has been specifically instructed in radiation safety as it relates to this application.
4. Is cleared and endorsed by the Radiation Safety Committee to be:
 - a. Familiar with Title 10 CFR-19 and CRF-20;
 - b. Rules and Regulations in Protection Against Radiation Hazards, State of Illinois, Dept. of Public Health;
 - c. The conditions of the license NRC 12-00013-05 as they apply to the Hose Plant.

Experience:

1. Worked in Caterpillar Research Chemistry for two years.
2. Associated with rubber compounding and processing in tire development and the Hose Plant since 1968.

C.M. Hayden

Training:

1. B.S. Chemistry (May 1978) from Illinois State University

2. "Radioisotope Techniques in Research & Development," ORAU, Oak Ridge, TN
9/15/83-9/26/83.

Experience:

1. Research Chemist at Caterpillar since June 1978.