

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND,
MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND,
OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION 8
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA,
PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR
WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR
WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA,
NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH,
OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON,
AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS
TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

☐ A. NEW LICENSE

☐ B. AMENDMENT TO LICENSE NUMBER

☒ C. RENEWAL OF LICENSE NUMBER 12-13655-01

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

Koppers Company, Inc.
3900 S. Laramie Avenue
Cicero Station
Chicago, IL 60650

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Same as Item #2.

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

F. M. Spinola

TELEPHONE NUMBER

312/242-1720

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount
which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY 3P

AMOUNT
ENCLOSED \$120.00

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS
PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN,
IS TRUE AND CORRECT TO THE BEST OF THEIR 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.

SIGNATURE—CERTIFYING OFFICER

TYPED/PRINTED NAME

TITLE

DATE

F. M. Spinola

Plant Manager

4/17/85

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

<\$250K	\$1M-3.5M
\$250K-500K	\$3.5M-7M
\$500K-750K	\$7M-10M
\$750K-1M	>\$10M

b. NUMBER OF EMPLOYEES (Total for entire facility excluding outside contractors)

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Dollars and/or staff hours)
ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE
PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit
it to protect confidential commercial or financial—proprietary—information furnished to
the agency in confidence)

☐ YES

☐ NO

RECEIVED

FOR NRC USE ONLY

TYPE OF FEE

FEE LOG

FEE CATEGORY

CR

8506060186 850517

REG LIC30

12-13655-01

PDR

AMOUNT RECEIVED

CHECK NUMBER

CONTROL NO. 78760

DATE

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY:** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).
2. **PRINCIPAL PURPOSE(S):** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30, 32, 33, 34, 35 and 40 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.
3. **ROUTINE USES:** The information may be (a) provided to State health departments for their information and use; and (b) provided to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.
5. **SYSTEM MANAGER(S) AND ADDRESS:** U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

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5. RADIOACTIVE MATERIAL

<u>Element/Mass No.</u> <u>A.</u>	<u>Chemical/Physical</u> <u>Form B.</u>	<u>Name of Mfg.</u> <u>& Model No.</u>	<u>Max. Activity in Mc.</u> <u>per Source</u> <u>C</u>
1. Cesium 137	Sealed Sources	General-nuclear GN1-VD(HP)	Seventeen (17) sources Not to exceed 15 milli- curies per source
2. Cesium 137	Sealed Source	Industrial-nucle- onic S-6	One (1) not to exceed 50 millicuries
3. Cesium 137	Sealed Source	Ohmart Model A2101	One (1) not to exceed 50 millicuries
4. Cesium 137	Sealed Sources	Amersham/Searle Model 850283 or 850263 or 3M Model 4PGM	Two (2) sources of 200 millicuries
5. Cesium 137	Sealed Sources	Invalco Model A-00-237 or 3M Model 4F6S	Four (4) of 35 milli- curies each and 2 sources of 25 millicuries each
6. Cesium 137	Sealed Source	Ohmart Model A2102	One (1) source of 100 millicuries
7. Cesium 137	Sealed Sources	Ohmart Model SHLG-1	Four (4) sources of 100 millicuries each
8. Cesium 137	Sealed Source	New England- Nuclear Model NER570	One (1) source of 50 millicuries
9. Cesium 137	Sealed Source	Amersham Model CDC .809	One (1) source of 100 millicuries
10. Cesium 137	Sealed Sources	Kay-Ray Model 7700B	Two (2) sources of 25 millicuries each
11. Cesium 137	Sealed Sources	Amersham Model CDC .809	Three (3) sources of 100 millicuries each
12. Cesium 137	Sealed Source	Ohmart Model A-2102	One (1) source of 150 millicuries
13. Cesium 137	Sealed Source	Texas Nuclear Model 696894	Eight (8) sources not to exceed 100 milli- curies per source

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6. PURPOSE(S) FOR WHICH LICENSED MATERIALS WILL BE USED

<u>VESSEL NO.</u>	<u>DESCRIPTION</u>	<u>NO. OF SOURCES</u>	
1. MM-1A	Crude Prod. PAA	3	2 mc
MM-1B	Crude Prod. PAA	3	2 mc
AS-201	PAA Stripper Column	3	3 mc
AS-202	PAA Still Column	3	3 mc
MR-201C	Decomposer C	3	15 mc
MR-201A	Decomposer A	1	15 mc
Bldg. #5	Locked Storage-previously on MR-201B	1	15 mc
2. MS-203	Residue Tank (top)	1	50 mc
3. MS-1110	Rundown Tank Rx No.5	1	50 mc
4. V-102	Tar Unit #2 Distillation Column	1	200 mc
Bldg. #5	Locked Storage-previously in MAA Plant	1	200 mc
5. Bldg. #5	Locked Storage-previously on MS-102	1	35 mc
Bldg. #5	Locked Storage-previously on MS-102	1	35 mc
Bldg. #5	Locked Storage-previously on AS-101	1	25 Mc
Bldg. #5	Locked Storage-previously on AS-101	1	25 mc
Bldg. #5	Locked Storage-previously on MS-105	1	35 mc
Bldg. #5	Locked Storage-previously on MS-105	1	35 mc
6. MS-3110	Rundown Tank Rx No. 6	1	100 mc
7. GK-155A	"A" Scrubber	1	100 mc
GK-155B	"B" Scrubber	1	100 mc
GK-1155	"C" Scrubber	1	100 mc
GK-3155	"D" Scrubber	1	100 mc
8. V-101	Tar Unit #1 Distillation Column	1	50 mc
9. GK-1155-D	"D" Scrubber Line	1	100 mc
10. V-101	Tar Unit #1 Distillation Column	1	25 mc
V-102	Tar Unit #2 Distillation Column	1	25 mc
11. GK-155-D	"B" Scrubber Line	1	100 mCi
GK-155-C	"A" Scrubber Line	1	100 mCi
GK-1155-C	"C" Scrubber Line	1	100 mCi
12. MS-103	Residue Tank (middle)	1	150 mCi
13. To be installed in PAA Plant expansion - currently in Building #5 locked storage (i.e., naphthalene vaporizers (4), stripper feed tank, crude PAA treatment vessel, and pre-flash vessel).		7	100 mCi
		1	50 mCi

NOTE: Plans are in progress to dispose of the eight (8) sources currently in locked storage.

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1. To be used in source-well liquid level gauging installations (General Nuclear Type CS-20 & CS-30) for level control.
2. To be used in Industrial Nucleonics LS-101 gauges for level control.
3. To be used in Ohmart source holder Model SH RH-A for liquid level control.
4. To be used in Texas Nuclear source holder Model 5179 for liquid level control.
5. To be used in Invalco Model B-20-06 source holder for level control - now in locked storage.
6. To be used on Ohmart Model SHLG-1 source holder for liquid level control.
7. To be used in Ohmart Model SHLG-1 source holder for liquid level control.
8. To be used in Kay-Ray Model No. 7062 source holder for liquid level control.
9. To be used in Kay-Ray Model 7062P source holder for density measurement.
10. To be used in Kay-Ray Model 7062P source holder for liquid level control.
11. To be used in Kay-Ray Model 3307 source holder for density measurement.
12. To be used in Ohmart Model SHD source holder for liquid level control.
13. To be used in Texas Nuclear Model Nos. 5201 or 5205 source holders for level measurement.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM - TRAINING & EXPERIENCE

• Charles W. Flickinger

Mr. Charles W. Flickinger received his B.S. in chemical engineering from the Pennsylvania State University, and M.S. in industrial hygiene from the Graduate School of Public Health, University of Pittsburgh. He is currently Manager, Corporate Industrial Hygiene, and is located at the Koppers Monroeville Science and Technology Center. During the past twenty-three years, he has worked with previously licensed users and radiographers as the Radiation Protection Officer, as well as being named "Individual User" for NRC Licenses 37-3138-2, -3, and -4. Since writing the "Administrative Control and Radiological Protection Procedures for the CO^{60} Source (10 mc) at the Koppers Science and Technology Center," he thoroughly understands and is completely familiar with the techniques used in handling radioactive sources. The radiological safety aspects of handling the sources have been his responsibility in the past. Mr. Flickinger has made leak tests and is capable of operating the Decade Scaler counting device.

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Formal education for the degree work at the University of Pittsburgh included Health Physics lectures and a Health Physics laboratory course involving principles and practices of radiation protection; procedures for radiation monitoring and techniques for calibration of survey meters and counting systems; mathematics and calculations basic to the use and measurement of radioactivity; and the biological effects of radiation. He has copies of and is thoroughly familiar with the NRC regulations and knows the appropriate restrictions, limitations, and notifications. He is currently named Radiation Safety Officer in the following NRC Licenses: 37-03138-05, 12-13655-01, 37-17897-01, and 47-16933-01. He is also authorized to make radiation intensity surveys and leak tests in these licenses.

Mr. Flickinger has conducted leak tests/surveys and is capable of operating all equipment discussed in Item (9).

● **Michael H. Juba**

Mr. Michael H. Juba received his B.S. in chemistry from St. Vincent College, and M.S. in industrial hygiene from the Graduate School of Public Health, University of Pittsburgh. He is currently Corporate Industrial Hygienist and is located at the Koppers Monroeville Science and Technology Center. During the past eight years as a member of the Industrial Hygiene and Radiation Health Physics Department of the Gulf Oil Corporation, he has served as an alternate Radiation Protection Officer. As such, he is familiar with proper radiation source handling and survey techniques.

Course work as part of the masters program at the University of Pittsburgh included Health Physics lectures and a Health Physics laboratory course involving principles and practices of radiation protection; procedures for radiation monitoring and techniques for calibration of survey meters and counting systems; mathematics and calculations basic to the use and measurement of radioactivity; and the biological effects of radiation. In addition, he has attended a one-week training course in Basic Radiation Protection (ionizing and non-ionizing) at the Harvard School of Public Health in 1977.

Mr. Juba has conducted leak tests/surveys and is capable of operating all equipment discussed in Item (9).

7. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL CITED IN SECTION 5

<u>Full Name</u>	<u>Title</u>
a. John M. Nash	Environmental Director
b. Ron Jablonski	Safety Director
c. Abe Green	Safety Supervisor
d. Bill Campbell	Maintenance Supervisor
e. Ray Yurkewycz	Process Engineering
f. Florentino Olvena, Jr.	Plant Engineer
g. Mark Gotich	Instrument & Electrical Supervisor
h. James Lamb	Chief Engineer

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Listed individuals have attended radioactive material training outlined in Item #8, and reviewed operating procedures and precautions to be taken in handling and manipulating sealed Cesium-137 sources.

8. TRAINING PROGRAM OUTLINE

**RADIOACTIVE MATERIAL, SEALED SOURCES
TRAINING COURSE OUTLINE**

1. Functions of each source unit
2. Radioactive emissions from each source
3. Definition of radioactive terms:
 - a. Millicurie (mc)
 - b. Milliroentgens per hour (mR/hr)
4. Fundamentals of radiation safety:
 - a. Shielding
 - b. Time
 - c. Distance
5. Characteristics of Cesium-137 radiation
6. Hazards of excessive exposure to radiation
7. Levels of radiation encountered
8. Instrument for detection of radiation intensity
9. Personnel monitoring units
10. Review of the license conditions and appropriate NRC Regulations
11. Review of "Operating Procedures and Precautions to be Taken in Handling and Manipulating Sealed Radioactive Cesium-137 Sources" (see Item #10)

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9. FACILITIES AND EQUIPMENT - KOPPERS RESEARCH - MONROEVILLE, PA

- Victoreen Model 490 Thyac III (Serial #2668) equipped with a Model 489-4 beta-gamma probe (Serial #1610)

Reference Data

- Thyac III Ranges: 0-800, 0-8000, 0-80,000, and 0-800,000 counts per minute
- Accuracy \pm 10% of full-scale indication
- Model 489-4 beta-gamma probe uses a Victoreen 1B85 Geiger tube with 30 mg/cm² centimeter wall thickness and retractable beta shield
- Beta-gamma probe calibration ranges are 0-20, 0-2, and 0-0.2 mR/hr for the X100, X10 and X1 ranges respectively

Calibration

- Semiannual calibration is performed by RAD Services, Inc., 2045 Route 2886, Pittsburgh, PA 15239 (NRC License #37-17010-02), using a 3-point calibration on each scale. In addition, the ratemeter is checked prior to and after use with the manufacturer's built-in check source.
- Nuclear-Chicago Model 2510 Cutie-Pie Survey Meter consisting of:
 - Model 2588, Serial #2058 monitoring unit
 - Model 2526 medium range ion chamber for rate of dose measurements up to 2500 mR/hr and accumulated dose measurements up to 25 mR

Reference Data

- Ranges: Model 2526 ion chamber has three full-scale linear ranges of 25, 250, and 2500 mR/hr for rate-of-dose operating mode and three full-scale linear ranges of 0.25, 2.5, and 25 mR for accumulated dose operating mode
- Accuracy: \pm 10% of full-scale on all ranges

Calibration

- Semiannual calibration is performed by RAD Services, Inc., 2045 Route 286, Pittsburgh, PA 15239 (License #37-17010-02), using a 3-point calibration on each scale. In addition, the Model 2526 chamber includes a manufacturer's check source which is stored in the plastic beta shield as field check of instrument response.

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- **Pocket Dosimeters**

- 1 Victoreen Model 541F Dosimeter, 0-200 mR range
- 3 Landsverk Model L50 Dosimeters, 0-200 mR range
- 1 Dosimeter Corp. of America pocket dosimeter read-out/charger Model 909
- 1 Dosimeter Corp. of America pocket dosimeter calibrator Model #3060, Serial #021

9. FACILITIES AND EQUIPMENT - KOPPERS - CHICAGO, IL

- G. E. Smith & Associates Model GS-1000A Geiger Counter (serial #5N484)

Reference Data

- Ranges: 0-20 mR/hr
- Accuracy: $\pm 10\%$ of full-scale indication
- Gamma probe

- G. E. Smith & Associates, Model GS-50A Geiger Counter (serial #SN1931)

Reference Data

- Ranges: 0-20 mR/hr
- Accuracy: $\pm 10\%$ of full-scale indication
- Gamma probe

Calibration

- Annual calibration is performed by Health Physics Associates, Northbrook, Illinois.

- **Pocket Dosimeters**

- Seventeen (17) Dosimeter Corp. of America Dosimeters, Model 862, 0-200 mR range.
- One (1) Victoreen Dosimeter Charger/Reader, Model 2000A; Serial #2255

10. RADIATION PROTECTION PROGRAM

Because of the sealed source material applications, radiation exposure monitoring of involved personnel is not routinely conducted. All equipment containing radioactive material are identified by a **"CAUTION - RADIOACTIVE MATERIAL"** label or tag located on the face of the source housing.

Leak testing is performed every six months by the Radiation Protection Officers or a trained technician.

Leak tests are conducted according to the following procedure:

- Cotton-tipped swabs are moistened with distilled water and wiped over the source housing and flange.
- After each wipe has been collected, the swab is placed in a glass bottle (cotton tip down) labeled and sealed. Care is taken not to touch the cotton tip during wipe collection.
- All samples are forwarded to C. W. Flickinger or M. H. Juba for count determination.

Upon receipt wipe samples are counted using a Nuclear Chicago Model #181A decade scaler, serial #457 equipped with a Nuclear Chicago GM Tube Model #000108, serial #013592. Counting efficiencies (depending on the isotope) are determined using the following standard sources:

- New England Nuclear Cesium-137 reference source NES-255
- New England Nuclear Chlorine-36 reference source NES-200D
- Eberline Thorium-230 reference source Serial #11778

Copies of the following forms as utilized in collecting, counting, and reporting leak tests are attached:

- Form A - General Leak Test Survey Form completed for each source.
- Form B - completed prior to counting each group of wipe samples.
- Form C - completed for each wipe sample counted.

In addition, a permanent record of all raw count data is maintained in a Radiation Logbook referenced at the bottom of Form C.

FORM A

DENSITY/LEVEL GAUGE SURVEY AND LEAK TEST DATA SHEET

DATE: _____ SURVEYED BY: _____

GROUP/DIVISION: _____ PLANT: _____

LOCATION OF UNIT: _____ ISOTOPE: _____

SERIAL/IDENTIFICATION #: _____ LICENSE #: _____

ASSAY DATE: _____ HALF LIFE: _____ ACTIVITY: _____

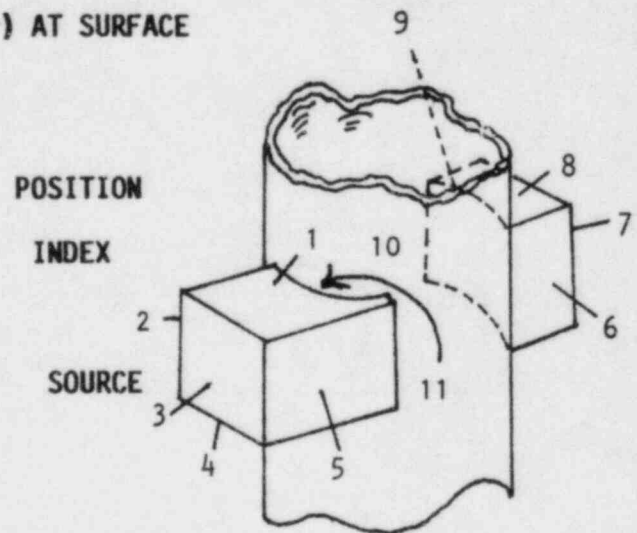
SURVEY INSTRUMENT: _____

CALIBRATION DATE: _____

INSPECTION CHECKLIST	YES	NO	N/A
1. The device has affixed the required manufacturer's label(s).			
2. A sign bearing the statement "CAUTION - RADIOACTIVE MATERIAL" is posted in the proximity of the gauge.			
3. A reading taken with the survey instrument indicates open-closed shutter mechanism is operational.			
4. Unit in operation; shutter check not possible.			

SURVEY/MEASUREMENTS (mR/hr) AT SURFACE

Shutter Open		Shutter Closed	
1. _____	6. _____	6. _____	
2. _____	7. _____	7. _____	
3. _____	8. _____	8. _____	
4. _____	9. _____	9. _____	
5. _____	10. _____	10. _____	
	11. _____	11. _____	



OVER

CONTROL NO. 78760

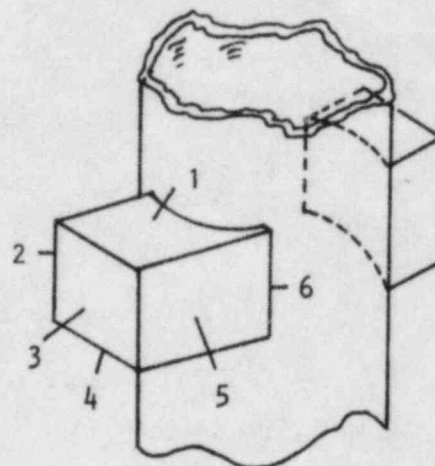
LEAK TESTS

Sample ID Number

1. _____
2. _____
3. _____
4. _____
5. _____

POSITION
INDEX

SOURCE



COMMENTS:

FORM B

LEAK TEST RESULTS

DATE _____ ANALYST _____
 GROUP/DIVISION _____
 PLANT _____
 LICENSE NUMBER _____
 EQUIPMENT _____
 GIEGER PLATEAU _____
 SOURCE TO DETECTOR DISTANCE _____

CALIBRATION SOURCE

NUCLIDE	MAJOR RADIATIONS/ ENERGIES	INITIAL ACTIVITY (uCi)	DATE	$T_{1/2}$ ⁽¹⁾	n ⁽²⁾	CURRENT ⁽³⁾ ACTIVITY (uCi)
---------	----------------------------------	------------------------------	------	--------------------------	--------------------	---

- (1) $T_{1/2}$ = half-life of the radionuclide
 (2) n = number of half-lives = $t/T_{1/2}$
 where: t = elapsed time
 (3) Current Activity = $I_0 e^{-0.693t/T_{1/2}}$
 where: I_0 = original activity of radionuclide
 e = base of natural logarithms (2.718)
 t = elapsed time
 $T_{1/2}$ = half-life of the radionuclide

COUNTING EFFICIENCY

Observed Counts
(average of three readings)

5 min count (calibration source) $\frac{\text{_____}}{5 \text{ min}} = \text{_____ cpm}$

5 min blank count $\frac{\text{_____}}{5 \text{ min}} = \text{_____ cpm}$

Net Efficiency (E_n) = $\frac{C_o - B}{C_k} = \text{_____ cpm/dpm}$

where: C_o = observed count (cpm)
 B = blank (cpm)
 C_k = known emission rate (dpm) (2.22×10^6 dpm/uCi)

OVER

FORM C

LEAK TEST DATA

[illegible]

- (1) See Leak Test Data Sheet (page 2) for Sample ID/position index correlation.
(2) Count represents the average of three 5-minute readings.

$$(3) \text{ Approximate Activity (uCi)} = \frac{C_0 - B}{E_n} \times 4.505 \times 10^{-7} \text{ uCi/dpm}$$

where: C = observed count (wipe sample) (cpm)
 B₀ = blank count (cpm)
 En = net counting efficiency (cpm/dpm)

NOTE: - Regulated limit for surface contamination is 0.005 uCi or 5.0×10^{-3} uCi removable radioactive material as specified in Title 10, part 31.5c.

- Raw data available in OH&PS-IH Logbook No. _____, page(s) _____.

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In all cases a written summary report is sent to the group manager along with completed copies of Forms A, B, and C.

If 0.005 microcuries or more of removable contamination is found, the group manager will be immediately informed and the instrument withdrawn from use. If required, decontamination and repair or disposal of the unit will be made in accordance with NRC regulations. Also, a report will be filed within five days of the test with the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20055, describing the equipment involved, the test results, and corrective action taken. A copy will also be sent to the Director of Region III, U.S. NRC Office of Inspection and Enforcement, 799 Roosevelt Road, Glen Ellyn, IL 60137.

The following radiation protection procedures are attached:

- Operating procedures to be taken when handling and manipulating sealed Cesium-137 sources
- Emergency procedures, notification and reporting of accidents, incidents, radiation defects and noncompliance concerning sealed sources of ionizing radiation
- Procedures for purchasing, receiving and opening packages containing radioactive material(s)
- Entry of vessels equipped with radioactive sources

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KOPPERS COMPANY, INC.
CHICAGO, ILLINOIS
PHTHALIC ANHYDRIDE PLANT

RADIATION PROTECTION PROGRAM

**OPERATING PROCEDURES AND PRECAUTIONS TO BE TAKEN WHEN
HANDLING AND MANIPULATING SEALED RADIOACTIVE CESIUM-137 SOURCES**

Upon receipt of all sources, they must be placed in locked storage and C. W. Flickinger or M. H. Juba (Radiation Protection Officers) notified to conduct leak tests/surveys. Quality padlocks (non-mastered) will be provided for each gauge with restricted access to keys.

A one-hour "Cesium-137 Sealed Sources Training Course" (Item #8) will be presented to individuals listed in Item #7 as well as any other personnel who may be involved in source handling and manipulation, by C. W. Flickinger or M. H. Juba (Radiation Protection Officers) prior to installation of sources and yearly thereafter.

No maintenance on sealed sources per se is allowed. Any source container maintenance/repair will necessitate returning the unit(s) to the vendor(s).

A radiological survey meter (range 0-20 mR/hr) is available to monitor the radiation intensity of the sources when they must be handled and to estimate personnel exposure potentials. Personnel dosimetry using direct reading pocket dosimeters (0-200 mR) and/or lapel and ring film badges is conducted on all personnel involved in source handling/installation.

Prior to handling source rods or extended working periods in the vicinity of the sources, all personnel must receive a zeroed pocket dosimeter. The person's name and dosimeter serial number must be entered into a dosimetry logbook. In addition, the work area or handling procedure is surveyed/monitored to ensure that exposure is no more than 5 mR/hr at 1 foot from the source. At the end of the day or working period, the dosimeter is read and the exposure in rems recorded in the dosimetry logbook.

Two styles of General Nuclear, Inc. source units are available, including a CS-20 source rod, source holder and reel unit found on Vessels MM-1A (three 2mc Cesium-137 sources), MM-1B (three 2mc Cesium-137 sources), and AS-201 (three 3mc Cesium-137 sources), AS-202 (three 3mc Cesium-137 sources), and MR-201C (three 15mc Cesium-137 sources), and a CS-30 source rod and holder found on Vessels MR-201A (one 15mc Cesium-137 source).

An Industrial Nucleonics Model 6S 50mc Cesium-137 source, Model LS-101 source container is located on Vessel MS-203.

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Rundown Tanks MS-3110 and MS-1110 and residue tank MS-103 are equipped with Ohmart Model A2101 devices containing 100 millicuries, 50 millicuries and 150 millicuries of Cesium-137 respectively. These units employ a source holder and reel assembly similar to the General Nuclear CS-20 units.

A, B, C, and D Scrubbers (GK-155A, GK-155B, GK-1155, and GK-3155) are equipped with Ohmart Model SHLG-1 gauges mounted directly on the scrubber exterior similar to the Industrial Nucleonics unit on MS-203.

Kay-Ray density gauges Model No. 3307 on A, B, & C scrubber lines (GK-155-C, GK-155-D, GK-1155-C) and Model No. 7062 on D scrubber line (GK-1155-D) are similar in design to Ohmart Model SHLG-1 and Industrial Nucleonics Model LS-101 devices.

Recently purchased Texas Nuclear sources to be installed as part of an expansion to the Phthalic Anhydride Plant include:

Seven (7) Texas Nuclear Model 5205 source housings and one (1) Texas Nuclear Model 5201 source housing containing CS-137 in Texas Nuclear Model 696894 capsule with no single source to exceed 100 millicuries.

Both models are similar to Industrial Nucleonics, Ohmart Model SHLG-1 and Kay-Ray devices.

Because of some differences in handling techniques, each manufacturer/design is considered separately.

GENERAL NUCLEAR, INC. CS-20 UNITS

The GNI Model CS-20 consists of a shield and source rod. The source rod can be lowered into the operating position or raised back into the shield by means of a takeup reel mounted on top of the shield. The reel is covered with a locking cap to prevent unauthorized use. The entire unit except for the lead fill is made out of stainless steel.

The source is a GNI-VD(HP) model containing a Cesium-137 microsieve pellet and is commonly used in oilwell logging operations. After assembly into the source rod the source is in effect, triple encapsulated.

Basic Radiation Safety Data

1. When working with this or any radiation device, always use the proper radiation measuring equipment. A 0-20 mR/hr meter is to be used and pocket dosimeters (0-200 mR) are to be worn. The dosimeter unit number and final reading at the end of each shift are to be recorded in the dosimetry logbook for each person working on or with these units.

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Page 12.

2. Wipe (leak) tests will be made every six months. The rod is returned to the OFF position and the area wiped where the cable attaches as well as the area inside the cap cover.
3. Radiation intensity values at 12 inches from the source shield should read less than 5 mR/hr with the source in the OFF position.
4. Dose Rate Data - Unshielded:

<u>Source Strength</u>	<u>mR/hr at 1 yd.</u>	<u>mR/hr at 1 ft</u>
2 mc	0.72	2.88
3 mc	1.07	4.3
5 mc	1.8	7.2
10 mc	3.6	14.4
15 mc	5.4	21.6

5. Always return the source rod to the shield when work is to be done inside the vessel.

Operating Instructions

(This unit should always be in a locked position and secured with a padlock.)

To turn device ON:

1. Remove padlock, cap and the locking pin.
2. Release the reel and lower the rod until the cable stop rests in the cable guide.
3. Replace the cap, locking pin, and secure with padlock.

To turn device OFF:

1. Remove padlock and cap and reel the cable up until the locking pin can be inserted through the liner tube and the source rod.
2. Insert the locking pin.
3. Replace the cap, locking pin, and secure with padlock.

GENERAL NUCLEAR CS-30 UNITS

Basic Radiation Safety Data

1. When working with this or any radiation device, always use proper radiation measuring equipment. A 0-20 mR/hr meter is to be used and pocket dosimeters (0-200 mR) are to be worn. The dosimeter unit number and final reading at the end of the shift are to be recorded in the dosimetry logbook for each person working on those units.
2. Wipe tests are made every six months. To do this, return the rod to the OFF position and wipe the exposed portion of the source rod. Never attempt to remove the source rod to make the wipe.
3. Radiation intensity values at 12 inches from the source shield should read less than 5 mR/hr with the source in the OFF position.
4. The source in this device contains 15 millicuries of Cesium-137.
5. Fifteen (15) millicuries of Cesium-137 has a dose rate of 5.4 mR/hr at one yard and 1.3 mR/hr at six (6) feet when unshielded.

Operating Instructions:

(This unit should always be in a locked position and secured with a padlock.)

To turn device ON:

1. Remove padlock.
2. Attach the extension rod provided with this unit, if applicable.
3. Unlock the rod and remove the stop pin.
4. Push the rod into the vessel so that the locking pin can be inserted through the shield and rod.
5. Insert locking pin.
6. Secure with padlock.

To turn device OFF:

1. Remove padlock.
2. Unlock the rod and remove the stop pin.

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3. Pull the rod back into the shield until it stops against the retaining ring.
4. Insert the stop pin through the shield and the rod.
5. Lock into place.
6. Secure with padlock.

INDUSTRIAL NUCLEONICS

A 50mc Cesium-137 source is mounted in a Model LS-101 source container directly on the outside of Vessel MS-203 and does not require positioning as previously described (General Nuclear sources). Once installed, the only manipulation of the unit is to open or close the source window. When a person is working inside the vessel the source must be placed in the shielded (OFF) position and the area surveyed to determine if the source is shielded properly. As with the other sources, it will be wipe (leak) tested, at intervals not to exceed six (6) months, by wiping the source container.

OHMART MODEL SHLG-1

Four Ohmart Model SHLG-1 devices are mounted directly on the vessel exterior and do not require any source positioning. Once installed, the only manipulation of the unit is to open or close the source window. As a result, operating instructions and leak test procedures outlined for the Model LS-101 Industrial Nucleonics gauge apply.

KAY-RAY MODELS 7062P AND 3307

The Kay-Ray models noted are mounted directly in the vessel exterior and do not require any source positioning. Once installed, the only manipulation of the unit is to open or close the source window. As a result, operating instructions and leak test procedures outlined for the Model LS-101 Nucleonics gauge apply.

TEXAS NUCLEAR

Texas Nuclear device Models 5201 and 5205 with source capsule Model 696894 are mounted directly on the vessel exterior and do not require any source positioning. Once installed, the only manipulation of the unit is to open or close the source window. As a result, operating instructions and leak test procedures outlined for the Model LS-101 Nucleonics gauge apply.

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KOPPERS COMPANY, INC.
CHICAGO, ILLINOIS
TAR PLANT AREA

TEXAS NUCLEAR CNA CONTINUOUS LEVEL GAUGES
INSTRUCTIONS FOR USE AND HANDLING

Two Texas Nuclear, Series CNA, Continuous Level Gauge Assemblies contain a source holder (Texas Nuclear No. 5179) with a pneumatic shutter activator and shutter indicator switch. Each source holder contains 200 mCi of Cesium-137.

Each source holder is mounted directly on the outside of tar stills No. 1 and No. 2. Once installed, the only manipulation of the units is to open or close the source window.

KAY-RAY MODEL 4800F SINGLE-POINT LEVEL SYSTEM
INSTRUCTIONS FOR USE AND HANDLING

Two Kay-Ray point level systems include a Kay-Ray Model 7062P source holder containing a 25 millicuries Cesium-137 source, Model 7700B.

Each source holder is mounted directly on the outside of tar stills No. 1 and No. 2. Once installed, the only manipulation of the units is to open or close the source window.

Basic Radiation Safety Data

When handling the subject devices, a 0-20 mR/hr survey meter is to be used and pocket dosimeters (0-200 mR) are to be worn. The dosimeter unit number and final reading at the end of the shift are to be recorded in the dosimetry logbook for each involved employee.

When an individual is working inside the stills, the source must be locked in the shielded (closed) position and the area inside the vessel surveyed to confirm the source is actually closed. The source will be wipe (leak) tested at intervals not to exceed six (6) months according to the suppliers instructions.

The source must only be handled by or under the supervision of individuals cited in Item #7.

No maintenance can be performed on the source holder. If maintenance is required, the source holder must be returned to the vendor(s).

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KOPPERS COMPANY, INC.
CHICAGO, ILLINOIS

GENERAL

Charles W. Flickinger or M. H. Juba (Radiation Protection Officers) must be notified by telephone prior to any source handling.

Telephone: Charles W. Flickinger
412/327-3000, Ext. 5135 (Koppers S&T Center)
412/793-0143 (home)

Michael H. Juba
412/327-3000, Ext. 5138 (Koppers S&T Center)
412/731-4977 (home)

In the event of fire or explosion involving source material, IMMEDIATELY notify the following:

1. Ron Jablonski
and/or Chicago Plant
O. Olvena

AND

2. Charles W. Flickinger:
Telephone: 412/327-3000, Ext. 5135 (Koppers S&T Center)
412/793-0143 (home)

Michael H. Juba:
Telephone: 412/327-3000, Ext. 5138 (Koppers S&T Center)
412/731-4977 (home)

VESSEL ENTRY

If maintenance is required inside a vessel equipped with a radioactive device, the Plant's "Safety Work Permit" is required. A copy of the Permit and Procedure is included. This procedure alerts the Safety Department which requires the source be locked in the shielded (OFF) position while the work is being performed. This Safety Work Permit must be signed by Plant Operations and the Safety Department.

EMERGENCY PROCEDURE TO BE FOLLOWED AFTER DAMAGE TO SOURCE HOLDERS

1. This procedure applies to all instances where damage is incurred by the source holder.

MATERIAL LICENSE APPLICATION ADDENDUM
Page 17.

2. Immediately rope off the area around the source holder to a minimum of 15 feet in diameter.
3. Inform plant Radiation Protection Officer* and person responsible for the use of the source.
4. Inform by phone or telegram the proper regional NRC office of the accident.
5. Limit access to source head until a radiation survey and source wipe can be performed by qualified personnel or a representative of source manufacturer.
6. Relocation or removal of a source holder will be done under the supervision of C. W. Flickinger, M. H. Juba or other NRC authorized person(s).

* Charles W. Flickinger:
412/327-3000, Ext. 5135 (Koppers S&T Center)
412/793-0143 (home)

* Michael H. Juba:
412/327-3000, Ext. 5138 (Koppers S&T Center)
412/731-4977 (home)

STORAGE

All radioactive sources not in active service are placed in Building #5 locked storage.

A separate storage room has been designated, posted with "CAUTION - RADIOACTIVE MATERIAL" signs and padlocked.

Access is restricted to individuals listed in Item #7.

Leak tests are performed every six months pending disposal and license amendment.

ENTRY OF VESSELS
EQUIPPED WITH RADIOACTIVE SOURCES

Policy

To ensure that exposure to ionizing radiation is maintained as far below the applicable radiation protection guidelines as reasonably achievable. Entry of a vessel equipped with a radioactive source should be permitted only after all reasonable steps have been taken to ensure that no potential for radiation exists.

Definitions

Vessel

Any enclosure where employees may have to enter.

Entry

Placing any part of the body inside the vessel. The placing of hands and arms into a vessel constitutes entry.

Radiation Source

Any source of radiation, either ionizing or nonionizing—usually a sealed source of ionizing radiation.

Radiation Survey

Survey of all areas which might be occupied by personnel.

Procedures

- All vessels containing a radioactive source shall be posted with a sign near, but not on, the entry port. The sign shall give notice that a radioactive source is present and what approvals are necessary prior to entry. No area shall be entered if the radiation exposure rate is greater than 2.5 mrad/hr.
- Prior to entry into a vessel equipped with a radioactive source, the source shall be locked or tagged out and written approval obtained utilizing a form similar to Attachment I, or a standardized vessel entry permit having a separate section and sign-off for radiation clearance. All radiation checks should be approved by a person who has principal responsibility for employee safety and/or radiation protection.
- The above items would be mandatory, in addition to all other requirements and procedures for vessel entry.

MHJ:mjt
July 23, 1984

CONTROL NO. 28760

ATTACHMENT I

Radiation Protection
Vessel Entry Permit

Location of Vessel: *

Identity of Vessel: *

Purpose of Entry: *

Potential Health Hazards: *

Source Locked (tagged) out by:

Time:

Date:

Vessel Surveyed for Radiation by:

Instrument Used:

Survey Readings (mR/hr)

Note: Entry is prohibited if radiation exposure rate is greater than 2.5 mR/hr.

Name of Employees Entering Vessel/estimated duration:

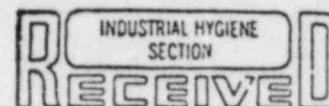
Source Returned to Service by:

Time:

Date:

Approved by:

* Not required if already part of a vessel entry permit being modified to include Radiation Protection Items.



Interoffice Correspondence

NOV 16 1979

To ALL PLANTS

From G. G. Kenney

Location _____

Location Pittsburgh

Subject Safety Work Permits

Date November 13, 1979

Attached for your review is a copy of the recently revised Safety Work Permit T-306 Rev. 3. A few of the larger plants such as Bridgeville and Chicago have been using a more detailed Work Permit.

A safety work permit system is an essential tool in the control of hazards and prevention of losses. If you do not already have a safety work permit system in effect at your plant, it is suggested that one be initiated at once.

A checklist arrangement showing essential safety items and precautionary measures that must be taken has been included on the revised Safety Work Permit. As a control measure, for those plants utilizing nuclear sealed radiation sources, provision has been made to indicate the status of such equipment.

A completed copy of the Safety Work Permit should be retained in the plant file for record purposes and evidence that proper precautionary measures have been taken in the various phases of plant operations.

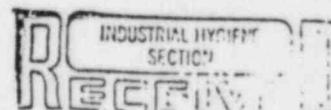
A supply of these Permits can be obtained by requisitioning T-306 Rev. 3 forms from the Pgh. Storeroom.

Also attached is a copy of the Safety Work Permit Procedure that can be used as a guideline to assist you in establishing a Safety Work Permit System.

G. G. Kenney
G. G. Kenney

GGK/s
attach.

CC: Production Mgrs.
G. Mitchell - Parr
A. J. Varrati - Thiem
H. J. Vannoy - Heath, Ohio
C. Flickinger - Monroeville
Dr. A. W. Lawrence



NOV 16 1979

CONTROL NO. 28760

KOPPERS

TAKE TIME TO BE SAFE

04045

SAFETY WORK PERMIT

DEPARTMENT & LOCATION

DATE

TIME

A.M.

WEATHER

P.M.

DESCRIPTION OF EQUIPMENT TO BE TESTED

EQUIP. NO.

TESTING
REQUIRED

FLAMMABLE OR EXPLOSIVE VAPORS

YES NO

OXYGEN DEFICIENCY

OTHER

FOR: 1. ENTERING A CONFINED SPACE. 2. HOT WORK - BURNING, WELDING, ETC.
3. OPENING LINES UNDER PRESSURE. 4. COLD WORK - DRILLING, ETC.

WORK TO BE DONE:

☐ BURNING

☐ WELDING

PERMIT REQUESTED

BY

SAFETY CHECK LIST	YES	NO	SPECIAL PRECAUTIONS	YES	NO
Notify Operators			Electrical Grounding		
Hose At Scene			Protective Clothing/Tools		
Fire Watch			Respiratory Protection		
Portable Extinguisher			Harness/Life Line		
Wet Down Area			Area & Equipment Safe		
Lines & Equip. Cleared			Explosion Proof Lights		
Radiation Controls Off			Switches Locked Out		
PIPING DATA			<input type="checkbox"/> STEAM <input type="checkbox"/> FLUSH <input type="checkbox"/> BLANK		
			<input type="checkbox"/> VALVE OFF <input type="checkbox"/> DISCONNECT		

PERMIT VALID FOR _____ HOURS

TEST PERFORMED

BY (i)

(s)

T-306 REV. 3

PRESS HARD FOR CLEAR COPIES

10M 9-79

Original - Safety Department

Copy (1) - Retained By Worker(s)

Copy (2) - Post At Work Area - Return To Safety Dept. Upon Completion Of Work For The Day.

ORGANIC MATERIALS GROUP

SAFETY WORK PERMIT PROCEDURE

PURPOSE: The purpose of Safety Work Permits is to protect employees against exposure to conditions where an accident potential may exist and as a precaution against fires and damage to property and equipment.

USE: Permits are to be used for all work done by plant personnel or outside contractors which involve:

1. Entering tanks, vessels, pits or other confined spaces.
2. Cutting, welding, lead burning or other similar hot work, or the use of any portable spark or heat producing equipment in potential hazardous areas.
3. Any work requiring special precautions to insure personal safety or protection of equipment, materials and property.

When multiple crafts are needed on a job, a safety permit must be provided for each craft unless the entire crew is working under the same supervisor.

The permit format is self-explanatory and should be properly completed with the necessary data. One copy should be carried by the person performing the work, one copy should be posted in the work area, and one copy maintained in the plant file.

RESPONSIBILITY: The responsibility for the proper use of these permits and the accuracy thereof, rests with the supervisors of the area involved. The permits are to be signed in full -- initials are not allowed.

1. Permits are to be originated by the department supervisor requesting the work.
2. Permits cannot be issued until all precautions prescribed by the permit are met. This may include blanking of lines, locking out power supplies, purging and providing all necessary protective safety equipment.
3. The permit is valid only for the period of time indicated but not to exceed one shift. If work must continue, the relieving supervisor must reinspect the area and revalidate the permit.
4. The permit applies only to the specified work in the area designated in the permit.
5. Upon finishing the work, the person performing the work or the supervisor of the job must note the completion time and return his copy to the area supervisor. This copy should be maintained in a plant file.

GAS TESTS: The responsibility for determining whether a gas test is necessary rests with the supervision of the department responsible for the work area.

Tests should be conducted only by qualified personnel.

Necessary tests should be made for the conditions involved and may include a determination of the presence of combustibles in the atmosphere, oxygen deficiency, and known toxic substances that may be prevalent.

Tests should be made immediately prior to commencement of the work. Undue delays necessitate retesting. Where deemed advisable periodic tests at frequent intervals should be made during the course of the job.

No work shall be performed or area entered when gas test is required until after test is made and conditions found to be satisfactory.

EXCEPTIONS: Safety Work Permits are not usually required in certain maintenance shop areas such as machine shops, electric shops, garages, or similar locations.

Procedures for Purchasing, Receiving and Opening
Packages Containing Radioactive Material(s)

Policy

To ensure that exposure to ionizing radiation is maintained as low as reasonably achievable (ALARA) and to comply with Title 10, CFR Part 20.205, all packages containing radioactive material, unless exempted under the preceding regulation, must be surveyed as soon as possible following receipt.

Koppers Notification Requirements

Prior to the purchase of any radiation source, the Plant Radiation Protection Officer (RPO) or local individual responsible for proper and safe use must notify the Occupational Health and Product Safety Department - Industrial Hygiene Section (OH&PS-IH) as indicated below.

	<u>OFFICE</u>	<u>HOME</u>
Primary - M. H. Juba	(412) 327-3000, ext. 5138	(412) 731-4977
Alternate - C. W. Flickinger	(412) 327-3000, ext. 5135	(412) 793-0143

As soon as a timetable for shipment has been established, the RPO shall immediately notify OH&PS-IH. As much lead time as possible is requested and a minimum of one week advance notice is necessary to insure availability of equipment and/or personnel, should leak testing/radiation level surveying be required.

Procedures

- Notify OH&PS-IH as previously described to ensure the following:
 - Appropriate license application or license amendments have been initiated
 - Operating procedures are available

- Training and instruction to workers is in process or completed
 - Compliance with Title 10, CFR Parts 19, 20, 30, and 31
 - Determine if external surfaces of the package must be surveyed for leakage and high radiation levels
- Upon receipt, the Plant individual accepting the package will:
 - Visually inspect package for any sign of damage (e.g. wetness, crushed). If damage is noted, notify the Plant RPO and OH&PS-IH
 - Check for the presence of warning labels as required by NRC regulations

Note: Each package of radioactive material must be labeled on two opposite sides with the appropriate warning label as described in Attachment 2A.

Note: The package label should identify the following:

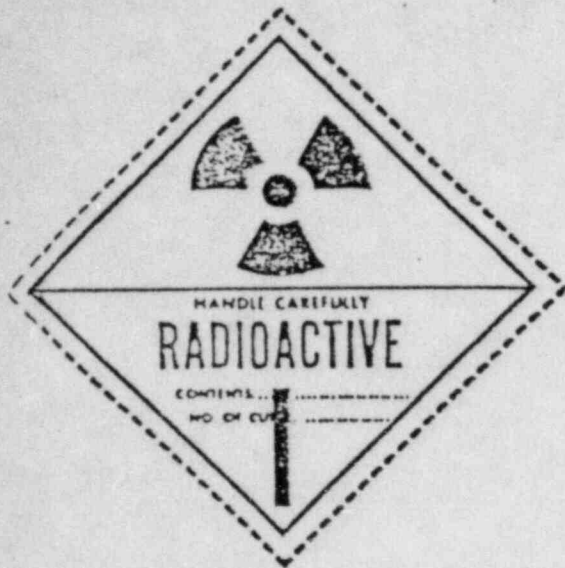
<u>contents</u>	- Radionuclide and shipping name "Radioactive Materials, N.O.S."
<u>no. of curies</u>	- Maximum activity within the package
<u>transport index</u>	- Maximum mR/hr at 3 feet from the package center rounded off to next highest tenth, e.g., 1.02 mR/hr has a transport index of 1.1

- If it has been previously determined that the external surfaces of the package must be surveyed based on the radioactivity and transport group of the radiation source (as described in 10 CFR, Part 20.205, paragraph B), the following testing is required:
 - Measure and record the exposure rate at 3 feet from the package center using the Victoreen Thyac III survey meter or comparable instrument. If >10 mR/hr--stop procedure and notify OH&PS-IH.

- Measure and record the surface exposure rate using the Victoreen Thyac III survey meter (or comparable instrument). If >200 mR/hr--stop procedure and notify OH&PS-IH contact.
- Put on gloves and open the outer package (following manufacturer's directions, if supplied) and remove packing slip. Open inner package to verify contents (compare requisition, packing slips, and label on bottle, source holder, etc.), check integrity of final source container (inspect for breakage of seals or vials, loss of liquid, discoloration of packing material etc.). Check also that the shipment does not exceed possession limits as specified in license.
- Wipe external surface of final source container with moistened cotton swab, according to leak test procedures and forward to OH&PS-IH for assay.
- Monitor the packing material and shipping container(s) for contamination using the Victoreen Thyac III survey meter (or comparable instrument) before discarding. If contaminated, treat as radioactive waste, if not, obliterate radiation labels before discarding in regular trash. (Radioactive contamination is defined as packing material survey meter readings greater than 5 mR/hr after the source material has been removed.)

Note: See the enclosed Survey Form to record survey data (Attachment 2B).

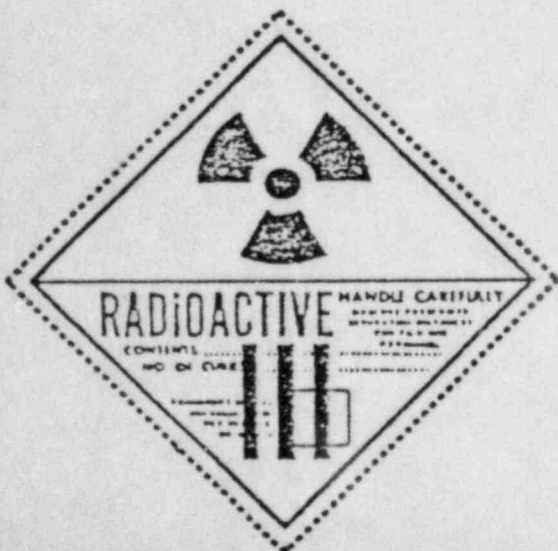
ATTACHMENT 2A



White I (one red stripe) - package surface
<0.5 mR/hr; 0mR/hr @ 3 feet.



Yellow II (two red stripes) - package surface
<10 mR/hr; 0.5 mR/hr @ 3 feet.



Yellow III (three red stripes) - package surface
<200 mR/hr; 10 mR/hr @ 3 feet.

SURVEY FORM1. Package Condition

Punctured	()	Yes	()	No
Crushed	()	Yes	()	No
Wet or stained	()	Yes	()	No
Other	_____			

2. Exposure Level

a. At 3 feet from center of package = _____ mR/hr.

Transportation index on label = _____ units.

b. At package surface = _____ mR/hr.

3. Contents

a. Does description of packing slip agree with label on source holder?

() Yes No ()comments:

b. Integrity of source holder:

Breakage	()	Yes	()	No
Leakage	()	Yes	()	No
Other	_____			

c. Wipe-test of source holder:

Sample ID	Description
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

4. Final Disposal of Packing Material

a. Survey of packing material = _____ mR/hr

b. Disposal of material and empty box:

- () Contaminated... handled as radioactive waste
- () No contamination... labels defaced and package
discarded in regular trash

/mad
10/December/1984

EMERGENCY PROCEDURES, NOTIFICATION AND REPORTING OF
ACCIDENTS, INCIDENTS, RADIATION DEFECTS AND
NONCOMPLIANCE CONCERNING SEALED
SOURCES OF IONIZING RADIATION, RADIOACTIVE
MATERIALS AND OTHER SOURCES OF ELECTROMAGNETIC RADIATION

General

Any unusual incident or accident related to the use of radiation sources which 1) actually or potentially involves the loss of control over radioactive materials and sources of radiation; 2) human exposure and/or injury; or 3) which may be cause of concern to employees shall be promptly reported and investigated, in order 1) to establish and record facts of the incident or accident, 2) to identify the reporting action required, and 3) to prevent recurrence.

Personnel Monitoring Devices

Personnel taking part in emergency operations shall have on their bodies, monitoring devices such as film or TLD badge or pocket dosimeters. In those cases where there is a likelihood for excessive extremity exposure, finger and/or wrist dosimeters shall be worn. In addition, at least one appropriately ranged direct reading survey instrument shall be provided each working party.

Koppers Notification Requirements

The individual responsible for the proper and safe use of the source of radiation, shall immediately notify the facility manager and the Radiation Protection Officer (RPO) if any situation has occurred that has resulted in actual or potential loss of control of the source, release of radioactive material or has caused actual or potential property damage.

The RPO is responsible for collecting all information concerning the incident, keeping the facility manager fully informed, and reporting details of the incident to the Occupational Health and Product Safety Department-Industrial Hygiene Section (OH&PS-IH) as follows:

	<u>OFFICE</u>	<u>HOME</u>
Primary - M. H. Juba	(412) 327-3000, ext. 5138	(412) 731-4977
Alternate - C. W. Flickinger	(412) 327-3000, ext. 5135	(412) 793-0143

Regulatory Agency Notification Requirements

Those facilities licensed and regulated by the United States Nuclear Regulatory Commission (NRC) shall report any defect in a radiation producing device which may constitute a substantial safety hazard (Title 10, CFR Part 21). Any incident which might need to be reported under this regulation shall be evaluated by the following procedures:

1. An investigation, if necessary, of the incident will be made by a committee composed of the facility manager, plant RPO, corporate (OH&PS-IH) RPO, plant and/or group safety personnel.
2. If deemed necessary, by the investigation committee, the appropriate NRC regional office and/or state agency will be notified.
3. A report will then be drafted, finalized and signed by all members of the investigation team. This report, along with a letter of notification, will then be sent to the NRC signed by the plant manager and the responsible individual as designated on the license. _

Emergency Procedures

Each facility RPO shall prepare a set of emergency instructions for each sealed source of ionizing radiation. In general, these plans should include an emergency notification list, along with procedures to limit exposure, the release of effluents and the spread of contamination. Where necessary, the procedures shall also include warning systems, evacuation routes and designate a medical care facility. Emergencies may result from:

- A. Failure of shielding or mechanical failure of shutter mechanism
- B. Fire and/or explosion involving the rupture or melt down of a source holder
- C. Fires or other major emergencies where the source(s) cannot be located

Guidance for the Preparation of Emergency Procedures

The following guidance has been extracted from material listed in the reference section of this document:

- A. Incident involving the failure of a source to return to its shielded position or where the irradiation port fails to close:
 1. Person responsible for using the source shall:

- a. Immediately repeat shut-down procedures
- b. Immediately inform all personnel in the area of the failure and instruct same to vacate
- c. Notify the facility RPO

2. The Plant RPO shall:

- a. Verify the extent of the incident, inform facility management, group safety, and the OH&PS-IH Section
- b. If necessary, initiate the erection of barriers, fences (a minimum of 15 feet in any direction from the source), and signs to prevent casual access to the radiation area where a radiation area is defined in 10 CFR 20.202 as any area in which radiation levels exist where a major portion of the body could receive in any one hour period a dose in excess of 5 millirems

Note: Where available a survey meter should be used to establish safe distances.

- c. Notify OH&PS-IH Section personnel for further assistance/instructions
- d. Prepare a complete history of the incident, subsequent actions and corrective steps taken, for submission to the appropriate regulatory agency as described previously

B. Fire and/or explosion involving the rupture or melt down of a source holder:

- 1. The responsible user of the source of radioactive materials or the individual discovering the emergency shall:
 - a. Immediately sound the alarm
 - b. Follow normal emergency procedures for evacuation
 - c. Attempt to put out any fires if a radiation hazard is not immediately present
 - d. Notify the fire department, the RPO and other local safety personnel

2. The Plant RPO shall:

- a. Verify the extent of the emergency, involvement of a sealed source(s) and inform plant management, group safety, and the OH&PS-IH Section
- b. Advise fire fighting and other rescue personnel of hazards to be anticipated
- c. Instruct fire fighters to keep at least one water stream on the source(s) and surrounding structure(s)
- d. Follow the emergency, monitor the exterior of the area and erect appropriate warning signs, barriers, or establish guard posts to prevent unauthorized access
- e. Permit no persons to resume work or enter the area without prior clearance by the OH&PS-IH Section

Note: After the situation has been stabilized, a radiation survey of the area and source leak test will have to be conducted.

- f. Prepare a complete history of the incident, subsequent actions and corrective steps taken, for submission to the appropriate regulatory agency as described previously

C. Fires and other major emergencies where the source(s) cannot be located:

1. The responsible user of the source of radioactive materials or the individual discovering the emergency shall:
 - a. Immediately sound the alarm
 - b. Follow normal emergency procedures for evacuation
 - c. Attempt to put out any fires if a radiation hazard is not immediately present
 - d. Notify the fire department, the RPO and other local safety personnel

2. The Plant RPO shall:

- a. Verify the extent of the emergency and inform the plant manager, group safety, and the OH&PS-IH Section as appropriate
- b. Advise fire fighting and other rescue personnel of hazards to be anticipated
- c. Follow the emergency, monitor the exterior of the area and erect appropriate warning signs, barriers, or establish guard posts to prevent unauthorized access
- d. Permit no persons to resume work or enter the restricted area without prior clearance by the OH&PS-IH Section

3. OH&PS-IH Section personnel will:

- a. After the situation has been stabilized, conduct a survey of the area to locate the source
- b. Upon discovery, wipe test the source and proceed no further until leak test results are available
- c. Remove the source to an approved storage area, after leak test results show removable radioactive material to be less than 0.005 microcuries
- d. Dispose of the source, in accordance with applicable local, state or federal law, should leak test results equal or exceed 0.005 microcuries
- e. Prepare a complete history of the incident, subsequent actions and corrective steps taken for submission to the appropriate regulatory agency as described previously

Special Cases

Situations where a sealed source is determined to be leaking, based on routine leak testing/surveying or personnel are overexposed to ionizing radiation, will be addressed as follows:

A. Leaking Source

In most cases, source leakage will be detected via leak test swabs or swipes and reported to the Plant RPO.

Any test which reveals the presence of more than 0.005 microcuries of removable radioactive material shall be considered evidence that the sealed source is leaking (Title 10, Part 34, Section .25 Code of Federal Regulations).

1. The following actions are required by the OH&PS-IH Section RPO:
 - a. Inform plant management
 - b. The equipment involved will be immediately withdrawn from service for decontamination/repair or disposal, in accordance with local, state, or federal law, as applicable
 - c. Prepare a report to be filed, within five days of the test results, with the NRC describing the following:
 - the equipment involved
 - test results
 - corrective action taken

B. Actions to be Followed in Event of Injury or Overexposure to Personnel Due to Ionizing Radiation

1. The Plant RPO shall:
 - a. Report all radiation accidents involving personnel (wounds, overexposure, ingestion, inhalation) to the OH&PS-IH Section
 - b. Ensure decontamination is conducted using clean running water
 - c. Call a physician qualified to treat radiation injury
 - d. Permit no person(s) involved in a radiation injury to return to work without the approval of the medical director and the attending physician
 - e. Prepare a complete history of events leading to and subsequent to the injury for the records of the facility and for submission outlined in the notification procedures listed above

References

1. Code of Federal Regulations, Title 10, Part 20.
2. NCRP Report No. 24, Protection Against Radiation from Sealed Gamma Sources.
3. NCRP Report No. 29, Exposure to Radiation in an Emergency.
4. NCRP Report No. 32, Radiation Protection in Educational Institutes.
5. NCRP Report No. 39, Basic Radiation Protection Criteria.
6. National Bureau of Standards Handbook 48, Control and Removal of Radioactive Contamination in Laboratories.

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MATERIAL LICENSE APPLICATION ADDENDUM
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11. DISPOSAL OF LICENSED SOURCES WILL BE HANDLED ACCORDING TO NRC REGULATIONS THROUGH A LICENSED SERVICE. IN THE PAST THE FOLLOWING HAVE BEEN UTILIZED:

- ADCO Services, Inc.
P. O. Box 35, Tinley Park, IL 60477
NRC License #12-11286-01

- Nuclear Sources and Services, Incorporated
P. O. Box 34042, 5711 Etheridge Street, Houston, TX 77034
NRC License Nos. 11-2991 and 11-1811

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