

Field Notes

6/4/63
W. P. Ellis

Union Carbide Corporation
Union Carbide Chemicals Co
Olefins Co
South Charleston, West Virginia

Licenses Nos. 47-260-2, -3, -4, and -6.

Not Reproduced
For State

Personnel monitoring - records in med. Dep.
Have routine Clinical Analysis of urine
Blood tests ^{semi-annually for Skatol group} periodically -
Pre-employment & Termination physical

47-260-4 also 47-260-6

Film badges from Tracerlab on weekly
basis - Four people covered

No detectable readings -

Ekraba Gotthard Sheffman Stele

47-206-2 Personnel Exposures - 7 employees
Special instrumentation

Film badges from Nuclear Chicago on
monthly basis - maximum reading was
20 mrem/month -

44 mrem/quarter - third quarter 62

Sessions employees have assigned dosimeter
and results are tabulated daily and
monthly - Sent to medical quarterly
41 mrem in north typical maximum -

under supervision of W. H. Kitchan

[redacted] Calibration of Inst
and wipe tests - asst in teaching program -
maximum exposure 5 mrem for a
single exposure - maximum for month -
Dosimeter reading

[redacted] maximum
reading 5 mm surveying
1 c Sr-90 density gage - the
max monthly exposure 5 mR
Survey all equipment.
Rep for Session goes thru William.
When Source comes to Store for
Sessions group - William goes to
Stores, make Survey and determine
Source is in good cond. Assign
it a Number. Accompany store master
of source from Box - letter to Store
Fire Dep. and Sessions - record
survey ^{reading} contact + 1 foot -

When Session makes Installation He
fills out Rad Source Log Sheet #2
William survey recorded on Survey
Data Sheet.

Chief of Fire dept had CD course
and is CD director. Had verbal
instruction from [redacted] and is instructed
to rope off area and call operator -
Has instruction on truck - CD Kit
CD 700 710 and 720

Have 10 Survey Inst in Experimental

Instruments

All instruments are calibrated each
6 months date noted on inst -

- ✓ cutie weight 305F 0-50 Gm tube
- 4 Jordan ~~cutie~~ cutie pie ~~AGB-10K~~ AGB-10K_{sp}
- ✓ 3 Tracerlab Gm tube 54-14 to 25 m/hr
15 ~~54-14~~
- ✓ universal atomic Gm tube model 700
② 50 m/hr -
- ✓ Victoreen CD ⁽⁹²⁰⁾ 960 Ion Chamber -
Range 50 r/hr -
- ✓ Pocket Dosimeters - 24 -
200 m direct reading
⑥ E.D. dosimeter
- ✓ ④ dosimeter changers.

Leak tests

511 South Charleston

scale of pressure
in to in Hc

1100 cfm = .005 Hc

324

all sources are leak tested on receipt.

Surveys

Maximum reading @ 1' was 5hr/hr

Disposed Lense - 2

511-27 - 150 mc CS-137 returned to
Obnort 12-19-62 < 1 mile at best

Source ASR-3 - C316-SSD under GL Lense
Look at source

511-28 500 mc CS-137
To Niagara August 1962 Returned 12-20-62

H₂ in committee Dec 1

Chromatograph

~~August 62~~
~~July 62~~ model 26-751 Argon Diode Ionization
Detector With 100 mc H³ Source

farrell-ash unit -

U.S. Radium makes
Folts

May 62

250 mc H³ Aerograph Gas
Chromatograph

U.S. Radium three H³ foils

292 mc

132 mc

76 mc

TO be used in Chromatographic cell Dev.
Still use some of these

USRC Foil

Sr-90 .03 mc in Jordan PGB-10 KB-SR
Sr-90 20 mc in C-5 Holder used for ~~chromatograph~~
~~500 mc~~ Flow meter in S.C. Plant

Sr-90 500 mc Slurry System at S.C.
assigned 514 (on committee before -6)

T.E.N. Stull

No forms 4 or 5 Completed
No employees less than 18-

Receipts 47-260-6 ~~License~~
no other material.

BaC¹⁴O₃

1962 100 mc

1961 5 mc

1963 2 mc — from New England Nuclear
in polyphenol

Have 3mc ready to inactivate -
usually convert carbon back to BaC¹⁴O₃
Have not inactivated any since last
inspection -

None to Sewer -

X Transfers to Mellon Inst Pittsburgh Pa
June 27-909-7

Receipts

Rec 1000c Co-60 10-20-61
from AFCL

Water Tests	5.5 $\times 10^{-8}$	9-9-59
" "	6.4 $\times 10^{-8}$	11-9-62
" "	6.1 $\times 10^{-8}$	5-21-62
	1.4 $\times 10^{-6}$	12-1-61
	9.2 $\times 10^{-6}$	5-10-62
		10-8-62

Dr. Straben Facility

701

Research + Dev.
Form 3 Posted

Reloket model K-281 Counter with
lead shield wall + Gm tube
detector

Carbon 14 Lab

Sign on door "Carbon Rad mat"

Sign on storage Bin under Sink
Carbon Rad mat

Carbon Stored under work table
C-14 Isotopes containers labeled with Sign
and Date etc -

one glove box

C-14 Hot or distillation inside Hot Lab
Lab locked when not one present -

Tracer lab monitor with End window
Gm tube

Waste can properly labeled -

11

Henry

* Three shipments

2-18-63

1.1 mc

C¹⁴

Ethylene
admixt
in compound
of hydrogen
phosphide

4-1-63

0.4 mc

"

4-18-63

2.1 mc

Terpitol
Anonics 08
C-14

Returned 4 Panels of Co-60 to AFCL
100 curies 10-20-61

These were decayed & were
returned to make room for
others -

End window Geiger tube monitor for
C-14 - Have not recorded any survey
made with these instruments -
no records of survey level
does make surveys

Bldg 722 Irradiation Laboratory

Form 3 Filled

All personnel logged in & issued
a Dosimeter

Closed circuit T.V.

39 Perils 10" long $\frac{1}{2}$ " in diameter

5 1/2 center core perils around well

Constant recording monitor of radiation

Charts filed by Fred Williams

Jordan monitoring unit with

Ionization chambers in selected
positions

When elevator is moving doors cannot
be opened -

Interlocked with monitor

Source cannot be raised with door open
door cannot be opened when source is up -

Red light on with source operating
water level detector & interlock
with door sample

Emergency trip and hand crank -

48" concrete well -

Horn sounds when source in motion
Crash bar on door to Room -

telephone removed - have intercom

Press button to clear monitor
interlock with door -

Sign at door 'High Rad area'

Fusible link to hold source up -

Two men must be present -

Light On in Room when source
actuated -

Two Jordan Detectors ~~15 MC~~ } Cal Source
Solid 9r-90 15 MC
2 MC
2 MC

Pocket meter readings < 1 mrem -

Bldg locked when not occupied
Separate fence -

Alhambra Calif -

Serial # 50-51

I 138-1

II 138-2

II 138-3

Co - 60
up about 2/3 of time

Have formal training for
Sessions now.

Harbin
Research + Dev 770
where Ketchum is

Used C¹⁴ to Calibrate Chromatographs
Total of 4.56×10^{-7} curies (.4 MC)
over a 3 day period

~~Yes sir~~ → Done in 745 Bldg 4/16 - 18/1983
Air flow on Hood 800 CFM -

2 mc Carbon-14 in Special Instrument Dept
on committee here.

2. Inst Bldg
Record of source location + date
Is on Board

Dosimeter readings recorded for
Inst men.

Instructions
2 hrs per day for 2 wks.

10 d/m/cc for H³ out Hood -

Procedures - Same as others
Personnel Training

Chromatograph in Chromatograph Lab
Cant Rad Anat. Syntol
Sr-90 10mC 1-27-63

511 Tech Center
512 Institute
514 - S.C

space

Special Installation Dept
L. J. Rogers - Review

H³ Purchased 20 curies - H³
attached ^{to solids.} Generated with tank
Partial
measure pressure on Bull of H³

~~20~~ Generated 1 curie

Lost 6 curies - Stored in Hood - 1250 CFM
or slow leak - 1-25-61 to 2-21-61

Polyethylene ^{film} tagging about one curie
or irradiated

Materials used were on order of H.C.
~~Spent~~ over period of year
Dec 59 - to April 61 @
irradiation about one each week -
in open air -

Date of Receipt Stamped on Source

Olefins

Special Inst Job + Check out gage

Sign on door "Caution Rad. mat

Nuclear Chicago Single Channel
Analyzer - Model 132 B Scaler
and Model 1620 B power supply

Storage Bin made of concrete block
Sign on door - Caution Rad. mat Symbol
Sources in Storage 745

100 mc of I-131

Au-198

200 mc

Oct 1962

All sources labeled

No water 15 min per week
Max reading at door 1 mR/hr

Fenced area and sign C.R. in Symbol

In der
GL Jinn

Schwart 300 mc Sr-90

C.R. mat

No GL no-

Sign

on door

to

Hood

H² + C14 in Hood - Hood runs
all time.

Sign C.R.M. + Symbol
For 3 posted

Research and Dev. 70 Bldg

~~Isotope Storage (Kitchen)~~
~~Special about Bldg 745~~

Research + Dev (Shaw) 701

$$2.54 \frac{\text{cm}}{\text{in}} \times 2.54 \frac{\text{cm}}{\text{in}}$$

$$\begin{array}{r} 12 \times 2.54 \frac{\text{cm}}{\text{in}} \\ \hline 5.08 \frac{\text{cm}}{\text{in}} \\ 2.54 \\ \hline 30.48 \end{array}$$

$$\begin{array}{r} (30.48)^3 \\ \hline 30.48 \\ 24384 \\ 12192 \\ \hline 91440 \end{array} \quad \frac{\text{cc}}{\text{ft}^3}$$

$$979.0304$$

$$\frac{28.32}{5.04 \times 10^7} \frac{\text{cu. ft}}{\text{cuft}}$$

$$\begin{array}{r} 11328 \\ 141600 \\ \hline 142.7328 \times 10^7 \times 10^3 \frac{\text{cc}}{\text{cc}} \\ \times \end{array}$$

$$\begin{array}{r} 1.427 \overline{) 1.00000} \\ 9989 \\ \hline .0110 \end{array}$$

$$142.73 \times 10^{10} \text{ cc}$$

$$1.427 \times 10^{12} \text{ cc}$$

10

$$\frac{1 \times 10^6 \mu\text{c}}{1.427 \times 10^{12} \text{ cc}} = .7 \times 10^{-6} \frac{\mu\text{c}}{\text{cc}}$$

$$= 7 \times 10^{-7} \frac{\mu\text{c}}{\text{cc}}$$

$$\left\{ \begin{array}{l} 2 \times 10^{-7} \\ 5 \times 10^{-6} \end{array} \right\}$$

Sherry read out of LS-101 & 102
will use 200mc source in h_g

47-260-2 user Mr. H.T. Sessions

Seal test SHRN + SHRH seal 3 years

506 SHRD and HM-8 every 6 mos

Seal test before placing in operation

Seal tests by N.H. Ketcham or L.J. Rogers

No compliance: Personnel 200mc each -
will return to OR

Sign of Radiation Sign Posted

who calibrates first?

How much H³

Do you have Fan 4 & 5

	Cs-137	
Permit	one 500 mc	4.60
A+B	+ 200 mc source	

Rad corp - SHRN SHRH
SHRD HM-8

And nuc. LS-101 102

C	3 source SHRH	3.00
---	------------------	------

D	two 500 mc	3.00
	two 1000 mc H-C 506	

E	SHRH	.75
---	------	-----

F	ASR-50-3	.50
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9.85

47-260-6 W. J. Skroba, Chairman
N.H. Ketcham RSO

Leak Test well fabricated Sauer

use in W. Va + other states if AEC notified

copy of manual to each user -

Interlocks

Red light

audible alarm inside

door open from inside

Telephone TV

Filter badges Pocket dosimeters

Use meter when entering cell

continuous monitoring in cell ~~outside~~ in control

Fusible links

~~has~~ Surveys & records

Filter contamination ?

How much use

Power failure

Training

Fire Dept - Emergency Pers

How are receipt handled -
notify safety, Fire Dept, medical

what type dist on emergency truck ?

Review - P. W. Gregory
Head of Ind Relations
Tech Center

Bldg 791

Dr. E. M. Best Jr. MD
Medical Director
Tech Center

770

Mr. R. M. Berg
Asst. Director in
Research & Dev. Dept.

740

L. J. Rogers ~~not~~
Dir of S.I.D.

47-260-3

Technical Center ~ 3300 employees
Industrial Hygiene Lab
Form 3 Posted

Counting Leak tests
Instrument calibration

Co-60 1 mc source 47-260-3

Tracerlab R-31

Source container labeled "Cont. Rad mat" symbol
Source label cont Rad mat Symbol

Date 3-19-59

Co-60 1.1 mc

✓ RCL Scaler model 1 with Well
Counter and Gm tube detector
For counting

✓ Tracerlab - gas monitor 543-D
with Gm tube 20,000 c/hr

Instrument cal by sliding platform

RCL-
mod 10400
Helium gas
End window
tube -

✓ 1 ~~CDV~~ Dosimeter charger Victoreen mod 2000

1 CDV-720 500 r/hr

1 Jordon 10,000 r/hr

47-260-3

F.C. Young - NE Bolton - ^{W.H.} Ketchum

C-14 25 mC

Co-60 Sealed Source 1MC

Incineration of G14 one mC per month
Stack 40' high 135,000 ft³/hr
Less than 2×10^{-9} Mc/ml

disseminated into the committee files

Dr. Young is with Union Carbide
Canada Ltd.

S.I.D. RADIOACTIVE MATERIALS INVENTORY

AS OF APRIL 15, 1963

Session

Cesium 137 Sources

Source Holder	Identification Number	Material	Activity	Bldg & Location	Plant
61-101	SHRM 511-1	Cesium 137	200 mc	745 Storage T. C	
	SHRM 511-2		200 mc	745 Storage T. C	
	SHRM 511-3		200 mc	745 Storage T. C	
	511-4		200 mc	Bldg. 421 — S. Charleston	
	511-5		150 mc	* Bldg. 414 #2 Unit — SC	
	511-6		150 mc	745 Storage Bldg. 511-421 Jar SC	
A	511-10		500 mc	745 Storage T. C	
	SHRM 511-11		20 mc	Bldg. 421 SC	
	SHRM 511-12		20 mc	Bldg. 414 #1 Unit SC	
	511-13		20 mc	745 Storage T. C	
	511-14		20 mc	414 #1 Unit SC	
	511-15		20 mc	414 #1 Unit SC	
	511-17		50 mc	745 Storage T. C	
	511-18		50 mc	414 #1 Unit SC	
	511-19		50 mc	414 #1 Unit SC	
	511-20		100 mc	745 Storage T. C	
	511-21		150 mc	414 #2 Unit SC	
	511-22		150 mc	745 Storage T. C	
	511-23		150 mc	745 Storage T. C	
	SHRM 511-24		1000 mc	414 #7 Unit S. C	
	ASR-3 511-25		450 mc	745 Storage T. C	
NE 506	511-26		1750 mc	745 Storage — Two sources in one pig 750 + 1000	
ASR-50-3	511-28		500 mc	Cellosize Unit, Institute	
	511-29		500 mc	Cellosize Unit, Institute	
	511-30		1000 mc	Bldg. 771 #5 Cell — Pilot Plant T. C	
	T-31		1000 mc	Bldg. 153 #2 Dilution Tank — in test facility	
	511-32		150 mc	Bldg. 414 #2 Cell SC	
	511-33		150 mc	Bldg. 414 #2 Cell SC	

Total CS-137 8900 mc

7-17-63

16,380 H³ mcBldg 745 — Not in use at Present
Tagging organics —

Strontium 90

Identification Number	Activity	Location
3631	20 mc	Bldg. 194 2nd Floor
T-34	1000 mc	Bldg. 745 Lab Area — SC
600-2	10 mc	Bldg. 740-3311
Total Str 90		1030 mc

Not Reproduced
For State

Carbon 14

Identification Number	Activity	Location
C-14	2 mc	Bldg. 745 Fume Hood
Total Carbon 14	2 mc	

Tritium

Identification Number	Activity	Location
Tritium	16,380 mc	745 Fume Hood
Tritium	500 mc	745 Storage Area
Total Tritium	16,880 mc	

Radium 226 Pellets

Identification Number	Number Pieces	Activity	Location
P-1	5	5 mc	745 Storage
P-2	5	5 mc	745 Storage
P-3	2	2 mc	745 Storage
P-4	1	1 mc	745 Storage
P-5	4	4 mc	745 Storage
P-6	5	5 mc	Texas City, Texas
P-7	2	2 mc	745 Storage
P-8	2	2 mc	745 Storage
P-9	6	6 mc	745 Storage
P-10	5	5 mc	745 Storage
P-11	2	2 mc	745 Storage
P-26	Unknown	Unknown	745 Storage Ra 226 Salts
P-29	1	.1 mc	745 Storage Alphatron Cell
P-30	1	.1 mc	745 Storage Alphatron Cell
P-32	4	4 mc	745 Storage Formerly LAB
Total 43 pieces 1 mc Pellets			

Other Sources

Identification Number	Type	Activity	Location
B-1	Au 198	Background Unknown	745 Storage
B-2	Au 198	Unknown .02 mr/hr	745 Storage
B-3	Il31	Unknown .015 mr/hr	745 Storage
B-4	Str 90	1 μ c	745 Storage
B-5	Au 198	Unknown .015 mr/hr	745 Storage
B-6	H ₃ Foil	500 mc	745 Storage

Radium 226 Compensating Sources

Identification Number	Number Pieces	Activity	Location
R-12	1	.1 mc	Bldg. 153
R-13	1	.150 mc	745 Storage
R-14	1	.500 mc	745 Storage
R-15	1	1 mc	745 Storage
R-17	1	1 mc	745 Storage
R-18	1	.3 mc	745 Storage
R-19	1	.1 mc	745 Storage
R-20	1	.150 mc	745 Storage
R-21	2	2.64 mc	745 Storage
R-22	Several	4.166 mc	745 Storage
R-23	1	1.665 mc	745 Storage
R-24	1	.500 mc	745 Storage
R-25	1	.1 mc	Bldg. 153
R-27	1	.1 mc	745 Storage
R-28	1	.1 mc	Bldg. 113 Institute
R-31	1	.300 mc	745 Storage
R-32	1	.1 mc	745 Storage
R-16	1	1 mc	745 Storage
R-5	1	1 mc	745 Storage

Total Radium Comp. Sources & Other Radium 15.171 mc

TABLE I

LICENSED ENCAPSULATED RADIATION SOURCES
Inventory as of December 31, 1962 (not including radium)

Manufacturer's Name and Type of Housing	Kind of Isotope	No. of Sources	Amount in Each Source* (millicuries)	Total Amount* (millicuries)	Required Frequency for leak Test	Responsible Agency
<u>BROWNSVILLE PLANT</u>						
Ohmart HM-8	Cs 137	1	750	750	6 mos.	Texas
<u>INSTITUTE PLANT</u>						
Ind. Nucleonics BB-0041	Cs 137	1	150	150	3 yrs.	AEC
Ind. Nucleonics BBS-10051	Cs 137	1	50	50	3 yrs.	AEC
Ind. Nucleonics BBS-10073	Sr 90	1	1000	<i>Institute</i> 1000	6 mos.	AEC
Ind. Nucleonics BB-0041	Cs 137	1	200	200	3 yrs.	AEC
<u>SEADRIFT PLANT</u>						
Ohmart SHRM	Cs 137	1	125	125	3 yrs.	Texas
Ohmart SHRM	Cs 137	6	150	900	3 yrs.	Texas
Ohmart SHRD	Cs 137	2	300	600	3 yrs.	Texas
E. K. Cole SKS 101/233	Co 60	1	30 microcuries	0.03	6 mos.	Texas
Ohmart HM-8	Cs 137	2	750	1500	3 yrs.	Texas
U. S. Nuclear Source G 223	Co 60	1	1	1	3 yrs.	Texas
<u>SOUTH CHARLESTON PLANT</u>						
Ohmart SHRM	Cs 137	11	100	1100	3 yrs.	AEC
Ohmart SHRM	Cs 137	2	50	100	3 yrs.	AEC
Ind. Nucleonics LS-101	Cs 137	1	25	25	6 mos.	AEC
Jordan Meter	Sr 90	1	0.003	0.003	6 mos.	AEC

- 6 license

(Continued)

TABLE I (Continued)

Manufacturer's Name and Type of Housing	Kind of Isotope	No. of Sources	Amount in Each Source* (millicuries)	Total Amount* (millicuries)	Required Frequency for Leak Test	Responsible Agency
<u>TECHNICAL CENTER</u>						
Ohmart SHRH H	Cs 137	2	200	400	3 yrs.	AEC
Ohmart SHRM	Cs 137	1	20	20	3 yrs.	AEC
Ohmart SHRM	Cs 137	5	150	750	3 yrs.	AEC
Ohmart SHRM	Cs 137	2	200	400	3 yrs.	AEC
Ohmart SHRH-A H	Cs 137	3	1000	3000	3 yrs.	AEC
Ohmart SHRM-P	Cs 137	4	20	80	3 yrs.	AEC
Ohmart SHRM-P	Cs 137	3	50	150	3 yrs.	AEC
Ohmart SHRM-P	Cs 137	1	100	100	3 yrs.	AEC
Ohmart HM-8	Cs 137	1	500	500	6 mos.	AEC
Ohmart ASR-3	Cs 137	1	500	500	6 mos.	AEC
Nuclear Chicago						
Model 506	Cs 137	1	1750	1750	6 mos.	AEC
Ohmart SHRD (z gauge)	Cs 137	1	500	500	6 mos.	AEC
Ohmart ASR-3	Cs 137	1	450	450	6 mos.	AEC
AECL KCP-1 and C-129	Co 60	1	39 pencils up to 250 curies ea.	Approx. 1600 curies	6 mos. (water)	AEC
Tracerlab R-31	Co 60	1	1.1	1.1	6 mos.	AEC
Jordan Meter	Sr 90	1	.03	.03	6 mos.	AEC
Ind. Nucleonics C-5	Sr 90	1	20	20	6 mos.	AEC
Ind. Nucleonics DH-3	Sr 90	1	500	500	6 mos.	AEC S.C
Chromatograph Det.	Sr 90	1	10	10	6 mos.	AEC TC
Chromatograph Det.	Sr 90	2	20	40	6 mos.	AEC

NOTE: Tritium foil sources held by the Technical Center are not included in this table.

(Continued)

TABLE I (Continued)

<u>Manufacturer's Name and Type of Housing</u>	<u>Kind of Isotope</u>	<u>No. of Sources</u>	<u>Amount in Each Source* (millicuries)</u>	<u>Total Amount* (millicuries)</u>	<u>Required Frequency for Leak Test</u>	<u>Responsible Agency</u>
<u>TORRANCE PLANT</u>						
Ohmart SHRM	Cs 137	12	50	600	6 mos.	California
<u>WHITING PLANT</u>						
Ohmart SHRM	Cs 137	1	80	80	3 yrs.	AEC
Ohmart SHRM	Cs 137	1	100	100	3 yrs.	AEC
Ohmart SHRM	Cs 137	2	50	100	3 yrs.	AEC
Ohmart SHRM	Cs 137	4	100	400	3 yrs.	AEC
Ohmart SHRM	Cs 137	8	50	400	3 yrs.	AEC
Ohmart SHRM	Cs 137	10	50	500	3 yrs.	AEC

Grand Total Number of Sources 1055

*Amount of activity at time of purchase.
No decay correction made.

NOTE: All of the above encapsulated sources were purchased originally under license agreements with the AEC. Radium sources have not been subject to licensing by the AEC but are included in the new State regulations. Information on approximately 80 radium sources in the Company's possession will be given in a future Summary Report.