

TECHNICAL CENTER
RADIOACTIVE MATERIALS AND RADIATION-PRODUCING DEVICES
INVENTORY AS OF APRIL 1, 1980

INVENTORY OUTLINE

I. RADIOACTIVE MATERIALS

A. STORAGE AREA

1. INDEFINITE STORAGE
2. AWAITING INSTALLATION
3. AWAITING DISPOSAL

B. IN USE AT THE TECHNICAL CENTER

C. SOURCES AT OTHER LOCATIONS ON OUR LICENSES

D. CALIBRATION AND CHECK SOURCES

E. UNENCAPSULATED ISOTOPES

II. RADIATION-PRODUCING DEVICES

A. X-RAY MACHINES

B. MICROWAVE GENERATORS

C. LASERS

A-68

I. RADIOACTIVE MATERIALS

ISOTOPE	A C T I V I T Y (mCi)							
	A.1	A.2	A.3	B	C	D	E	Total
Am-241	4564.0					9.8×10^{-5}		4564.000098
Ba-133						5.3×10^{-4}		5.3×10^{-4}
C-14			26.1			8.52×10^{-4}	637.343	663.443852
Cd-109						4.679×10^{-3}		4.679×10^{-3}
Cl-36						3.1×10^{-5}		3.1×10^{-5}
Co-60						9.364×10^{-4}		9.364×10^{-4}
Cs-137	20620.9	708.3		189.2		1725.781038		23244.18104
Fe-55				43.8				43.8
H-3			1220.0	7871.7	759.3	7×10^{-5}		9851.00005
Ni-63				67.4		2.08×10^{-4}		67.400208
Po-210				0.0375				0.0375
Ra-226			0.06	0.2		2.01338×10^{-2}		0.2801338
Sr-90	1334.6					6.14×10^{-6}		1334.600006

II. RADIATION-PRODUCING DEVICES

X-Ray Machines: 10
 Microwave Generators: 26
 Lasers: 13

I. A.1. STORAGE AREA - INDEFINITE STORAGE

Isotope	Serial #	Mfr. and Model #	Acitivity (mCi) Calib. Date	Activity as of 4/1/80 (mCi)	Comments	Date In
Cs-137	64126	SHRM-PA	100 6/75	89.4		9/7/77
Sr-90	S-1006	Numinco SH1A	1000 2/64	667.3		2/4/64
Sr-90	S-1005	Numinco SH1A	1000 2/64	667.3		2/14/64
Cs-137	559	TN-5192	200 1/23/75	177.5		5/10/78
Cs-137	274	TN-5190	200 12/10/73	172.9		5/10/78
Cs-137	302	TN-5190	200 12/10/73	172.9		5/10/78
Cs-137	215	TN-5192	200 9/14/73	171.9		5/10/78
Cs-137	299	TN-5190	200 12/10/73	172.9		5/10/78
Cs-137	6783	HM-8	2000 8/67	1492.6		12/28/78
Am-241-Be	2545	Container 1100	930 10/75	923.6	At Seadrift	12/10/79
Am-241-Be	2	TN-5010	1300 9/6/65	1271.5	Moisture Gauge	10/3/74
Cs-137	2372	TN-5176	4000 8/28/74	3516.2	(for Alloy)	10/3/74
Cs-137	572	TN-5192	200 1/75	177.2		11/20/78
Cs-137	548	TN-5192	200 1/23/75	177.5		4/10/79
Cs-137	545	TN-5192	200 1/23/75	177.5		4/10/79
Cs-137	534	TN-5192	200 1/23/75	177.5		4/10/79
Cs-137	551	TN-5192	200 1/23/75	177.5		4/10/79
Cs-137	524	TN-5192	200 10/30/74	175.8		4/10/79
Cs-137	580	TN-5192	200 1/23/75	177.5		4/10/79

I. A.1. STORAGE AREA - INDEFINITE STORAGE (Page 2)

Isotope	Serial #	Mfr. and Model #	Activity (mCi) Calib. Date	Activity as of 4/1/80 (mCi)	Comments	Date In
Cs-137	515	TN-5192	200 1/23/75	177.5		4/10/79
Cs-137	560	TN-5192	200 1/23/75	177.5		4/10/79
Cs-137	61063	SHRM-PA	100 7/70	79.8		8/21/75
Cs-137	L-469	SHRM-PA	100 2/75	88.8		12/4/75
Cs-137	64127	SHRM-PA	100 6/75	89.4		9/7/77
Cs-137	64128	SHRM-PA	100 6/75	89.4		9/7/77
Cs-137	64154	SHRM-PA	100 2/75	88.8		12/4/75
Cs-137	285	TN-5190	200 12/10/73	172.9		1/19/77
Cs-137	60410	SHRH-A	1500 1/69	1156.7		12/3/75
Cs-137	60409	SHRH-A	1500 1/69	1156.7		12/3/75
Cs-137	511-30 6901-25135	SHRH-A	1000 1/62	656.0		5/10/78
Cs-137	65620	SR-1	500 3/77	465.6		6/20/79
Cs-137	65621	SR-1	500 3/77	465.6		6/20/79
Cs-137	567	TN-5192	200 1/75	177.2		10/19/76
Cs-137	2684	SHRH-36	500 4/77	466.5		5/3/77
Cs-137	2683	SHRH-36	500 4/77	466.5		5/3/77
Cs-137	1760	SHRM	100 7/70	79.8		9/5/75
Cs-137	2475	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2476	SHRM-60	500 8/76	459.3		11/28/79

I. A.1. STORAGE AREA - INDEFINITE STORAGE (Page 3)

Isotope	Serial #	Mfr. and Model #	Acitivity (mCi) Calib. Date	Activity as of 4/1/80 (mCi)	Comments	Date In
Cs-137	2477	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2549	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2552	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2553	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2555	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2556	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2557	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2561	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2562	SHRM-60	500 8/76	459.3		11/28/79
Cs-137	2563	SHRM-60	500 8/76	459.3		11/28/79
Am-241-Be	1504	Alum. Suitcase	2390 6/19/74	2369.2	Sent to Taft for Profile	
Cs-137	65199	SR-1	300 9/77	282.7		1/2/80
Cs-137	1266	SHRM-5	100 3/66	72.2		1/17/80
Cs-137	6779	HM-8	2000 8/67	1492.9	No lock. 500 mr/hr contact.	3/17/80

I. A.2. STORAGE AREA - AWAITING INSTALLATION

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I. A.3. STORAGE AREA - AWAITING DISPOSAL

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I. B. SOURCES IN USE AT THE TECH CENTER

Isotope	Serial #	Mfr. and Model #	Activity (mCi) Calib. Date	Activity as of 4/1/80 (mCi)	Comments	Location
Ni-63	A-1743	Varian Gas Chromatograph	8 1/80	8.0	Mr. Bill Lambdin 770/250 - Ext. 4481	770/249
Cs-137	2180	SHRM	50 12/77	47.3	Rocket Hollow A1 W Cell Dr. Joe Amos	Bldg. 777
Cs-137	2181	SHRM	50 12/77	47.3	Rocket Hollow A2 W Cell Dr. Joe Amos	Bldg. 777
Cs-137	2182	SHRM	50 12/77	47.3	Rocket Hollow B1 E Cell Dr. Joe Amos	Bldg. 777
Cs-137	2503	SHRM	50 12/77	47.3	Rocket Hollow B2 E Cell Dr. Joe Amos	Bldg. 777
Fe-55	445	PGT-100 Analyzer	50 10/79	43.8	Phil Gaarenstroom 770/228	Bldg. 777 Analy.Sup.Lab
Ra-226	6901-24	Indl. Nucleonics Pipe Wall Thickness Gauge	0.2 1958	0.2	B.H.Clark 2000/2131	2000/2104
Ni-63	767	Varian 3700 Gas Chromatograph	8 5/78	7.9	J. Marchio 770/262	770/245
Ni-63	C0587	HP 5840A Gas Chromatograph	15 8/77	14.7	S.A.Siegrist 770/318	770/315
Ni-63	C1048	HP 5840A Gas Chromatograph	15 3/79	14.9	E.R.Lashley 770/316	770/347
Ni-63	234	Bendix Gas Chromatograph	15 9/74	14.4	R.L.Berglund 770/350	770/345
H-3	146	AID Portable Gas Chromatograph	200 1/65	84.7		770/343
H-3	119	Bendix Gas Chroma- tograph Analog Tech Corp.	1000 8/75	7670.5	S.A.Siegrist 770/318	770/323

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I. D. CALIBRATION AND CHECK SOURCES 2Q80

Isotope	Serial #	Mfr. and Model #	Activity (mCi) Calib. Date	Activity as of 4/1/80 (mCi)	Comments	Location
Cs-137	M-644	Ohmart Comp. Cell	0.5 11/67	0.335	Contained in lead pig	747-Calibration Room
Cs-137	512	TN-5192	200 11/74	176.5		Ditto
Cs-137	60476	SHRH-A	2000 12/68	1539.3		Ditto
Cs-137	511-36 6901-25050	SHRM-PA	10 5/64	6.92		Ditto
Cs-137	V-857	Comp. Cell	0.5 10/67	0.375	Contained in lead pig	747-Cabinet 2
Cs-137	6901-25058	Comp. Cell	0.5 5/64	0.346	Ditto	Ditto
Cs-137	M-645	Comp. Cell	0.5 6/66	0.363	Ditto (2 sources in pig)	Ditto
Cs-137	J-698	Comp. Cell	0.5 11/67	0.375	Ditto	Ditto
Cs-137	L-837	Comp. Cell	0.25 4/76	0.228	Ditto	Ditto
Cs-137	V-856	Comp. Cell	0.5 10/67	0.375	Ditto	Ditto
Cs-137	T-609	Comp. Cell	0.25 12/67	0.188	Ditto	Ditto
Cs-137	M-629	Comp. Cell	0.1 10/71	0.083	Ditto	Ditto
Cs-137	454	Comp. Cell	0.5 11/64	0.350	Ditto (2 sources in pig)	Ditto

I.D.CALIBRATION AND CHECK SOURCES 2Q80 (Page 2)

Isotope	Serial #	Mfr. and Model #	Activity (μ Ci) Calib. Date	Activity as of 4/1/80 (μ Ci)	Comments	Location
Am-241	Am-601	MRC Disk	0.1 6/70	0.098	Calibration Source	740/2309
C-14	N/A	Eberline CS-4A	0.5 2/78	0.5	Calibration Source	740/2309
Cs-137	617	Beckman	0.1 1/78	0.094	LS-9000 Check Source	740/2309
Ra-226	N/A	Numinco Disk			Check Source	740/2309
Ba-133	CT-200-3 G 3-45	Baird Atomic Disk	0.598 1/79	0.530	Energy Calib. Source	740/2309
Co-60	CT-200-7 G 7-78	Baird Atomic Disk	1.06 1/79	0.899	Energy Calib. Source	740/2309
Cd-109	CT-200-1 G 1-25	Baird Atomic Disk	9.21 1/79	4.679	Energy Calib. Source	740/2309
Cs-137	CT-200-4 G 4-102	Baird Atomic Disk	1.08 1/79	1.04	Energy Calib. Source	740/2309
H-3	H 262123	Beckman Vial	0.04 4/77	0.034	LS9000 Calib. Set	740/2309
C-14	C 260039	Beckman Vial	0.013 2/77	0.013	LS9000 Calib. Set	740/2309
H-3	H 263102	Beckman Vial	0.043 6/77	0.036	LS9000 Calib. Set	740/2309
C-14	C 262070	Beckman Vial	0.014 4/77	0.014	LS9000 Calib. Set	740/2309
C-14	107-2	IPL Disk	0.157 8/71	0.157	LB II Calib. Set	740/2309

Isotope	Serial #	Mfr. and Model #	Activity (μ Ci) Calib. Date	Activity as of 4/1/80 (μ Ci)	Comments	Location
Cl-36	107-3	IPL Disk	0.031 8/71	0.031	LB II Calib. Set	740/2309
Ni-63	107-5	"	0.222 8/71	0.208	"	"
Sr-90	107-4	"	0.00761 8/71	0.00614	"	"
C-14	107-1	"	0.168 8/71	0.168	"	"
Cs-137	7105-1	"	0.0104 12/70	0.0084	"	"
Cs-137	7105-2	"	0.107 12/70	0.086	"	"
Co-60	7105-3	"	0.0149 12/70	0.0044	"	"
Co-60	7105-4	"	0.113 12/70	0.033	"	"
Ra-226	7105-5	"	0.124 12/70	0.123	"	"
Ra-226	7105-6	"	0.0109 12/70	0.0108	"	"
Ra-226	740-5303	Packard Tri-Carb LSC	20.0 1/70	20.0	Internal Source	740/4313
Cs-137	Cs-106	Beckman LSC	20.0 1/74	17.0	Internal Source	740/4315
Cs-137	-	-	10.0 1/75	8.86	Three check sources stored in a lead cylin.	747 Cabinet 2

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I.E. UNENCAPSULATED ISOTOPES

List of the Radiolabeled Chemicals with the Registration
Chemistry Group, Union Carbide Agricultural Products Company

<u>Compound</u>	<u>Label</u>	<u>Amount (mCi)</u>
Potassium cyanide	Carbon-14	75.0
UC 51109	"	2.72
Barium carbonate	"	3.00
UC 44858	"	6.57
Standak oxime	"	0.50
Standak	"	41.99
Acetonitrile	"	2.50
Acetic Acid	"	2.995
Methomyl	"	4.00
Aldicarb N-methyl- ¹⁴ C	"	0.718
Aldicarb tert- ¹⁴ C	"	0.388
Aldicarb S-methyl- ¹⁴ C	"	148.1
Carbaryl N-methyl- ¹⁴ C	"	0.692
Carbaryl carbonyl- ¹⁴ C	"	0.146
Carbaryl 1-naphthyl- ¹⁴ C	"	190.00
Thiodicarb	"	129.77
Radiolabeled biological matter	"	25.06
Radioactive waste	"	3.194
	TOTAL	637.343

II.A - X-RAY INVENTORY

<u>ID</u>	<u>Use</u>	<u>Location</u>
X-1	Analytical (Microscope)	770/123
X-2	Analytical (Microscope)	740/3308
X-3	Analytical (Diffraction)	770/252
X-4	Analytical (Diffraction/Fluorescence)	770/252
X-5	Analytical (Diffraction)	770/424
X-6	Analytical	770/115
X-7	Medical	791 - X-Ray Room
X-8	Industrial Radiography	511/Test & Inspection Bldg.
X-9	Industrial Radiography	Institute (511/2149)
X-10	Analytical (Diffraction)	770/252

II.B

INVENTORY

1.	M-1	Montgomery Ward-Signature	Bldg. 339	Lunch Room
2.	M-2	Litton Industries	Bldg. 701	Lunch Room
3.	M-3	Whirlpool Model REM 7400	Bldg. 704	Lunch Room
4.	M-4	Whirlpool Mealminder	Bldg. 705	Lunch Room
5.	M-5	Whirlpool Mealminder	Bldg. 706	Lunch Room
6.	M-6	Whirlpool Mealminder	Bldg. 707	Lunch Room
7.	M-7	Whirlpool Mealminder	Bldg. 708	Lunch Room
8.	M-8	Thermador Thermatronic	Bldg. 720	Lunch Room
9.	M-9	Litton Systems 70/30	Bldg. 740	
10.	M-10	Litton Systems 70/30	Bldg. 770	Lunch Room
11.	M-11	Whirlpool Mealminder	Bldg. 771	Lunch Room
12.	M-12	Amana Radarange	Bldg. 773	Lunch Room
13.	M-13	Amana Radarange	Bldg. 781	Lunch Room
14.	M-14	Sears	Bldg. 785	
15.	M-15	Litton Systems 70/30	Bldg. 2000	Lunch Room (Left Oven)
16.	M-16	Litton Systems 70/30	Bldg. 2000	Lunch Room (Right Oven)
17.	M-17	Litton Sytems 70/30	Bldg. 3001	Lunch Room (Right Oven)
18.	M-18	Litton Systems 70/30	Bldg. 3001	Lunch Room (Left Oven)
19.	M-19	Litton Minutemaster	Bldg. 6000	Lunch Room (1st Floor)
20.	M-20	Litton Minutemaster	Bldg. 6000	Lunch Room (Guard Office)
21.	M-21	Litton Minutemaster	Bldg. 6000	Lunch Room (2nd Floor)
22.	M-22	Whirlpool Model REM 7400	Guard House	
23.	M-23	Whirlpool Model RFM 7300	Bldg. 791	Cafeteria
24.	M-24	Whirlpool Model RFM 7300	Bldg. 791	Cafeteria

INVENTORY (CONTD)

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|-----|------|---------------------------|------------|------------------------|
| 25. | M-25 | Montgomery Ward, KSA8039A | Bldg. 727 | Lunch Room (2nd Floor) |
| 26. | M-26 | Litton Minutemaster | Bldg. 3001 | Lunch Room (by Window) |

II.C. LASER INVENTORY

<u>I.D.</u>	<u>Use</u>	<u>Location</u>
L-1	Research	740/3305
L-2	Research	740/3305
L-3	Research	740/3305
L-4	Research	740/3305
L-5	Research	770/466
L-6	Research	770/159E
L-7	Research	770/466
L-8	Research	720/146
L-9	Research	720/146
L-10	Construction	511/5518
L-11	Construction	511/5518
L-12	Research	740/3305
L-13	Research	740/3305