

A SUMMARY OF THE NONREACTOR EVENT
REPORT DATABASE FOR 1981

ENGINEERING EVALUATION REPORT

by the

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OF OPERATIONAL DATA

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NOTE: This report characterizes the Nonreactor Event Report (NRER) database which is currently under development by the Office for Analysis and Evaluation of Operational Data. This report is intended to be descriptive only and not to provide any analysis of events represented by NRER database records.

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Introduction

Information on licensed nuclear materials and fuel cycle operational events and on radiation exposures comprise the AEOD Nonreactor Event Report (NRER) database.* NRER database "items" contain operational data information extracted from documents associated with nonreactor licensed activities and with reactor overexposures. The database includes 158 reports submitted by nonreactor licensees to the NRC regional offices during 1981 and documents associated with 10 reactor radiation exposure events. It also contains operational data extracted from other sources, primarily inspection reports. It does not include information from certain fuel cycle licensee reports, such as those related to routine effluent releases, nor does it include information from reports of misadministrations.** The purpose of this report is to characterize the 1981 operational data included in the NRER database. A printout of database records is available upon request to AEOD.

Discussion

According to records kept by the NRC regional offices, 248 nonreactor licensee event reports were received during 1981 (reports of medical misadministrations would add another 444). Information from 158 of the 248 reports was included in the NRER database; the other reports (58 source materials and 32 special nuclear materials licensee reports) had been submitted in response to reporting requirements concerning normal occurrences such as routine effluent releases. Table I includes information on the types of licensees that submitted the 158 reports.

An NRER database item may be associated with more than one type of event. For example, a report from a radiography licensee concerning a personnel radiation exposure would be associated with radiography events and with radiation exposures, e.g., it would be counted in the total number of radiation exposure events as well in the total number of events involving radiography. The 158 nonreactor licensee reports were cataloged as 219 events in 10 different areas. The details are included in Table II of Enclosure 1. Note that, because some reports are associated with more than one event type, the total number of events exceeds the total number of reports. The 158 nonreactor licensee reports were most frequently concerned with lost, abandoned, and stolen material (48 times), personnel radiation exposures (47 times), and leaking sources (29 times). The reports were associated less frequently with several other areas.

1. Lost, Abandoned, and Stolen Material

Forty-eight (48) events were identified during 1981 (29 first half, 19 second half) that involved lost, abandoned, or stolen licensed material. Report documents on these events are summarized in Table III. Report documents consisted primarily of reports of lost material (21) and of abandoned well-logging sources (20). Only one (1) of the 48 events resulted in a radiation overexposure.

* The NRER database utilizes the System 1022 database management system which operates on the Oak Ridge National Laboratory (ORNL) DEC system-10 computer. A users' guide for the NRER database is in preparation.

** The results of an AEOD study of 444 medical misadministrations reported for 1981 have been published elsewhere.

The 21 reports of lost sources involved varying quantities of 13 different isotopes. Ten of the lost sources were found (3) or disposed of in a commercial waste disposal area (7). No final disposition was reported for the remaining 11 lost sources.

2. Radiation Exposure Events

The NRER database contains information on 63 events during 1981 in which there was the potential for radiation overexposures (36 during the first half and 27 during the second). Of these events, 28 (17 during the first half and 11 during the second) involved real radiation overexposures. Reactor licensees accounted for 7 of the overexposures and nonreactor licensees accounted for 21. Information on the 28 overexposures is provided in Table IV.

Of the 47 licensee reports received during 1981 related to nonreactor radiation exposure events, 21 were determined to be true overexposures. Of the 20, only 15 concerned overexposures which occurred in 1981, i.e., 25% occurred prior to 1981.

The types of licensees associated with the overexposures occurring in 1981 were as follows:

<u>Licensee Type</u>	<u># Overexposure Events</u>	<u>% of total</u>
Reactor	7	30.4
Radiography (Fixed 3, Field 2)	5	21.7
Source and Special Nuclear Materials	4	17.4
Gauges	3	13.0
Commercial/Industrial (Manufacturing & Dist.)	2	8.7
Academic	1	4.4
Medical	<u>1</u>	<u>4.4</u>
	23	100

3. Leaking Sources

Thirty-one (31) events were identified during 1981 (18 first half, 13 second half). Twenty-nine (29) of these were reported by licensees. Information from the reports is included in Table V. None of these was associated with a radiation overexposure.

The leaking source was part of a gauge or measuring device in 13 of the 29 reported leaking source events and part of other types of equipment in the remaining events. Iodine-125 was the isotope most frequently involved in leaking source events (8 times). Three (3) reports of events involving leakage of I-125 seeds used in cancer therapy led AEOD to publish a case study of the leaking sources. Four other events involved leakage of I-125 bone densitometer sources. The sources were returned to the producer (AECL) by the distributor (Norland Corporation).

The rest of the leaking source reports do not indicate potential generic problems and appear to be of statistical interest only. However, growth in the NRER data base should increase the likelihood that such problems will be recognized in the future.

4. Fuel Cycle Facility Event Reports

The NRER database contains information from twenty-one (21) fuel cycle licensee event reports received by NRC regional offices during 1981 as follows: 9 from uranium recovery facilities, 2 from uranium hexafluoride conversion facilities, 8 from fuel fabrication plants, and 2 from other fuel cycle licensees. The NRER database does not include information from fuel cycle licensee reports of routine effluent releases.

The 9 reports from the uranium recovery facilities concerned a total of 4 uranium recovery facilities and 6 different events (a personnel internal overexposure, a fire, a tailings discharge line failure, and three events related to seepage at a solution mining uranium recovery operation). The uranium hexafluoride facility reports concerned a personnel internal overexposure event and a transportation accident in which yellowcake samples were dropped from a truck. Seven of the eight fuel fabrication plant reports concerned events at the NFS, Erwin fuel fabrication plant (one internal overexposure, one report on a ventilation system upgrade, four reports on stack effluents exceeding limits and one concerning an effluent release with the stack monitor inoperable). The two reports from other (source material) licensees concerned a fire and false overexposure.

5. Medical and Teletherapy

Thirteen (13) licensee event reports received during 1981 (4 first half, 9 second half) were related to the medical use of licensed byproduct material. Seven of the 13 concerned personnel radiation exposures, although it was determined that only one of these events involved a real 1981 radiation overexposure (in addition, one involved a real radiation overexposure which occurred in 1980).

Two (2) additional licensee event reports concerned teletherapy events. One event involved failure of the Co60 source to retract. The other involved a high film badge exposure. Neither event involved a radiation overexposure.

6. Gauges/Measuring Systems

Twelve (12) events during 1981 (7 first half, 5 second half) were related to licensed byproduct material in gauges/measuring systems. Information from the reports is included in Table VI. Generally, reports concerned LAS (lost, abandoned, or stolen) material or personnel radiation exposures.

Although six (6) of the 12 reported events involved radiation exposures, only three (3) overexposures actually occurred. However, two (2) of the overexposure events were classified as abnormal occurrences.

Seven (7) of the 12 reported events involved cesium-137 and four (4) of the 7 involved gauges containing more than a curie of Cs-137.

7. Radiography

Eighteen (18) events were identified during 1981 (10 first half, 8 second half) which involved radiography. Half of the events occurred at fixed radiography sites and half occurred at remote (field) radiography sites. Information on the reported events is included in Table VII.

Reported radiography events usually involved personnel radiation exposures. Licensed radiography activities warranted for 5 of the 15 nonreactor licensee overexposure events which occurred in 1981. Four of the 5 were quarterly whole body doses in excess of the limit. The fifth was a dose of as much as 450 REM to the fingertips of the radiographer. All 5 radiography radiation overexposures resulted because of failure to follow operating procedures.

Radiography was involved in 13 of the 49 events in 1981 that involved one or more curies of radioactive material. Eleven (11) of 13 events involved personnel radiation exposures.

8. Manufacturing and Distribution

Eight (8) events were identified during 1981 which involved the manufacturing and distribution of byproduct material. Information from the reports is included in Table VIII.

Although six (6) of the 8 reported events involved radiation exposures, only three (3) overexposures actually occurred, and of the three overexposures only one occurred in 1981. One of the two 1980 overexposure events was classified as an abnormal occurrence. The occurrence consisted of a number of significant radiation overexposures to three employees (Automation Industries) which occurred during 1980 and several prior years.

Conclusions

The AEOD Nonreactor Event Report (NRER) data base contains information on licensed nuclear materials and fuel cycle operational events and on personnel radiation exposure events. The NRER database management system provides for input, storage, retrieval and computer-assisted analyses of operational event data and may be used in identifying trends in operational safety events which may signal a need for remedial actions by the NRC and/or licensees. The database currently contains information on 1981 operational events including reports by licensees to the NRC regional offices.

Although the NRER database has been valuable in highlighting potential safety problems, analyses of the NRER data from 1981 did not reveal any clear and significant trends. However, this is not surprising considering data from only one year was available. Furthermore, the system only just recently became available for use and is not fully developed in the sense that it has not received feedback from system users. The NRER system will be further developed in response to the needs of system users.

Table I

Types of Licensees That
Submitted Reports During 1981

<u>License Type</u>	<u># Licensees of Type</u>	<u># Reports Received</u>
Academic	390	4
Medical	2622	26
Commercial/Industrial		
Measuring Systems		
Well Logging	139	23
Other Measuring Systems	<u>3259</u>	<u>24</u>
	3398	47
M.D. & S.	324	13
Exempt Distribution	188	0
Other Comm/Ind.	<u>67</u>	<u>0</u>
	3977	62
Radiography		
Single Location (In Plant)	139	4
Multiple Locations (Field)	<u>214</u>	<u>12</u>
	358	16
Irradiator Licenses	197	3
R&D Licenses	550	7
Source Materials **		
Mills	32	
UF ₆	2	
Other	<u>226</u>	
	300	70
Special Nuclear Material**	40	41
Other***	<u>427</u>	<u>17</u>
	8861	158

* Medical misadministration reports are not included.

** Routine environmental effluent release reports, e.g., reports required by 40.65 and 70.59 were not included in the totals for source and special nuclear materials licensees.

*** Includes reports received from non-licensees (no program code).

Table IIFrequency With Which Reports Were
Associated With Particular Areas

<u>Area With Which Report Was Associated</u>	<u># Reports Associated</u>	<u>% Total</u>
Lost, Abandoned and Stolen Material	48	23.3
Personnel Radiation Exposures	47	21.1
Leaking Sources	29	13.0
Source Material and UF ₆ Conversion	16	7.2
Medical and Teletherapy	15	6.7
Gauges/Measuring Systems	12	5.4
Radiography	12	5.4
Special Nuclear Material	8	3.6
Manufacturing and Distribution	8	3.6
Other	<u>24</u>	<u>10.3</u>
Total	219	100

TABLE III

1981 Reports on Lost, Abandoned, and Stolen Material
Part I

<u>Isotope</u>	<u>Amount</u>	<u>Location</u> <u>City/Co. State</u>	<u>Licensee</u>	<u>Event Date</u>	<u>Disposition</u>
AM241	C	CHICAGO IL	ST JOSEPH HOSPITAL	1/21/1981	Lost; commercial waste disposal
AM241	F	OFFSHORE TX	DRESSER INDUSTRIES	3/12/1981	Stuck source recovered
CS137	C	RUMFORD ME	BOISE CASCADE	2/16/1981	Lost; scrap metal
CS137	C	STERLING IL	COMMUNITY GENERAL HOSPITAL	5/25/1981	Lost; commercial waste disposal
CS137	E	HIGH I BLK TX	DRESSER INDUSTRIES	3/02/1981	Stuck source recovered
CS137	E	HOUSTON TX	MUSTANG SERVICES CO	6/18/1981	Lost and recovered (unshielded)
CS137	F	ABILENE TX	PA INCORPORATED	4/30/1981	Stolen truck recovered
FE55	C	PRINCETON NJ	PRINCETON GAMMA-TECH INC	2/02/1981	Lost; commercial waste disposal
H3	D	BELTSVILLE MD	AGRICULTURE, DEPT OF	3/09/1981	Lost; commercial waste disposal
H3	Z	MONROEVILLE PA	UNITED STATES STEEL CORP	5/29/1981	Lost; commercial waste disposal
I125		GREENSBURG PA	WESTMORELAND HOSP ASSN	11/16/1981	Lost unshielded; unknown
I125	A	ROCHESTER MN	MAYO CLINIC	8/06/1981	Control lost but regained
I125	C	DETROIT MI	HENRY FORD HOSPITAL	2/27/1981	Lost; unknown
I125	C	GREENSBURG PA	WESTMORELAND HOSP ASSN	2/10/1981	Lost; unknown
IR192	E	BURLINGTON MA	TECH/OPS INC.	6/22/1981	Package lost; recovered
IR192	F	HENRYETTA OK	BILL MILLER, INC.	1/02/1980	Source stolen; ret'd anonymously
KR85	C	FT MONMOUT NJ	ARMY, DEPT OF	9/03/1981	Lost; unknown
NI63	C	SPRING HOU PA	ROHM AND HAAS	7/29/1981	Lost; unknown
P0210	C	GREENBELT MD	NASA GODDARD FL CTR	5/29/1918	Lost; unknown
PM147	B	STATE COLL PA	HRB SINGER	1/20/1981	Lost; unknown
PM147	C	NORFOLK VA	NAVY, DEPT OF THE	6/08/1981	Lost; unknown
PU238	E	INDIANA PA	CORATOMIC, INC.	6/01/1979	Lost; commercial waste disposal
RA226	B	OFFSHORE TX	GEARHART INDUSTRIES INC	10/12/1981	Tool calibrator lost
SNM	Z	BAXLEY GA	GEORGIA POWER (HATCH)	10/01/1981	Lost; unknown
TC99M	Z	WATERBURY CT	DIAGNOSTIC RADIOLOGY AS	12/04/1981	Lost; unknown
XE133	C	LEBANON PA	GOOD SAMARITAN HOSP	1/08/81	Lost; recovered
Z	Z	WILLISTON SC	INTERIOR, DEPT OF THE	8/21/1981	Dropped source recovered
Z	Z	MUSKOGEE OK	MUSKOGEE TESTING LAB	7/17/1981	Stolen truck recovered

* See key for amount.

TABLE III

1981 Reports on Lost, Abandoned, and Stolen Material
Part II - Abandoned Well Logging Sources

<u>Isotope</u>	<u>Amount</u>	<u>Location</u> <u>City/Co. State</u>	<u>Licensee</u>	<u>Event Date</u>
AM241	C	CIMMARON CO OK	GEARHART INDUSTRIES INC	11/08/1981
AM241	F	GRAND CO UT	DRESSER INDUSTRIES	7/06/1981
AM241	F	OFFSHORE LA	DRESSER INDUSTRIES	10/23/1980
AM241	F	OFFSHORE TX	SCHLUMBERGER TECHNOLOGY	9/11/1981
AM241	F	OFFSHORE LA	SCHLUMBERGER TECHNOLOGY	10/09/1981
AM241	F	MURRAY CO OK	SCHLUMBERGER TECHNOLOGY	8/24/1981
CS137	C	SOMERSET PA	CENTURY GEOPHYSICAL CORP	8/21/1981
CS137	C	PRUDHOE BA AK	GEARHART INDUSTRIES INC	4/01/1981
CS137	C	ELLIS CO. OK	GEARHART INDUSTRIES INC	5/06/1981
CS137	C	FT WORTH TX	GEARHART INDUSTRIES INC	8/25/1981
CS137	D	LAS GRANDE AZ	INTERIOR, DEPT OF THE	4/26/1981
CS137	D	DENVER CO	INTERIOR, DEPT OF THE	4/26/1981
CS137	E	SALTWELL WV	BASIN SURVEYS	7/04/1981
CS137	E	WEST UNION WV	BASIN SURVEYS INC.	5/03/1981
CS137	E	CARTER CTY OK	DRESSER INDUSTRIES	3/16/1981
CS137	E	TILLMAN CO OK	GEARHART INDUSTRIES INC	1/23/1981
CS137	E	ERIC CO. PA	GEARHART INDUSTRIES INC	11/30/1981
CS137	E	LE FLORE C TX	SCHLUMBERGER TECHNOLOGY	2/19/1981
CS137	F	MCCLAIN CO OK	GEARHART INDUSTRIES INC	6/02/1981
H3	E	OFFSHORE LA	DRESSER INDUSTRIES	2/10/1981

* Key

Amount

A < 1 mCi
 B 1 mCi - < 1 mCi
 C 1 mCi - < 100 mCi
 D 100 mCi - < 1 mCi
 E 1 mCi - < 10 mCi
 F 10 mCi - < 100 mCi

Z unknown

TABLE IV

1981 Reports of Personnel Radiation Overexposures

<u>Licensee</u>	<u>Location</u>	<u>Number Exposed</u>	<u>Exposure Level*</u>	<u>Event Date</u>	<u>Report Date</u>	<u>License/Docket #</u>
<u>Reactor</u>						
COMM ED CO (DRESDEN 2)	MORRIS IL	1	H	3/05/1981	4/03/1981	5002
COMM ED CO (DRESDEN 2)	MORRIS IL	1	H	3/31/1981	4/15/1981	5002
CP&L (BRUNSWICK 2)	SOUTHPORT NC	1	H	7/17/1981	7/17/1981	5002
CP&L (ROBINSON 2)	HARTSVILLE SC	1	H	5/30/1981	5/31/1981	500261
CP&L (ROBINSON 2)	HARTSVILLE SC	1	G	8/15/1981	9/14/1981	500261
PORTLAND GEN ELE (TROJAN1)	PRESCOTT OR	1	G	4/02/1981	5/25/1981	500344
TVA (BROWNS FERRY 1)	DECATUR AL	1	Y	6/07/1981	6/08/1981	500259
<u>Nonreactor</u>						
<u>(Pre-1981 Events)</u>						
AUTOMATION INDUSTRIES	PHOENIXVIL PA	3	A	12/31/1980	2/03/1981	0370061109 0
BATTELLE COLUMBUS LAB	COLUMBUS OH	1	E	7/02/1980	5/21/1981	700008
PATHFINDER MINES CORP.	RIVERTON WY	1	I	7/17/1980	2/27/1981	402259
PHARMATOPES, INC.	OAK PARK MI	1	E	12/31/1980	2/23/1981	0081830801 0
VETERANS ADMINISTRATION	PRESCOTT AZ	1	G	9/29/1980	6/04/1981	0021272601 0
<u>(1981 Events)</u>						
ALLIED CHEMICAL CORP.	METROPOLIS IL	1	I	7/21/1981	8/14/1981	403
AMFLETH EXPANSION CO	EVELETH MN	12	D**	4/07/1981	5/05/1981	0221107201 0
FERR-MOORE CORPORATION	CIMARRON OK	2	I	4/21/1981	5/29/1981	700925
MAGNAFLUX CORPORATION	CHICAGO IL	1	G	2/05/1981	3/17/1981	0120062207 0
MALLINCKRODT INC.	ST. LOUIS MO	1	I	7/29/1981	8/26/1981	0240420601 0
MARQUETTE UNIVERSITY	MILWAUKEE WI	1	E	6/30/1981	7/29/1981	0480293106 0
MET LAB, INC.	HAMPTON VA	1	H	3/31/1981	5/04/1981	0450996301 0
MID-CON INSPECTION SERVICES	CASPER WY	2	H	12/31/1981	1/20/1981	0491667001 0
MUSTANG SERVICES CO	HOUSTON TX	1	D**	6/18/1981	6/26/1981	0421755201 0
NUCLEAR DIAGNOSTICS, IN	TROY MI	1	I	3/08/1981	9/11/1981	0211416101 0
NUCLEAR FUEL SERVICES, INC	ERWIN TN	1	I	2/05/1981	9/14/1981	700148
NUCLEAR METALS, INC.	CONCORD MA	1	I	4/30/1981	12/04/1981	400672
RELIANCE TESTING LAB, INC	EDGEMERE DE	1	A	9/01/1981	9/01/1981	0191717601 0
ST FRANCIS HOSP OF NEW CAST	NEW CASTLE PA	1	G	6/30/1981	7/16/1981	0370773901 0
SUN SHIPBUILDING & DRYD	CHESTER PA	1	G	9/03/1981	9/08/1981	0370250001 0
UNION ELECTRIC CO	LABADIE MO	1	H	5/06/1981	5/06/1981	0240202003 0

*Exposure Level Key: A > 375 rem (extremity); D > 0.5 rem (whole body); E > 18.75 rem/qr (extremity); G > 1.25 rem/qr (whole body); H > 3 rem/qr (whole body); I > MPC hours (internal)

**Abnormal occurrence

TABLE IV

1981 Reports of Personnel Radiation Overexposures

Licensee	Location		Number Exposed	Exposure Level*	Event Date	Report Date	License/Docket #
<u>Reactor</u>							
COMM ED CO (DRESDEN 2)	MORRIS	IL	1	H	3/05/1981	4/03/1981	500237
COMM ED CO (DRESDEN 2)	MORRIS	IL	1	H	3/31/1981	4/15/1981	500237
CP&L (BRUNSWICK 2)	SOUTHPORT	NC	1	H	7/17/1981	7/17/1981	500324
CP&L (ROBINSON 2)	HARTSVILLE	SC	1	H	5/30/1981	5/31/1981	500261
CP&L (ROBINSON 2)	HARTSVILLE	SC	1	G	8/15/1981	9/14/1981	500261
PORTLAND GEN ELE (TROJAN1)	PRESCOTT	OR	1	G	4/02/1981	5/25/1981	500344
TVA (BROWNS FERRY 1)	DECATUR	AL	1	Y	6/07/1981	6/08/1981	500257
<u>Nonreactor</u>							
<u>(Pre-1981 Events)</u>							
AUTOMATION INDUSTRIES	PHOENIXVIL	PA	3	A	12/31/1980	2/03/1981	0370061109 0
BATTELLE COLUMBUS LAB	COLUMBUS	OH	1	E	7/02/1980	5/21/1981	700008
PATHFINDER MINES CORP.	RIVERTON	WY	1	I	7/17/1980	2/27/1981	402259
PHARMATOPES, INC.	OAK PARK	MI	1	E	12/31/1980	2/23/1981	0081830801 0
VETERANS ADMINISTRATION	PRESCOTT	AZ	1	G	9/29/1980	6/04/1981	0021272601 0
<u>(1981 Events)</u>							
ALLIED CHEMICAL CORP.	METROPOLIS	IL	1	I	7/21/1981	8/14/1981	403392
EVELETH EXPANSION CO	EVELETH	MN	12	D**	4/07/1981	5/05/1981	0221107201 0
FERR-MCGEE CORPORATION	CIMARRON	OK	2	I	4/21/1981	5/29/1981	700925
MAGNAFLUX CORPORATION	CHICAGO	IL	1	G	2/05/1981	3/17/1981	0120062207 0
MALLINCKRODT INC.	ST. LOUIS	MO	1	I	7/29/1981	8/26/1981	0240420601 0
HARQUETTE UNIVERSITY	MILWAUKEE	WI	1	E	6/30/1981	7/29/1981	0480293106 0
MET LAB, INC.	HAMPTON	VA	1	H	3/31/1981	5/04/1981	0450996301 0
MID-CON INSPECTION SERVICES	CASPER	WY	2	H	12/31/1981	1/20/1981	0491667001 0
MUSTANG SERVICES CO	HOUSTON	TX	1	D**	6/18/1981	6/26/1981	0421755201 0
NUCLEAR DIAGNOSTICS, IN	TROY	MI	1	I	3/08/1981	9/11/1981	0211416101 0
NUCLEAR FUEL SERVICES, INC	ERWIN	TN	1	I	2/05/1981	9/14/1981	700143
NUCLEAR METALS, INC.	CONCORD	MA	1	I	4/30/1981	12/04/1981	400672
RELIANCE TESTING LAB, INC	EDGEMERE	DE	1	A	9/01/1981	9/01/1981	0191717601 0
ST FRANCIS HOSP OF NEW CAST	NEW CASTLE	PA	1	G	6/30/1981	7/16/1981	0370773901 0
SUN SHIPBUILDING & DRYD	CHESTER	PA	1	G	9/03/1981	9/08/1981	0370250001 0
UNION ELECTRIC CO	LABADIE	MO	1	H	5/06/1981	5/06/1981	0240202003 0

*Exposure Level Key: A > 375 rem (extremity); D > 0.5 rem (whole body); E > 18.75 rem/qtr (extremity); G > 1.25 rem/qtr (whole body); H > 3 rem/qtr (whole body); I > MPC hours (internal)

**Abnormal occurrence

TABLE V

1981 Reports of Leaking Sources

<u>Licensee</u>	<u>Location</u>	<u>Event Date</u>	<u>Report Date</u>	<u>Isotope</u>	<u>License No.</u>
ALUMAX FOILS	ST LOUIS MO	2/09/1981	2/09/1981	SR90	GEN
AMP INCORPORATED	HARRISBURG PA	4/21/1981	4/22/1981	TL204	0370122003
AMP INCORPORATED	HARRISBURG PA	6/01/1981	6/07/1981	PM147	0370122003
ARMY, DEPT OF THE	DUGWAY UT	11/24/1981	11/24/1981	NI63	0430131609
BRIGHAM & WOMEN'S HOSPITAL	BOSTON MA	8/07/1981	8/28/1981	I125	0201713101
CLAIROL INC	STAMFORD CT	12/01/1980	1/09/1981	PO210	GEN
CLAIROL INC	STAMFORD CT		5/15/1981	PO210	GEN
CLAIROL INC	SADDLE BRO NJ	4/23/1981	5/19/1981	PO210	GEN
CLAIROL INC	STAMFORD CT		7/13/1981	PO210	GEN
E. I. DU PONT	DEEPWATER NJ	6/02/1981	6/03/1981	NI63	0290088601
FORD MOTOR COMPANY	DEARBORN MI	1/21/1981	3/17/1981	AM241	0210411412
HARVARD UNIVERSITY	CAMBRIDGE MA	11/01/1981	11/27/1981	CO60	0200029753
INTERIOR, DEPT OF THE	DENVER CO	4/26/1981	7/31/1981	CS137	0050267802
KAY-RAY INC	ARLINGTON H IL	1/09/1981	4/14/1981	CS137	0121118401
KAY-RAY INC	ARLINGTON IL	8/24/1981	11/05/1981	CS137	0121118401
MAYO CLINIC	ROCHESTER MN	7/07/1981	10/02/1981	I125	0220051903
NASA LEWIS RES CTR	CLEVELAND OH	3/05/1981	3/12/1981	PM147	GEN
NAVY, DEPT OF THE	CHARLESTON SC	6/22/1981	6/26/1981	SR90	0080003812
NORLAND CORPORATION	FT ATKINSON WI	4/20/1981	4/21/1981	I125	0481340301
NORLAND CORPORATION	FT ATKINSON WI	7/10/1981	7/10/1981	I125	0481340301
NORLAND CORPORATION	FT ATKINSON WI	8/07/1981	9/11/1981	I125	0481340301
PHILIP MORRIS U.S.A.	RICHMOND VA	2/20/1981	2/25/1981	SR90	0450038506
ST FRANCIS GENERAL HOSP	PITTSBURGH PA	12/11/1981	12/22/1981	SR90	0370107201
U CONN HEALTH CTR	FARMINGTON CT	5/12/1981	5/22/1981	I125	0061302202
U OF INDIANA	INDIANAPOL IN	11/17/1981	11/23/1981	I125	0130275203
U OF MONTANA	MISSOULA MT	2/20/1981	2/25/1981	NI63	0250170603
U OF NOTRE DAME	NOTRE DAME IN	6/02/1981	6/04/1981	FE55	130198315
VIRGINIA COMMONWEALTH U	RICHMOND VA	7/07/1981	7/23/1981	I125	0450004817
WELDERS TESTING LABS	GARWOOD NJ	7/31/1981	9/01/1981	IR192	0291972801

TABLE VI

1981 Gauges/Measuring Systems Event Reports

<u>Licensee</u>	<u>Event Location</u>	<u>Event Date</u>	<u>Report Date</u>	<u>Isotope</u>	<u>Quant.</u>	<u>Associated Area*</u>
ROISE CASCADE	RUMFORD ME	2/16/1981	6/04/1981	CS137	1-100 mCi	LAS
EVELETH EXPANSION CO	EVELETH MN	4/07/1981	5/05/1981	CS137	10-100 mCi	EXP (12)
GEARHART INDUSTRIES, INC.	FORT WORTH TX	10/31/1980	2/09/1981	UNKNOWN	UNKNOWN	EXP (0)
HALLIBURTON CO WELEX DI	FAIRFAX OK	1/11/1981	1/29/1981	CS137	0.1-1 Ci	
KAY-RAY INC	TATUM TX	11/03/1980	1/29/1981	UNKNOWN	UNKNOWN	
KAY-RAY INC	ARLINGTON IL	8/24/1981	11/05/1981	CS137	1-10 Ci	LKS
MIDWEST STEEL	PORTAGE IN	6/01/1981	6/18/1981	AM241	1-100 mCi	
MUSKOGEE TESTING LAB	MUSKOGEE OK		7/17/1981	UNKNOWN	UNKNOWN	LAS
MUSTANG SERVICES CO	HOUSTON TX	6/18/1981	6/26/1981	CS137	1-10 mCi	EXP (1) LAS
STEARNS-ROGER INC	HOMER CITY PA	8/25/1981	9/02/1981	UNKNOWN	UNKNOWN	EXP (0)
UNION ELECTRIC CO	LABADJE MO	5/06/1981	5/06/1981	CS137	1-10 Ci	EXP (1)
UNITED STATES PIPE & FOUNDR	BURLINGTON NJ	9/30/1981	9/30/1981	CS137	0.1-1 Ci	EXP (0)

* LAS = Lost, abandoned, or stolen material

EXP (0) = Personnel radiation exposure (number of individuals actually overexposed)

LKS = Leaking source

TABLE VII

1981 Radiography Event Reports

<u>Licensee</u>	<u>Event Location</u>	<u>Event Date</u>	<u>Report Date</u>	<u>Associated Area*</u>
ALASKA WELDING CENTER	FAIRBANKS AK	3/25/1981	3/27/1981	EXP (0)
AUTOMATION INDUSTRIES, INC	PHOENIXVIL PA	10/06/1981	11/05/1981	
BABCOCK & WILCOX CO	BARBERTON OH	8/23/1981	9/29/1981	EXP (0)
GENERAL DYNAMICS, E.B. DIV	GROTON CT	11/12/1979	3/20/1981	EXP (0)
GENERAL DYNAMICS, E.B. DIV.	GROTON CT	2/20/1981	3/18/1981	EXP (0)
MAGNAFLUX CORPORATION	CHICAGO IL	2/05/1981	3/17/1981	EXP (1)
MID-CON INSPECTION SERVICES	CASPER WY	12/31/1981	1/20/1981	EXP (2)
NEWPORT NEWS SHIPBUILDING	NEWPORT NE VA	2/28/1981	3/02/1981	EXP (0)
RELIANCE TESTING LAB, INC	EDGEMERE DE	9/01/1981	9/01/1981	EXP (1)
SUN SHIPBUILDING & DRYD	CHESTER PA	9/03/1981	9/08/1981	EXP (1)
UNITED STATES TESTING CO	CLINTON IL	5/14/1981	6/18/1981	EXP (0)
WELDERS TESTING LABS	GARWOOD NJ	7/31/1981	9/01/1981	LKS

* EXP () = Personnel Radiation Exposure (Number of individuals actually overexposed).
 LKS = Leaking Source.

TABLE VIII

1981 Manufacturing and Distribution Reports

<u>Licensee</u>	<u>Location</u>	<u>Event Date</u>	<u>Report Date</u>	<u>Isotope</u>	<u>License No.</u>
AUTOMATION INDUSTRIES	PHOENIXVIL PA	12/31/1980	2/03/1981	IR192	0370061109
AUTOMATION INDUSTRIES	PHOENIXVIL PA	10/06/1981	11/05/1981	IR192	0370061109
CANBERRA INDUSTRIES, INC	MERIDAN CT	7/31/1980	1/12/1981	UNKNOWN	0061509901
CANBERRA INDUSTRIES, INC	MERIDAN CT	9/30/1980	2/17/1981	UNKNOWN	0061509901
MALLINCKRODT INC.	ST. LOUIS MO	7/29/1981	8/26/1981	I131	0240420601
PHARMATOPES, INC.	OAK PARK MI	12/31/1980	2/23/1981	TC99M	0081830801
PHARMATOPES, INC.	OAK PARK MI	3/31/1981	6/02/1981	TC99M	0081830801
TECH/OPS INC.	BURLINGTON MA	11/19/1981	12/31/1981	IR192	0200027703