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A SUMMARY OF THE NONREACTOR EVENT REPORT DATABASE AND THE SANDIA TRANSPORTATION DATABASE FOR THE PERIOD JANUARY - JUNE 1982

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.

A SUMMARY OF THE NONREACTOR EVENT REPORT DATABASE FOR THE PERIOD JANUARY-JUNE 1982

Introduction

The AEOD Nonreactor Event Report (NRER) database contains information on licensed nuclear materials and fuel cycle operational events and on personnel radiation exposure events. The NRER data base 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 AEOD report "Summary of the Nonreactor Event Report Database for 1981," dated August 30, 1982, summarized 1981 data. The database has since been updated to include information from reports in the first half of 1982 on operational events including those described in reports by licensees to the NRC Regional Offices. The NRER database includes 72 reports submitted by nonreactor licensees to the NRC regional offices during the first half of 1982 and documents associated with nine 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 operational data included in the NRER database for the period January-June 1982. A printout of database records is available upon request to AEOD.

Except when included in licensee reports to NRC Regional Offices, AEOD has not incorporated information on transportation events into the NRER database, because DOE funds a transportation incident file at Sandia. However, future NRER items will be categorized to indicate whether reports are related to transportation incidents. Discussion Section 9, below, includes a summary of AEOD review of the 1981 and 1982 portion of the Sandia Transportation Events File.

Discussion

According to records kept by the NRC Regional Offices, 121 nonreactor licensee event reports were received during the first half of 1982. This is approximately the same rate as in 1981 when an average of 124 reports were received during a six-month period. Information from 72 of the 121 reports was included in the NRER database; the other reports (39 source materials and eight special nuclear materials licensee reports) had been submitted in response to reporting requirements concerning normal occurrences such as routine effluent releases. On a semiannual basis this is approximately the same number of reports as was included for 1981 (158 reports were included for all of 1981). Table I includes information on the types of licensees that submitted the 72 reports.

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

** The results of an AEOD study of 238 medical misadministrations reported for 1982 have been published elsewhere.

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 counted in the total number of radiation exposure events as well as in the total number of events involving radiography. The 72 nonreactor licensee reports were cataloged as 100 events in 11 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 72 nonreactor licensee reports were most frequently concerned with personnel radiation exposures (20 times) and with lost, abandoned, and stolen material (18 times). The reports were associated less frequently with several other areas.

1. Radiation Exposure Events

The NRER database contains information from 50 reports during the first half of 1982 concerning events in which there was the potential for radiation overexposures. Of these events, 15 involved real radiation overexposures although only two of the 15 overexposures occurred during 1982. Reactor licensees accounted for four of the overexposures and nonreactor licensees accounted for 11. Information on the 15 overexposures is provided in Table III.

Of the 41 licensee reports received during the first half of 1982 related to nonreactor radiation exposure events, 11 were true overexposures. All of the 11 occurred prior to 1982. This is an important consideration when reviewing overexposure data for any current period, i.e., the actual number of overexposures will probably not be known until some future time.

The types of licensees associated with the overexposures reported during the first half of 1982 were as follows:

Licensee Type	# Overexposure Events	% of total
Reactor	4	26.6
Radiography (Fixed 1, Field 2)	3	20.0
Source and Special Nuclear Materials	3	20.0
Gauges	1	6.7
Commercial/Industrial (Manufacturing & Dist.)	1	6.7
Medical	3	20.0
	15	100

For comparison, the NRER database for 1981 contains information on 28 reported events that involved real radiation overexposures. Twenty-three (23) of the 28 occurred in 1981. Seven (7) of the 23 involved reactor licensees and 16 involved nonreactor licensees.

2. Lost, Abandoned, and Stolen Material

Eighteen (18) events reported during the first half of 1982 involved lost, abandoned, or stolen licensed material (LAS). Report documents on these events are summarized in Table IV. Report documents consisted of five reports of lost, and four reports of stolen material and nine reports of abandoned well-logging sources. None of the 18 events resulted in a radiation overexposure.

The nine reports of lost and stolen sources involved varying quantities of eight different isotopes. Three of the lost sources were disposed of in a commercial waste disposal area, one was recovered, and the last was never recovered.

Material was recovered intact in only one of the four events in which it was stolen. In that event an unlocked, unsecured radiography exposure device containing 24 Ci of Ir-192 was lost after falling from a truck driven by a licensee employee. The lost device was found and reported by a passerby.

There were three reported events in which stolen material was never recovered. In the first (Salisbury Engineering, Inc.) a moisture-density gauge was stolen from an unlocked, unsecured case in the back of an open bed pickup truck. In the second event (Deptartment of Health and Human Services), several millicuries each of six different organic chemical compounds labelled with tritium or carbon-14 were missing from an unlocked NIH storage freezer. The labelled materials had been used in highly competitive interferon research. In the third event (Stan A. Huber Consultants) a box containing five sealed calibration sources was stolen through the broken window of the car of a consultant's representative.

In 1981 forty-eight (48) events were identified that involved LAS. The report documents consisted primarily of reports of lost material (21) and of abandoned well-logging sources(20). Three (3) sources were stolen but all three were recovered intact. Thus, in the first half of 1982 there were relatively fewer LAS events, but of these about the same proportion involved abandoned well-logging sources. In 1982 there was a relative decrease in events involving lost material and an increase in events involving stolen material, particularly events in which the stolen material was never recovered.

3. Leaking Sources

Eleven (11) events were identified during the first half of 1982. Information from the reports is included in Table V. None of these was associated with a radiation overexposure.

Cesium-137 was the isotope most frequently involved in leaking source events (five times). Iodine-125 was involved in three (3) of the remaining six source leakage incidents.

Two (2) reports received from Kay-Ray Inc., in the first half of 1982 concerned leakage from General Radioisotope Products (GRP) model 850233 Cs-137 sealed sources. GRP is no longer in business; it was a licensee of the State of California. An earlier report dated 4/14/81 and a subsequent report dated 6/28/82 brought the total to five (5) leaking GRP model 850233 sources manufactured in June 1975. In all cases the sources had been returned to Kay-Ray by users for reasons other than suspected or verified source leakage; leakage was detected during a leak test prior to removing the source capsule from the source holder. In addition, Kay-Ray Inc. reported to NRC on 11/11/80 the leakage of five (5) other GRP model 850233 sources. Kay-Ray has indicated there is no potential for a health and safety problem because the contamination in all cases has been contained within the source housing. However, because Kay-Ray has stated that more than 2000 devices containing GRP sources have been distributed, AEOD and NMSS are performing an evaluation of this matter.

The 1/12/82 letter from Norland Instruments reported two leak test results >0.005 mCi on I-125 sealed sources manufactured by AECL and noted the sources were from the same batch as the leaking sources reported on 7/10/81 and 9/11/81. The 3/22/82 letter from Norland reported the disposition of I-125 sealed sources that were obtained in a batch manufactured by AECL in June 1981 for use in bone densitometers and that were involved in earlier reported leakage incidents.

The rest of the leaking source reports appear to be of statistical interest only.

In 1981 thirty-one (31) leaking source events were identified. These types of reports were received less frequently in 1982.

4. Fuel Cycle Facility Event Reports

The NRER database contains information from fourteen (14) fuel cycle licensee event reports received by NRC Regional Offices during the first half of 1982 as follows: nine uranium recovery facilities, four from fuel fabrication plants, and one from other fuel cycle licensees. The NRER database does not include information from fuel cycle licensee reports of routine effluent releases.

The nine reports from the uranium recovery facilities concerned a total of four uranium recovery facilities and eight different events (a mine water transfer line failure, licensee efforts to decrease airborne concentrations in a mill, and six events related to seepage at a solution mining uranium recovery operation). All four fuel fabrication plant reports concerned events at the NFS, Erwin fuel fabrication plant (three reports on stack effluents exceeding limits and one concerning efforts to improve soluble airborne uranium sampling. The one report from "another" (source material) licensee concerned a skin overexposure received by a depleted uranium melting and casting technician.

Fuel cycle facility event reports were similar to those received in 1981. Information from twenty-one (21) fuel cycle licensee event reports was included in the NRER database for 1981. In 1981 the most frequent report topic for reports from uranium recovery facilities was seepage at solution mining activities (three of six events reported). Similarly, seven of eight fuel fabrication plant reports concerned the NFS, Erwin plant and five of those seven concerned stack effluents exceeding limits.

5. Radiography

Ten (10) licensee event reports received during the first half of 1982 involved radiography. One of the events occurred at a fixed radiography site and nine (9) occurred at remote (field) radiography sites. Information on the reported events is included in Table VI.

Six (6) of the ten reported radiography events involved personnel radiation exposures. Two (2) of the six were nonreactor licensee overexposure events (both of these occurred in 1981). One was a quarterly whole body dose in excess of the 1.25 rem limit and the other an excessive whole body dose to an individual in an unrestricted area (near a source disconnect). The remaining four of the ten reported radiography events involved, (1) loss of an unlocked, unsecured exposure device, (2) fire in a source storage area, (3) malfunction of an exposure device (inability to drive source out due to blistering of the S-tube), and (4) warning devices installed at entrance to radiography room.

In 1981, eighteen (18) radiography events occurred at field and fixed sites with an equal frequency. Radiography accounted for five of the 15 radiation overexposures which occurred in 1981. Although radiography events during the first half of 1982 occurred at about the same rate as in 1981, a larger proportion (90%) occurred at field sites.

6. Manufacturing and Distribution

Six (6) events identified during the first half of 1982 involved the manufacturing and distribution of byproduct material. Information from the reports is included in Table VII.

Although two (2) of the six reported events involved radiation exposures, only one of the two involved an overexposure. The overexposure occurred in September 1980 when three employees of the New England Nuclear Corporation in North Billerica, MA were exposed to excessive airborne americium-241 while handling contaminated glove boxes during a renovation and decontamination operation. Calculations from bioassay data (assuming 100% soluble Am-241) indicated the individual with the highest exposure had received an intake of 8.3×10^{-3} mCi and would receive 50 year cumulative whole body and bone doses of 3.40 and 92.92 rem, respectively.

In 1981 eight (8) events were identified that involved the manufacturing and distribution of byproduct material. One of the eight events involved a real radiation overexposure. No overexposures occurred in the first half of 1982.

7. Gauges/Measuring Systems

Five (5) events during the first half of 1982 were related to licensed byproduct material in gauges/measuring systems. Information from the reports is included in Table VIII. The reports concerned LAS (lost, abandoned, or stolen) material, leaking sources or personnel radiation exposures. The one reported event that involved a radiation exposure was not an overexposure.

Three (3) of the five reported events involved cesium-137 and two involved americium-241. Two (2) of the five involved gauges manufactured by Kay-Ray Inc., containing 200 mCi Cs-137 General Radioisotope Product (GRP) sealed sources (both events involved leakage of the GRP sources).

In 1981 twelve (12) events occurred that were related to licensed byproduct material in gauges/measuring systems and three of these involved radiation overexposures. Two (2) of the three overexposures were classified as abnormal occurrences. No overexposures occurred in the first half of 1982.

8. Medical and Teletherapy

Three (3) licensee event reports received during the first half of 1982 were related to the medical use of licensed byproduct material; two of the three involved personnel radiation overexposures. However, both of the overexposure events occurred prior to 1982. In one overexposure a worker at St. Luke's Hospital in Cleveland, OH received a 1.279 rem (>1.250 rem) whole body dose during the first quarter of 1978. In the other overexposure a radiation safety technologist at the Albert Einstein Medical Center in Philadelphia, PA received an extremity dose of 25.32 rem for the fourth quarter 1981, as the result of an inadequate evaluation of the extremity exposure that could be received by the technologist during work to paint Cs-137 sources.

One additional licensee event report concerned an event in which a cobalt-60 teletherapy machine malfunctioned on June 22, 1981 at Blanchard Valley Hospital in Findlay, OH. The medical technologist was overexposed (9.710 rem whole body dose) while trying to correct the malfunction.

In 1981 thirteen (13) licensee event reports were related to the medical use of licensed byproduct material and one of these involved a radiation overexposure. In addition, two licensee event reports concerned teletherapy events. Neither involved an overexposure.

9. Transportation

The Sandia Transportation Events File was reviewed and found to contain 62 entries for 1981 and 15 for 1982. The data from 1982 are too incomplete to permit meaningful comparisons with other years. The data indicated that 1981 incidents amounted to about half the average annual number for the five-year period, 1976-1980, 118 events.

Table IX presents a breakdown of the shipping mode of the events contained in the file for 1981 and 1982; Table 2 summarizes the release (releases categorized as "contamination" are not shown). One release is listed as having a recovery cost in excess of $1,000. That release, one pint of material from a shipment from Fitzpatrick on I90 in Wall, South Dakota, is listed as having a cost of $5,000.

Findings and Conclusions

Reports during the period January-June 1982 of licensed nuclear material and fuel cycle operational events and of personnel radiation exposure events have been included in the AEOD NRER database. When compared on a six-month basis the total numbers and types of reports do not differ substantially from those received in 1981, as described in the AEOD report "Summary of the Nonreactor Event Report Database for 1981," dated August 30, 1982.

A total of 50 reports during the first half of 1982 of concerned events in which there was the potential for radiation overexposures. Of these events, 15 involved real overexposures, although only two involved overexposures that occurred during 1982. This can be compared with the 23 overexposures that occurred in 1981, but the comparison could be misleading because there is a time lag in the reporting of overexposures. This time lag has been due to problems such as delays in processing dosimetry and failure by licensees to recognize overexposures when they occur (e.g., overexposures are frequently identified during inspection by NRC Regional Offices).

In the first half of 1982 there were relatively fewer lost, abandoned, and stolen material (LAS) events. In 1982 there was a relative decrease in events involving lost material and an increase in events involving stolen material, particularly material that was never recovered.

Reports of leaking sources in the first half of 1982 were received relatively less frequently than 1981.

The types and numbers of fuel cycle facility event reports were similar in the first half of 1982 to those in 1981. This was generally true for reports concerning radiography, manufacturing and distribution, gauges/measuring systems, and medical/teletherapy events.

Data in the Sandia Transportation Events File indicate that no transportation event during the first half of 1982 was significant in terms of radiological health and safety.

Enclosure 1

Table I

Types of Licensees That
Submitted Reports During The First
Half 1982

License Type	# Licensees of Type		# Reports Received	
Academic		386		1
Medical		2629		10
Commercial/Industrial				
Measuring Systems				
Well Logging	150		10	
Other Measuring Systems	3250		7	
		3400		17
M.D. & S.		324		5
Exempt Distribution		176		0
Other Comm/Ind.		68		2
		3975		24
Radiography				
Single Location (In Plant)		140		1
Multiple Locations (Field)		221		9
		361		10
Irradiator Licenses		200		2
R&D Licenses		534		5
Source Materials **				
Mills		31		3
UF_6		2		0
Other		256		8
		289		
Special Nuclear Material**		38		4
Other***		477		6
		8889		72

* 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.

*** Number (#) of Reports Received includes reports received from non-licensees (no program code).

Table II

Frequency With Which Reports Were Associated With Particular Areas

Area With Which Report Was Associated	# Reports Associated	% Total
Personnel Radiation Exposures	20	20
Lost, Abandoned and Stolen Material	18	18
Leaking Sources	11	11
Radiography	10	10
Source Material and UF_6 Conversion	10	10
Manufacturing and Distribution	6	6
Releases of Material	6	6
Gauges/Measuring Systems	5	5
Medical and Teletherapy	4	4
Special Nuclear Material	4	4
Other	6	6
Total	100	100

Note: 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 counted in the total number of radiation exposure events as well in the total number of events involving radiography. The 72 nonreactor licensee reports were cataloged as 100 events in 11 different areas.

TABLE III

Personnel Radiation Overexposure Reports from the First Half of 1982

Licensee	Location	Number Exposed	Exposure Level*	Event Date	Report Date		License/ Docket #
Reactor							
COMM ED CO (ZION 1)	ZION IL	1	H	3/25/82	3/29/82		500295
CON ED CO (INDIAN PT 2)	BUCHANAN NY	1	H	6/01/82	6/02/82		500247
GPU NUCLEAR (MET ED TMI 2)	MIDDLETOWN PA	1	H	3/28/79	6/02/82		500320
NORTHEAST UTIL (MILLSTONE 1)	WATERFORD CN	1	Y	8/31/80	1/13/82		500245
Nonreactor							
(Pre-1981 Events)							
ALBERT EINSTEIN MED CTR	PHILADELPHIA PA	1	E	10/27/81	2/03/82	037004820	0
ATLAS CORPORATION	MOAB UT	10	I	5/31/81	6/23/82		403453
BASIN SURVEYS, INC	BUCHANNON WV	3	G	1/31/81	3/25/82	0470945301	0
BLANCHARD VALLEY HOSP	FINDLAY OH	1	G	6/22/81	4/06/82	0340629503	0
NEW ENGLAND NUCLEAR CORP	N BILLERIC MA	1	I	9/01/80	3/25/82	0200032013	0
NEYER, TISEO, & HINDO, LTD	FARMINGTON MI	1	G	10/14/79	1/14/82	0211489401	0
NUCLEAR ENERGY SERVICES INC	OFFSHORE TX	1	D	12/22/81	1/06/82	0421655901	0
NUCLEAR FUEL SERVICES, INC	ERWIN TN	1	I	3/31/81	2/08/82		700143
NUCLEAR METALS, INC.	CONCORD MA	1	I	12/31/81	3/01/82		400672
RAMSEY CONSTRUCTION AND FAB	BLACKWELL OK	1	G	12/09/81	1/08/82	0351943301	0
ST LUKE'S HOSPITAL	CLEVELAND OH	1	G	3/31/78	3/22/82	0340039808	0

* Exposure Level Key: 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); Y < 18 yrs of age

TABLE IV

Part I

January-June 1982 Reports on Lost, Abandoned, and Stolen Material

Isotope/Amt*	Location City/Co. State	Licensee	License #	Event Date	Disposition
AM241 / C	HAMMOND IN	SALISBURY ENGINEERING INC	0131787701	1/05/82	-STOLEN, NEVER RECOVERED
C14 / C	BETHESDA MD	HEALTH & HUMAN SVCS, DEPT OF	0190352005	2/21/82	-STOLEN, " "
CO57 / C	CHICAGO IL	STAN A. HUBER CONSULTANTS	0121750301	5/18/82	-STOLEN, " "
H3 / B	PHILADELPHIA PA	ST JOSEPH'S UNIVERSITY	0370175301	4/25/82	-LOST, COMM. WASTE DISPOSAL
H3 / F	PHILADELPHIA PA	BOEING COMPANY VERTOL DIV	0370842801	1/19/82	-LOST, COMM. WASTE DISPOSAL
I131 / C	BROCKTON MA	CARDINAL CUSHING GEN HOSP	0201282801	3/28/82	-ASSUMED LOST AND TO DISP.
IR192 / F	OIL CITY PA	CONSOLIDATED X-RAY SERVICE	0420845602	1/15/82	-LOST, RECOVERED INTACT
NI63 / D	BELTSVILLE MD	AGRICULTURE, DEPT OF	0190091503	3/02/82	-LOST, NEVER RECOVERED
TC99M / E	BOSTON MA	** TRANSPORTATION, DEPT OF	NON	1/18/82	-STOLEN, RECOVERED INTACT

Part II - Abandoned Well Logging Sources

AM241 / F	LINCOLN CO WY	HALLIBURTON CO WELEX DIV	0420106807	5/03/82
AM241 / F	OFFSHORE LA	SCHLUMBERGER TECHNOLOGY	0420009003	5/14/82
AM241 / F	CADDO CO. OK	SCHLUMBERGER TECHNOLOGY	0420009002	12/07/81
CO60 / D	MOAB UT	TEXASGULF CHEMICALS CO	0431114802	5/24/82
CS137 / E	CUSTER CO OK	DRESSER INDUSTRIES	0420296401	4/26/82
CS137 / E	WOODS CO. OK	DRESSER INDUSTRIES	0420296401	1/15/82
CS137 / E	S. MARSH IS LA	DRESSER INDUSTRIES	0420296401	7/30/81
CS137 / E	KINGFISHER OK	GEARHART INDUSTRIES INC	0420645803	1/07/82
RA226 / B	OFFSHORE AK	DRESSER INDUSTRIES	0420296401	3/25/82

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* Key

Amount

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

** Non-licensee

TABLE V

January-June 1982 Reports of Leaking Sources

Licensee	Location	License No.	Report Date	Isotope	Manufacturer Model No.
ADA OKLAHOMA WIRELINE SERVI	ADA OK	0351833501	1/18/82	CS137	GULF NUCLEAR MODEL CSV
AMP INCORPORATED	HARRISBURG PA	0370122003	5/26/82	PM147	TWIN CITY MODEL PM-147
ATOMIC ENERGY OF CANADA LTD	ONTARIO CN	0540030013	2/25/82	I125	AECL-CP MODEL C-235. C-324
DRESSER INDUSTRIES	OLNEY IL	0420296401	2/26/82	CS137	
KAY-RAY INC	ARLINGTON H IL	0121118401	1/06/82	CS137	GEN RADIOISOT. PROD 850233
KAY-RAY INC	ARLINGTON H IL	0121118401	3/31/82	CS137	GEN RADIOISOTOPES PROD 850233
NEW ENGLAND DEACONESS HOSP	BOSTON MA	0200028907	3/11/82	UNAT	VARIAN CLINAC 4 LINEAR ACL
NORLAND INSTRUMENTS	FT ATKINSO WI	0481340301	3/22/82	I125	AECL
NORLAND INSTRUMENTS	FT ATKINSO WI	0481340301	1/12/82	I125	AECL
OHMART CORPORATION	CINCINNATI OH	0340063903	2/12/82	CS137	3M COMPANY
ROHM AND HAAS COMPANY	SPRING HOU PA	0370166501	1/29/82	NI63	TRACOR MODEL 111-019-001

TABLE VI

January-June 1982 Radiography Event Reports

Licensee	Event Location	Event Date	Report Date	Isotope	Associated Area*
ANALYTIC INSPECTION, INC	OFFSHORE LA	1/24/82	2/04/82	UNKNOWN	EXP(0)
CONSOLIDATED X-RAY SERVICE	OIL CITY PA	1/15/82	2/15/82	IR192	LAS
MICHIGAN TESTING ENGINEERS	DETROIT MI	2/19/82	2/19/82	UNKNOWN	
NAVY, DEPT OF THE	MIAMI FL	3/08/82	3/08/82	IR192	
NUCLEAR ENERGY SERVICES INC	OFFSHORE TX	12/22/81	1/06/82	IR1192	EXP(1)
OKLAHOMA X-RAY INC	TULSA OK	2/18/82	2/26/82	IR192	
PITTSBURGH TESTING LAB	SALT LAKE UT	1/23/82	1/25/82	IR192	EXP(0)
RAMSEY CONSTRUCTION AND FAB	BLACKWELL OK	12/09/81	1/08/82	IR192	EXP(1)
VENEGAS INDUSTRIAL TESTING	NASHUA NH	12/31/81	1/22/82	UNKNOWN	
WISCONSIN INDUSTRIAL TESTING	POTTSTOWN PA	4/01/82	4/02/82	UNKNOWN	EXP(0)

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* EXP ( ) = Personnel Radiation Exposure (Number of individuals actually overexposed).
LAS = Lost, Abandoned or Stolen material

TABLE VII

January-June 1982 Manufacturing and Distribution Reports

Licensee	Location	Event Date	Report Date	Isotope/Amt*	License No.
ATOMIC ENERGY OF CANADA LTD	ONTARIO CN	2/25/82	2/25/82	I125 Z	0540030013
BOEING COMPANY VERTOL DIV	PHILADELPHIA PA	1/19/82	2/19/82	H3 F	0370842801
NAVY, DEPT OF THE	MIAMI FL	3/08/82	3/08/82	IR192 E	0091977001
NEW ENGLAND NUCLEAR CORP	LUBBOCK TX	12/16/81	1/13/82	TC99M E	0200032009
NEW ENGLAND NUCLEAR CORP	N BILLERIC MA	9/01/80	3/25/82	AM241 A	0200032013
NORLAND INSTRUMENTS	FT ATKINSO WI	6/30/81	3/22/82	I125 D	0481340301

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* Key

Amount

A		<	µCi
D	100 mCi	-<	1mCi
E	1 Ci	-<	10 Ci
F	10 Ci	-<	100 Ci
Z	Not reported		

TABLE VIII

January-June 1982 Gauges/Measuring Systems Event Reports

Licensee	License #	Event Location	Isotope	Report Date	Manufacturer Model No.
BETHLEHEM STEEL CORP	0370186101	BURNS HARB IN	CS137	2/01/82	
KAY-RAY INC	0121118401	ARLINGTON H IL	CS137	1/06/82	GEN RADIOISOT. PRODUC 850233
KAY-RAY INC	0121118401	ARLINGTON H IL	CS137	3/31/82	GEN RADIOISOTOPES PRODS 850233
SALISBURY ENGINEERING INC	0131787701	HAMMOND IN	AM241	1/06/82	CAMPBELL PACIFIC NUCLEAR
SCHLUMBERGER TECHNOLOGY	0420009003	OFFSHORE LA	AM241	6/10/82	

Table IX

TRANSPORTATION MODES FOR 1981 AND 1982 EVENTS
SANDIA TRANSPORTATION EVENTS FILE

Year	Mode				
	Air	Highway	Rail	Other	Release
1981	11	50		1	10
1982	2	10	2	1	2

SUMMARY OF RELEASES FROM TRANSPORTATION EVENTS
SANDIA TRANSPORTATION EVENTS FILE*

1981

20 millicuries unknown material lost or overlooked when company went out of business.

2 gallons H PO containing 1-5 grams.liter natural U leaked

10 mCi I131 lost

1.6 mCi Cr 51 lost

1 pint of LSA material not otherwise specified leaked from shipment from Fitzpatrick

.88 mCi depleted uranium penetrators lost

1 lb. thorium nitrate

350 g yellowcake

20 gallons of fluid containing approx. 40 mCi P32 leaked

1 cup uranium tetrafluoride

1982

20 mCi of tritium as watch faces lost in fire

1 lb. uranium tetrafluoride

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* Releases described as "contamination" are not included.