

AEOD/N209B

A SUMMARY OF THE NONREACTOR EVENT REPORT
DATABASE FOR THE PERIOD JULY-DECEMBER 1982

by the

Nonreactor Assessment Staff
Office for Analysis and Evaluation
of Operational Data

Prepared by: K. Black

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

8307050427 830614
PDR MISC
8307050421 PDR

A SUMMARY OF THE NONREACTOR EVENT REPORT DATABASE
FOR THE PERIOD JULY-DECEMBER 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 NRER database includes 90 reports submitted by nonreactor licensees to the NRC regional offices during the second half of 1982 and 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 July-December 1982.

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. An update of the Sandia Transportation Events File will be published separately.

DISCUSSION

Information on the 90 records entered into the NRER database during the second half of 1982 includes information from various types of licensees. Table 1 provides information on the types of licensees for which information was entered into the database.

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 90 nonreactor licensee reports were cataloged as 176 events in ten 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 90 nonreactor licensee reports were most frequently concerned with radiation exposures (26 times) and with lost, abandoned, and stolen material (19 times). The reports were associated less frequently with several other areas.

* 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 AEOD studies of medical misadministrations are published elsewhere.

1. Radiation Exposure Events

The NRER database contains information from 26 reports during the second half of 1982 concerning events in which there was the potential for radiation overexposures. Of these events, ten involved real radiation overexposures. Nonreactor licensees accounted for all of the exposures. Information on the ten overexposures is provided in Table III. The types of licensees associated with the overexposures reported during the second half of 1982 were as follows:

<u>Licensee Event</u>	<u>No. Overexposure Events</u>	<u>% of Total</u>
Radiography	1	10
Source and Special Nuclear Materials	4	40
Commercial/Industrial (Manufacturing & Dist.)	2	20
Medical	1	10
Other	<u>2</u> 10	<u>20</u> 100

For comparison, the NRER database for the first half of 1982 contains information on 15 reported events that involved real radiation overexposures. Four (4) of the 15 involve reactor licensees and 11 involved nonreactor licensees. It can be seen that there was little change from the first half of the year in the second.

2. Lost, Abandoned, and Stolen Material

Twenty-one (21) events reported during the second half of 1982 involved lost, abandoned, or stolen licensed material (LAS). Report documents of these events are summarized in Table IV. Report documents consisted of ten reports of lost, six reports of stolen material and five reports of abandoned well-logging sources. None of the 21 events resulted in a known radiation overexposure.

The 16 reports of lost and stolen sources involved varying quantities of seven different isotopes. Five of the lost sources were recovered and five were never recovered.

Material was recovered in only one of the six events in which it was stolen. Cesium 137 calibration sources, stolen in conjunction with a car theft, were recovered undamaged, in their original containers.

There were five reported events of theft in which the radioactive materials were not recovered. The events described as follows:

- High purity, depleted uranium, possessed under a general license was stolen from the U.S. Bureau of Mines.
- An infinity aiming collimator being manufactured for the U.S. Army by ADE Technology Corporation was stolen.
- Two moisture density gauges were stolen in separate events in conjunction with the theft of trucks. The licensees were NEYER, TISEO, and HINDO, Ltd. and D'Appelonia Group. A third density gauge was stolen from a construction trailer in a break-in. The licensee was Short-Elliott-Hendrickson.

About the same number of LAS reports (18) were received during the first half of 1982. Of that number, nine (9) concerned lost material, four (4) stolen, and nine (9) abandoned material. The numbers of reports of lost and stolen material were about the same for both halves of 1982. Fewer well logging sources were abandoned during the second half of the year than the first.

3. Leaking Sources

Nine (9) events were identified during the second 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 (three times). Cobalt-60 was involved in two (2) of the remaining six source leakage incidents.

During the second half of 1982, two reports of leaking General Radioisotope Products Cs sources were received. These reports concern additional evidence of leaking cesium sources mentioned in the AEOD report for the first half of 1982. NMSS is continuing an investigation with Kay-Ray, distributor of devices containing the sources.

In addition to the above reports, two reports of leaking ion chambers were received. AEOD is evaluating these reports to determine whether there is some problem with the sources. The remaining reports appear to be of statistical interest only.

There was little change in the number of events reported between the first half (11) and the second half (9) of 1982.

4. Fuel Cycle Facility Event Reports

The NRER database contains information from 25 fuel cycle licensee event reports received during the second half of 1982 as follows: seven uranium recovery facilities and 18 from fuel fabrication plants. The NRER database does not include information from fuel cycle licensee reports of routine effluent releases.

The seven reports from the uranium recovery facilities concerned a total of six uranium recovery facilities and six different events (two violations of license conditions, three well excursions, and two events related to personnel

exposures). The 18 fuel fabrication events concerned seven (7) facilities. Of the 18 events, 12 are of statistical value only. The remaining six can be summarized as follows:

- A small explosion occurred in a scrap recovery building. Explosion blew covers off two connected glove boxes, but did not result in any abnormal plant releases or personnel exposures.
- A UF_6 release was caused by a plugged vent line and a UF_6 leak from a hot cylinder through a faulty valve to the nitrogen purge system.
- Criticality alarms inoperable for 45 minutes.
- Report of waste tank overflow.
- ADU entered a deionized water tank.
- Bowed slab tanks were reported.

There were substantially more fuel cycle facility event reports received during the second half of 1982, and the events covered a wider range. None of the events from either the first or second half of the year had serious consequences.

5. Radiography

Five (5) licensee event reports received during the second half of 1982 involved radiography. Three of the events occurred at a fixed radiography site and two (2) occurred at remote (field) radiography sites. Information on the reported events is included in Table VI.

Two (2) of the five reported radiography events involved personnel radiation exposures, one of which was a nonreactor licensee overexposure events. One report concerned whole body doses to two individuals of 5.3 and 6.5 rem, respectively. The other concerned an exposure of 0.111 rem (not an overexposure). The remaining three reported radiography events concerned: (1) malfunction of an exposure device; and (2) warning devices installed at entrance to radiography room; and (3) storage in an unauthorized location.

In the first half of 1982, ten (10) radiography events occurred at field and fixed sites. Radiography events and real overexposures during the first half of 1982 occurred at about twice the rate as during the second half.

6. Manufacturing and Distribution (MAD)

Ten (10) events identified during the second half of 1982 involved the manufacturing and distribution of byproduct material. Information from the reports is included in Table VII. None of the events was significant as a MAD event.

7. Gauges/Measuring Systems

Three (3) events during the second 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, or personnel radiation exposures. Two reported events involved radiation exposures, one of which was a badge exposure.

8. Medical and Teletherapy

Eight (8) reports received during the second half of 1982 were related to the medical use of licensed byproduct material; four involved personnel radiation exposures (none were an overexposure). One report concerned use of an unauthorized procedure; one, improperly packaged material and one with leaking source and lost material.

Two event reports concerned teletherapy rooms for which the radiation monitor did not have a battery backup.

9. Findings and Conclusions

When reports in the NRER database for the second half of 1982 are compared with those from the first half, the number and type of reports do not differ substantially from one another.

One of the more significant events was the rupture of an americium source or sources during an attempt to recover the sources in a well-logging incident. The event is of interest because of the decontamination costs, as well as the volume of americium contaminated waste.

Table I
Types of Licensees That
Submitted Reports During The Second
Half 1982

<u>License Type</u>	<u># Licensees of Type</u>	<u>#Reports Received</u>
Academic	386	2
Medical	2629	14
Commercial/Industrial Measuring Systems		
Well Logging	150	5
Other Measuring Systems	<u>3250</u>	<u>10</u>
	3400	15
M.D. & S.	324	8
Other Comm/Ind.	<u>68</u>	<u>3</u>
	3975	26
Radiography		
Single Location (in Plant)	140	
Multiple Locations (Field)	<u>221</u>	<u>5</u>
	361	5
Irradiator Licenses	200	3
R&D Licenses	534	4
Source Materials**		
Mills	31	9
UF ₆	2	0
Other	<u>256</u>	<u>18</u>
	289	27
Special Nuclear Material	38	1
Other***	<u>477</u>	<u>8</u>
	8889	90

*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 IIFrequency With Which Reports Were
Associated with Particular Areas

<u>Area With Which Report Was Associated</u>	<u># Reports Associated</u>	<u>% Total</u>
Personnel Radiation Exposures	26	18
Lost, Abandoned and Stolen Material	19	13
Leaking Sources	9	6
Radiography	6	4
Source Material and UF ₆ Conversion	24	16
Manufacturing and Distribution	10	7
Releases of Material	15	10
Gauges/Measuring Systems	3	2
Medical and Teletherapy	11	8
Other	<u>23</u>	<u>16</u>
Total	146	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 as in the total number of events involving radiography.

Table III

Personnel Radiation Overexposure Reports

July - December 1982

Nonreactor

<u>Licensee</u>	<u>Location</u>	<u>Event Date</u>	<u>Report Date</u>	<u>No Exposed</u>	<u>Exposure Level*</u>
Advanced Medical Systems, Inc.	Cleveland, OH	82 12 13	82 12 25	1	D
Babcock & Wilcox	Lynchburg, VA	82 07 05	82 12 28	1	I
Evanston Hospital	Evanston, IL	82 09 09	82 12 09	3	I
EXAM	Michigan City, MI	82 10 04	82 10 06	2	G
Kay Ray	Chicago, IL	82 11 09	83 02 01	1	D
Mass. Institute of Technology	Cambridge, MA	82 07 28	82 10 22	1	I
New England Nuclear	Boston, MA	82 08 01	82 11 24	1	I
Nuclear Metals	Concord, MA	82 04 01	82 02 18	1	I
Plateau Resources	Shootaring, UT	82 10 30	82 11 19	3	I
Rio Algom, Ltd.	Moab, UT	82 07 01	83 03 02	2	I

* Exposure Level Exposure
D >3 Rem/Qtr.
G >1.25 Rem/Qtr.
I >MPC Hours

Table IV

Part I

July-December 1982 Reports on Lost, Abandoned, and Stolen Sources

<u>Isotope</u>	<u>Location</u>	<u>Licensee</u>	<u>License No.</u>	<u>Event Date</u>	<u>Disposition</u>
	Boston, MA	New England Nuclear Corp.	200032019	10/24/1982	Found
	Farmington, MI	Neyer, Tiseo and Hindo, Ltd.	211489401	6/11/1982	Stolen, unknown
AM241	Chippewa, WI	Short-Elliott-Hendrickson	481853001	10/11/1982	Unknown
C058	Sayreville, NJ	Perth Amboy General Hospital	291193501	9/18/1982	Unknown
C060	Boise, ID	Department of Agriculture	190091503	9/28/1982	Found
CS137	Clinton, IA	Chemplex Company	141199901	9/01/1982	Assumed lost to disp
CS137	Monroeville, PA	D'Appolonia Group	371711002	12/14/1982	Unknown
CS137	McKeesport, PA	McKeesport Hospital	370089603	9/14/1982	Found
CS137	Sedalia, MO	Nuclear Medicine Associates	341627201	8/03/1982	Found
CS137	Houston, TX	Schlumberger Well Services			Found
H3	Harwood Heights, IL	ADE Technology Corporation	121953701	10/07/1982	Stolen, unknown
H3	Lincroft, NJ	Bell Laboratories		11/30/1982	Unknown
H3	Salt Lake, UT	Veteran's Adm. Medical Center	430329901	10/14/1982	Commercial waste dis
IR192	Boston, MA	Massachusetts General Hospital	200381480	9/27/1982	Assumed lost to disp
U238	Boulder City, NV	US Bureau of Mines	GEN	7/29/1982	Stolen, unknown
	Princeton, NJ	Western Electric Company, Inc.	291294501	11/08/1982	Unknown

Part II

Abandoned Well Logging Sources

<u>Isotope</u>	<u>Location</u>	<u>Licensee</u>	<u>License No.</u>	<u>Event Date</u>
AM241	Grant Co., OK	Brand X Perforators, Inc.	351594501	10/01/1982
AM241	Jollytown, PA	Consolidated Coal Company	371699801	9/02/1982
AM241	Offshore, LA	Schlumberger Technology	420009003	10/22/1982
CS137	Offshore, LA	Dresser Industries	420296401	8/12/1982
CS137	Rock Spring, WY	Century Geophysical Corp.	350401704	11/03/1982

Table V

July-December 1982 Reports of Leaking Sources

<u>Licensee</u>	<u>Location</u>	<u>License No.</u>	<u>Report Date</u>	<u>Isotope</u>	<u>Manufacturer Model No.</u>
Air Force Hosp McConnell	McConnell, KS	151381201	12/27/1982	AM241	Amersham Ion Chamber
Air Force Hosp McConnell	McConnell, KS	151381201	9/15/1982	AM241	Amersham Ion Chamber
AMR Biological Research	Princeton, NJ	290985801	7/19/1982	NI63	
Dept of the Army	White Sand, NM	300240510	10/06/1982	C060	
Geisinger Medical Center	Scranton, PA	370142101	12/21/1982	CS137	Nuclear Assoc. 69-661-66
International Nutronics, Inc.	Dover, NJ	291384801	10/25/1982	C060	GE
Kay-Ray, Inc.	Arlington, IL	121118401	6/28/1982	CS137	Gen Radioisotope Prod 850233
Kay-Ray, Inc.	Arlington, IL	121118401	10/28/1982	CS137	GRP Model 850233
Massachusetts Inst of Tech*	Cambridge, MA	SNM81	10/22/1982		

* PuBe source had high levels of removable contamination, but the levels were less than .005 uCi.

Table VI

July-December 1982 Radiography Event Reports

<u>Licensee</u>	<u>Location</u>	<u>Event Date</u>	<u>Report Date</u>	<u>Isotope</u>	<u>Associated Area</u>
Exam Company	Michigan City, MI	10/04/1982	10/06/1982	IRI92	EXP (2)
Newport News Shipbuilding	Newport News, VA	7/15/1982	7/22/1982	Unknown	MAD
Nuclear Energy Services, Inc.	Houston, TX	3/12/1982	3/12/1982	Unknown	
Trans-Eastern Inspection, Inc.	Weston, WV	10/04/1982	10/27/1982	Unknown	EXP (0)
U.S. Testing Co., Inc.	Reading, PA	8/18/1982	10/05/1982	Unknown	

*EXP () = Personnel Radiation Exposure (No. of individuals actually exposed)

MAD = Manufacturing and Distribution

Table VII

July-December 1982 Manufacturing and Distribution

<u>Licensee</u>	<u>Location</u>	<u>Event Date</u>	<u>Report Date</u>	<u>Isotope</u>	<u>License No.</u>
Amersham Corporation	Arlington, IL	4/12/1982	5/13/1982		121283601
C. P. Clare and Company	Chicago, IL	2/16/1982	4/08/1982		121667601
Harrell, Inc.	East Norway, CN	5/18/1982	10/05/1982		061669901
Kay-Ray, Inc.	Arlington, IL	6/18/1982	6/28/1982	CS137	121118401
Kay-Ray, Inc.	Arlington, IL	11/09/1982	2/01/1982		121118401
Kay-Ray, Inc.	Arlington, IL	9/16/1982	10/28/1982	CS137	121118401
New England Nuclear	Boston, MA	8/01/1982	11/24/1982	U	200032019
New England Nuclear	Boston, MA	10/24/1982	10/26/1982		200032019
Newport News Shipbuilding	Newport News, VA	7/15/1982	7/22/1982		450942802
Victoreen, Inc.	Cleveland, OH	9/17/1982	10/19/1982	CS137	340048604

Table VIII

July-December 1982 Gauges/Measuring System Event Reports

<u>Licensee</u>	<u>Location</u>	<u>Event Date</u>	<u>Report Date</u>	<u>Isotope</u>	<u>License No.</u>
Bethlehem Steel Corp.	Burns Harb, IN	8/15/1982	9/14/1982	CS137	370186101
Chemplex Company	Clinton, IA	9/01/1982	9/24/1982	CS137	141199901
CTL Engineering, Inc.	Columbus, OH	5/31/1982	7/06/1982		341853301