

**Distribution of
Exempt License Material
from 1970 to 1989**

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August 1990**

This report compiles the data contained in the exempt distribution database. This database is composed of the reports of transfer made by the licensees under the requirements of 10 CFR 32 Subpart A "Exemptions". Several graphs have been prepared based on this data and are presented later. The whole is a continuation of a 1987 effort to quantify the number and activity distributed over time.

BACKGROUND

Radioactive material can appear in consumer products for a number of reasons. It can be added because of certain desirable radioactive, chemical, or physical properties, as in luminous watch dials. It could be found as a contaminate added either intentionally or unintentionally. Examples are procedures such as tagging in pipelines or use as a catalyst in petroleum cracking which result in some degree of contamination of the products. Lastly, radioactive material could be naturally occurring in products but could increase in concentration through processing, such as the increased uranium and thorium concentrations after the processing of rare earth oxides.

For our purposes, consumer products are considered to be those products, commodities, or materials containing byproduct or source material that are available to the general public. They are considered "off-the-shelf" items and are intended for widespread personal or household use. At present, the NRC has 161 specific licenses that authorize the distribution of products of this type. They also maintain a file of approximately 320 licenses that have been retired. These include only licenses under 10 CFR Part 32 Subpart A. As Part 40 licenses do not require periodic reports, they are not included in these files.

Criteria published by the AEC in 1965 set forth the terms of policy used by the NRC for the approval of consumer products. The criteria stated that approval of a proposed product will depend on two factors; the radiation exposures that will be associated with the product and the product's apparent usefulness. It also states that risks of exposure to radiation will generally be considered acceptable if it is unlikely that the individuals in the population will receive less than a few hundredths of the individual dose limits recommended by the ICRP, the NCRP and the FRC. The NEA revised its recommendations in 1985 for controlling consumer products. The guidelines, in part, established orders of benefits based on the concept of a linear non-threshold exposure effect model and stresses the use of non-radioactive alternatives. A policy statement was issued in July 1990 concerning items below regulatory concern (BRC). This policy superseded the 1965 criteria for evaluating consumer products and will not be discussed further.

DISCUSSION

For purposes of this paper, the following license categories have been established:

<u>CODE</u>	<u>DEVICES</u>
32.11	exempt concentrations
32.14A	timepieces, hands or dials
32.14B	automobile lock illuminators
32.14C	precision balance components
32.14D	automobile shift quadrants
32.14E	marine compasses
32.14F	thermostat dials and pointers
32.14G	electron tubes
32.14H	ionization measuring instruments containing byproduct material for the purposes of internal calibration
32.14I	spark gap irradiators
32.17	resins
32.18	small quantities
32.22	self luminous products
32.26	smoke detectors

These categories are explained in further detail in Appendix A.

Presented below are tables produced from the database. The tables indicate the total activity distributed over a twenty period from 1970 to 1989 and include all isotopes found in the database for each category. They provide an overview of the levels of radioactive material that have been distributed to exempt persons. For a more detailed view, graphs have been prepared to show yearly distribution totals and can be found in Appendix B. Due to the large number of different isotopes under categories 32.11 and 32.18, the isotopes have not been graphed, with one exception. Under 32.11, Co-60 has been graphed due to its use as a wear indicator. This use results in widespread distribution of low levels of radioactive material to an unaware sector of the public through its incorporation into molten steel. The isotopes graphed under 32.18 include those that either have large quantities distributed or that are otherwise figure prominently in industry.

For this effort, it would not be feasible to further quantify the numbers due to time constraints, inability to retrieve archived license files and the limited period of time that licensees are required to retain records. Failure to report on time and errors in reporting true unit and activity data also result in some distortion of totals obtained from the data. Appendix C contains an explanation of some of the errors identified. These areas could be improved by closer attention to detail by license reviewer at time of receipt of report or requesting a report.

Isotopes Distributed
Under 10 CFR Part 32.11
from 1970-1989

Isotope	Activity (millicuries)
Ag-110	368.00023
Ag-110m	0.00023
Al-26	0.00001
Au-198	205.67600
Ba-133	7.66502
Br-82	24.93250
C-14	508.30920
Ca-45	10.01000
Cd-109	0.00402
Cl-36	0.00890
Co-57	310.00000
Co-58	1060.00000
*Co-60	164031.82950
Cr-51	14.50290
Cs-134	148.32400
Cs-137	7.32420
Fe-55	6.74870
Fe-59	6481.62810
H-3	963022.30016
Hg-203	1196.22600
I-125	12934.69000
I-129	0.00180
I-131	4711.02000
Kr-85	52997.07600
Lu-172	1.40000
Mn-54	0.01900
Na-24	18.00500
Nb-94	0.00070
P-32	2882.90000
Pm-147	0.00116
Sc-46	2.30000
Sn-113	8.10900
Sr-90	1763.23879

Isotopes Distributed
Under 10 CFR Part 32.14
from 1970-1989

Isotope	Activity (millicuries)
** Category 32.14A	
*H-3	387546317.49100
*Pm-147	32677029.49484
** Category 32.14E	
*H-3	949852.00000
** Category 32.14G	
*Ba-133	3.37900
*C-14	5.59300
*Co-60	156.44900
*Cs-137	5898.70570
*H-3	6227316.97210
*Kr-85	378785.70771
*Ni-63	1437.66258
*Pm-147	229781.24100
** Category 32.14H	
*Am-241	0.00062
*Ba-133	1.11848
*Cl-36	0.88215
*Co-60	0.00200
*Cs-137	3.63168
*H-3	75670.00000
*Kr-85	408.02000
*Ni-63	6692.28400
*Pm-147	30524.37600

Isotopes Distributed
Under 10 CFR Part 32.18
from 1970-1989

Isotope	Activity (millicuries)
Ag-110	0.00263
Ag-110m	0.00163
Al-14	0.00000
Al-26	0.00017
Am-241	300003919.27681
As-73	0.10000
Au-195	3.51000
Ba-133	46.86626
Ba-140	0.01610
Bi-207	0.00110
Bi-210	0.15850
C-14	203034.79619
Ca-45	12.86252
Ca-56	0.32000
Cd-109	12.49888
Cd-115	0.01000
Ce-137	11.87000
Ce-141	0.62800
Ce-144	0.45400
Cl-36	0.96871
Co-57	122.56485
Co-58	130.02700
Co-60	32.09299
Cr-51	4827.49685
Cr-57	0.01360
Cs-134	0.26654
Cs-135	0.00600
Cs-136	0.02811
Cs-137	385.64116
Cu-64	0.20100
Eu-152	0.09800
Eu-154	0.11000
Eu-155	0.15400
Fe-55	40.48885
Fe-59	216.69992
Gd-153	0.26010
Gd-159	0.10000
H-3	110412.23713
Hg-203	0.07634
I-125	7109.55794
I-129	22.36613
I-131	12.26977
Ir-192	0.02200
Kr-81	2.57600
Kr-85	776.50427
La-140	28.40000
Mn-54	1.97524
Mo-99	1.25000
Na-22	0.83180
Nb-93m	0.04500

Nb-94	0.00130
Nb-95	0.01500
Nd-141	0.10000
Ni-63	1022.99891
P-32	95.45059
Pb-210	0.15800
Pm-147	1.94952
Po-210	4.71583
Pr-143	0.10000
Pr-144	0.15700
Pr-147	0.26000
Pr-149	0.00010
Pt-193	0.00060
Ra-226	0.00733
Ra-Br	0.00200
Rb-86	0.10100
Ru-103	0.02000
S-35	49.15473
Sb-125	0.04900
Sc-46	0.05500
Se-75	41.59210
Sn-113	53.47439
Sr-85	0.42449
Sr-89	0.01600
Sr-90	12.07067
Sr-90/Y-90	1.25872
Tc-99	0.45142
Tc-99m	0.02500
Th-228	0.00010
Th-230	0.00101
Tl-204	125.19068
Tm-170	0.02500
Tn-181	0.01000
Tu-182	0.02500
U-238	0.00040
V-90	0.00058
Y-88	0.02360
Y-90	0.04200
Zn-63	0.29000
Zn-65	7.02001
Zr-95	0.02100

Isotopes Distributed
Under 10 CFR Parts 32.22 and 26
from 1970-1989

Isotope	Activity (millicuries)
** Category 32.22	
*H-3	1517680493.15000
*Pm-147	0.46391
** Category 32.26	
*Am-241	393877.03962
*H-3	36000.00000
*Ni-63	10324.75800

DATA ANALYSIS

Upon reviewing the databases and the graphs produced, few trends were discernable, although the recent increase in use of Ni-63 and H-3 under 32.26 appears to coincide with the concerns for explosive detector type equipment. A major problem in recognizing trends in distribution involves incorrect and incomplete reporting by licensees. The seeming random patterns and missing years may be due to these omissions or could represent actual yearly distribution. Much of the information is not accessible in NRC licensee files. The reliability of the system to identify changes small in magnitude or over a relatively short period of time is decreased due to these difficulties and the five year reporting period. Much better data analysis could be done if reports were received annually. Due to BRC policy and the need for accurate information, we recommend a user need memo be sent to RES to change the reporting.

The databases contain 4874 records of 482 license numbers. Of the data present, 61% of the of the companies distribute products manufactured in the U.S., while a remaining 39% import their products. The predominant countries are Switzerland and Japan. The remaining are imports from Canada, England, France, Hong Kong, Sweden, Finland, West Germany, Korea, and Tokyo.

APPENDIX A

Exempt distribution licenses authorize the commercial distribution of byproduct material and products containing byproduct material to persons exempt from licensing requirements under 10 CFR Parts 30.14 through 30.20 inclusive. The requirements for manufacture or transfer are contained in 10 CFR Part 32 Subpart A. The reporting requirements are outlined in 10 CFR Part 32 Sections 12, 16, 20, 25, and 29. Descriptions of the materials regulated under each regulatory category are as follows:

Regulation category 32.11 licenses authorize the introduction of byproduct material in concentrations not exceeding those outlined in 10 CFR 30.70 into products or materials owned by or in the possession of the licensee or another; and the transfer of ownership or possession of the product or material containing the byproduct material to persons exempt under 10 CFR 30.14. The residual byproduct material must be the result of use of the byproduct material for another purpose, for example, use in a tracer study, and the licensee must provide reasonable assurance that the product or material is not likely to be incorporated into any product designed for ingestion or inhalation by, or application to, a human being. This is the only exempt distribution license that can also be issued by an Agreement State.

Regulation category 32.14 licenses authorize the application of byproduct material to, or the incorporation of byproduct material into, certain products as defined in 10 CFR 30.15 or to initially transfer for sale or distribution such products to persons exempt under 10 CFR 30.15. To facilitate record keeping, Part 32.14 has been divided into the following sections which parallel the sections in Part 30.15:

<u>CODE</u>	<u>DEVICES</u>
32.14A	timepieces, hands or dials
32.14B	automobile lock illuminators
32.14C	precision balance components
32.14D	automobile shift quadrants
32.14E	marine compasses
32.14F	thermostat dials and pointers
32.14G	electron tubes
32.14H	ionization measuring instruments containing byproduct material for the purposes of internal calibration
32.14I	spark gap irradiators

Regulation category 32.17 licenses authorize the manufacture of synthetic plastic resins containing scandium-46 designed to be used only for sand-consolidation in oil wells, or the initial transfer for sale or distribution of such products to persons exempt under 10 CFR 30.16.

Regulation category 32.18 licenses authorize the manufacture of quantities not exceeding those outlined in 10 CFR 30.71 Schedule B, or the distribution or transfer of such quantities to persons exempt under 10 CFR 30.18. The material is not to be introduced into any product designed for ingestion or inhalation by, or application to, a human being. The exempt quantities are not to be combined.

Regulation category 32.22 licenses authorize the manufacture of self-luminous products containing tritium, krypton-85 or promethium-147 or the initial transfer of such products to persons exempt under 10 CFR 30.19.

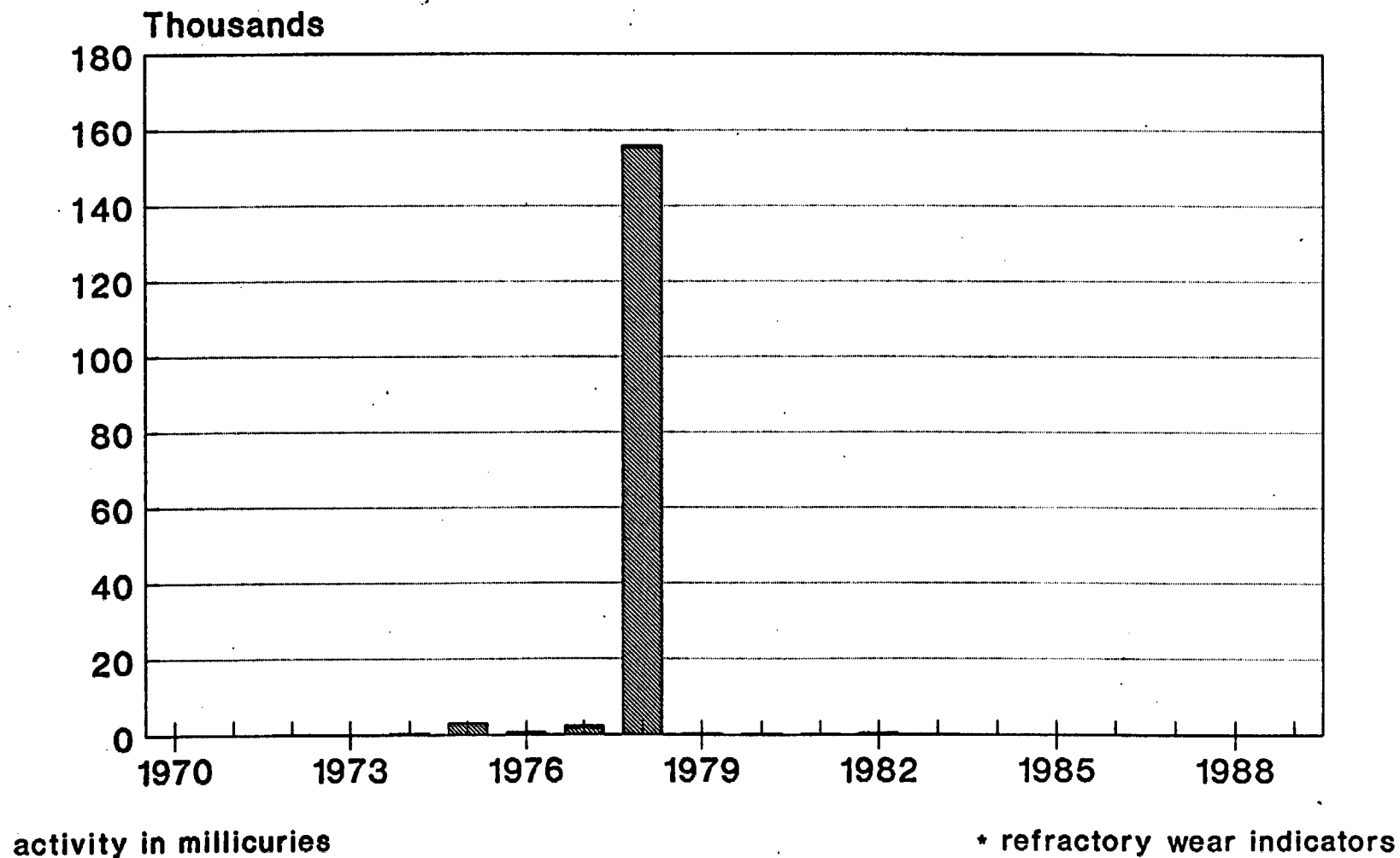
Regulation category 32.26 licenses authorize the manufacture of gas and aerosol detectors containing byproduct material and designed to protect life or property from fire and airborne hazards, or the initial transfer of such products to persons exempt under 10 CFR 30.20.

APPENDIX B

The following are the graphs of some of the isotopes. They show yearly activity totals distributed from 1970 to 1989 and present a more detailed view than the tables in the body of the report. The graphs are organized alphabetically by isotope within each regulation category.

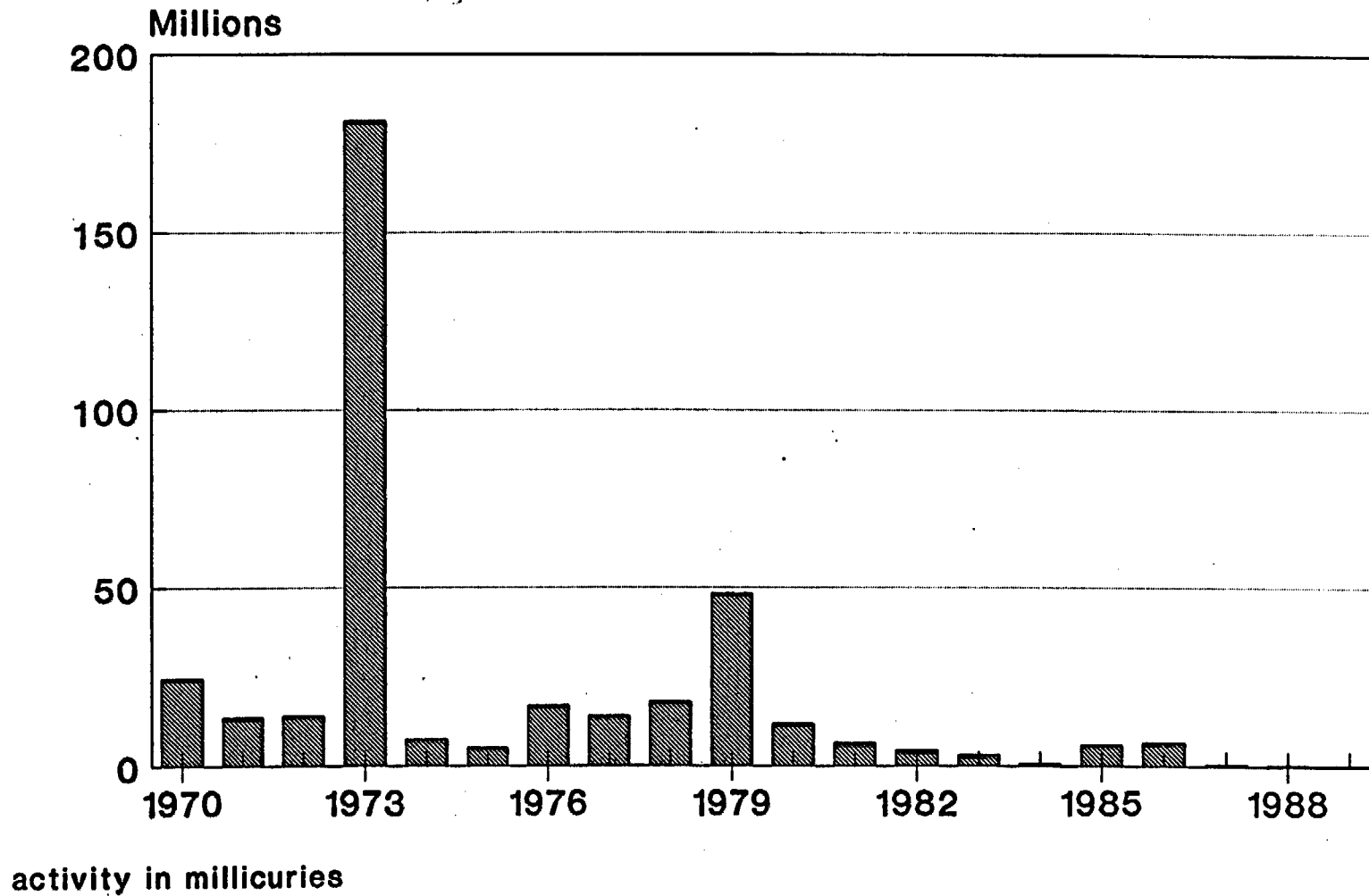
TOTAL ACTIVITY FOR Co-60 UNDER 10 CFR 32.11

Exempt Concentrations



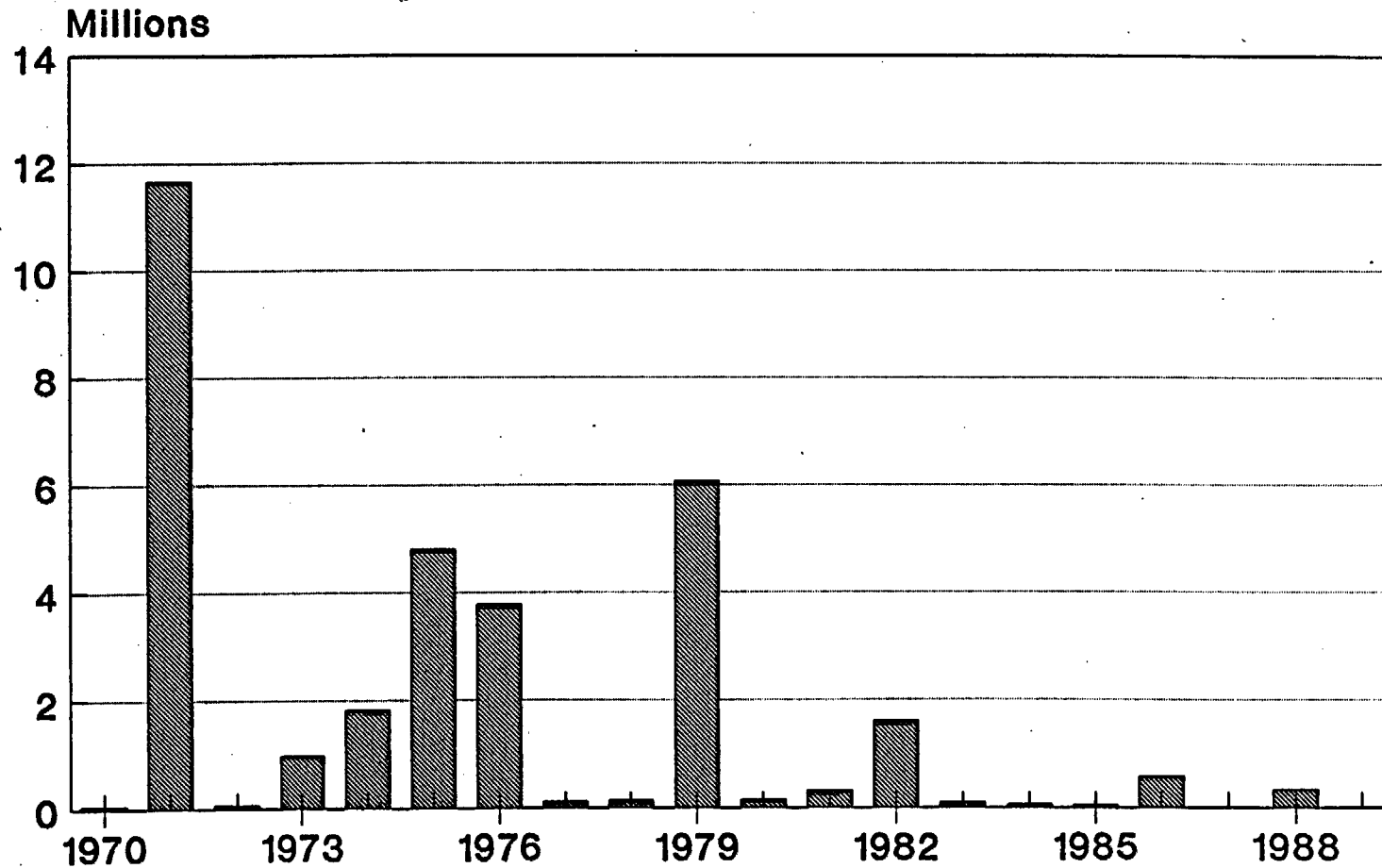
TOTAL ACTIVITY FOR H-3 UNDER 10 CFR 32.14A

Timepieces, Hands or Dials



TOTAL ACTIVITY FOR Pm-147 UNDER 10 CFR 32.14A

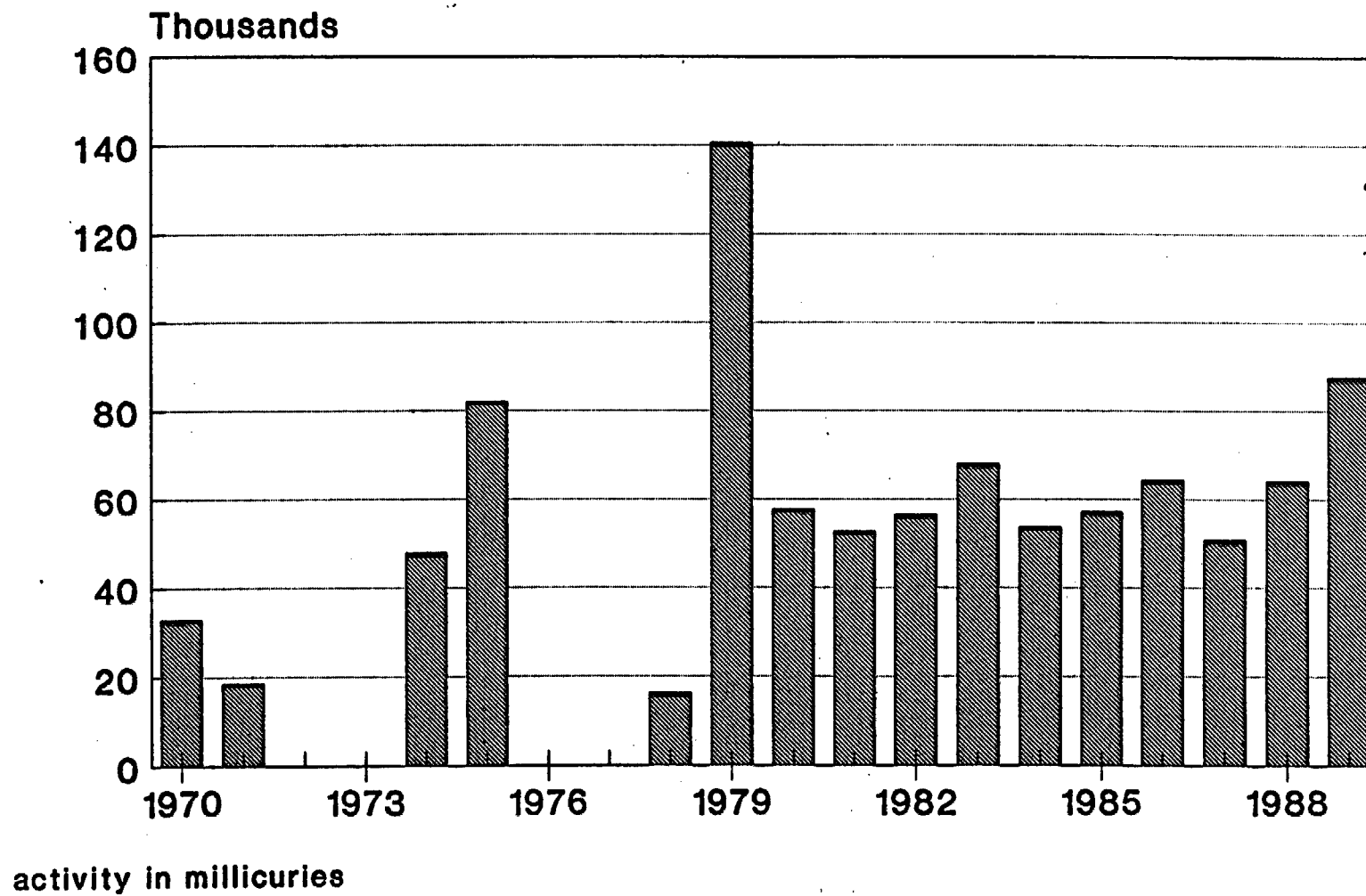
Timepieces, Hands or Dials



activity in millicuries

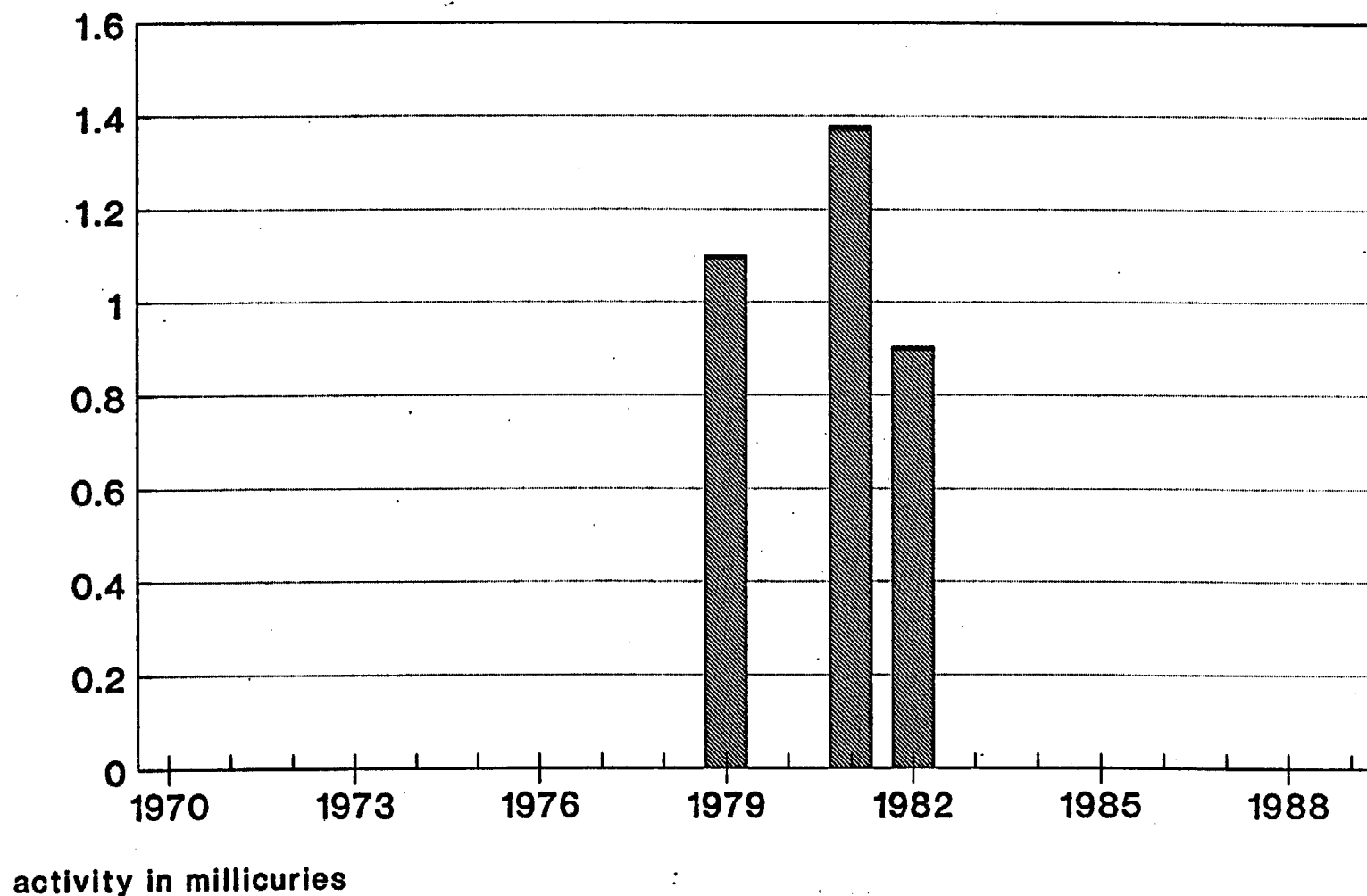
TOTAL ACTIVITY FOR H-3 UNDER 10 CFR 32.14E

Marine Compasses



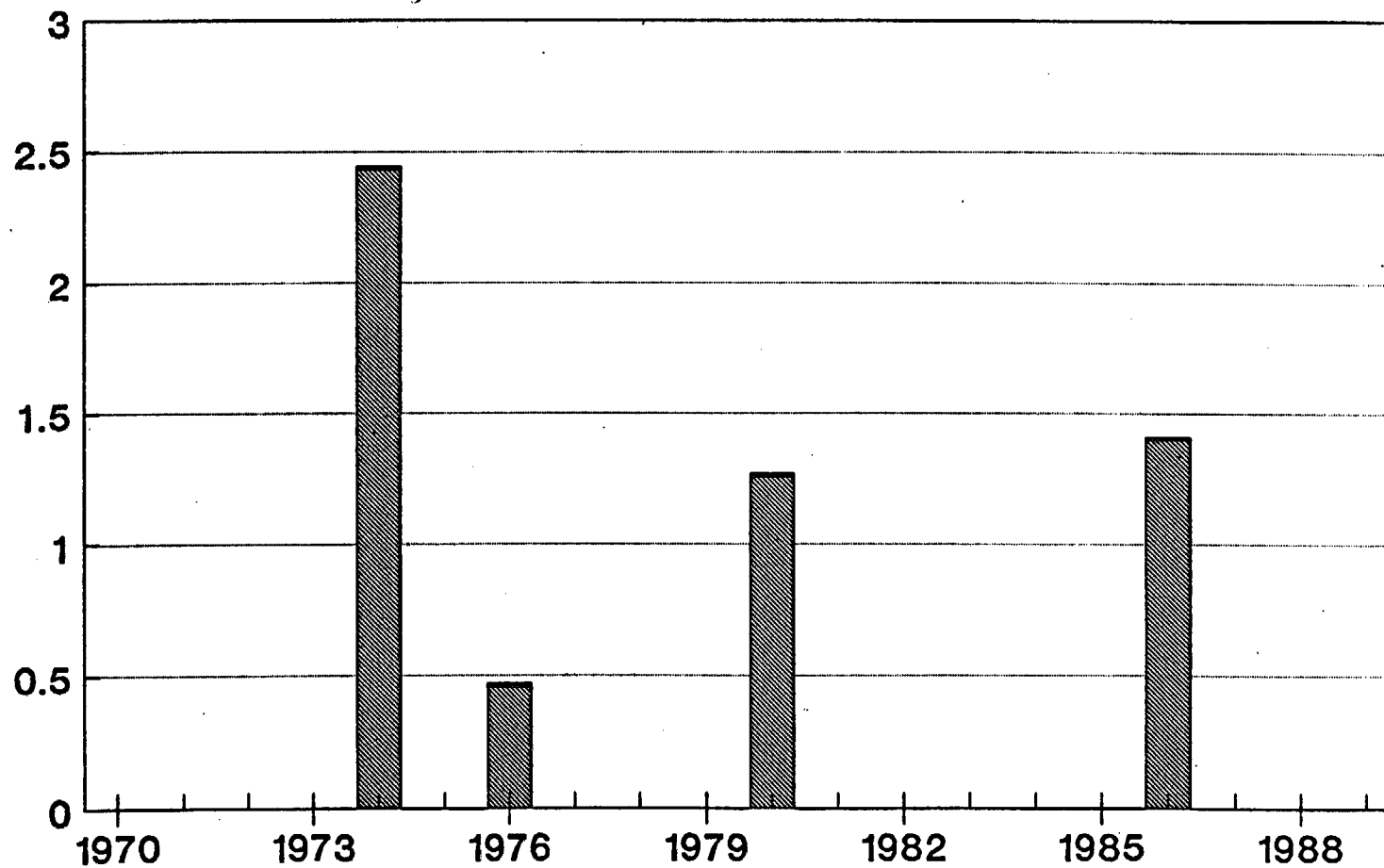
TOTAL ACTIVITY FOR Ba-133 UNDER 10 CFR 32.14G

Electron tubes



TOTAL ACTIVITY FOR C-14 UNDER 10 CFR 32.14G

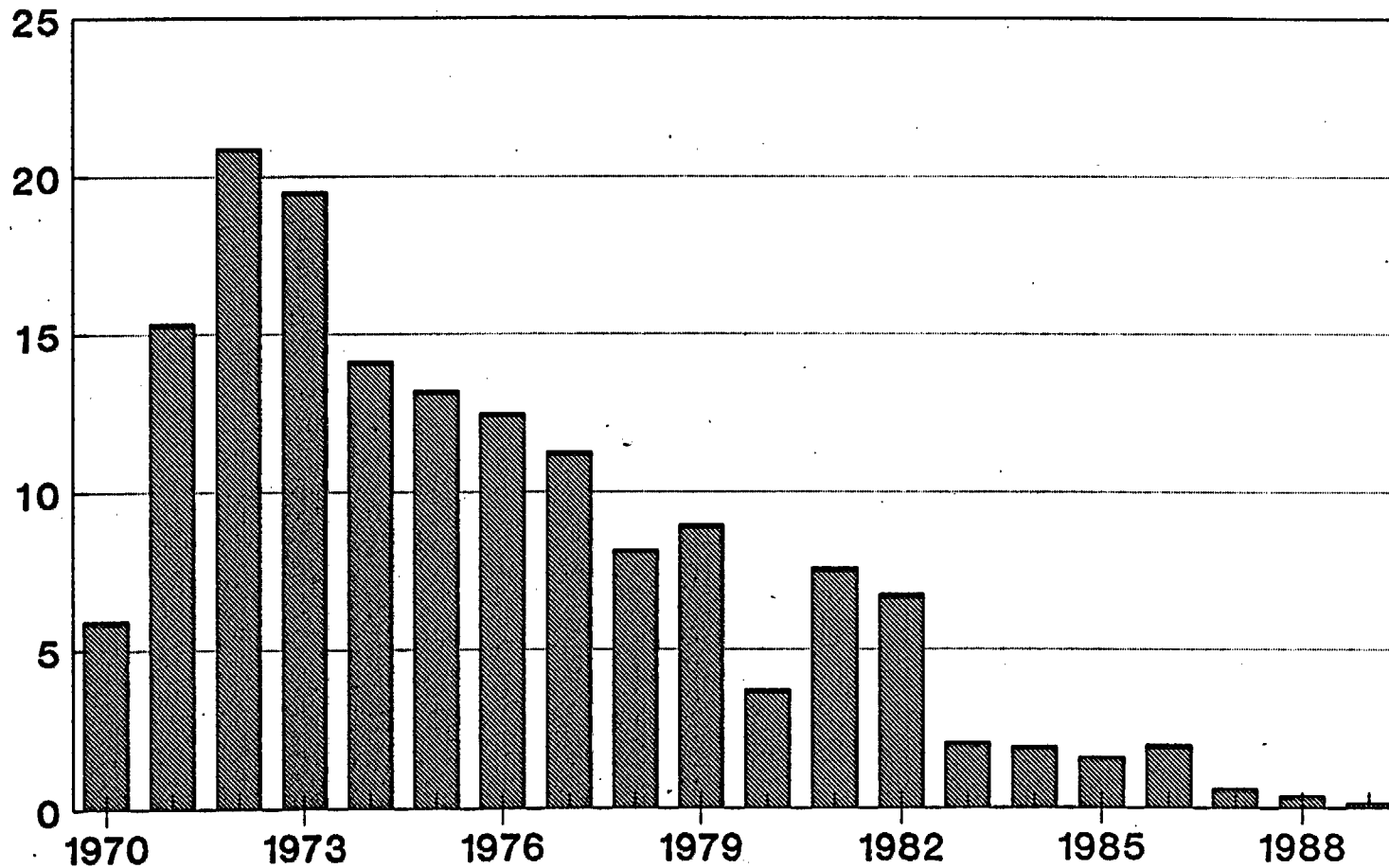
Electron tubes



activity in millicuries

TOTAL ACTIVITY FOR Co-60 UNDER 10 CFR 32.14G

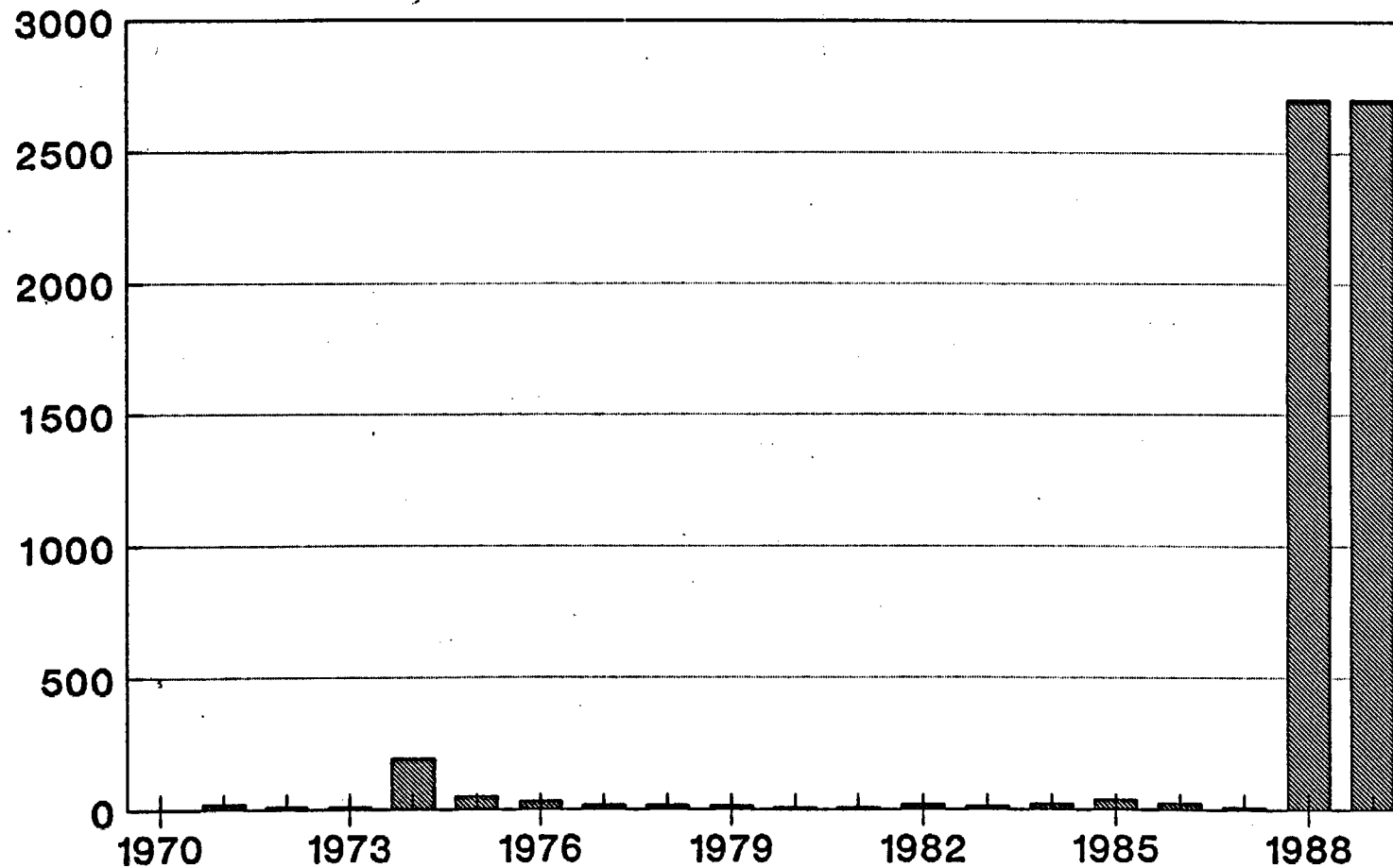
Electron tubes



activity in millicuries

TOTAL ACTIVITY FOR Cs-137 UNDER 10 CFR 32.14G

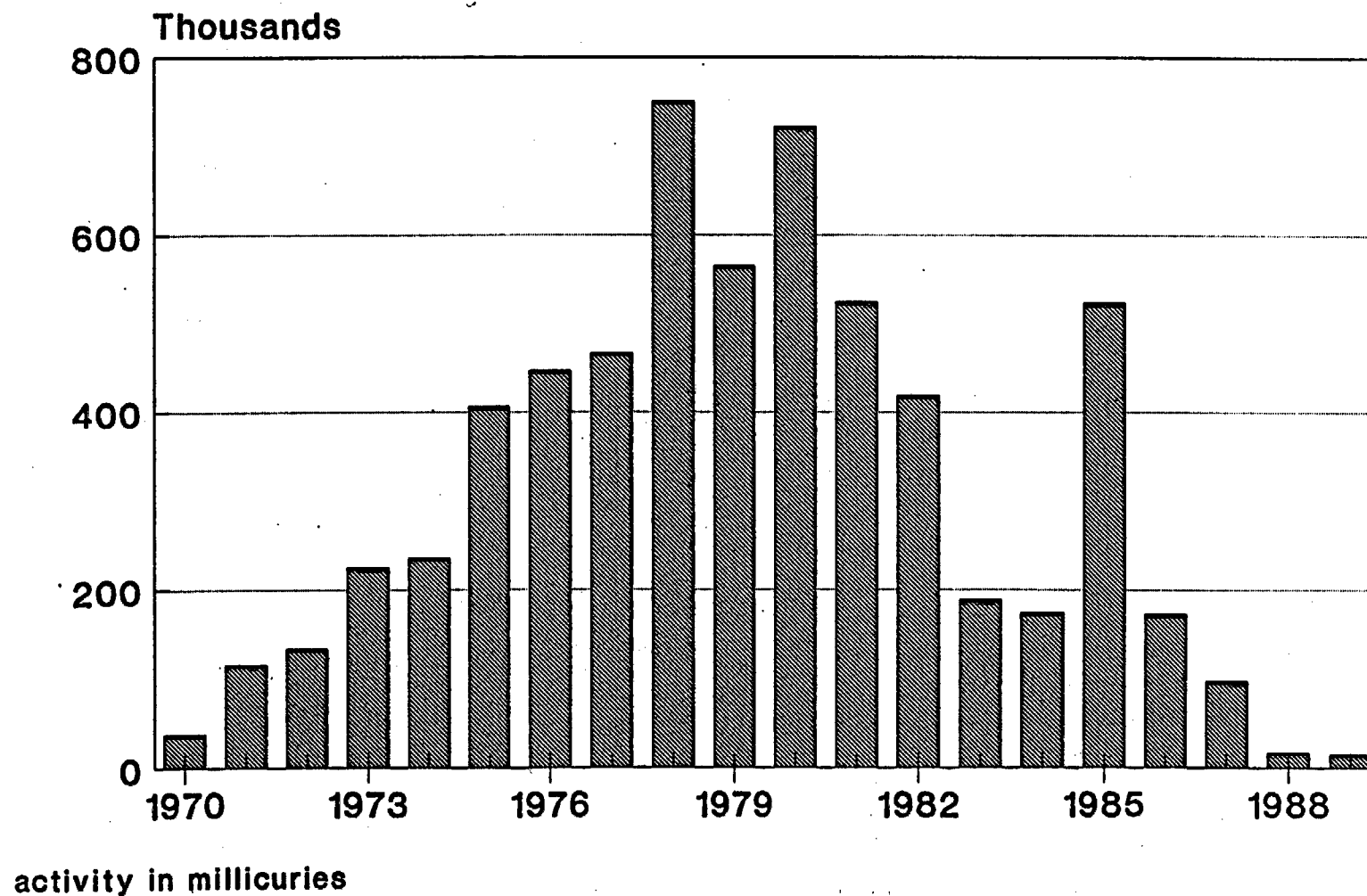
Electron tubes



activity in millicuries

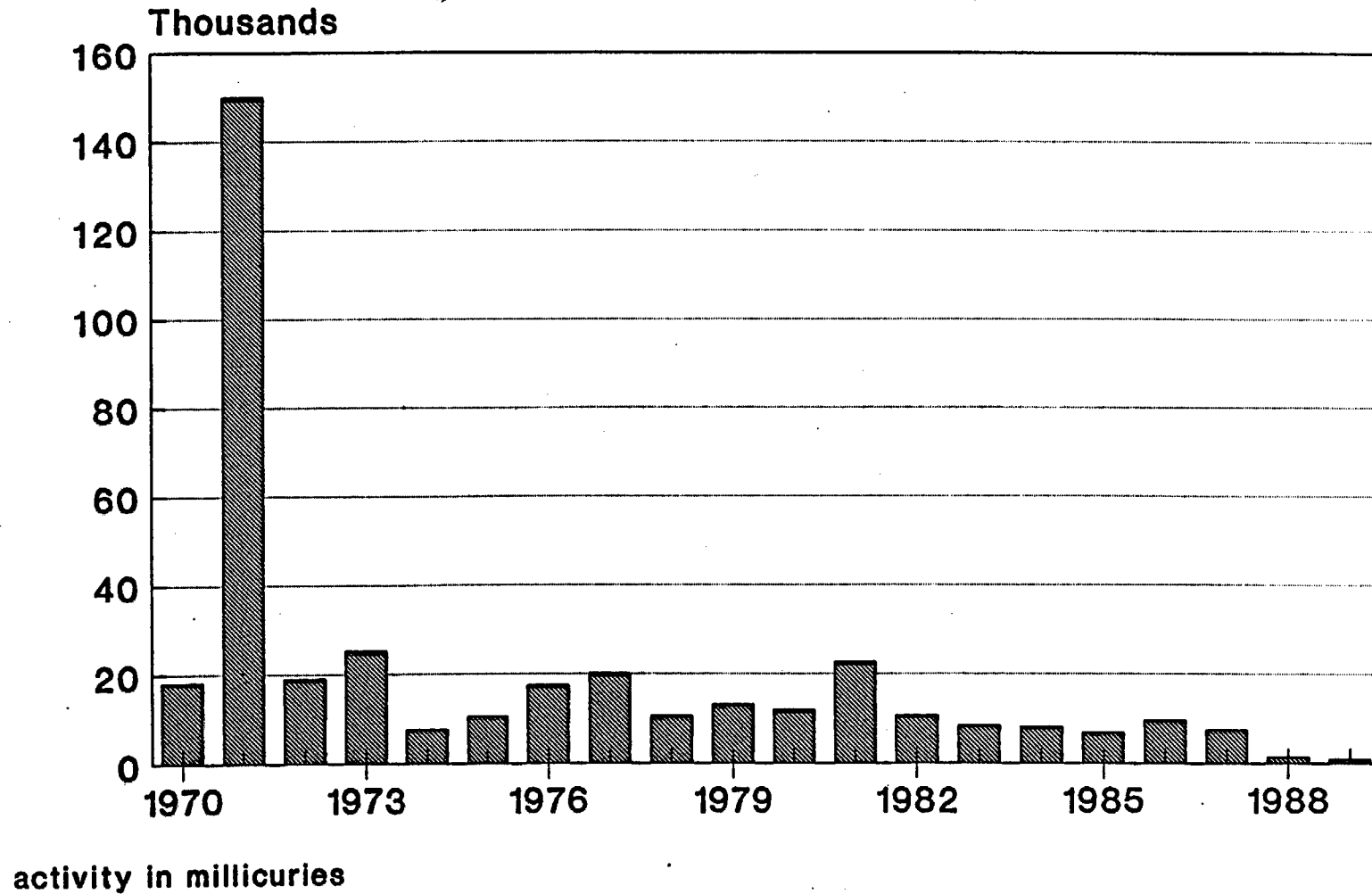
TOTAL ACTIVITY FOR H-3 UNDER 10 CFR 32.14G

Eletron tubes



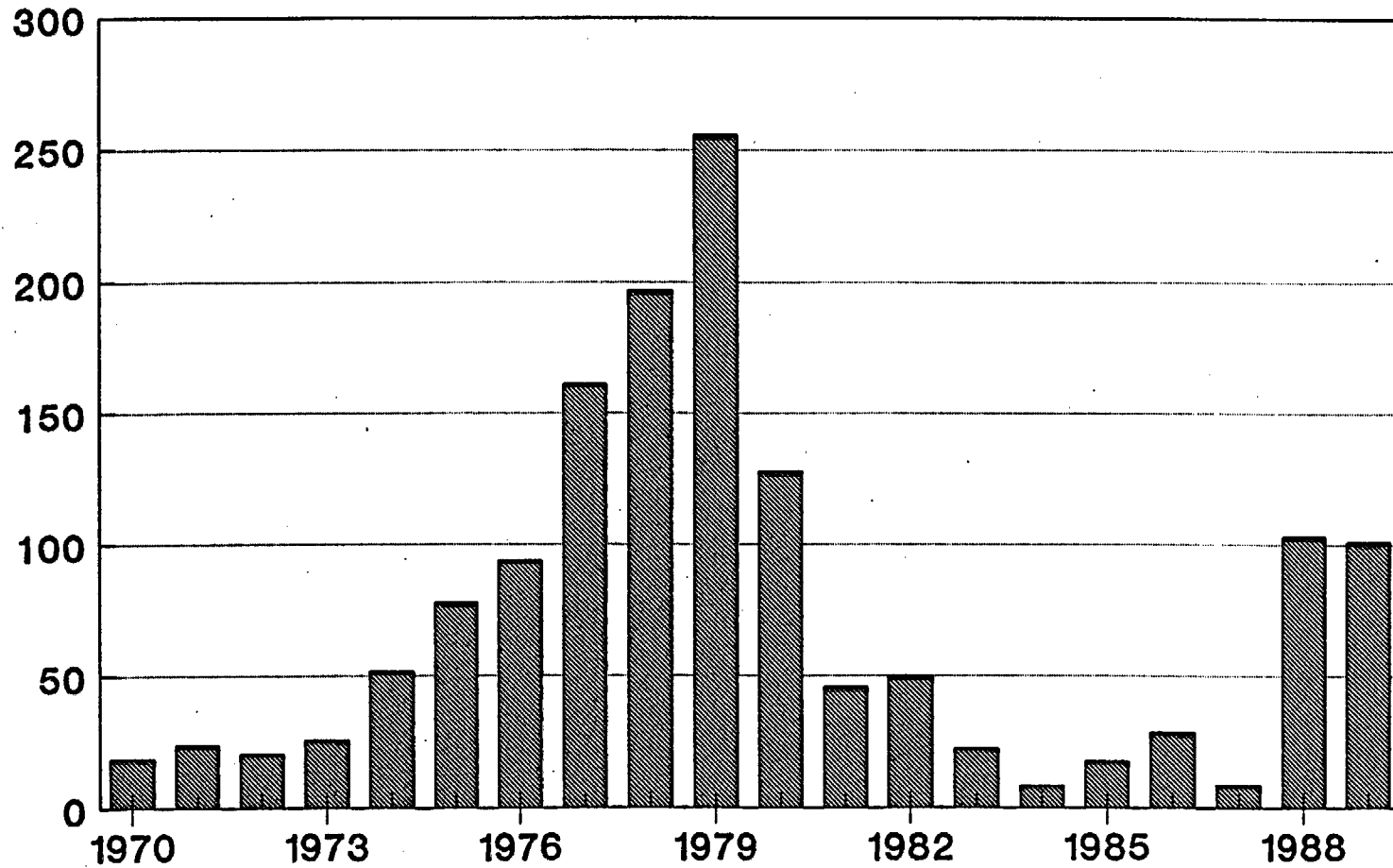
TOTAL ACTIVITY FOR Kr-85 UNDER 10 CFR 32.14G

Electron tubes



TOTAL ACTIVITY FOR Ni-63 UNDER 10 CFR 32.14G

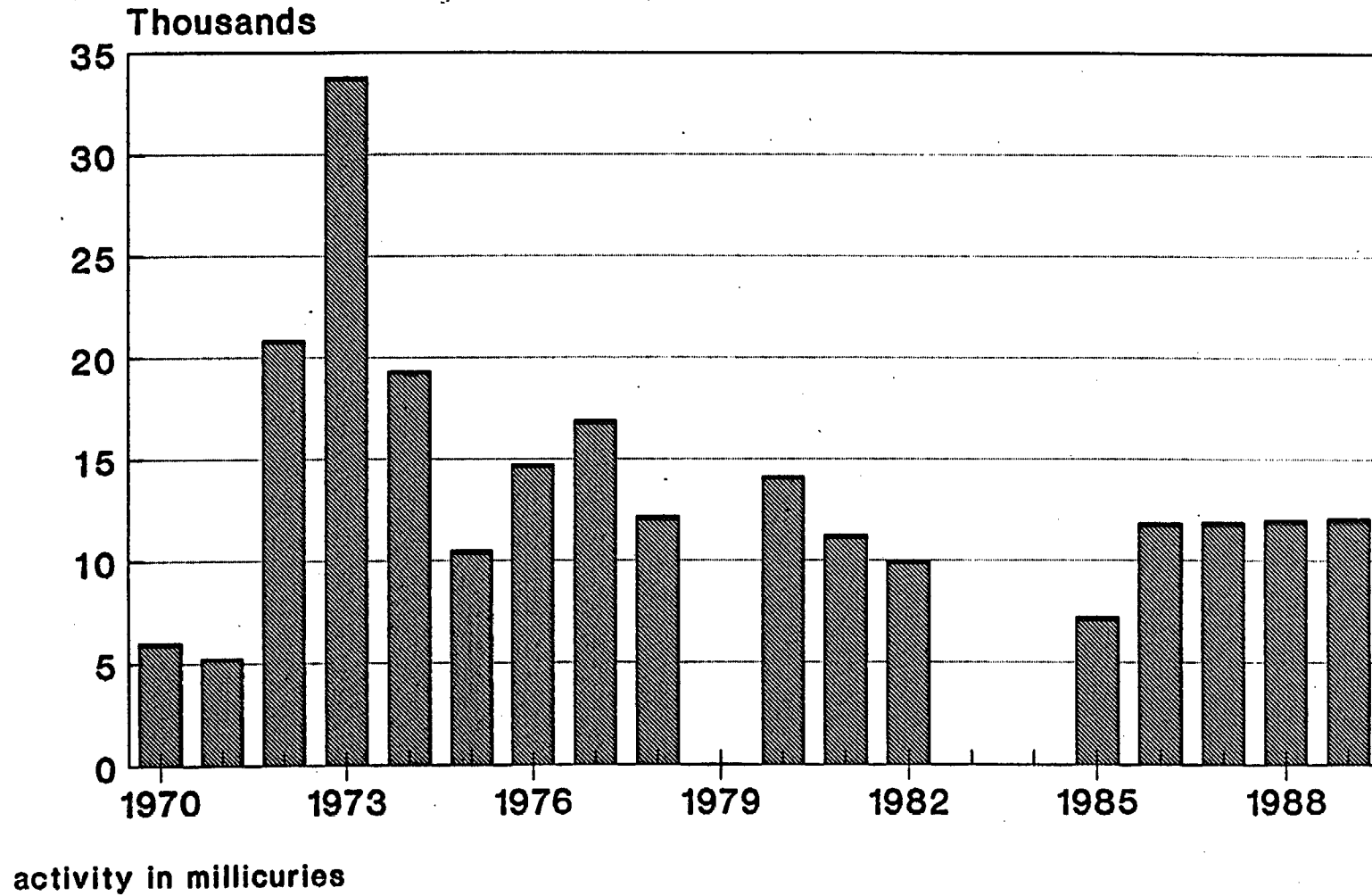
Electron tubes



activity in millicuries

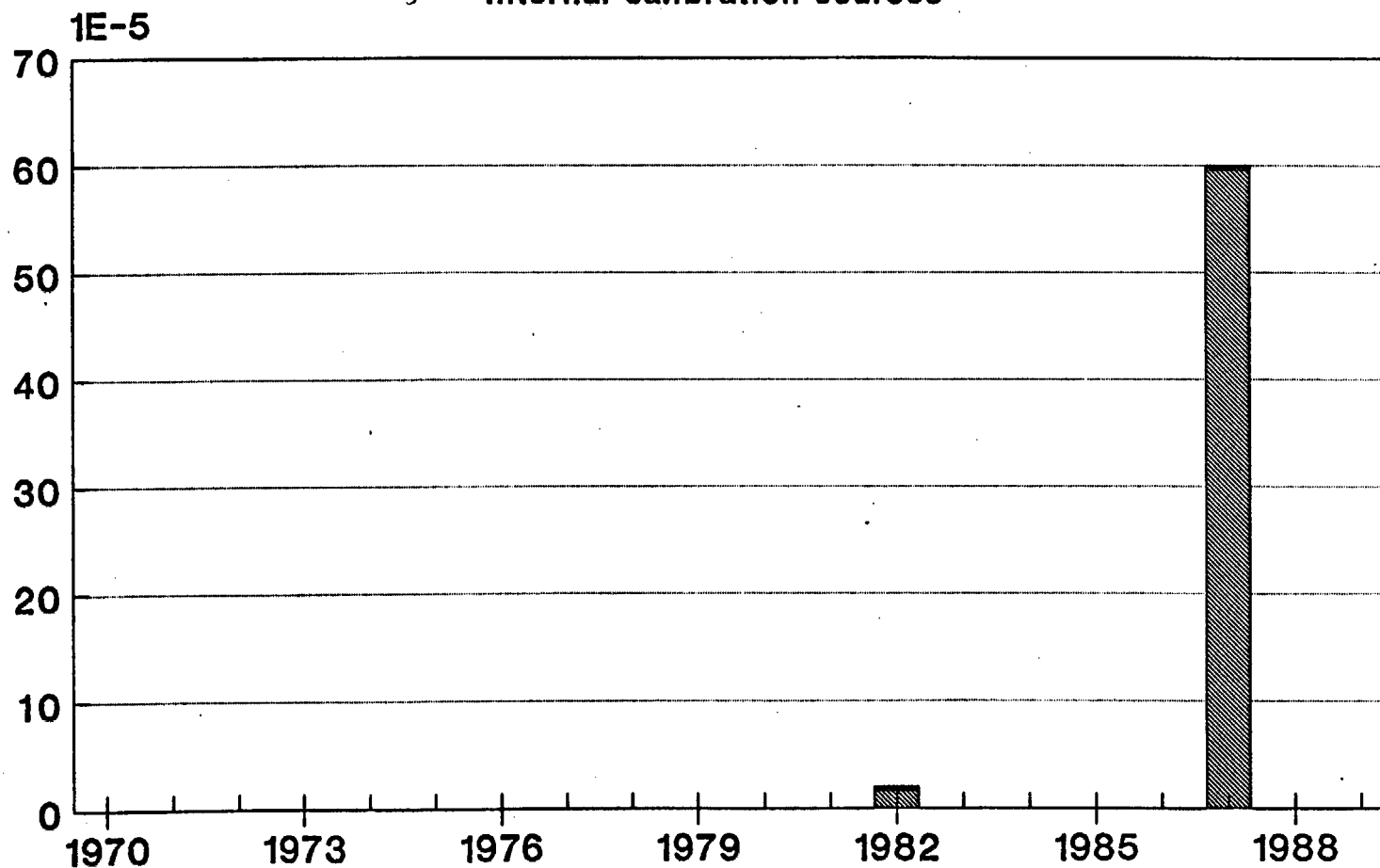
TOTAL ACTIVITY FOR Pm-147 UNDER 10 CFR 32.14G

Electron tubes



TOTAL ACTIVITY FOR Am-241 UNDER 10 CFR 32.14H

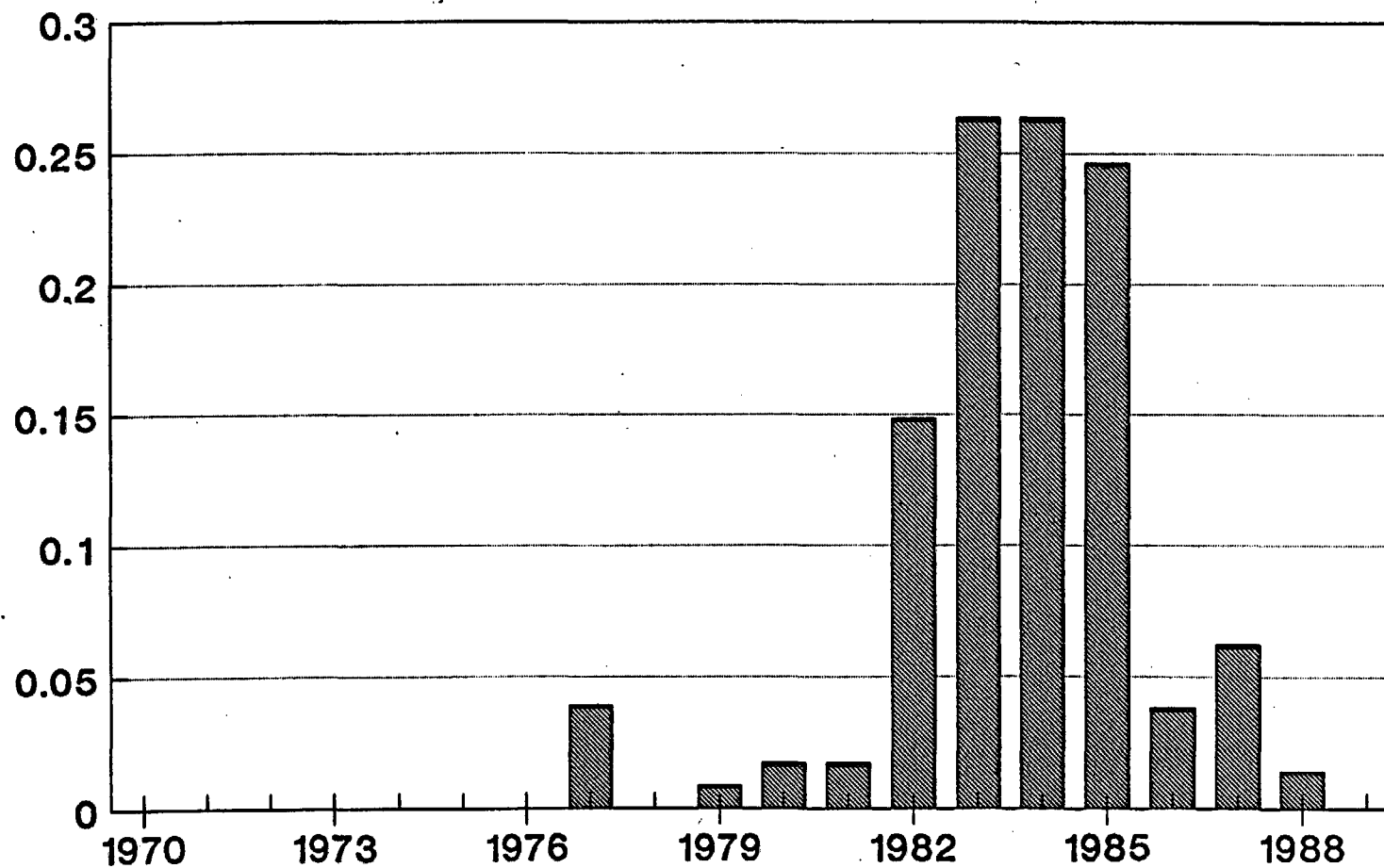
Internal calibration sources



activity in millicuries

TOTAL ACTIVITY FOR Ba-133 UNDER 10 CFR 32.14H

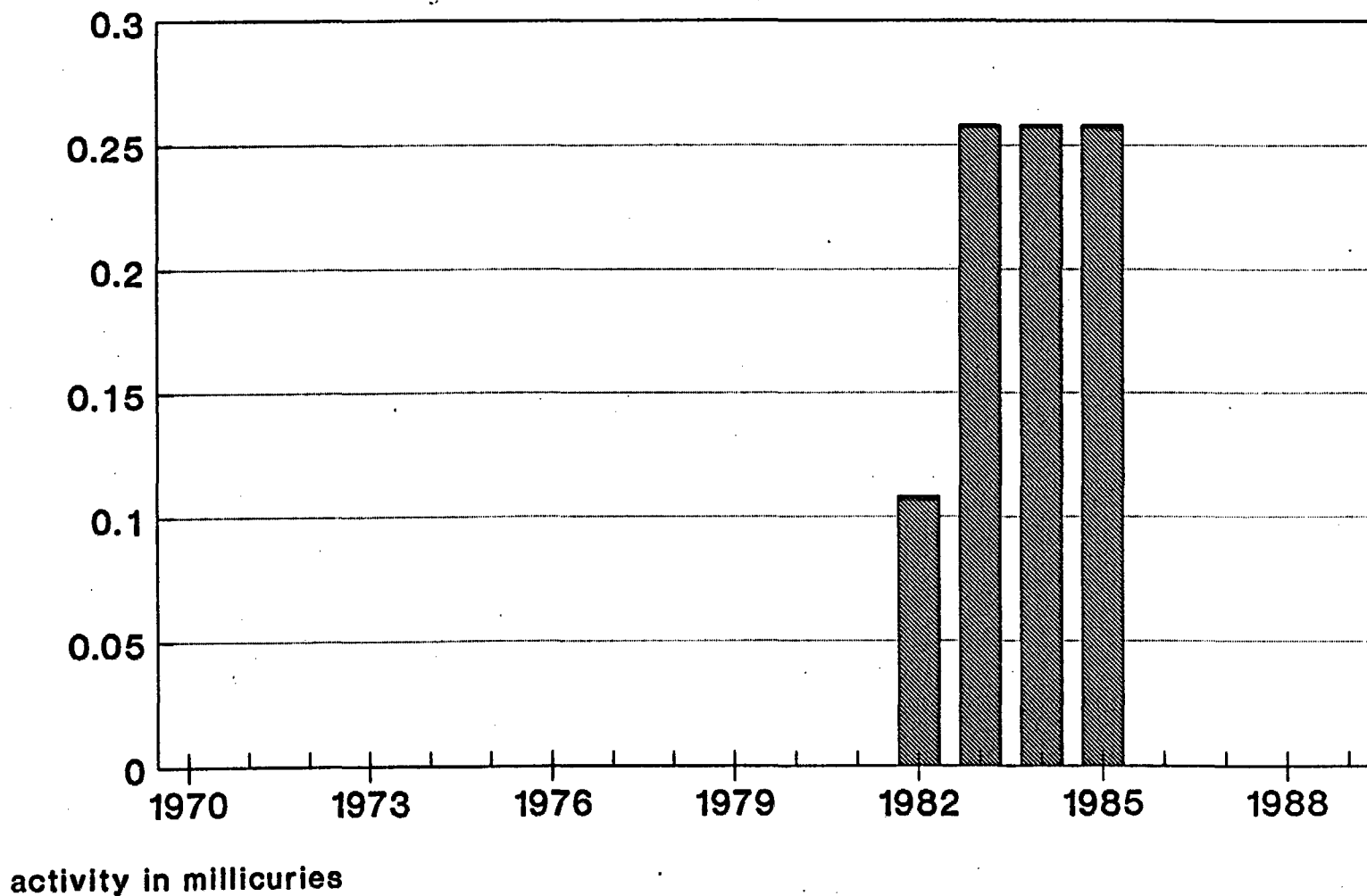
Internal calibration sources



activity in millicuries

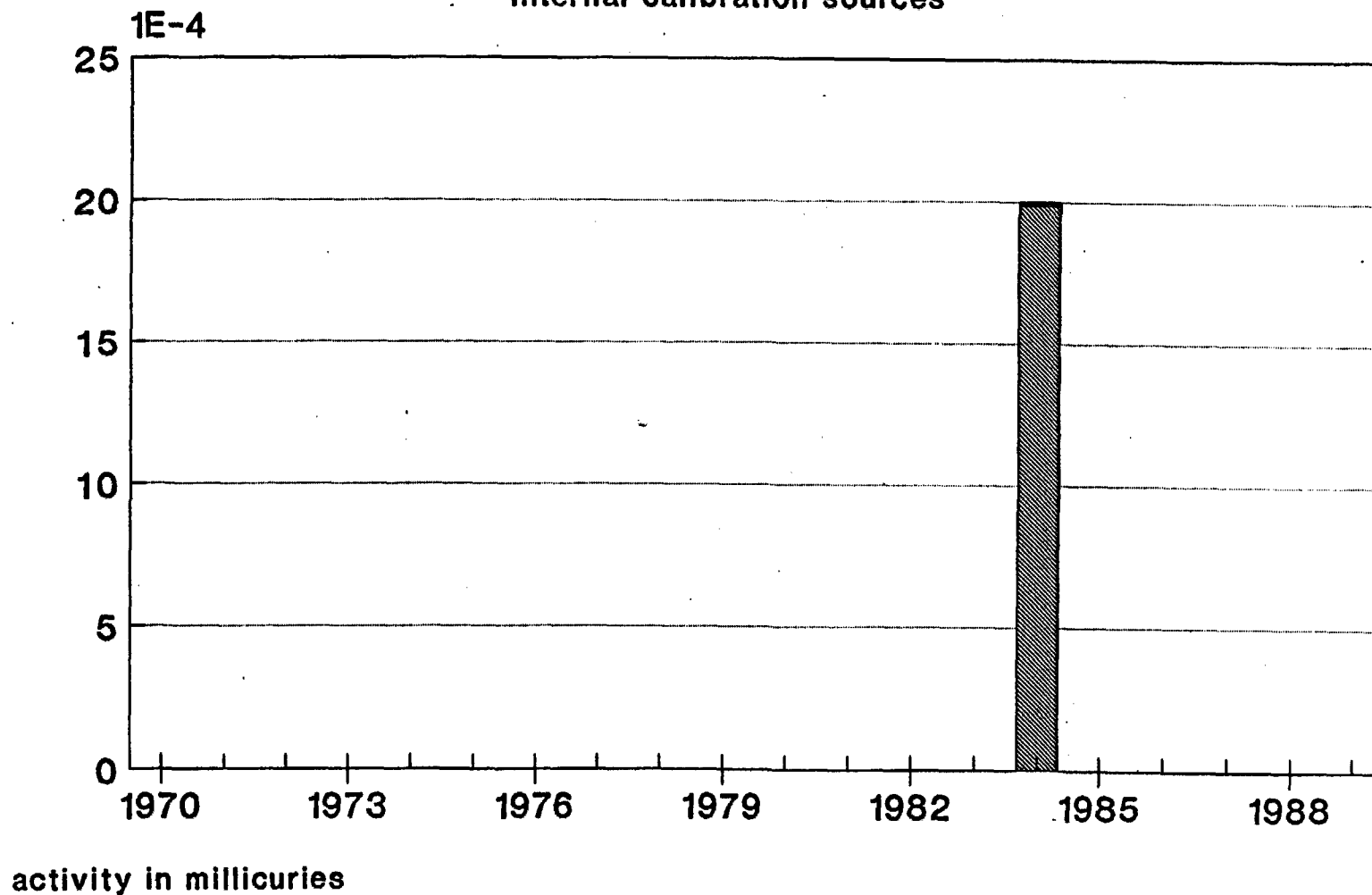
TOTAL ACTIVITY FOR CI-36 UNDER 10 CFR 32.14H

Internal calibration sources



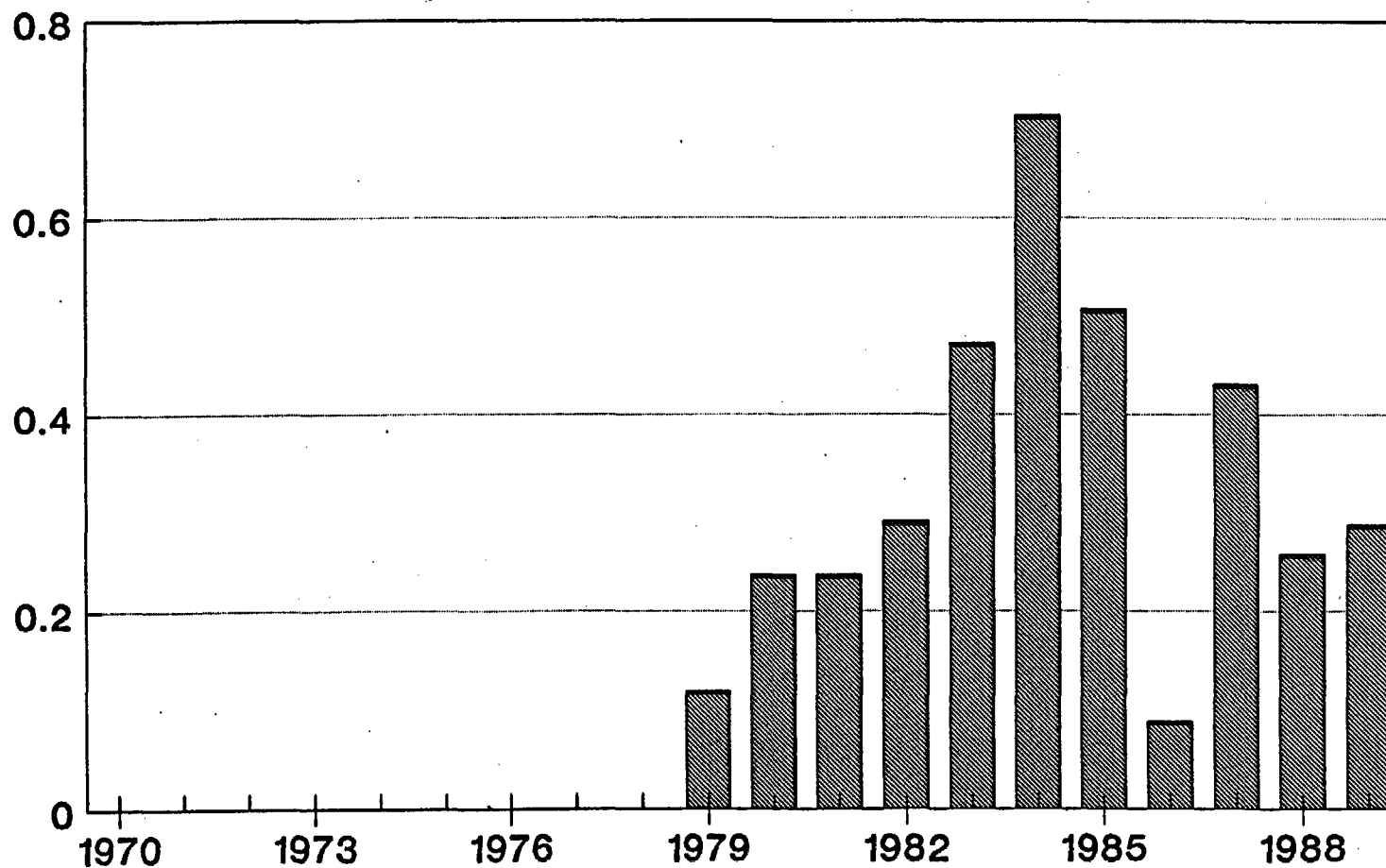
TOTAL ACTIVITY FOR Co-60 UNDER 10 CFR 32.14H

Internal calibration sources



TOTAL ACTIVITY FOR Cs-137 UNDER 10 CFR 32.14H

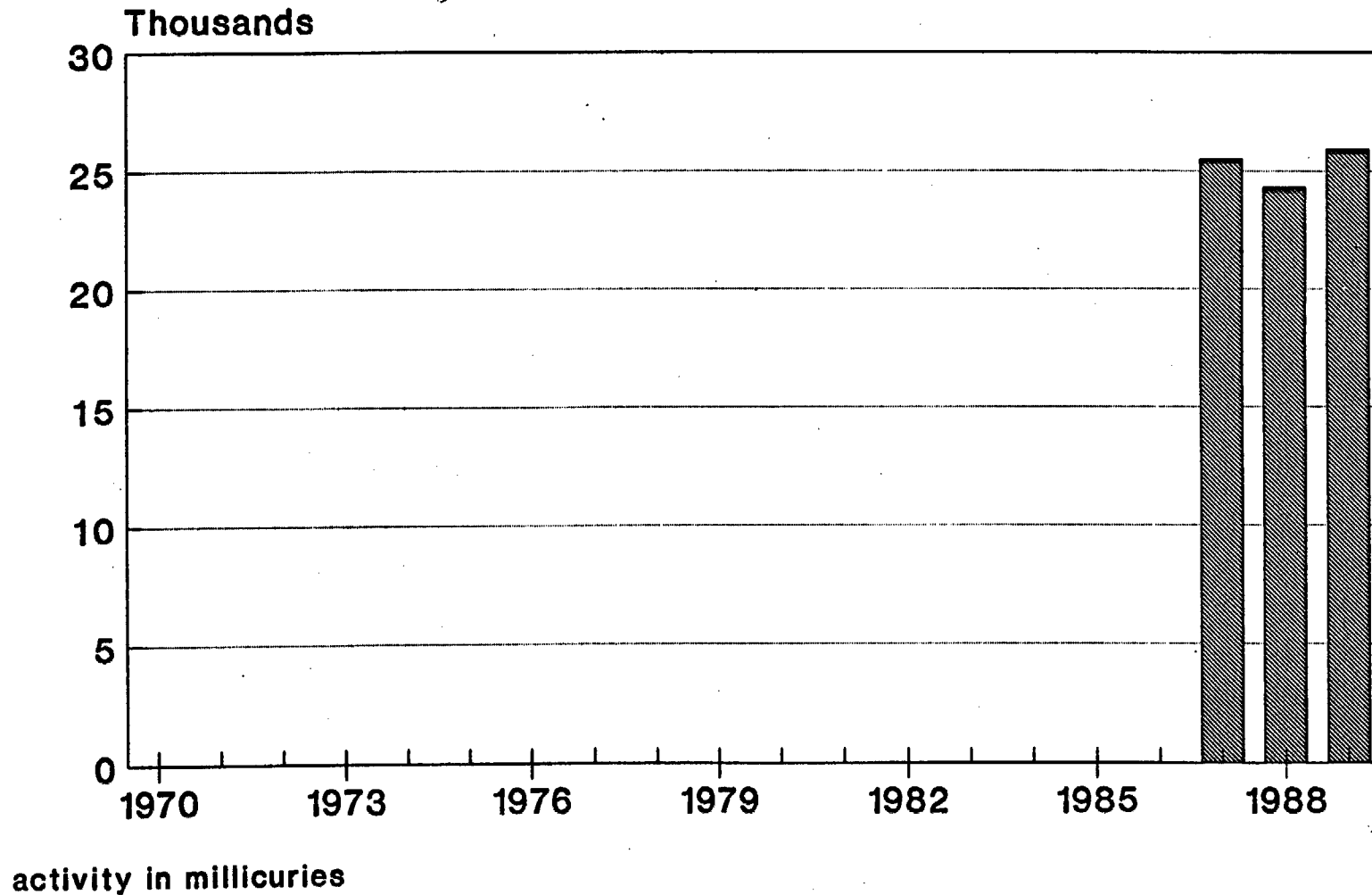
Internal calibration sources



activity in millicuries

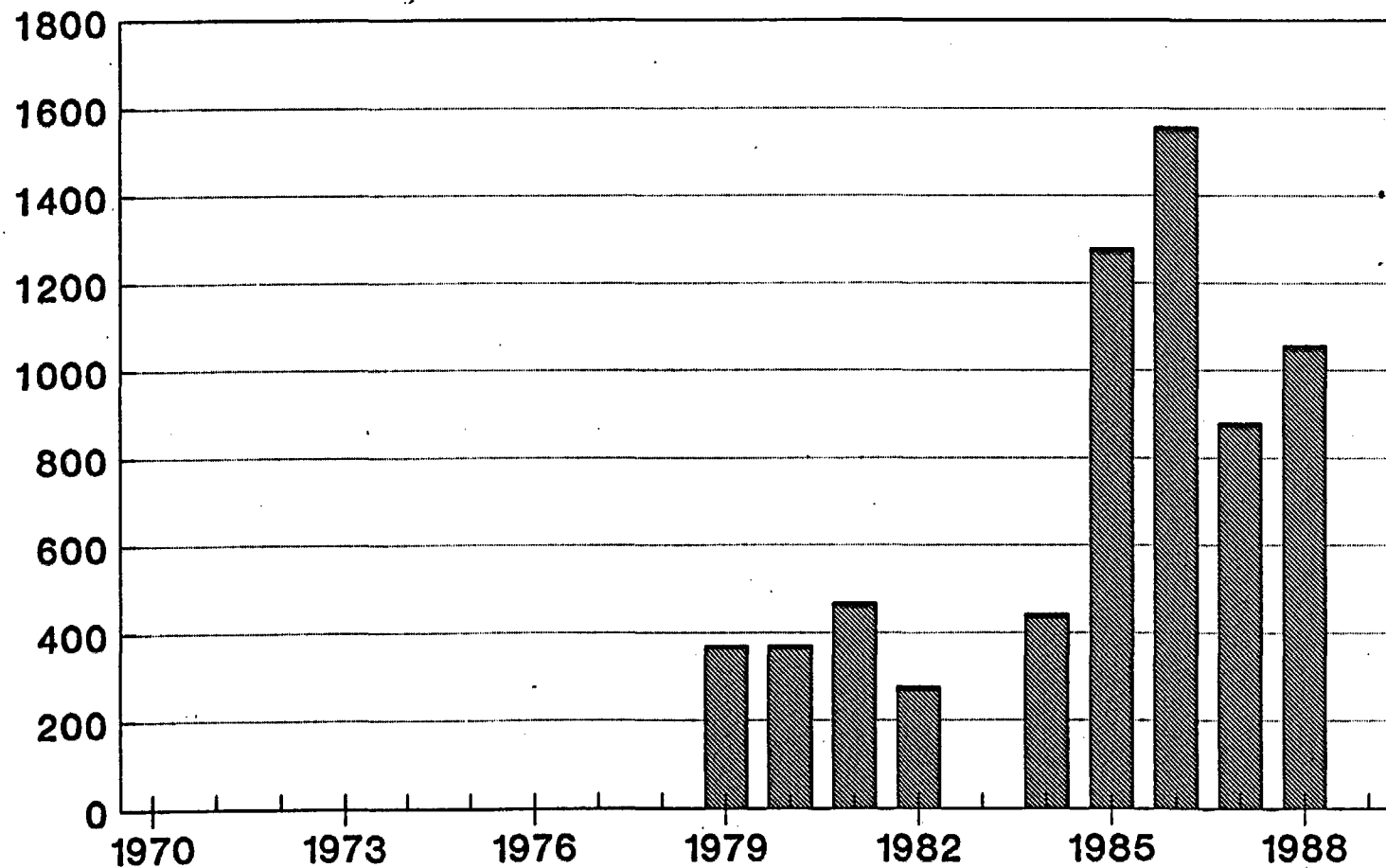
TOTAL ACTIVITY FOR H-3 UNDER 10 CFR 32.14H

Internal calibration sources



TOTAL ACTIVITY FOR Ni-63 UNDER 10 CFR 32.14H

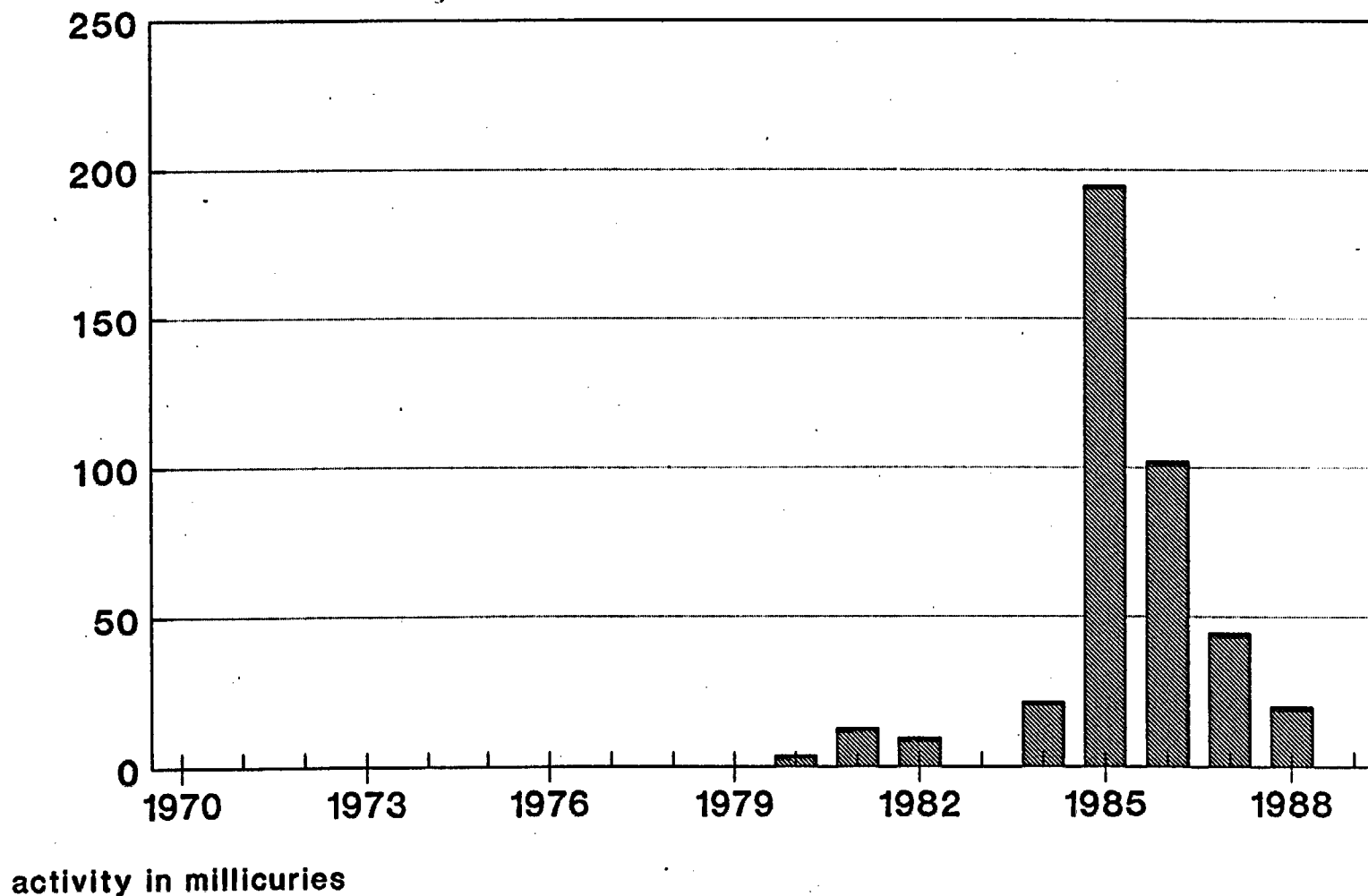
Internal calibration sources



activity in millicuries

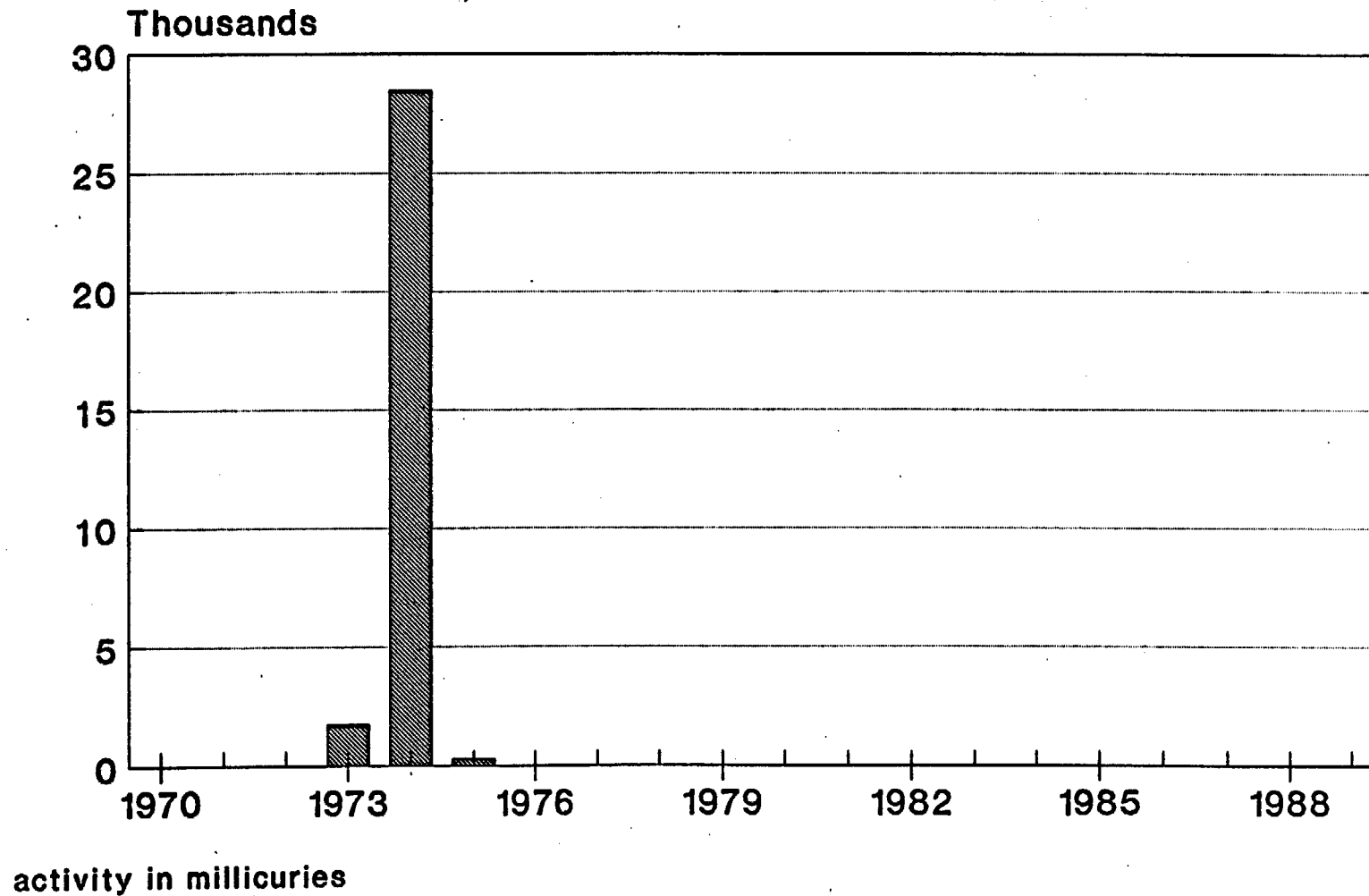
TOTAL ACTIVITY FOR Kr-85 UNDER 10 CFR 32.14H

Internal calibration sources



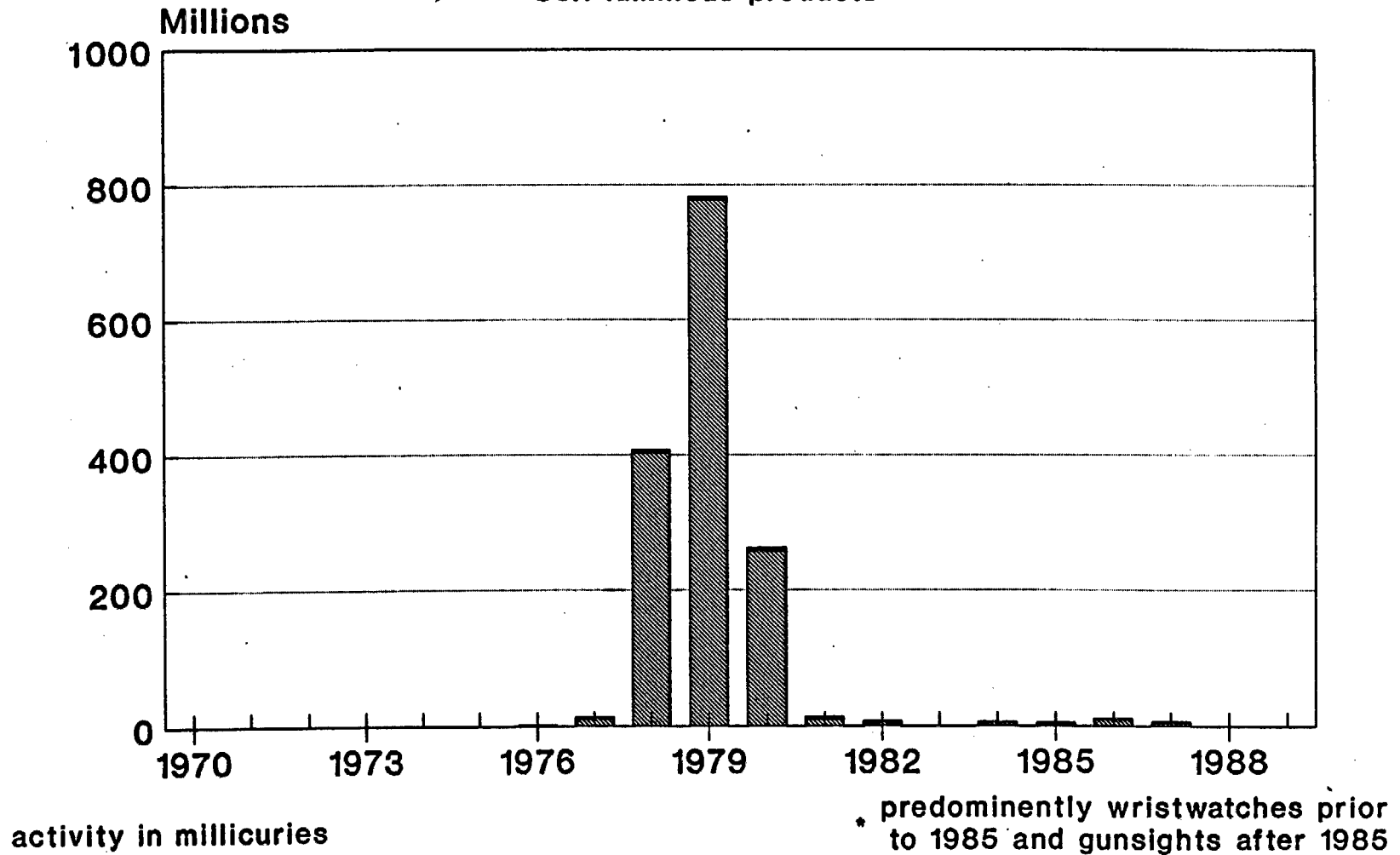
TOTAL ACTIVITY FOR Pm-147 UNDER 10 CFR 32.14H

Internal calibration sources



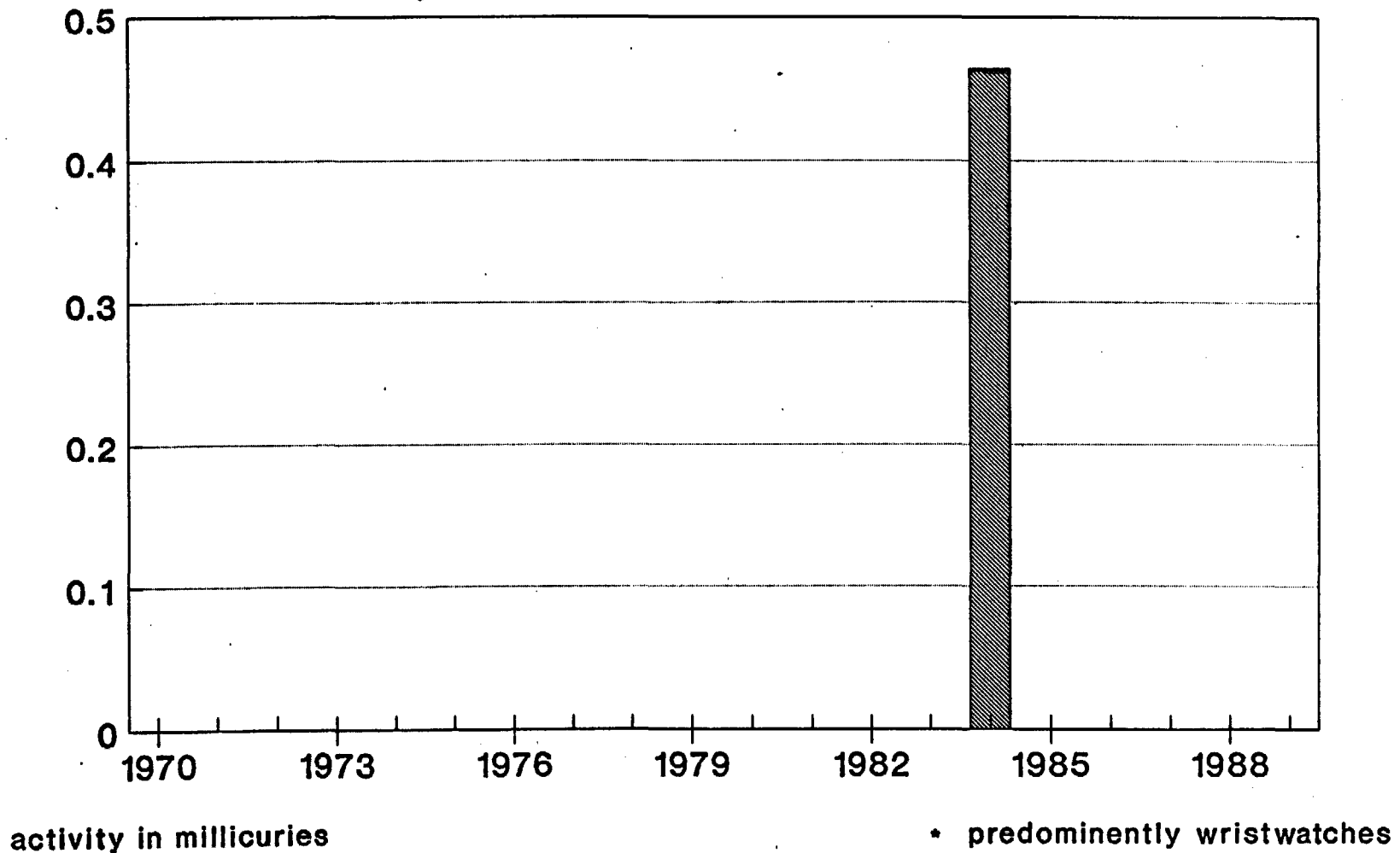
TOTAL ACTIVITY FOR H-3 UNDER 10 CFR 32.22

Self luminous products *



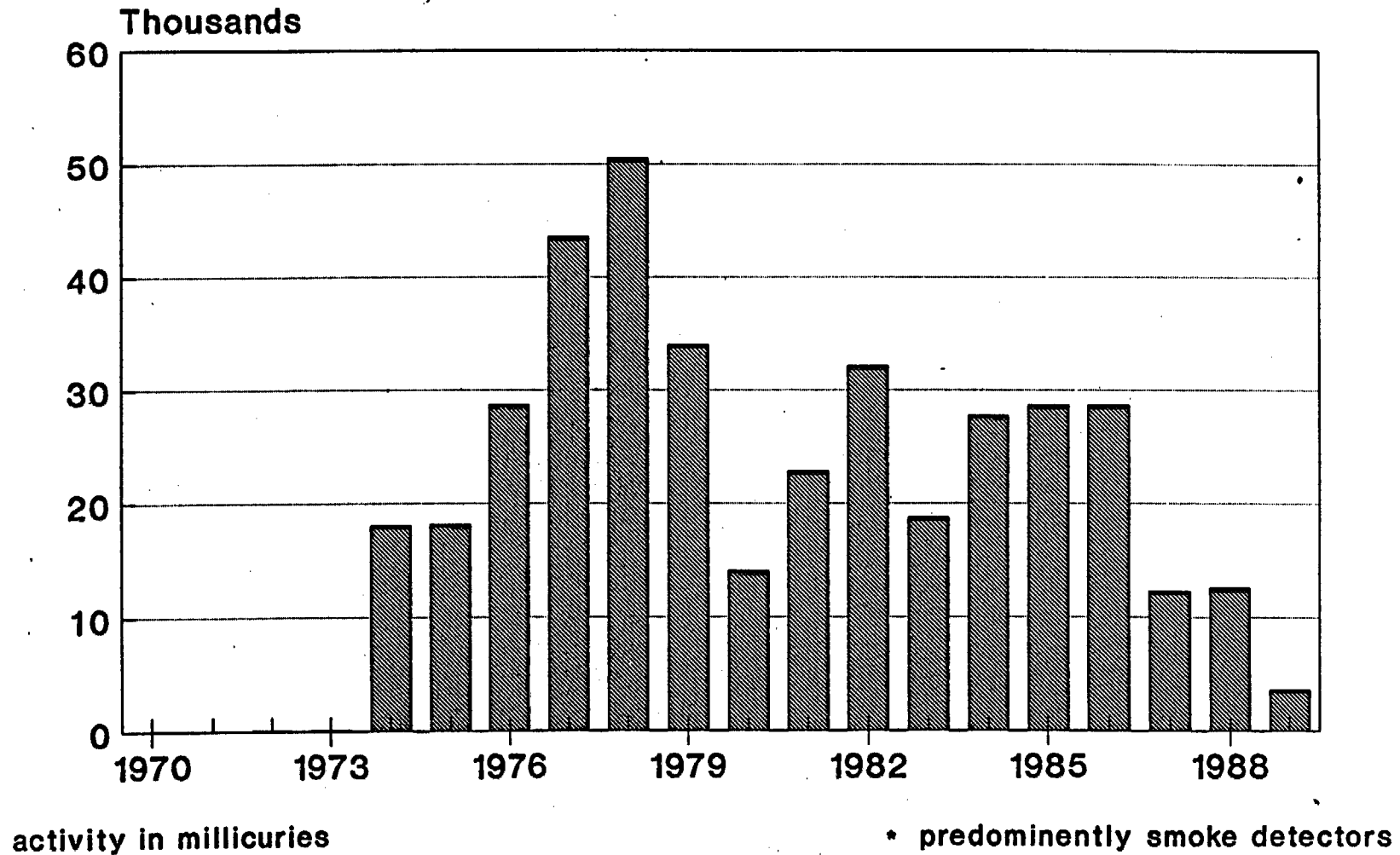
TOTAL ACTIVITY FOR Pm-147 UNDER 10 CFR 32.22

Self luminous devices •



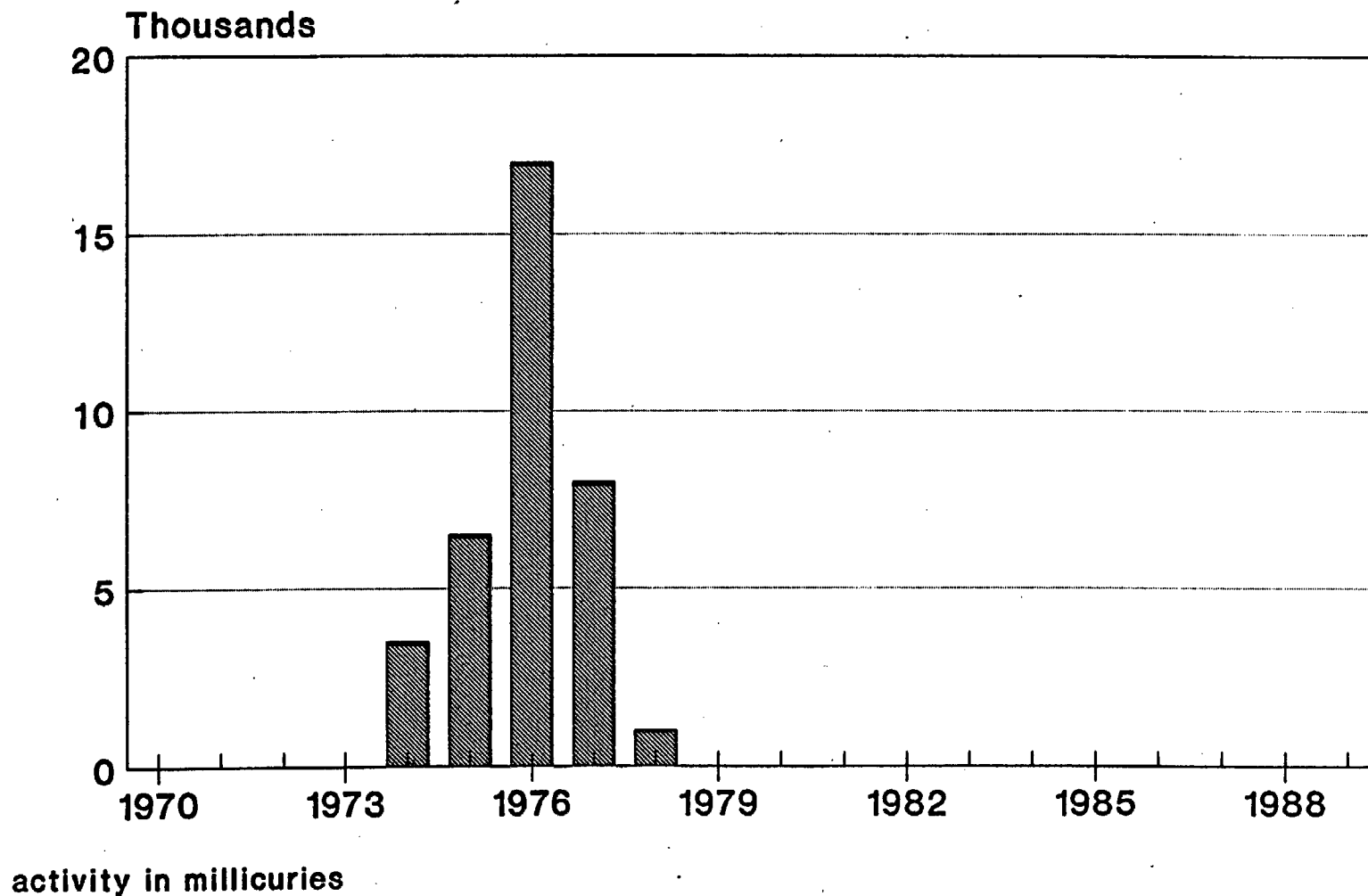
TOTAL ACTIVITY FOR Am-241 UNDER 10 CFR 32.26

Aerosol detectors *



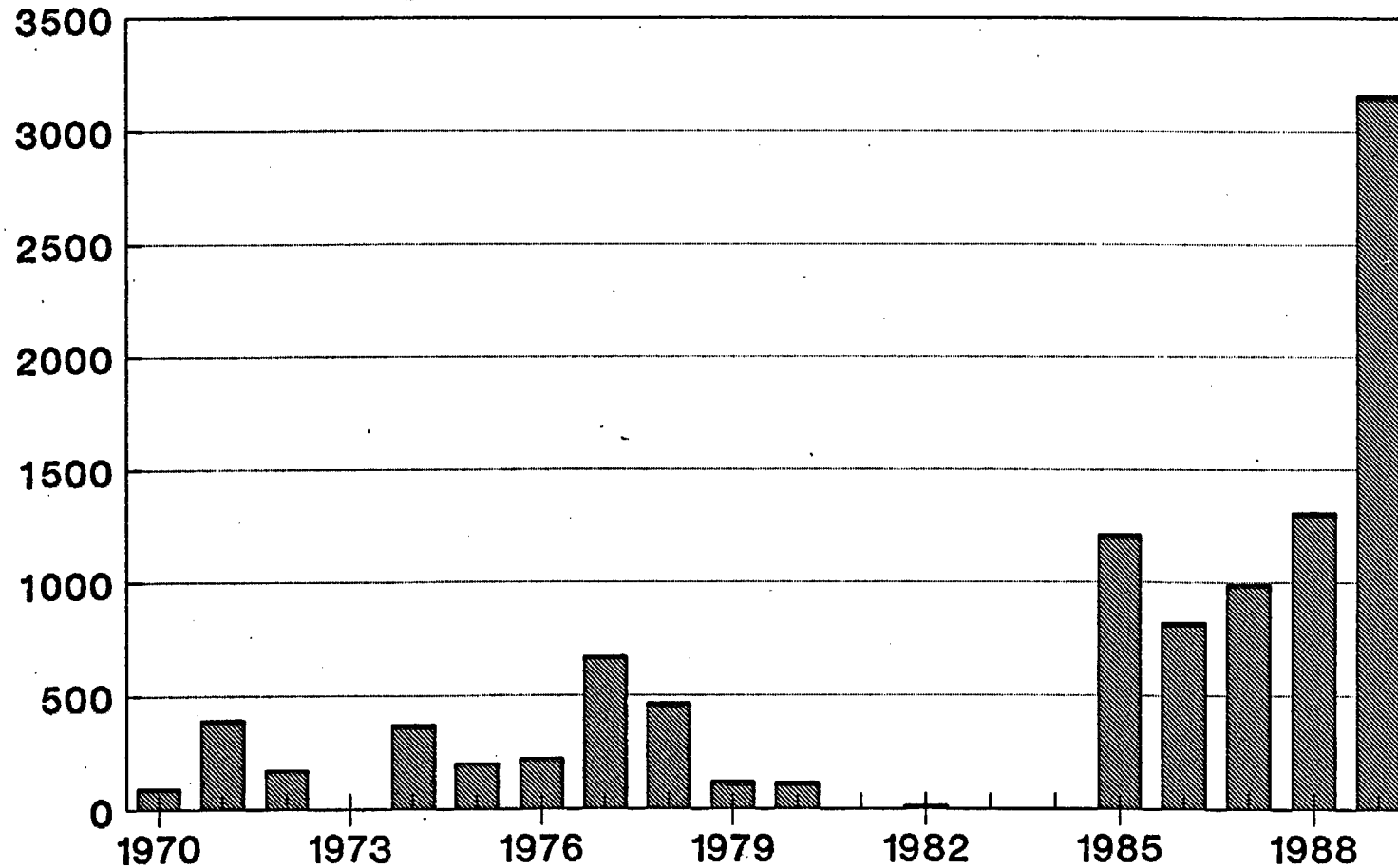
TOTAL ACTIVITY FOR H-3 UNDER 10 CFR 32.26

Aerosol detectors



TOTAL ACTIVITY FOR Ni-63 UNDER 10 CFR 32.26

Aerosol detectors *



activity in millicuries

* predominantly explosive vapor monitors

APPENDIX C

The major errors in the data, other than clerical, are those due to incomplete or missing distribution reports. Listed below are those years that data is missing for each of the licenses. Active licenses are listed first, followed by retired licenses. This consists of an estimated 28% of the data that should be present. Bearing this in mind, the data gives a fairly accurate view of the distribution of materials over the years.

In the lists, the columns labeled 'First Date' and 'Last Date' contain the earliest and latest record dates found in the database. The column labeled 'Years Missing' lists the years missing from the database between those first and last dates. The term 'NONE' indicates that there were no transfer records found in the database for that license and '86' in the 'Date Retired' column indicates that the license was retired on or before 1986.

ACTIVE

License Number	Date Issued	First Date	Last Date	Years Missing
01-17172-01E	1976	1977	1987	79,80,81
01-23735-01E	1988	NONE	NONE	
04-00720-07E	1977	1978	1988	
04-02624-03E	1973	1974	1987	80
Beckman 04-02624-04E	????	1977	1977	??
04-13468-01E	1969	1970	1989	83,84
General 04-14395-01E	1980	1982	1985	81
04-14395-02E	1988	NONE	NONE	9999
04-14886-01E	1973	1973	1983	
04-16762-01E	1975	1976	1986	80,83
04-16778-01E	1981	1981	1986	83
04-16982-01E	1976	1976	1989	84
04-17114-02E	1988?	NONE	NONE	??
04-17473-01E	1977	1977	1988	
04-17640-01E	????	1979	1982	??
04-17814-01E	????	1979	1984	??
04-19004-02E	1980	1980	1985	83
04-21357-01E	1984	1984	1988	
04-23311-02E	1984	NONE	NONE	
04-23500-01E	1984	1985	1989	
04-23504-01E	1985	NONE	NONE	
04-23594-01E	1986	NONE	NONE	
04-23692-01E	1988	NONE	NONE	
04-23699-01E	1987	NONE	NONE	
04-23738-01E	1989	NONE	NONE	
04-23759-01E	1989	NONE	NONE	
06-17085-02E	1977	1978	1989	88
06-20704-02E	19??	NONE	NONE	??
06-23696-01E	1988	NONE	NONE	
06-23763-01E	1989	NONE	NONE	
09-21481-02E	1989	NONE	NONE	
09-23730-01E	????	NONE	NONE	??
09-23745-01E	1989	NONE	NONE	
10-23513-01E	1985	NONE	NONE	
10-23654-01E	1986	NONE	NONE	
12-04933-06E	19??	1980	1989	??,82,83,84
12-09745-02E	1969	1970	1982	
12-12675-03E	1973?	1973	1988	??,76,77,78,83
12-12836-02E	1971	1972	1986	
12-15023-02E	1973	1976	1988	74,75,83
12-15537-02E	1975	1978	1989	76,77
12-16029-02E	19??	NONE	NONE	??
12-16244-02E	1974	1975	1984	
12-16856-01E	1976	1979	1989	77,78,83,84
12-17261-02E	1977	1979	1987	78
12-19060-02E	1978	1979	1988	84,85,86
12-19460-02E	1980	1980	1990	85
12-19544-02E	1981	1983	1986	82
12-21482-01E	1983	1983	1987	
12-21482-02E	1979?	1979	1984	??,83
12-23580-01E	1986	NONE	NONE	
12-23704-01E	1988	NONE	NONE	

12-23740-01E	1989	NONE	NONE	
12-23768-01E	1990	NONE	NONE	
13-02249-03E	1981	1982	1989	
13-03341-02E	1977	1979	1988	78,85
15-19986-01E	1982	1983	1989	84
17-00363-05E	19??	1983	1986	??
18-19750-02E	1974	1977	1986	75,76,80
18-23770-01E	1990	NONE	NONE	
19-00428-11E	1969	1970	1989	
19-14977-01E	1972	1972	1988	75,81
19-17348-01E	1977	1978	1984	81,83
19-23454-01E	1980	1984	1986	81,82,83
19-23643-01E	1986	NONE	NONE	
20-00320-14E	1972	1974	1987	73,83
20-02079-02E	1969	1970	1986	
20-02237-03E	1969	1971	1982	70
20-02804-03E	1986	1985	1986	
20-05520-04E	1975	1976	1984	79,80,81,82
20-07875-02E	1973	1973	1988	83,84,85
20-13270-02E	1969	1970	1989	
20-13881-02E	1971	1981	1986	71-80
20-15285-02E	1974	1976	1986	75
20-15525-02E	1973?	1974	1989	??,80,83,84
20-16532-02E	1983	1984	1987	
20-18145-01E	1978	1978	1988	80
20-20526-02E	1982	NONE	NONE	
20-20993-02E	1988	NONE	NONE	
20-21438-02E	1984	NONE	NONE	
20-23583-01E	1980	NONE	NONE	
20-23713-02E	1988	NONE	NONE	
21-19874-02E	1984	NONE	NONE	
21-23662-01E	1987	NONE	NONE	
21-24662-01	1986	NONE	NONE	
22-18199-02E	1981	1983	1984	82
24-00513-36E	1988	NONE	NONE	
24-06015-04	1981?	1982	1986	??
24-16379-01E	1976	1976	1987	
26-18033-01E	1978	1978	1989	
28-20851-01E	1985	NONE	NONE	
28-23568-01E	1986	NONE	NONE	
29-00139-06E	1976	1985	1986	76-84
29-01788-02E	1982	NONE	NONE	
29-06910-03E	1972	1974	1986	73,77
29-08864-04E	1969	1974	1982	70-73
29-12747-02E	1972	1973	1989	
29-13180-02E	1972	1971	1982	
29-13374-05E	1984	1985	1989	
29-15775-02E	1975	1976	1986	
29-19080-02E	1979	1986	1986	80-85
29-20609-02	1985	NONE	NONE	
29-23702-01E	1987	NONE	NONE	
29-23717-01	1989	NONE	NONE	
29-27805-01E	1986	NONE	NONE	
29-27907-01	1987	NONE	NONE	
29-28355-02E	1990	NONE	NONE	
30-23697-01E	1988	NONE	NONE	
30-23701-01E	1988	NONE	NONE	
30-23706-01E	1988	NONE	NONE	

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	30-23724-01E	1988	NONE	NONE	
	31-00615-02E	????	1975	1981	??
	31-01452-03E	1973	1974	1989	
Rolex	31-05997-02E	1961	1963	1989	62
Longines	31-07408-04E	1984	1986	1989	85
Bulova	31-07692-05E	1979	1979	1986	
	31-12593-02E	1984	NONE	NONE	
	31-15292-01E	1973	1973	1989	
	31-15819-01E	????	1983	1989	??
	31-15964-01E	1974	1976	1989	75
Helbrox	31-15993-01E	1974	1977	1979	75,76
	31-23515-01E	1985	1985	1989	
	31-23630-01E	????	NONE	NONE	??
	31-23705-01E	1989	NONE	NONE	
	31-23712-01E	1988	NONE	NONE	
	31-23721-01E	1988	1987	1988	
	32-16736-02E	1989	NONE	NONE	
	32-23499-01E	1985	NONE	NONE	
	32-23734-01E	1989	NONE	NONE	
	34-00054-07E	1969	1970	1989	77,83,84
	34-13477-03E	1980	1980	1989	
	34-17118-02E	1979	1980	1989	79
	34-17880-02E	????	1979	1983	??,82
	34-18156-02E	1988	NONE	NONE	
	34-18214-02E	1984	NONE	NONE	
	34-23627-01E	1986	NONE	NONE	
Victorinox	34-25957-03E	1988	NONE	NONE	
	35-17262-02E	1978	1978	1988	
	35-19956-03E	1989	NONE	NONE	
	37-00030-07E	1965	1970	1984	66,67,68,69
Wadsworth Research	37-02401-05E	1985	1985	1989	
	37-03572-08E	????	1983	1988	??,87
	37-11287-05E	1986	NONE	NONE	
	37-19629-03E	1981	1982	1985	
	37-23598-01	1986	NONE	NONE	
	37-28398-01E	1989	NONE	NONE	
	40-16545-01E	????	1976	1986	??
	41-14168-01E	1972	1972	1989	
	41-15597-01E	????	1974	1988	??
Lectrum	42-21454-01E	1984	1984	1988	
	42-23668-01E	1987	NONE	NONE	
	45-23698-01E	1988	NONE	NONE	
	45-23703-01E	1988	NONE	NONE	
	46-23247-01E	1986	NONE	NONE	
	48-20111-02E	1989	NONE	NONE	
	50-23596-01E	????	NONE	NONE	
	52-19336-02E	1980	NONE	NONE	
Unitime	55-14065-02E	????	1973	1987	??,83
	55-14833-02E	1977	NONE	NONE	
	55-16476-01E	????	1976	1983	??,81,82
Belair	55-23732-01E	1988	NONE	NONE	

RETIRE

License Number	Date Issued	First Date	Last Date	Date Retired	Years Missing
01-15494-01E		NONE		1978	
01-17738-01E		NONE		1978	
02-02624-03E					
02-15407-01E		1973	1975	1977	
02-16727-01E		1976	1981	86	
04-00720-02E		1970	1987	86	76,83
04-05241-09		1970	1971	86	
04-05664-02E		1978	1979	1982	
04-12377-01E		1970	1980	86	77,78,79
04-12402-01E		1970	1971	86	
04-12403-01		1970		86	
04-12420-01		1970		86	
04-12452-01		1970		86	
04-12574-01		1970		86	
04-12833-01		1970	1977	1978	
04-13846-01E		NONE		1970	
04-13847-01E		1971	1973	86	
04-13954-01E		1971	1976	1978	
04-14002-01E		NONE		86	
04-14838-01E		1972	1974	86	
04-15454-01E		NONE		1978	
04-15965-01E		1975	1976	1979	
04-15988-01E		1975		86	
04-16163-01E		1975	1978	86	
04-16302-01E		1975	1978	1979	
04-16456-01E		1977		1977	
04-16623-01E		NONE		86	
04-16948-01E		NONE		86	
04-16983-01E		1977		86	
04-17026-01E		1978		86	
04-17114-01E	1976	1977	1982	1986	79,80
04-17166-01E		1977	1978	1979	
04-17192-01E		1977	1978	1982	
04-17260-01E		1978	1979	86	
04-17352-01E		1977	1979	1982	
04-17370-01E		1979	1981	86	80
04-17463-01		NONE		1978	
04-17679-01E		1978		1986	
04-17827-01E		1978	1981	86	80
04-17890-01E		NONE		1978	
04-21245-01E	1983	NONE		1988	
04-21427-01E	1983	NONE		1988	
04-23311-01E		1984	1989	1989	
04-23547-01E	1985	1985		1988	
05-13943-01E		1971	1981	86	
05-15863-01E		1975	1979	86	
05-16698-01E		1976	1979	86	
05-18258-01E		1979		86	
05-23512-01E	1985	NONE		1990	
06-07984-02E		1974	1981	1989	80

06-08185-02E		1963	1983	86	66
06-08185-05E		1978	1982	86	
06-08185-06E		1971	1981	1984	
06-12458-01E		1970	1973	1977	
06-12458-03E		1978		1980	
06-12461-01		1970		86	
06-12573-01E		1970	1979	86	
06-13373-01E		1970		86	
06-15214-02E		1074	1977	1978	
06-15796-03E		1975	1982	86	
06-15809-02E		1970	1975	86	
06-16132-02E		NONE		86	
06-17292-02E		1978	1979	1980	
06-17810-02E		1979		1984	
06-18069-02E	1978	1978	1983	1989	
08-00566-05E		1970	1981	1986	
08-00566-13E		1979	1983	1986	81
08-23604-01E	1987	NONE		1990	
09-17650-01E	1985	1978	1982	1988	
09-18293-01E		1979		1980	
09-21142-01		NONE		1987	
09-21344-01E	1983	NONE		1988	
09-21481-01E	1984	1985	1989	1989	
10-09653-01E		1970	1978	1979	
10-12408-01E		1970	1978	1977	
10-17090-01E		1977	1980	86	
10-19289-01E		1980	1983	86	82
12-00140-04		1970	1985	1986	72,77,79,80,83
12-00140-04E		1982	1985	1985	
12-00369-04E		1973	1979	86	
12-00369-05E		1972	1979	1979	
12-00621-05E		1972	1981	1975	80
12-02612-04		1970	1971	86	
12-02748-04E		1970	1981	86	
12-02748-06E		1977	1981	86	
12-03231-02E	??	NONE		86	
12-04933-05E		1972	1974	86	
12-05675-03E		1970	1981	86	
12-06661-02E		1973	1988	1989	82-86
12-09605-03E		1970	1971	86	
12-09695-02E		1970	1979	1978	74,74,77,78
12-09700-01	??	NONE		86	
12-09911-01E		1970	1975	1979	
12-10423-02E		1970	1979	1979	
12-11063-04		1971	1974	86	
12-11166-02E		1070	1981	86	76
12-12267-03E	1973	1974	1986	1989	
12-12333-01E		1970	1976	86	
12-12603-01		1970	1971	1973	
12-12687-01E		1968	1986	1990	70
12-12836-08E	1980	1987	1989	1990	
12-13837-01		1975	1978	1986	76
12-13978-01E		1971	1973	1986	
12-14960-01E		1973		86	
12-15641-02E		1974	1978	86	
12-15880-02E		1976	1982	86	
12-15951-01E		1974	1977	1979	
12-16029-01E		1976	1985	1989	80

12-16676-02E		1977	1989	1990	
12-18079-01E		1979		86	
12-18379-01E	1979	1979	1982	1983	80
12-18379-02E		1979	1981	86	
12-19879-02E	1983	1984	1987	1990	
12-20418-02E	??	NONE		1990	
12-21478-01	1984	NONE		1989	
12-23570-01E	1986	NONE		1990	
12-23686-01E	1987	NONE		1990	
13-00155-11	??	NONE		86	
13-03102-03		1974	1978	1981	77
14-14168-01E		1985			
16-17089-01E		1978		1980	
16-19058-01E	1979	NONE		86	
17-00363-04E		1979	1982	86	
19-13377-01E		1970	1971		
19-15849-01E	1973	1975	1976	1978	
19-16902-01E	1976	1977	1978	1981	
19-17694-01E	??	NONE		86	
19-18042-01E		1979	1980	1980	
20-00277-06E		1974	1986	1989	80-83
20-00277-07E					
20-01896-04E		1970	1979	86	
20-01896-05E					
20-02804-02E		1976	1981	1986	
20-12960-03E		1974	1983	86	80,81,82
20-13386-02E	1980	1981	1982	86	
20-13482-01E		1974	1976	1978	
20-14069-01E	1971	1971	1979	1981	73,74
20-15134-02E	??	NONE		1978	
20-15464-05		1985	1989	1990	
20-15515-02E		1986			
20-15744-01E		1974	1975	86	
20-15930-02E	1974	1975	1983	1984	
20-16039-02E	??	NONE		86	
20-16059-02E	1975	1979	1982	1984	
20-16171-02E		1978		1978	
20-17584-02E		1978	1980	86	
20-18116-02E		1978	1980	86	
20-18386-04E	1983	1981	1985	1990	
20-21229-01		1985		86	
21-00182-06E		1977	1982	1987	
21-04811-05		1970	1974		
21-12192-01		1972	1987	1986	73,75,76,78,80-84
21-12430-01E		1971	1973	86	72
21-15297-02E		1974	1981	86	
21-23621-01E	1986	NONE		1990	
22-00057-37E		1972	1977	1979	
22-00057-55E		1978	1979	86	
22-01870-10E		1970	1972	86	
22-01870-14E		1976	1981	1990	
22-01870-17E		1976	1983	86	
22-13838-02E		1972	1982	86	
22-17541-03E		1978		86	
22-20334-01	1983	1984		1988	
22-23395-01	1984	NONE		1989	
23-17569-02E	1983	NONE		1988	
24-01113-14		1970	1984	86	81,82

24-06015-03E		1970	1981	1984	
24-10452-01	??	NONE		86	
24-12517-01E		1971	1978	1978	
24-16931-02E		1978	1981	86	
26-15156-01E		1973	1978	1978	
26-17445-01E	1977	1978	1980	86	
26-17445-02E	1984	NONE		1989	
29-00018-05E		1973	1987	1988	75,79
29-00055-02		1975	1981	86	80
29-00134-06E		1977	1982		
29-01699-05E		1970	1971	86	
29-01818-02E		1976	1979	86	
29-04459-02E		1971	1979	86	
29-04563-03	1985	NONE	1986		
29-09801-03E		1983	1987	1987	
29-09801-04E	1985	NONE		1988	
29-13374-04E		1970	1982	86	79
29-13377-01E		1975	1980	86	
29-13915-04E		1978	1988	1988	
29-14930-02E	1977	1978	1980	86	
29-14967-03E	??	NONE		1978	
29-15830-03E	1978	NONE		1980	NO TRANSFERS MADE
29-17180-02E		1979		86	
29-17399-02E		1978	1979	86	
29-17857-02E	??	NONE		86	
29-17864-01E		NONE		1980	NO TRANSFERS MADE
29-21225-01	??	NONE		86	
30-00692-06E		1973	1982	1987	
30-17077-01E		1978	1980	86	
31-02612-05E		1970	1983	1987	74,75
31-03334-09E		1971	1977	1979	
31-03572-07E	??	NONE			
31-07408-03E		1970	1982	86	
31-07673-01E		1970	1979	86	77
31-07692-02E		1970	1976	86	
31-07692-03E		1970	1980	1978	
31-07692-04E	1978	1979		1990	
31-07815-01E		1970	1977	86	
31-07887-01E		1970	1978	1978	
31-08263-02E		1972	1976	86	
31-09187-01E		1970	1976	1977	73
31-09690-02E		1970	1971	1978	
31-09996-01		1970		86	
31-10160-01E		1970	1980	86	
31-10569-01E		1970	1980	1985	
31-10606-01E		1970	1979	86	
31-11076-01E		1970	1980	1990	
31-11713-01E		1970	1976	1978	72
31-12079-01		1970		1974	
31-12131-01		1970	1971	1974	
31-12131-01E		1970	1971	1974	
31-12268-01		1970		86	
31-12268-01E		1970		86	
31-12415-01		1970		86	
31-12484-01E	1963	1968	1986	1990	
31-12487-01E		1970	1979	86	78
31-12490-01E		1973		1977	
31-12539-01		1971		1972	

31-12553-01E		1971	1972	1977	
31-12593-01E		1970	1983	86	82
31-12593-02E	1984	1984	1989	1989	
31-12601-01		1970		1973	
31-12656-01		1970		1973	
31-12794-01E	??	NONE		86	
31-12982-01		1970	1973	1973	
31-13209-01		1971	1972	1974	
31-13272-01		1970		86	
31-13372-01E		1970	1986	1990	73,81-84
31-13375-01E		1970	1975	86	72-74
31-13556-01E		1970	1978	1978	73-75
31-13794-01	??	NONE		86	
31-14851-01E		1977	1982	1988	
31-14926-01E		1972	1973	1977	
31-14943-01E		1973	1981	86	78,79
31-15352-01E		1973	1974	1976	
31-15706-01E		1974	1981	86	
31-15811-01E		1975	1983	1989	
31-15976-01E		1974		86	
31-16416-01E		1976	1979	1980	
31-16640-01E		1976	1978	1978	
31-16702-01E		1976	1981	86	
31-16951-01E		1977		1977	
31-17091-04E	??	NONE		1978	
31-17459-01E		1978		86	
31-17748-01E		1978		86	
31-18056-01E		1978	1979	1979	
31-18366-01E	??	NONE		1984	
31-19796-01E		1985	1986	1986	
31-21048-01	1983	1983	1988	1988	
31-24822-01E	1987	NONE		1990	
32-16736-01E		1976	1986	1986	
32-16823-01E		1976	1982	86	
32-23564-01E	??	NONE		1986	
32-23630-01E	??	NONE			
34-00486-08E		1970	1979	86	
34-00486-12E	1985	NONE		1990	
34-00583-07E		1976	1978	86	
34-00811-03		1971	1983	86	73
34-06838-05		1976	1979	86	77,78
34-15313-02E	1972	1973	1979	1979	
34-17992-03E	??	NONE		86	
35-13559-01		1981		86	
35-13559-02E		1971	1976	86	72,73
35-19956-02E	1982	1986		1987	
36-11033-12E		1974	1979	1978	
37-01861-05		1978	1982	86	
37-03572-02E		1971	1980	86	
37-03572-03E		1971	1972	86	
37-03572-07E	??	NONE		1978	
37-04764-02E		1970	1984	1990	76
37-09385-01E		1970	1984	1987	80
37-10060-02E		1970		86	
37-11311-02E	??	NONE		86	
37-12844-03E	??	NONE		1979	
37-15810-02E		1978		86	
37-16174-02E		1976	1982	86	79

37-17035-02E	??	NONE		1982	
37-23446-01E	??	NONE		1989	
39-17673-01E		1979	1980	86	
41-11468-01E		1984			
42-00553-03		1971	1973	86	
42-01688-05E	??	NONE		1977	
42-01688-07E		1978	1980	1987	
42-07432-03E		1974	1982	86	77
42-11062-03E		1976	1978	1978	
42-15004-01E	1972	1972	1978	1983	
42-15556-01E		1975	1979	86	
42-16322-02E		1978	1980	86	
42-16741-01E		1976	1979	1980	
42-17456-01E	??	NONE		86	
42-18135-01E		1979	1981	86	
42-18200-01E	??	NONE		86	
42-19366-01E	??	NONE		86	
42-19871-01E	??	NONE		86	
43-14991-02E		1978	1980	1982	
45-13733-03E		1973	1975	86	
45-19138-01E	??	NONE		86	
46-17879-01E	??	NONE		86	
48-14075-02E	1976	1978	1987	1987	83,84
48-16514-02E		1976	1978	86	
48-17407-02E	1977	1978	1979	1980	
50-12578-02	??	NONE		86	
52-13159-01E		1970	1980	86	76
52-13554-01	??	NONE		86	
52-15968-03E		1975	1985	86	81-84
55-13999-01E		1971	1980	1981	76
55-14019-01E		1971	1981	1981	79,80
55-14019-02	??	NONE		86	
55-14028-01E		1978	1979	1981	
55-14833-01E		1971	1981		
55-14982-02E		1973	1981	1977	
56-12661-01E		1974		86	
56-14143-01E		1973	1975	1976	
CA 0164-07		1980	1988	1988	87
CA 2820-59E		1986	1987	1989	

**Instructions for Using the Exempt
Distribution Database (ELI)**

- I. Getting everything from 3.5" diskette to a fixed disk
- A. Copy all diskettes to the directory on the fixed disk that contains dBASE III PLUS. Do not put in a subdirectory under the dBASE III PLUS directory.
 - B. Remove the diskettes and store them in a safe place with the write protect on. It is recommended to make working copies of the database diskettes. Save changes to the database to the working copy, then check the copy you just made on the diskette to make sure the file is correct. Then, use the working copy to update the original database diskettes. REMEMBER - if the database in the computer fails and you save it to the original database diskette without checking it first, you may have destroyed the original database. ALWAYS HAVE TWO COPIES OF YOUR DATABASES ON TWO SEPARATE DISKETTES.

II. IMPORTANT ---

- * Use uppercase at all times unless specified.
- * Enter isotopes in the following format:
Make the first letter uppercase and any following letters lowercase (i.e. Am-241, Ba-133, Co-60, ...).
- * The letter in the license number must be uppercase.

III. Explanations of the database files (see Appendix A)

A. Main databases

1. The active license numbers are found in the ACTIVE.DBF file. It is indexed on ACTNUM.NDX (sorted by license number), ACTNAME.NDX (sorted by licensee name), and ACTREG.NDX (sorted by regulation category).
2. The retired license numbers are found in the RETIRED.DBF file. It is indexed on RETNUM.NDX (sorted by license number), RETNAME.NDX (sorted by licensee name), and RETREG.NDX (sorted by reg. cat.).
3. The main databases contain pertinent company information. The fields are ...

Structure for database:
Number of data records:
Date of last update :

Field	Field Name	Type	Width	Dec
1	LICENSEE	Character	80	
2	ADDRESS	Character	43	
3	CITY	Character	30	
4	NUMBER	Character	15	
5	PRODUCT	Character	60	
6	REGCAT	Character	10	
7	COUNTRY	Character	15	
8	COMMENT	Character	80	
9	NEED	Character	65	
10	ISSUDATE	Character	5	
11	LASTDATE	Character	5	
12	RETDATE	Character	5	
** Total **			414	

B. Auxiliary databases

1. The active license numbers are found in the ACTAUX.DBF file. It is indexed on ACTXNUM.NDX (sorted by license number).
2. The retired license numbers are found in the RETAUX.DBF file. It is indexed on RETXNUM.NDX (sorted by license number).
3. The auxiliary databases contain the yearly isotope information reported by the company. The fields are...

```

Structure for database:
Number of data records:
Date of last update   :
Field  Field Name      Type      Width  Dec
1  ISOTOPE             Character  10
2  UNITSOLD            Character  15
3  NUMBER              Character  15
4  TOTACT              Character  15
5  YEARSOLD            Character  5
6  REGCAT              Character  10
** Total **           71

```

IV. Accessing the program

- A. Color monitor - at the system prompt, type LICCHG
B. Monochrome monitor - type LICCHGBW

V. Using the program

- A. Enter the license number.**

LICENSEE INFORMATION SYSTEM

TYPE LICENSE NUMBER:

PRESS RETURN ON BLANK FIELD TO QUIT

B. If entered incorrectly or the license number has not previously been entered into the main database, the screen below will appear. If the license number is not already in the main database, it must be entered through dBASE III PLUS.

LICENSEE INFORMATION SYSTEM
TYPE LICENSE NUMBER: 20-00277-02E
*** RECORD NOT FOUND ***
PRESS "T" TO TRY AGAIN OR "Q" TO QUIT Q

C. If a recognized license is entered, the following screen will appear. Review the data. Answer Y to edit the existing data or N to proceed to the isotope data.

LICENSEE INFORMATION SYSTEM
TYPE LICENSE NUMBER: 20-15525-02E
LICENSEE: ION TRACK INSTRUMENTS, INC.
ADDRESS: 109 TERRACE HALL AVE
CITY, STATE, ZIP: BURLINGTON, MA 01803
PRODUCT: GAS AND EXPLOSIVE DETECTORS
REGULATION CATEGORY: 32.26
MANUFACTURED IN:
COMMENTS: DATA FOR 74-89
EDIT DATA (Y/N)? N

D. Choose to EDIT existing isotope data or to APPEND new isotope data. To return to the program to the first screen, choose QUIT.

LICENSEE INFORMATION SYSTEM
LICENSE NUMBER: 20-15525-02E
ISOTOPE DATA ROUTINE
1) EDIT DATA
2) APPEND DATA
3) QUIT

E. EDIT screen: Use help menu at top of screen to manipulate data in the window. BE CAREFUL; watch the license number field, the data will move into other license numbers.

CURSOR	<-- -->	Field:	UP	DOWN	Char:	DELETE	Insert Mode:	Ins
Char:	-	Field:	↑	↓	Char:	Del	Exit/Save:	End
Field:	Home End	Page:	PgUp	PgDn	Field:	Y	Abort:	Esc
Pan:	-	Help:	N/A		Record:	U	Memo:	Home

ISOTOPE	H-3
UNITSOLD	6
NUMBER	20-15525-02E
TOTACT	3500
YEARSOLD	1974
REGCAT	32.26
MOVE	Y

F. APPEND screen: will enter only data for the license number shown at the top of the screen.

<div>LICENSEE INFORMATION SYSTEM</div> <div>LICENSE NUMBER: 20-15525-02E</div>	
<div>ISOTOPE:</div> <div>UNITS SOLD:</div> <div>TOTAL ACTIVITY:</div> <div>YEAR SOLD:</div> <div>REGULATION CATEGORY:</div>	
<div>TYPE IN ISOTOPE DATA AND PRESS RETURN KEY</div>	

G. Function keys can be used when entering data. They are...

EXEMPT DISTRIBUTION - CHANGE LICENSEE'S DATA PROGRAM									
F2	F3	F4	F5	F6	F7	F8	F9	F10	
Am-241	Cs-137	H-3	Kr-85	Ni-63	32.11	32.14	32.18	32.22	

Appendix A - Breakdown of database files

Active database files -

database

ACTIVE

index

ACTNUM

ACTNAME

ACTREG

sorted by

license number

license name

reg. category

ACTAUX

ACTXNUM

license number

Retired database files -

RETIRED

RETNUM

RETNAME

RETREG

license number

licensee name

reg. category

RETAUX

RETXNUM

license number