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September 30, 1968

SECRETARIAT

AEC-R 30/ES

PROPOSED AMENDMENTS TO 10 CFR PARTS 30 AND 32
CLASS EXEMPTION OF BYPRODUCT MATERIAL IN
GAS AND AEROSOL DETECTORS

Note by the Secretary

The Director of Regulation has requested that the attached report by the Director of Radiation Protection Standards be circulated for consideration by the Commission at an early date.

W. B. McCool

Secretary

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ATOMIC ENERGY COMMISSION

PROPOSED AMENDMENTS TO 10 CFR PARTS 30 AND 32

CLASS EXEMPTION OF BYPRODUCT MATERIAL IN GAS AND AEROSOL DETECTORS

Report to the Director of Regulation
by the Director of Radiation Protection Standards

THE PROBLEM

1. To consider proposed amendments to 10 CFR Parts 30 and 32 which would (a) exempt from licensing requirements the possession and use of byproduct material contained in gas and aerosol detectors, and (b) establish requirements for the issuance of specific licenses authorizing the distribution of gas and aerosol detectors for possession and use under the exemption.

BACKGROUND AND SUMMARY

2. We have received three petitions^{1/} to exempt from licensing requirements three different byproduct materials in smoke detectors for use in fire detection and fire protection systems. The proposed class exemption for gas and aerosol detectors in Appendix "A" is intended to satisfy these petitions and to provide for specific licenses for manufacture, import, or transfer of these detectors and other detectors of gases and aerosols incorporating radionuclides for use on a license exempt basis. This class exemption for gas and aerosol detectors is like the class exemption for luminous products which was published

^{1/} Fanwel, Inc. and Honeywell, Inc. have requested an exemption for uranium-232 (a byproduct material) and nickel-63, respectively, in smoke detectors. Pyrotronics, Inc. has asked, in effect, for an exemption for americium-241 in smoke detectors.

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June 21, 1968, in the Federal Register for public comment.* Under this class exemption, use of detectors designed to protect life or property and manufactured pursuant to a license issued under the proposed §§32.25 and 32.26 would be exempted from regulatory control. Export of detectors to any country, including Soviet Bloc Countries, as well as receipt, possession, use, transfer, ownership, and acquisition would be exempt from AEC licensing requirements and regulations.

3. Currently available smoke detectors which incorporate radioactive material are the ionization type^{2/} detector which employs either americium-241 or radium as the source of ionization.^{3/} Smoke detectors containing uranium-232, krypton-85, nickel-63, and tritium and detectors of other types of gases and aerosols are under development. A typical fire detector system for commercial use consists of 15 to 20 smoke detector units which are ceiling mounted and electrically connected to an alarm panel. Such a system would cost about \$2,500 plus installation. Other systems designed for the home are under development and are expected to sell for less than \$50.00. Installation in the home would consist merely of hanging the unit on a wall. Widespread residential use of smoke detectors utilizing radioactive material is feasible only if the detectors are made available on a license exempt basis.

^{2/} The ionization type smoke detector operates on a principle of interference with a normal ion current when smoke particles or other products of combustion enter the ionization chamber.

^{3/} In 1964, 10 CFR Part 40 was amended to provide an exemption for 0.005 microcurie of uranium when contained in a detector head in a fire detection system. In January 1968, the petitioner for that exemption reported it had made extensive field tests of prototype fire detection units and is currently working on further development of the detector for use in air pollution control.

*Approved by the Commission at Regulatory Meeting 257 on June 11, 1968. See AEC-R 30/89 - Changes in Proposed Class Exemption for Self-Luminous Products.

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4. Since 1963 americium-241 has been the principal radio-isotope used in smoke detectors. External radiation levels for detectors using americium are about 0.01 the level for radium units. A currently distributed model contains 80 microcuries of americium-241. Approximately 30,000 units presently are distributed annually. Manufacture, import, and distribution are authorized by AEC specific licenses. Use, which has been almost entirely nonresidential, has been principally under the general license in 10 CFR §31.5, although smoke detectors are also being used under specific licenses in a small number of cases. It is likely that presently marketed smoke detectors can be shown to meet the safety criteria of the proposed class exemption. Upon such a showing by the manufacturer, persons using the smoke detectors under a general or specific license would be informed that further use would be exempted from AEC licensing requirements.

5. One ionization type smoke detector now available is also "highly satisfactory" for detection of UF_6 (see Appendix "D"). Other devices using byproduct material are being developed and used in specialized applications to detect trace amounts of toxic gases in air. These devices are used under a specific license or a general license and require as much as 100 millicuries of krypton-85 for NO_2 detection, and 900 microcuries of americium-241 or 6 curies of tritium for CO_2 and O_2 detection. Although these toxic gas detectors may not satisfy the safety criteria of the proposed class exemption, development

of devices which would satisfy the criteria appears likely. We believe that gas and aerosol detectors which are intended to protect life and property from airborne hazards as well as fires, and which satisfy the safety criteria in the proposed rule in Appendix "A", should be exempt from licensing requirements.

6. The class exemption for gas and aerosol detectors would permit their widespread use in homes and industry. The use of smoke detectors in fire detection systems is likely to be the principal use in the home. Industrial use, for example in the chemical industry, could include use of both smoke detectors and detectors of toxic atmospheres. The small amount of radioactive material per unit, and the design, would limit the potential exposure from such widespread use. Regulatory control of the ultimate disposal of exempt devices is not practical although the manufacturer may be required to provide recommended disposal instructions with the device. Ultimate disposal is likely to be by land burial in the course of ordinary trash removal.

7. The proposed criteria (see Appendix "A") would require a manufacturer to design and construct his gas and aerosol detectors such that the personnel exposures associated with use and disposal of a single exempt unit are unlikely to exceed about 1% of the ICRP and the FRC dose limits for individuals in the population. With present technology, effective detectors of smoke and other airborne hazards can be manufactured which meet these criteria. We believe the benefit from use of such detectors containing byproduct material offsets the small risk from radiation exposure.

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8. Unlike the class exemption for luminous products, this class exemption would apply to products with clearly defined end uses. Accordingly, this class exemption does not include a provision that would specifically reserve authority to deny applications where the end uses cannot be reasonably foreseen.

9. Issuance of a class exemption and criteria for granting of specific licenses to manufacture and distribute the detectors would be consistent with recommendations of the Radioisotopes Licensing Review Panel in its report of September 5, 1967, to the Commission. The concept of a class exemption for smoke detectors received favorable consideration at the November 15, 1967, meeting with representatives of the Agreement States.

STAFF JUDGMENTS

10. The Divisions of Materials Licensing, State and Licensee Relations, Compliance, International Affairs, and Operational Safety, and the Office of the General Counsel concur in the recommendation of this paper. The Office of Congressional Relations concurs in the draft letter to the Joint Committee on Atomic Energy attached as Appendix "B". The Division of Public Information prepared the draft public announcement attached as Appendix "C".

RECOMMENDATION

11. The Director of Regulation recommends that the Atomic Energy Commission:
- a. Approve publication of the notice of proposed rule making to amend 10 CFR Parts 30 and 32 in the form contained in Appendix "A", allowing 60 days for public comment;
 - b. Note that the Joint Committee on Atomic Energy will be informed of these actions by letter such as Appendix "B";
 - c. Note that a public announcement such as Appendix "C" will be issued upon filing of the notice of proposed rule making with the Federal Register;

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- d. Note that the petitioners affected by this proposed rule will be informed of the proposed amendments; and
- e. Note that the Federal Radiation Council will be informed of the proposed amendments.
-

LIST OF ENCLOSURES

APPENDIX

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APPENDIX "A"

ATOMIC ENERGY COMMISSION

10 CFR PARTS 30 AND 32

Byproduct Material in Gas and Aerosol
Detectors: Exemption from Licensing

Petitions for rule making have been filed with the Atomic Energy Commission requesting exemption from licensing requirements of certain quantities of byproduct material in smoke detectors for use in fire detection and fire protection systems. (Docket Nos. PRM 30-27, PRM 40-11, and PRM 30-39.)

In view of the petitions and other indications of interest, the Commission is considering amendments of 10 CFR Parts 30 and 32 to (a) establish, in a new §30.20, a class exemption for byproduct material contained in gas and aerosol detectors when such detectors have been manufactured, imported, or transferred pursuant to a specific license issued by the Commission, authorizing distribution for use under the exemption, and (b) establish, in a new §32.25, requirements for the issuance of specific licenses authorizing manufacture, import, or transfer of byproduct material contained in gas and aerosol detectors for possession and use under the exemption and, in a new §32.27, requirements for reports of transfer of byproduct material under the licenses. Safety criteria for such gas and aerosol detectors would be set out in a new §32.26. The proposed amendments are expected to

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simplify, in a manner consistent with the Commission's published criteria for the approval of products intended for use by the general public (30 F.R. 3462), the Commission's regulatory process applicable to byproduct material contained in gas and aerosol detectors.

The proposed class exemption for gas and aerosol detectors is similar in concept to the proposed class exemption for luminous products published in the FEDERAL REGISTER on June 21, 1968, for public comment. The factors taken into consideration by the Commission in formulating the criteria for such class exemptions were set forth in that notice of proposed rule making (33 F.R. 9198). The safety criteria in the proposed §32.26 take into consideration the feasibility of designing gas and aerosol detectors to attain the end use objectives with minimum radiation exposure.

The proposed exemption would apply to "gas and aerosol detectors" designed to protect life or property from fires and airborne hazards. The term "gas and aerosol detectors" includes detectors, indicators, testers, and analyzers for gases, vapors, dusts, fumes, mists, and other airborne contaminants, products of combustion (both visible and invisible), and oxygen deficient atmospheres.

An applicant for a license to manufacture, import, or transfer gas and aerosol detectors for use under the exemption would be required to submit, among other things, sufficient information, including the

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results of prototype tests and quality control procedures, to demonstrate that the radiation dose and dose commitment criteria set forth in proposed §32.26 would be met.

To meet the criteria, however, the manufacturer would have to exercise care in selection of the type and quantity of the radionuclide and in the design and construction of containment and shielding features used in his detectors. The conditions under which the detectors are distributed and installed would also require consideration to assure that repetitive handling of numbers of units or collection of units at any one location is unlikely to cause persons such as installers, servicemen, or warehousemen to receive exposures in excess of the applicable limits.

Notices of licensing of manufacture, import, or transfer of individual gas and aerosol detectors for use under the class exemption would be published in the FEDERAL REGISTER for the information of the public. Copies of the licenses would be available for examination at the Commission's Public Document Room at 1717 H Street, NW., Washington, D. C.

Petitions for rule making for exemption of gas and aerosol detectors which do not meet the conditions of the proposed amendments (§§32.25 and 32.26) would be considered on a case-by-case basis.

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The Commission is considering a finding that the exemption from licensing requirements for the receipt, possession, use, transfer, export, ownership, or acquisition of byproduct material in gas and aerosol detectors, under the conditions specified in the proposed amendments, will not constitute an unreasonable risk to the common defense and security and to the health and safety of the public.

Under the provisions of §150.15(a)(6) of 10 CFR Part 150, "Exemptions and Continued Regulatory Authority in Agreement States Under Section 274", the transfer of possession or control by the manufacturer, processor, or producer of products distributed for use under the proposed exemption would be subject to the Commission's licensing and regulatory requirements even if the product is manufactured pursuant to an Agreement State license.

Pursuant to the Atomic Energy Act of 1954, as amended, and section 553 of Title 5 of the United States Code, notice is hereby given that adoption of the following amendments to 10 CFR Parts 30 and 32 is contemplated. All interested persons who desire to submit written comments or suggestions for consideration in connection with the proposed amendments should send them to the Secretary, U. S. Atomic Energy Commission, Washington, D.C. 20545, Attention:

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Chief, Public Proceedings Branch, within 60 days after publication of this notice in the FEDERAL REGISTER. Comments received after that period will be considered if it is practicable to do so, but assurance of consideration cannot be given except as to comments filed within the period specified. Copies of petitions and comments may be examined in the Commission's Public Document Room at 1717 H Street, NW., Washington, D. C.

1. A new §30.20 is added to 10 CFR Part 30 to read as follows:

§30.20 Gas and aerosol detectors.

(a) Except for persons who incorporate byproduct material into gas and aerosol detectors, or who import such products for sale or distribution, any person is exempt from the requirements for a license set forth in section 81 of the Act and from the regulations in Parts 20 and 30-36 of this chapter to the extent that such person receives, possesses, uses, transfers, exports, owns, or acquires byproduct material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards, and manufactured, imported, or transferred in accordance with a specific license issued by the Commission pursuant to §32.25 of this chapter, which license authorizes the transfer of the detectors for use under this section.

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(b) Any person who desires to incorporate byproduct material into gas and aerosol detectors, or to transfer or to import for sale or distribution such detectors for use pursuant to paragraph (a) of this section, should apply for a license pursuant to §32.25 of this chapter, which license states that the detectors may be transferred by the licensee to persons exempt from the regulations pursuant to paragraph (a) of this section or equivalent regulations of an Agreement State.

2. New §§32.25, 32.26, and 32.27 are added to 10 CFR Part 32 to read as follows:

§32.25 Gas and aerosol detectors: requirements for license to incorporate, import, or transfer.

An application for a specific license to incorporate byproduct material into gas and aerosol detectors designed to protect life or property from fires and airborne hazards, or to import or to transfer such detectors for distribution for use pursuant to §30.20 of this chapter or equivalent regulations of an Agreement State, will be approved if:

(a) The applicant satisfies the general requirements specified in §30.33 of this chapter, Provided, however, That the requirements of §§30.33(a)(2) and (3) do not apply to an

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application for a license to transfer byproduct material in gas and aerosol detectors manufactured, processed, or produced pursuant to a license issued by an Agreement State.

(b) The applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control procedures, labeling or marking, and conditions of use and disposal of the gas and aerosol detector to demonstrate that the detector will meet the criteria set forth in §32.26. The information should include:

(1) A description of the detector and its intended use or uses.

(2) The type and quantity of byproduct material to be used in the detector.

(3) Chemical and physical form of the byproduct material to be incorporated in the detector and changes in chemical and physical form that may occur during the useful life of the detector.

(4) Solubility in water and body fluids of the forms of the byproduct material identified in subparagraphs (3) and (12) of this paragraph.

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(5) Details of construction and design of the detector as related to containment and shielding of the byproduct material under normal and the most severe conditions of handling, storage, use, and disposal of the detector.

(6) Maximum external radiation levels at one and ten centimeters from any external surface of the detector and the method of measurement.

(7) Degree of access of human beings to the detector during normal handling and use.

(8) Total quantity of byproduct material expected to be distributed in detectors annually.

(9) The expected useful life of the detector.

(10) The proposed method of labeling or marking of each unit with identification of manufacturer or importer of the detector and byproduct material used in the detector.

(11) Procedures for prototype testing of the detector to demonstrate the effectiveness of the containment of the byproduct material in the detector and the radiation therefrom and other safety features under both normal and the most severe conditions of handling, storage, use, and disposal of the detector.

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(12) Results of the prototype testing of the detector, including any change in the form of the byproduct material contained in the detector, the extent to which the byproduct material may be released to the environment, any increase in external radiation levels, and any changes in safety features.

(13) The estimated radiation doses and dose commitments relevant to the criteria in §32.26 and the basis for such estimates.

(14) Quality control procedures to be followed in the fabrication of production lots of the detectors and the quality control standards the detector will be required to meet.

(15) Any additional information, including experimental studies and tests, required by the Commission.

§32.26 Same: safety criteria.

An applicant for a license under §32.25 shall demonstrate that the gas and aerosol detector is designed and will be constructed so that:

(a) In normal use and disposal of a single exempt unit and in normal handling of the quantities of exempt units likely to accumulate in one location during marketing, distribution,

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installation, and servicing of the detector, it is unlikely that the external radiation dose in any one year, or the dose commitment resulting from the intake of radioactive material in any one year, to the members of a suitable sample of the group of individuals expected to be most highly exposed to radiation or radioactive material from the detector will exceed the dose to the appropriate organ as specified in Column I of Table I;

(b) Under the conditions of §32.26(a), it is unlikely that the external radiation dose in any one year, or the dose commitment resulting from the intake of radioactive material in any one year, to any individual exposed to radiation or radioactive material from the detector will exceed the dose to the appropriate organ as specified in Column II of Table I; and

(c) Under the most severe conditions, including accidents or fire, likely to occur in use and disposal of a single exempt unit or in handling and storage of the quantities of exempt units likely to accumulate in one location during marketing, distribution, installation, and servicing of the gas and aerosol detector, the external radiation dose or dose commitment to any individual exposed to radiation or radioactive material from the detector would not exceed the dose to the appropriate organ as specified in Column III of Table I.

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(d) Table I

Part of Body	Column I (rem)	Column II (rem)	Column III (rem)
Whole body; head and trunk; active blood-forming organs; gonads; or lens of eye	0.005	0.5	15
Hands and forearms; feet and ankles; localized areas of skin averaged over areas no larger than 1 square centimeter	0.075	7.5	200
Other organs	0.015	1.5	50

§32.27 Conditions of licenses issued under §32.25: quality control, labeling, and reports of transfers.

Each person licensed under §32.25 shall:

- (a) Carry out adequate control procedures in the manufacture of the gas and aerosol detector to assure that each production lot meets the quality control standards approved by the Commission;

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(b) Label or mark each unit so that the byproduct material in the detector and the manufacturer or importer of the detector can be identified, and provide such other information with the unit as may be required by the Commission, including disposal instructions when appropriate; and

(c) File an annual report with the Director, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C. 20545, which shall state the total quantity of each byproduct material transferred to other persons for use under §30.20 of this chapter or equivalent regulations of an Agreement State during the reporting period. Each report shall cover the year ending June 30 and shall be filed within 30 days thereafter.

(Sec. 81, 68 Stat. 935; 42 U.S.C. 2111; sec. 161, 68 Stat. 948; 42 U.S.C. 2201)

Dated at _____ this _____ day of _____,
196__.

For the Atomic Energy Commission

W. B. McCool
Secretary

APPENDIX "B"

DRAFT LETTER TO THE JOINT COMMITTEE ON ATOMIC ENERGY

1. Enclosed for the information of the Joint Committee on Atomic Energy is a copy of a notice of proposed rule making to amend the Commission's regulations in 10 CFR Parts 30 and 32.

2. The proposed amendment ~~to Part 30~~ would provide an exemption from licensing requirements and Commission regulations for the use of byproduct material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards, if the detectors have been manufactured, imported, or transferred pursuant to a specific license issued to a manufacturer or importer by the Commission for distribution for use under the exemption. Export of detectors to any country, including Soviet Bloc Countries, as well as use, would be exempt from AEC licensing requirements and regulations.

3. Smoke detectors, also called fire detectors and early warning devices, are extensively used under a Commission general license; the use is subject to certain regulatory requirements. The proposed amendment would exempt from such requirements the user of smoke detectors and other similar gas and aerosol detectors. It would achieve the desirable degree of radiation protection of the user and the public through Commission licensing and control of the manufacture and distribution of the detectors.

4. The proposed class exemption for gas and aerosol detectors is consistent with the Commission's published criteria for the approval of products intended for use by the general public and is comparable to the proposed class exemption of tritium, krypton-85, and promethium-147 in self-luminous products which was published June 21, 1968 in the Federal Register.

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5. The notice of proposed rule making is being transmitted to the Office of the Federal Register. The notice will allow a period of 60 days for public comment after publication in the Federal Register.

6. Enclosed is a copy of a draft public announcement to be released by the Commission on this matter in the next few days.

APPENDIX "C"

DRAFT PUBLIC ANNOUNCEMENT

AEC PROPOSES LICENSING EXEMPTION OF RADIOISOTOPES
IN GAS AND AEROSOL DETECTORS

The Atomic Energy Commission is proposing a new class exemption from licensing for radioisotopes in smoke detectors and other gas and aerosol detectors designed to protect life or property from fires and airborne hazards.

In the past the Commission has approved the use of smoke detectors containing radioisotopes under a general license or specific license. Under the new proposal, use of such detectors which meet specific safety standards would be exempted as a class from further regulatory control. Manufacturers would continue to be licensed.

Currently available smoke detectors incorporating radioisotopes operate on a principle of interference with a normal ion current. A small amount of a radioisotope within an unsealed chamber causes an ion current between two electrodes. When smoke or other air contaminants enter the chamber, a change in the ion current results, and alarms or control equipment are activated. These detectors provide a means of detecting the gas or aerosol at low concentrations.

The proposed amendments would require a manufacturer seeking a license to distribute such detectors to submit results from prototype tests; these results must demonstrate that the exempt detectors would adequately contain the radioactive material and radiation under both normal and the most severe conditions of handling, storage, use, and disposal. To assure that detectors within the class exemption would not endanger public health, the Commission would also require details on the estimated radiation exposure associated with the detector.

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The proposed rule responds to petitions received by AEC from manufacturers seeking exemptions for smoke detectors containing americium-241, nickel-63, and uranium-232. Other detectors containing krypton-85 and tritium are under development. The proposed amendments would provide flexibility for selection of a radioisotope by the manufacturer and minimize regulatory restrictions on his development programs.

Details as to the safety standards and information which would be required from manufacturers can be found in the proposed amendments to Parts 30 and 32 which have been transmitted to the Federal Register. Interested persons may submit written comments or suggestions to the Secretary, U. S. Atomic Energy Commission, Washington, D. C. 20545, Attention: Chief, Public Proceedings Branch, within 60 days after publication of the notice in the Federal Register on _____. Copies of comments on the proposed rule changes may be examined at the Commission's Public Document Room at 1717 H Street NW, Washington, D.C.

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APPENDIX "D"

BACKGROUND

Fire Detection Equipment

Many fire and smoke detectors are available to the public but most of them are relatively expensive. Among the types available are heat detectors using mechanical devices that respond to heat such as small bimetal switches, thermocouples and expansion chambers; flame detectors which detect flame flicker; and smoke detectors which respond to smoke and other products of combustion. The beam type of smoke detector responds to interruption of a beam of light projected on to a photoconductive cell; the refraction type depends on reflection of light on to a photoconductive cell by smoke particles; and the ionization type, usually containing radioactive material, responds to the interference of smoke particles or other products of combustion with a normal current flow in an ion chamber. Smoke detectors using radioactive material but operating on other than the ionization principle may be developed.

The ionization type smoke detector responds to very small amounts of combustion products and therefore gives an early warning of most fires. It has found particular application in computer installations or other locations where extensive damage may be prevented through detection of invisible fumes such as those from insulation on overheated electrical wiring. An estimated 150,000 ionization type smoke detector units have been distributed in the U.S. Prior to 1963, all units contained radium. Since 1963, americium-241 has been the principal isotope used. An estimated 60,000 americium-241 units are in use in the U.S. and the current distribution rate is approximately 30,000 units per year. Pyrotronics, Inc., Union, New Jersey, has an AEC specific license to distribute smoke detectors containing up to 130 microcuries

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of americium-241. The units they are now distributing contain only 80 microcuries. Use of the Pyrotronics detectors, which has been almost entirely non-residential, is principally under the general license in 10 CFR 831.5, or equivalent regulations of an Agreement State. As summarized in the attachment to this Appendix, the Pyrotronics' unit has been used at AEC facilities for 9 years and has been found to be an effective "fire" detector. Approximately 2,600 units are currently in use at AEC facilities.

A typical fire detection system for commercial and industrial use consists of 15 to 20 smoke detector units, often combined with other types of detectors electrically connected to an alarm panel. In most cases, the detectors are mounted on the ceiling but some are located in air ducts, under floors and on the wall to be in the most likely pattern of smoke flow.

Other smoke detection systems are under development which would incorporate a detection chamber, emergency battery power supply, amplifier and alarm into a package comparable in external appearance to a door chime. These latter systems are expected to sell for less than \$50 and are designed for use in homes. Installation would consist merely of hanging the unit and plugging a cord into an electric outlet. Honeywell, Inc., in its petition for exemption of a smoke detector containing 1 millicurie of nickel-63 (PRM 30-39), claims that such detectors will be extensively used in the home as a life saving device if the Commission approves the proposed exemption. Detectors containing uranium-232, krypton-85, nickel-63 and tritium are under development.

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APPENDIX "D"

JUL 20 1967

TO : L. R. Rogers, Deputy Director
Division of Radiation Protection Standards

FROM : Martin B. Biles, Director
Division of Operational Safety

SUBJECT: PYROTRONICS' PYR-A-LARM "FIRE" DETECTORS

OS:ISFP:RBS

The following is in reply to the five questions in your subject-titled May 29, 1967, memorandum concerning AEC-wide experience with PYR-A-LARM "fire" detectors. Information concerning the experience of individual field offices (and their contractors) is available in our files.

Q. IS THE UNIT EFFECTIVE?

A. Yes.

Comment. Replies received from AEC field offices uniformly reflect agreement that PYR-A-LARM units are effective "fire" detectors when installed and maintained in accordance with manufacturers instructions. The device is approved by both Underwriters Laboratories and Factory Mutual. (One AEC plant reported these units were also "highly satisfactory" for UF₆ leak detection purposes!)

Our inquiry elicited two replies suggesting unsuitability of the device for use in dusty atmospheres, e.g. welding shops. One facility reported failure of four units used in an unidentified corrosive atmosphere. CH pointed out that the units will not perform satisfactorily in high radiation fields (i.e. over 500 R/hour) and that detector sensitivity will be reduced when used in atmospheres containing helium or argon.

Q. TO WHAT EXTENT HAVE PYR-A-LARM DETECTORS BEEN USED?

A. These detectors have been used on AEC facilities for about nine years. Approximately 2660 units (including all types cited in your May 29 memorandum) are currently in service.