POLICY ISSUE
(Notation Vote)

March 2, 1988 SECY-88-64

For: The Commissioners

From: Victor Stello, Jr.
Executive Director for Operations

Subject: NATURALLY OCCURRING AND ACCELERATOR-PRODUCED RADIOACTIVE MATERIALS

Purpose: To obtain Commission approval of the staff recommendations on the issue of whether NRC should seek legislative authority to regulate naturally occurring and accelerator-produced radioactive materials (NARM).

Category: This paper covers a major policy matter.

Introduction: NARM is in the environment, in homes, in consumer products, in industrial applications and in medical departments. Congress has never seen fit to expand Atomic Energy Commission/Nuclear Regulatory Commission (AEC/NRC) jurisdiction into the NARM arena, apparently because other agencies already have jurisdiction, and because the States have the primary responsibility for protecting the public health and safety. Thus, NRC's responsibilities and activities have remained linked to the neutron chain reaction.

In deciding whether NRC should seek legislative authority over NARM, it is important to understand what NARM encompasses; how it is used; how the NARM risks compare to other related risks; previous Congressional and Federal agency actions on radiation protection matters; and what the States are now doing to regulate NARM. Enclosure 1 to this paper is a report on a detailed examination of these matters.

Defining the universe of NARM is extremely important, since naturally occurring radioactive materials are ubiquitous. Radon-222 and radium-226 are significant sources of radiation to which the public is exposed. Radium can be unintentionally concentrated through routine operations such as phosphate mining

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and purifying drinking water. Radium use in medical departments, in industrial gauges, and in consumer products appears to be diminishing. Thousands of cyclotrons produce NARM and NARM wastes in hospitals, and in industrial and research applications. Eight radionuclides important to the medical community are produced exclusively by cyclotrons. They are: carbon-11; nitrogen-13; oxygen-15; cobalt-57; gallium-67; indium-111; iodine-123; and thallium-201. Two other important radionuclides produced through cyclotrons or nuclear reactors are fluorine-18 and strontium-87. Most of these isotopes have half-lives in the order of minutes to hours.

The quantities and concentrations of NARM form a continuum in the human world, and the potential hazards of NARM form a continuum ranging from background to potentially significant ones in all facets of life. Thus, any effort to control the risks from NARM calls for an integrated control program to ensure that the dominant hazards are appropriately addressed, without undue attention to the lesser hazards. However, incidents and problems involving NARM do not always reflect a consistent and significant actual hazard associated with NARM. To be sure, there have been significant incidents involving contamination of facilities, loss of materials, and inadvertent introduction of radium into commerce, but significant exposures of the public to discrete sources of radium rarely occur, based on available data. One particular NARM problem is proper disposal of discrete radium sources, primarily radium needles. Meager information exists on the hazards associated with cyclotron-produced radiopharmaceuticals, probably due mainly to their relatively infrequent use. Apparently, about 1% of the total misadministrations of diagnostic radiopharmaceuticals involves cyclotron-produced radionuclides.

Congress has already vested jurisdiction over NARM in the Environmental Protection Agency; the Consumer Product Safety Commission; the Department of Health and Human Services; and the Department of Labor. In addition, the Departments of Agriculture, Commerce, Energy, Housing and Urban Development, the Interior, State, and Transportation, and the U.S. Postal Service and the Interstate Commerce Commission have possible or actual interests in exposures to or commerce in NARM.

There has never been an explicit decision on the Federal role versus the State role, in protecting the public from exposures to ionizing radiation, except that set out in Section 274 of the Atomic Energy Act of 1954, as amended. Federal agencies exercise discretion regarding the degree to which they implement their authorities to control exposures to ionizing radiation. Furthermore, Congressional mandates to the above agencies vary so greatly that it is not clear whether the worst

and most controllable exposures are being addressed without undue attention to lesser ones. As a consequence of all of the above, Federal controls over ionizing radiation, in general, and over NARM, in particular, are fragmented and uneven.

All 29 Agreement States regulate and control discrete sources of NARM in the same way they do Atomic Energy Act materials. Of the 21 non-Agreement States, only 4 have a NARM licensing program. Of the remainder, 2 states have voluntary or partial licensing programs, and 14 states have registration programs, leaving one state, Montana, with nothing. With regard to NARM inspections, all 29 Agreement States inspect NARM, as do 14 non-Agreement States, whereas 4 states conduct partial inspections. Five states conduct no inspections. A comparison of the 1977 versus 1987 level of activity indicates that the states are increasing the amount of attention they give to NARM. Nonetheless, on August 26, 1987, the Conference of Radiation Control Program Directors (CRCPD) once again urged that the NRC seek legislative authority to regulate NARM. The August 26, 1987 position paper of CRCPD is reproduced in Enclosure 2.

Issues: Based on an analysis of the sources and uses of NARM, the incidents and problems with it, and the current jurisdictions and activities of other Federal agencies and the States, we believe that the answers to the following eight questions will clarify the issue of whether NRC should seek regulatory authority over NARM:

1. Is there a national problem with NARM?
2. Are there currently integrated Federal controls over NARM?
3. Would NRC regulation of NARM overlap other Federal agencies' programs?
4. Are the States' controls over NARM adequate?
5. Is NARM a Federal, State, or professional responsibility?
6. Would Congress consider the NRC responsible for controlling NARM hazards?
7. What are the resource implications? and
8. Would NRC responsibility for NARM regulation change the nature of NRC?

These eight questions were examined through an extensive literature search, and are addressed in Section VII of Enclosure 1.

Alternatives: Based on analyses of these questions, the following five options, regarding possible NRC involvement with NARM, are evaluated in Section VIII of Enclosure 1:

1. Status quo, but continue to encourage the CRCPD efforts on NARM regulations;
2. Seek legislative authority over NARM;

3. Seek authority to regulate radium disposal;
4. Seek authority to regulate cyclotron-produced radionuclides for medical use only; and
5. Refer the issue of NARM regulation to the Committee on Interagency Radiation Research and Policy Coordination (CIRRPC).

The evaluation of those options leads to the conclusion that, given that many Federal agencies already have jurisdiction over NARM, and given that the States are increasing their regulation of NARM, the unregulated NARM risks are not rising to a level that they should be the next target of Congressional legislation. A forthcoming EPA regulation will address radium disposal. NRC can facilitate that regulation by specifying acceptable and unacceptable concentrations of radium for disposal at low-level waste sites. Finally, we believe NRC regulation of NARM in hospitals would divert limited hospital resources to a lesser problem (NARM), at the expense of greater problems in hospitals.

Recommendations: Two recommendations evolve from this review:

1. Refer the issue of NARM regulation to CIRRPC for the purposes of developing an integrated policy and agency assignments on NARM, in particular, and ionizing radiation, in general, in those situations where agency jurisdictions overlap (e.g., in the Federal regulatory programs dealing with health care activities).

2. Inform the Governors of the states not within the "CRCPD Recognized NARM Licensing States" program that NRC is not seeking legislative authority to regulate NARM because such regulation is a responsibility of the States, and because other Federal agencies already have jurisdiction over most facets of NARM hazards; urge those Governors to take the necessary actions and to assign appropriate resources to become such recognized States.

Although not directly within the scope of this assignment, it should be noted that information gathered during the conduct of this study suggests that, because of the varying Congressional mandates of the numerous agencies having jurisdiction over ionizing radiation, because of the varying and conflicting priorities and programs among those agencies, and because there has never been an explicit and consistent determination of the Federal role versus the State role in protecting the public from exposures to ionizing radiation, there is a need for better integration of the numerous Federal programs governing exposures to ionizing radiation.

Coordination: With regard to recommendation 1, we contacted the Chairman of CIRRPC on February 11, 1988, and read that recommendation to him. The Chairman concurred with the recommendation.

The Office of Governmental and Public Affairs participated in the development of the enclosed report and concurs in this paper and the enclosed report.

Note: The Conference of Radiation Control Program Directors has expressed an interest in meeting with the Commissioners, in an open meeting, to discuss their most recent urging that NRC seek legislative authority over NARM. We recommend a Commission meeting on this subject with an invitation to the CRCPD to participate. We believe benefits would derive from the Conference having this paper, and Enclosure 1, in advance of any such meeting with the Commission. If the Commission agrees, we will forward this paper, and Enclosure 1, to the Conference in appropriate advance of the meeting.

Victor Stello, Jr.
Executive Director
for Operations

Enclosures:
1. "Naturally Occurring and Accelerator-Produced Radioactive Materials - The 1987 Review"
2. August 26, 1987 CRCPD Position Paper on NARM

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS, INC.

August 26, 1987

Harold R. Denton, Director
Office of Governmental and Public Affairs
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

The purpose of this letter is to formally share with you and the Nuclear Regulatory Commission the position of the Conference of Radiation Program Directors on naturally occurring and accellerator produced radioacive material (NARM).

The issue, simply stated, is that NARM radioactive material is not adequately or uniformly regulated in the United States, and as a result, has the potential for significant exposure to the public and for contamination of the environment.

The concern for nonuniform control of NARM has been voiced by state radiation control directors since the early 1960's and has been brought to the attention of the NRC on many occasions over the last several years. This same concern has been expressed by the Agreement States, as a group, and by the Conference of Radiation Control Program Directors, Inc. (CRCPD), which represents both Agreement and non-Agreement states. Let me also draw your attention to the June 26, 1987, letter to Samuel Chalk from Warren Sinclair, President of NCRP, in which Mr. Chalk specifically addresses the NARM issue. A copy is enclosed.

The most recent action on the NARM issue taken by the Conference is the adoption of a "Position Paper on NRC Regulatory Control of NARM," which was approved by the membership at our 1985 annual meeting. The 1985 position has been updated to reflect current concerns. A copy of our position paper is enclosed.

The Conference strongly urges the Nuclear Regulatory Commission to begin the appropriate actions necessary to regulate this hazardous radioactive material in the states which are not currently regulating NARM. It is our belief that because (1) there is no single federal agency where uniform guidance on NARM is provided and that (2) in some states there is no control of NARM, the resulting potential for public health exposure and environmental contamination presents an intolerable situation. We believe a uniform regulatory program operated by the NRC

is the best solution. The details of our rationale for NRC control of NARM is clearly described in our position paper.

The Conference is developing a compilation of recent incidents involving NARM which we will share with you as soon as possible. In the meantime, we believe the position paper adequately describes the need for NRC action.

The Conference is ready and willing to present its position to the Commission as the NARM issue is considered. Please do not hesitate to contact me at (206) 753-3468 or Chuck Hardin, our Executive Secretary, at (502) 227-4543.

Sincerely,

T. R. Strong
Chairman

TRS/db

Enclosure

Revised

August 24, 1987

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS

POSITION PAPER ON

NRC REGULATORY CONTROL OF NARM

Introduction

The Atomic Energy Act of 1954, as amended, authorizes the U.S. Nuclear Regulatory Commission (NRC) to control the manufacture, transfer, import, export, use and disposal of radioactive materials classified as byproduct, source and special nuclear materials. The Act does not provide for the regulatory control by the NRC of naturally occurring and accelerator produced radioactive material (NARM). This 1954 decision to exclude NARM was based on the fact that controlling the radioactive materials associated with weapons development was the nation's only significant concern. Even when the use of NARM became more widespread, this omission was never corrected. Reference 1 (see page 15) has a more complete legislative history on why NARM was never included under the Atomic Energy Act.

NARM represents the same types of public health and safety risks, and in fact includes some of the identical radionuclides, which are regulated by the NRC under the Atomic Energy Act. Due to these similar characteristics, and in order to ensure the adequate protection of the public health and safety, the Conference of Radiation Control Program Directors believe NARM should be controlled in the same way other radioactive materials are regulated under the Atomic Energy Act.

Characteristics and Use of NARM

Most common substances contain small quantities of naturally occurring radioactive materials. For clarification, the radioactive materials proposed to be added the the authority granted by the Atomic Energy Act would (1) be those materials either concentrated in nature as a result of man's activities or deliberately concentrated for their radioactive properties; or (2) discrete sources. Diffuse sources such as phosphate residues, nonuranium ores, and slags are not intended to be included. The NRC would be required to determine which materials pose a potential threat to public health and safety and which should therefore be covered under the Act.

The most common example of NARM is Radium-226. Radium is considered to be one of the most hazardous of all radionuclides for at least two reasons: it has a 1600 year half-life and it decays to the radioactive gas Radon-222. Radium also has one of the lowest allowable concentrations of any radionuclide in water. It has been estimated that about 20 percent of all radioactive material

users possess Radium sources. Between 1912 and 1961, nearly 2,000 grams (2000 curies) of Radium were processed in, or imported into, the United States. A recent survey of all state radiation control programs identified about 130 curies of Radium currently registered. Since less than 200 curies have been disposed in licensed disposal facilities, this may indeed be a significant public health and safety problems, due largely to the inconsistent regulation of NARM. Because Radium is the most common NARM and presents the greatest of potential problems, it will receive most of the attention in the discussion that follows.

There are numerous other radionuclides considered to be NARM (see Reference 1 for specific examples). NARM is used in every state in the United States. In the areas of medicine, NARM is used for applications such as diagnostic nuclear medicine imaging where the radionuclide is injected into the patient, and in therapeutic applications where sealed sources are used to treat cancerous tumors. NARM is used in industry for things like integral parts of gauges, in devices for various measurements, and in the academic field for various research and teaching applications. There is currently estimated to be about 10,000 users and possessors of NARM in the United States. The use of Radium in most applications appears to be declining, thus creating a disposal problem to be discussed later. At the same time, it appears that the use of accelerator-produced radionuclides is growing.

Present Control of NARM

The regulation of NARM is fragmented, nonuniform, and incomplete at both the federal and state levels. Absent a federal mandate, most states have established some sort of program for the control of NARM. However, these programs vary greatly in their degree of regulatory responsibility and control.

The Atomic Energy Act provides for states after they qualify to assume regulatory control for radioactive materials specified in the Act. Twenty-eight states have agreements with the NRC for full regulatory control of certain radioactive materials as allowed under the act. These NRC Agreement States regulate and control NARM in the same way they do for Atomic Energy Act materials for which they have regulatory responsibility and authority.

Those states which have not entered into agreements with the NRC have widely differing regulatory authority and control over NARM,[2] and this is where the major problem lies. Of the twenty-two non-NRC Agreement States, only five have a NARM licensing program. Of the remainder, two states have voluntary or partial licensing programs, while 15 have very limited initial registration requirements. At the same time, the interstate transportation of NARM is covered by uniform U.S. DOT regulations.

In the area of NARM inspections, the regulatory picture is somewhat better[2]. In non-NRC Agreement States, fourteen have inspection programs while four states conduct partial inspections. Five states conduct no NARM inspections.

The Conference of Radiation Control Program Directors (CRCPD) has attempted to correct this nonuniform regulatory control situation at the state level by developing a "NARM Licensing State" qualification program. This program is intended to provide a thorough review of NARM regulatory control in both Agreement and Non-Agreement States using consistent review criteria. It is assumed that a state which has been certified as a "Licensing State" has a program compatible with the requirements of an NRC agreement. Because of this program, and to alleviate the concerns of some states which would not otherwise support the position, it is recommended that an amendment to the Atomic Energy Act provide for recognition of the NARM regulatory programs in those non-Agreement States which do not want to enter into a full agreement. It would be desirable to provide for a mechanism for these states to continue this adequate program without the additional administrative burden of applying for NRC Agreement State status.

The lack of uniform licensing and regulatory control at both the federal and state level has led to a variety of problems which present both potential and real public health and safety threats. Some of these problems are described as follows.

— There have been numerous incident reports dealing with NARM. Most have involved Radium sources. From 1966 to 1969 the Federal Bureau of Radiological Health conducted a voluntary program to document NARM incidents in the states. During this period, there was an average of

twenty-nine incidents per year involving Radium alone, most of which involved loss of the material[1]. Because of nonuniform regulations, this is believed to be an underestimate of the problem. In more recent years, the frequency appears to be decreasing. However, without uniform regulations and the uniform reporting system which this would require, the real threat and impact to public health and safety cannot be determined.

— As with Atomic Energy Act materials, there have also been misadministrations of NARM radiopharmaceuticals. However, these events are not being captured in any national incident reporting system, and lessons learned are not adequately shared.

— The nonuniform state-to-state regulation of NARM creates interstate commerce problems. If a manufacturer in a state with an adequate NARM regulatory program ships NARM sources to a state not regulating NARM, or vice versa, control over how this source will be used can be lost. This has lead some states to deny reciprocal regulatory agreements to states not designated as "Licensing States".

— Where NARM sealed sources and devices containing NARM are manufactured in or distributed from states without adequate NARM control programs, such sources and devices (which can include medical sources) probably have not undergone a regulatory review for adequacy of radiation safety design and manufacturing controls.

— NRC regulations allow for the distribution to the public of very small quantities of radioactive materials contained in consumer products, such as smoke detectors. These materials are called "generally licensed", (i.e., no "specific" license is required), and an evaluation must be performed to show that this general distribution will not result in risks to health and safety. Products that include NARM may not receive adequate evaluation and these consumer products may create health and safety problems.

— Due to the lack of adequate regulatory control, various instruments and devices containing radium have been manufactured in the past for the military without any distribution limitations or markings. Such devices have been found in numerous instances in the public's possession and may have caused significant radiation exposures.

— In non-Agreement States with NARM inspection programs, about 70 percent of the NARM users are also licensed by the NRC to possess and use material[2]. This requires both State and NRC inspectors to inspect the same facility, in many cases duplicating efforts and wasting already limited resources.

— Ensuring the proper disposal of NARM is probably the greatest and most visible problem that has been exacerbated by nonuniform regulation.

Disposal of NARM

Since most accelerator produced radionuclides have relatively short half-lives, they are typically stored on-site for decay and do not present a disposal problem. The exceptions to this may be accelerator targets and other components; however, nonuniform reporting requirements again make data gathering difficult. Therefore, the focus of this section will be on naturally occurring radionuclides, particularly Radium. It should be noted that the proposed Super Collider is estimated to separate from 10,000 to 40,000 cubic feet of LLRW annually, which will be classified as NARM.

One of the major problems with disposal is that although states have made a strong case for it, NARM was not included as a low-level radioactive waste covered by the Low-Level Radioactive Waste Policy Amendments Act of 1985. Like mixed wastes, this material was left as an orphan waste stream. As a result, it is very uncertain how it will be properly disposed. Note that none of the Compact regions has included NARM as a low-level waste for which it must be responsible.

Because Radium is considered by many to be as toxic as transuranic materials, it is currently very difficult to dispose in a licensed low-level radioactive waste disposal site. The Barnwell site will not accept any discrete Radium sources. The Hanford site has imposed limits for disposal of Radium more stringent than are those for transuranics. Although the Beatty site will

accept Radium, other problems beyond the scope of this paper have limited such disposals. Inclusion of NARM under the Atomic Energy Act would require that the NRC include Radium in its waste classification system. Such classification would lead to the setting of uniform standards for acceptance of Radium at the disposal sites. It would also serve to establish a Class C limit for Radium which would specify the assignment of responsibility, either state or federal government, for disposal.

It should be noted that the Conference of Radiation Control Program Directors is in the process of establishing a disposal mechanism for discrete Radium sources. It is hoped that through this program many Radium sources, now being stored because disposal is difficult, can be properly disposed.

It should also be noted that forced Radium storage creates other radiological hazards. Unwanted or unneeded Radium must be stored if disposal in a licensed low-level radioactive waste site is difficult, impractical, or too expensive. Storage requires adequate shielding and proper security. In addition, Radium sources frequently leak and become contaminated.

In addition to sealed sources, there are other discrete Radium contaminated waste which will probably be generated in increasing quantities and require safe disposal. These include clean-up resins from drinking water supplies contaminated with Radium, and scale on piping used for oil and gas collection and transmission which has been discovered to trap relatively large concentra-

tions of Radium. Uniform regulation of NARM will provide assurance that these sources and others will be properly controlled and safely disposed in the future.

NARM and RCRA

The Resource Conservation and Recovery Act (RCRA) exempts materials which are covered under the Atomic Energy Act. The Environmental Protection Agency (EPA) is authorized to regulate NARM under RCRA but has not proposed regulations to do so. It is strongly believed that discrete NARM sources should not be regulated under RCRA because (1) this would not provide for the up-front control of its use, and (2) it would not adequately solve the disposal problems. Diffuse NARM, such as phosphate residues, nonuranium ores and slags, is probably more appropriately regulated under RCRA.

It is strongly believed that NRC disposal regulations are much more appropriate for discrete NARM waste than are RCRA disposal regulations. If discrete NARM is not included under the Atomic Energy Act, then it would probably eventually come under the control of RCRA. Not only would this create a dual regulatory problem at those disposal sites which currently accept NARM, it would also create a dual regulatory problem in those Agreement States which regulate NARM under regulations which NRC represents to be compatible with radioactive materials covered by agreements with NRC. This would lead to a situation similar to the one which currently exists with mixed wastes.

NARM and CERCLA

The Congress has provided authorization to the U.S. Environmental Protection Agency to "clean-up" areas contaminated by hazardous substances. This authority is provided by the Hazardous Substances Response Trust Fund, established under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980. Some areas and facilities which have been contaminated with NARM have received funding for "clean-up" under this Act.

A question has been raised: If the Atomic Energy Act is amended to include NARM would such amendment affect or restrict the use of CERCLA funds for NARM contaminated areas or facilities? To clarify the issue, a new section is proposed in CERCLA which would allow the continuation of such funding for NARM contaminated areas and facilities.

Other Studies and Opinions

Over the past several years other organizations and groups have taken the position that NARM should be included under NRC regulatory control.

— The NRC Agreement States, following their October 1974 meeting, recommended that NRC bring NARM under its regulatory control.

— The Conference of Radiation Control Program Directors in a May 8, 1975, letter to the then NRC Commissioner Kennedy, stressed the need for NARM to be regulated at the federal level.

— A task force established in 1976 by NRC to study the NARM issue recommended that NRC seek legislative authority to regulate NARM.

— The National Governors' Association, in its publication, The Agreement State Program: A State Perspective, dated January 1983,[3] states, "The Atomic Energy Act should be amended to authorize the regulation of radioactive materials not presently affected by the Act, that is, naturally-occurring and accelerator-produced radioactive material (NARM)."

— A 1984 survey (NUREG-0976) of the states by NRC showed that all the (then) twenty-seven Agreement States and sixteen of the twenty-three nonagreement states supported the regulation of NARM by NRC. Of the remaining seven, only four were opposed to NRC regulating NARM with two undecided and one with no reply.

— At the October 1984 meeting of the NRC Agreement States, a resolution was again adopted which called upon the NRC to include NARM under the Atomic Energy Act.

— In May 1985, the Conference of Radiation Control Program Directors again adopted a position that NARM should be included under the Atomic Energy Act control.

— At the October 1986 meeting of the Agreement States, the attending states again advocated inclusion of responsibility to regulate NARM in the Atomic Energy Act.

Conference Position

The Conference of Radiation Control Program Directors has evaluated the NARM issue in the United States and has observed that the use of NARM is common and widespread throughout the country and that the control of NARM is varied and fragmented. The resulting nonuniform control of NARM creates confusion on the part of users and waste generators, and creates a potential for excessive radiation exposure to both radiation workers and the general public.

Based on the information contained in this paper and in a 1985 Conference resolution, the Conference recommends that the Atomic Energy Act of 1954 be amended to authorize the Nuclear Regulatory Commission to regulate discrete sources of naturally-occurring and accelerator-produced radioactive materials in the same way it is authorized to regulate other radioactive material identified in the act.

The Conference concludes that there are some non-NRC Agreement State radiation control programs adequately protecting the public through the regulation and control of NARM. Since the twenty-eight Agreement States control and regulate NARM in the same manner as material currently identified in the Atomic Energy Act, the NRC Agreement State members recommend that NRC establish procedures to maintain the continuation of NARM regulatory authority and control immediately following amendment of the Act.

Suggested language amending the Atomic Energy Act is attached to this Position Paper.

SUGGESTED AMENDMENT

for

The ATOMIC ENERGY ACT of 1954

to

AUTHORIZE THE U.S. NUCLEAR REGULATORY COMMISSION

to REGULATE

NATURALLY-OCCURRING & ACCELERATOR-PRODUCED RADIOACTIVE

MATERIAL (NARM)

The following suggested changes in the Atomic Energy Act would authorize the U.S. Nuclear Regulatory Commission to regulate and control Naturally-Occurring & Accelerator Produced Radioactive Material (NARM) in a similar manner as radioactive material currently authorized by the Act.

Note: Bracketed word or words indicate the word(s) are to be deleted. Underlined words or words, indicate new word(s) are to be added.

1. Ref: Chapter 2, Section 11 e.

Add a new (3) with the following wording:

e. The term "byproduct material" means (1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, [and] (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content,

and, (3) discrete naturally-occurring or accelerator produced radioactive material (NARM) as determined by the Commission.

2. Ref: Chapter 2, Section 11

Add a new definition to read as follows, then re-alphabetize appropriately:

The term "naturally-occurring radioactive material" means a material or substance that is radioactive as it exists in nature.

3. Ref: Chapter 2, Section 11

Add a new definition to read as follows, then re-alphabetize appropriately:

The term "accelerator-produced radioactive material" means a material or substance made radioactive by exposure to the radiation of a particle accelerator.

4. Ref: Chapter 2, Section 11

Add a new definition to read as follows, then re-alphabetize appropriately:

The term "particle accelerator" means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum, and of discharging the resultant particulate or other radiation into a medium at energies usually excess of 1 MeV.

5. Ref: Chapter 14

Add a new Section to read as follows, then re-number appropriately:

The Commission shall, on January 1, 1992, assume regulatory responsibility for the regulation and control of byproduct materials as defined in Section II e (3) and shall by this date have established rules, regulations, and standards to govern the possession and use of byproduct materials as defined in Section II e (3).

Prior to January 1, 1992, any reference made to byproduct materials, when a specified type of byproduct materials is not mentioned, shall mean byproduct materials as defined in Section II e (1) and (2). On January 1, 19982, and thereafter, any references made to byproduct materials when a specific type of byproduct materials is not mentioned, shall mean byproduct materials as defined in Section II e (1), (2), and (3).

6. Ref: Chapter 19, Section 274b.

Add a new sub-item (3) with the following wording, and re-numbering as appropriate.

b. Except as provided in subsection c., the Commission is authorized to enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission under chapters 6, 7, and 8, and section 161 of this Act, with respect to any one or more of the following materials within the State-

(1) byproduct materials as defined in section 11 e. (1);

(2) byproduct materials as defined in section 11 e. (2);

(3) byproduct materials as defined in Section 11 e (3);

[(3)] 4 source materials;

[(4)] 5 special nuclear materials in quantities not sufficient to form a critical mass.

7. Ref: Chapter 19, Section 274

Add a new subsection to read as follows, and re-alphabetize as appropriate.

The Commission shall on January 1, 1992, assume responsibility for the regulation and control of byproduct materials as identified in subsection b (3) of Section 274. No agreement pursuant to byproduct materials as identified in subsection b (3) of Section 274 shall become effective prior to January 1, 1992.

Agreements entered into prior to January 1, 1992, pursuant to byproduct materials as identified in subsection b (1) of Section 274 shall as of January 1, 1992, be deemed to also include byproduct materials as identified in subsection b (3) of Section 274 unless the Commission determines to the contrary based on public health and safety considerations, or unless the State which has entered into such an agreement prior to January 1, 1992, determines that it does not desire regulatory authority over byproduct materials as identified in subsection b (3) of section 274.

The Commission shall establish a procedure to maintain the continuation of regulatory authority for those materials identified in subsection b (3) of section 274 in a state which has not entered into an agreement prior to January 1, 1992.

8. Ref: Chapter 19, Section 274

Add a new subsection to read as follows, and re-alphabetize as appropriate.

Agreements entered into pursuant to subsection b shall not exclude states from being eligible for the assertion of claims against the Hazardous Substance Response Trust Fund established under the Comprehensive Environmental Response Compensation and Liability Act of 1980 when such claims relate to any of the materials included in the agreements.

REFERENCES

1. Office of Nuclear Material Safety and Safeguards, NRC, Regulation of Naturally Occurring and Accelerator Produced Radioactive Materials: A Task Force Review, NUREG-0301, July, 1977.

2. Office of State Programs, NRC, Regulation of Naturally Occurring and Accelerator-Produced Radioactive Materials: An Update, NUREG-0976, October, 1984.

3. H. Brown, The Agreement State Program: A State Perspective, National Governors' Association, Washington, D.C., January, 1983.