

CRCPD PART N TENORM IMPLEMENTATION GUIDANCE

T. Cardwell, Texas Department of Health

ABSTRACT

In 1998, the Conference of Radiation Control Program Directors, Inc. (CRCPD) adopted Part N of the Suggested State Regulations for Control of Radiation. The E-36 Committee was formed to develop guidance on implementation of Part N. The Committee members were Sam Finklea of South Carolina, Mike Ryan with the University of South Carolina, and David Bernhardt. I was named Chair of the committee and Charles Simmons with _____ was an advisor to the committee.

The document was developed to provide guidance to the regulatory community in promulgating Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) regulations, using Part N as a model, and to give guidance to the regulated community in complying with the regulations.

The document assists entities in making a determination if Part N applies to a facility. Part N only applies to processes that concentrate naturally occurring isotopes. There are exemptions that apply to some materials with NORM, and Part N does not regulate material that was concentrated as a result of source material recovery.

The two types of licenses that could apply to facilities that would be regulated under Part N are discussed. The General License is a license that is issued pursuant to the regulations and does not require the licensee to make application. The general license places minimal burden on the licensee. A specific license requires an application and must be applied for prior to performing activities authorized by the license.

Disposal options for TENORM are presented. Options other than transfers to facilities authorized by the U.S. Nuclear Regulatory Commission (NRC) or an Agreement State must be evaluated. The evaluation must assure that no member of the general public would receive an exposure in excess of the limit established by the regulatory authority.

The document discusses site release and how to comply with release criteria. Computer modeling programs are presented with different exposure pathways and scenarios. Information on performing surveys of equipment, buildings and open lands for release for unrestricted use is presented.

Finally, the document presents discusses financial assurance requirements, the instruments that may be used for financial assurance, and methods to calculate the amount of assurance needed.

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The Implementation document has been published as a CRCPD committee report. The document has been through a peer review. The next step is to incorporate the needed changes and forward the guidance document to the CRCPD Board for publication as a CRCPD document.

INTRODUCTION

The Conference of Radiation Control Program Directors, Inc. (CRCPD) is an organization of individuals in state and local government who regulate the use of sources of radiation. During the early 1980's, the CRCPD determined that there was a need for consistency in the regulation of Naturally Occurring Radioactive Material (NORM). A few states had developed NORM regulations. Without guidance from the federal government, the regulations that were developed were not consistent from state to state. The CRCPD organized working groups to study the NORM issues and to develop NORM regulations. After numerous attempts to develop Norm regulations, the CRCPD formed a Commission that was directed to determine if it was possible to develop NORM regulations and if it was possible to complete a draft of NORM regulations within a year. In 1998, the NORM Commission on NORM determined that the term NORM was too broad to attempt to regulate and defined the term Technologically Enhanced Naturally Occurring Radioactive Material (TENORM). The NORM Commission then drafted the Suggested State Regulations (SSR) on TENORM. The CRCPD adopted the SSR Part N.

The CRCPD determined that, due to the diverse industries that generate TENORM, many of the industries may not have personnel familiar with radiation safety and that the different regulatory agencies that would need to adopt TENORM regulations may not have the resources needed to use Part N as a model regulation. Therefore, the CRCPD formed an ad hoc committee in December 1998 that was charged with developing an implementation document to assist both the regulatory and regulated communities. I, Thomas Cardwell, was named Chair of the committee and selected Sam Finklea of South Carolina, Dr. David Bernhardt a private consultant, and Dr. Mike Ryan with The University of South Carolina as committee members and one advisor Mr. Charles Simmons. The committee was given a deadline of October 1, 1999 to complete the implementation document. The committee first met in May of 1999, and held two stakeholders meetings and two committee meetings. The committee completed the charge as directed.

During the first committee meeting, the committee reviewed the Suggest State Regulation Part N and determined what topics needed explanation. The committee determined that the implementation document would have seven chapters. Each chapter was assigned to various committee members with deadlines for completion. After completion of the chapters, the document was completed as a first draft and reviewed. Necessary changes were made and a second draft was presented at a stakeholder meeting in August 1999. Comments and suggestions were reviewed and a final draft was prepared and submitted to the CRCPD Board for publication as a Committee Report.

CHAPTER ONE – INTRODUCTION OF DOCUMENT

Chapter one of the document discusses that the purpose of the document, which is to provide guidance to regulatory agencies that have the authority to adopt and implement Part N and to the facilities that generate TENORM. The introduction to the document discusses the annual dose limits of 1 millisievert to the general public from all operational or licensed TENORM activities established in Part N. Part N allows some flexibility from state to state by allowing the individual regulatory agencies to establish an exposure limit of some fraction of one millisievert to the reasonably maximally exposed individual from the disposal of TENORM material.

The exemption limit of 0.18 becquerels (Bq) per gram of radium is discussed. The 0.18 Bq per gram is an exemption limit that is based on the limit for cleanup of property contaminated with uranium mill tailings. This exemption limit is meant to apply to media such as soil and not piping, buildings, or equipment. Also, the exemption limit does not mean that everything above 0.18 Bq per gram must necessarily be regulated.

CHAPTER TWO – DO I HAVE TENORM

Chapter two discusses what type of radioactive material is defined as TENORM and whether Part N applies to specific types of radioactive material. This chapter explains that TENORM is material in which the concentration of the naturally occurring material has been concentrated by human intervention.

Part N does not apply to natural soil or rocks. This means that overburden from mining operations would not be regulated under Part N. The committee understands that some activities may change the pathway to humans and create exposure problems. However, the committee believes that these types of activities are regulated in the United States by other federal and/or state regulations.

The difference between TENORM and source material is discussed in this chapter. Part N does not attempt to regulate any material that is regulated as source material. Another point of confusion has been whether Part N applies to any material from source material recovery operations. Any material that has been contaminated, since 1978, from the fuel cycle or uranium recovery operations (mining and milling) or controlled and regulated under existing regulations for uranium mill tailings is not regulated under Part N. However, some materials that were contaminated from the fuel cycle or uranium recovery operations prior to 1978 may not be regulated as by-product material and may be regulated by Part N.

Another question that Chapter two attempts to answer is whether a particular material is exempted from regulation. Part N exempts some materials because the authors recognize that the societal benefit from the use of some materials, such as fertilizers, outweighs the radiation-associated risks presented by these materials. Other materials are exempted from Part N since they are adequately controlled under other regulations such as the Comprehensive Environmental Response, Compensation, and Liability Act

(CERCLA) and the Resources Conservation and Recovery Act (RCRA). Part N does not address regulation of the material while in Transport.

The 0.18 Bq per gram exemption may present some difficulty in certain cases in determining if material is exempted from regulation. The 0.18 Bq per gram limit is only meant to apply to media such as soil and not to equipment or pipes. The exemption could apply to the scales inside or on such equipment. There would need to be a determination as to the concentration of the TENORM in the scales excluding the weight of the equipment that was contaminated with the TENORM. Part N also prohibits the purposeful dilution of waste to render the waste exempt from regulation. The regulatory authority may consider relative volumes, radionuclides and their concentrations, and chemical and physical characteristics of waste streams in approving co-mingling of wastes for management purposes.

The chapter also discusses alternate methods of disposal such as landfarming. Any alternate method of disposal must be approved by the regulatory authority and must not be performed without prior approval by the regulatory authority.

CHAPTER THREE – LICENSES

If there is a determination that the material in question is not exempt from regulation, then there must be a determination as to what type of license is required. There are two types of licenses that may apply to a particular type of TENORM.

A general license is a passive license that is issued pursuant to the regulations and does not require an application to be submitted to the regulatory authority. Entities that generate TENORM but do not perform decontamination or dispose of TENORM will typically be able to operate under a general license. The general licensee may also perform routine maintenance that does not significantly increase the radiation exposure to workers. However, if the activity by the general licensee results in or may result in an exposure to a worker in excess of 5 millisieverts in a year, the activity may require a specific license. The general licensee cannot accept TENORM from others for disposal or dispose of TENORM, nor can a general licensee perform decontamination of land, equipment, or facilities.

A specific license is a license for which an application must be submitted to the regulatory authority and the license issued prior to performing the activity. The specific license will have conditions that further limit and define the activities of the entity that is specifically licensed. The specific licensee is required to comply with the requirements of regulations and any conditions listed on the specific license.

A specific license is required for anyone that accepts TENORM that is not exempt for manufacturing and distribution, decontamination, storage, processing, and/or disposal. There may be other activities that also require specific licensing, depending on the regulatory authority.

Chapter three also addresses waste management for both general and specific licenses. The licensee should implement good practices for waste management. These practices should include prevention of erosion by use of bermed areas for storage, using lined areas for storage to prevent migration and infiltration, and using covers to prevent wind blown migration. These preventative measures will assist in controlling worker and general public exposures.

CHAPTER FOUR - TRANSFER OR DISPOSAL OF TENORM WASTE

Chapter four discusses the disposal options allowed in Part N. TENORM wastes may be transferred to a facility licensed under requirements for uranium or thorium byproduct materials in either 40 CFR 192 or 10 CFR 40 Appendix A. These types of facilities must have approval to dispose of TENORM waste prior to disposal. In some cases, the co-mingling of TENORM wastes with uranium byproduct material may result in the waste being classified as mixed waste. TENORM wastes may be transferred to a facility specifically authorized to dispose of TENORM wastes.

A third option for disposal of TENORM waste is by alternative methods. Facilities that are generally licensed for disposal of TENORM wastes and that are specifically designed and controlled landfills may be approved. Other methods of disposal include on-site disposal and down-hole disposal of oilfield wastes.

Part N is meant to give some flexibility to states to evaluate and authorize alternate disposal options. However, any alternate method must be evaluated and determined to meet the criteria in Part N.5 and assure that whatever fraction of one millisievert per year the authority has approved will be met.

CHAPTER FIVE – RELEASE OF FACILITIES FOR UNRESTRICTED USE

Chapter five presents the reader with methods to model and evaluate a site to determine if the site is releasable for unrestricted use. This chapter stresses the fact that one millisievert is the annual radiation dose limit to the reasonably maximally exposed individual from all regulated sources of radiation. States are given some flexibility to set a release criteria of some fraction of one millisievert per year and to allot exposures from TENORM disposals in order to keep doses within the one millisievert annual limit.

This chapter defines exposure scenarios and the different exposure pathways to humans. The explanation includes an infant living in a residential environment, a residential farmer, children on playgrounds, or individuals in buildings. There is a discussion of the different types of computer modeling programs and special use programs such as Microshield (Grove 93) and Resrad-build. The chapter gives the reader information on multiple pathway programs. There are several appendices that discuss the selected models for assessing radiation exposures and a summary of parameters used in Resrad and alternate dispersion coefficients. Users of modeling programs are cautioned that an understanding of pathways and computer modeling is needed to be able to use these programs.

CHAPTER SIX – RADIATION MEASUREMENTS

Chapter six discusses performing surveys to assure compliance with Part N and documentation of release of facilities for unrestricted use. The chapter discusses the different radionuclides and where these radionuclides may accumulate in various processes. To be able to determine compliance with Part N, the surveyor needs to have an understanding of the radionuclides associated with NORM and the different measurement and detection devices used to perform qualitative and quantitative analyses of the radionuclides.

There are procedures that should be followed to assure compliance with releasing equipment. Appendix A of Part N sets limits for total contamination and removable contamination per 100 cm². A description of how to survey and perform wipe sampling is discussed in the chapter. Likewise there are procedures to follow for surveying and documenting the results for releases of facilities and land. “Facilities” refers to buildings, other structures, and building rubble that are to be left in place, transferred to the general public, or disposed of at an industrial or municipal landfill.

All surveys for releases of facilities, equipment, and/or land that has been associated with TENORM operations must be adequately documented for future reference. The type of documentation and form of documentation are discussed.

CHAPTER SEVEN – FINANCIAL ASSURANCE

The financial assurance that may be required of licensees who possess TENORM is discussed in this chapter. An applicant for a specific license to manufacture products containing TENORM, to decontaminate equipment or land, or to receive TENORM for disposal may require that the applicant provide proof of financial assurance in such form and amount as deemed appropriate by the licensing authority. For TENORM disposal facilities, there should be consideration to post-closure monitoring in determining the amount of financial assurance that would be required.

CONCLUSION

The Part N Implementation Document helps an entity determine if the material that is possessed is defined and regulated under Part N. The document also gives guidance in what the different types of licenses are and what type of license applies to particular types of activities. The questions of how to dispose of TENORM and how to comply with Part N are discussed in the document. The authors of the document understand that the document may be somewhat hard to understand for non-technical individuals, but with a limited understanding of radiation and health physics, the individual should find the document helpful.