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Special Waste

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Need comments ASAP. Mtg. 2/12/80 1:00 P.M.
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MEMORANDUM FOR: The Commissioners

FROM: William J. Dircks, Director
Office of Nuclear Material Safety & Safeguards

THRU: Lee V. Gossick
Executive Director for Operations

SUBJECT: POLICY STATEMENT ON LOW-LEVEL WASTE VOLUME REDUCTION

PURPOSE: To establish an NRC low-level waste volume reduction policy.

CATEGORY: This paper covers a policy question requiring Commission consideration.

ISSUES: A. Contents of Policy, including:

(1) Whether to establish requirements applicable to all all licensees to minimize the generation of waste.

(2) Whether to maintain the current policy which allows the licensee to select the volume reduction processing options best suited for his generated radioactive wastes.

(3) Whether to establish goals for volume reduction and conduct on active NRC program to achieve these goals.

B. Whether to Publish a Policy Statement on Low-Level Waste Volume Reduction in a Federal Register Notice.

Background:

In the memorandum, S. J. Chilk to L. V. Gossick, dated November 9, 1979, regarding the approval in part of staff recommendations addressed in SECY-79-383, the Commission requested the staff to prepare a policy statement on low-level waste volume reduction. The staff was also requested to inform the Commission as to when such a polich statement would be provided for the

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Commission's consideration. In SECY-79-383A, dated December 7, 1979, the staff indicated that the subject policy statement would be provided to the Commission prior to February 29, 1979.

Discussion:

In 1978, 75% of the volume of low-level radioactive waste disposed of at commercial disposal sites went to the Barnwell, South Carolina Shallow Land Burial Facility. In November 1979, the State of South Carolina, which licenses the Barnwell site, issued a license condition which would reduce the allowable waste volume to be received by 50% over a 2-year period. In order to meet the volume limitation for the first quarter of 1980 and to account for a large expected volume for a South Carolina fuel fabrication facility, Barnwell customers received notice of further disposal volume restrictions. In addition, the operators of the three operating commercial disposal facilities announced a substantial increase in disposal charges. This increase will be effective in March 1980.

The above actions have focused attention on volume reduction by NRC and Agreement State licensees. These licensees will need to reassess their present operations and their on-site storage capabilities in order to meet the disposal volume limitations to assure the operations are cost-effective and to assure that worker and public health and safety requirements continue to be met.

The recommended NRC policy covers three major areas. The first involves the minimization of generated wastes, and the second, the use of process

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equipment to reduce the volume of the generated wastes, and the third, NRC's goals for volume reduction and its role in achieving them.

The NRC staff believes that the primary emphasis by licensees should be placed on reducing the volume of waste generated. A strong management commitment will be required to implement the adminstrative controls needed to reduce waste generation. Controls which can be easily implemented at small cost to the licensee to reduce waste generation include: (1) the planning of laboratory and process activities prior to performing the experiments and operations; (2) providing tight control over experiments and operations to assure that all laboratory and plant equipment is optimally utilized without the unnecessary leakage, spills, and waste generation; (3) segregation of radioactive and non-radioactive activities; and (4) providing personnel training programs to assure that personnel are thoroughly knowledgeable in the laboratory and plant equipment and maintenance to minimize errors which result in increased waste volumes. NRC staff believe that if licensees implemented the above controls that a volume reduction of 20-40 percent could be achieved.

Another aspect of minimizing waste volumes is in the development of a "deminimus" level for low-level wastes. This level would provide guidance to a licensee in determining if the waste could be disposed of as non-radioactive material.

In the General Accounting Office (GAO) report, "Need for Greater Regulatory Oversight of Commercial Low-Level Radioactive Waste," dated August 16, 1978, the GAO recommended that the NRC "undertake a study aimed at minimizing waste volumes being generated at existing plants and adopt a policy on volume

reduction requiring operating plants and those undergoing license review to evaluate the costs and benefits of adopting volume reduction techniques and in reducing waste volumes." In SECY-78-576, dated November 6, 1978, the NRC staff responded that a study of volume reduction techniques was planned and the results of this study would be used to develop policies regarding the extent that volume reduction should be required by low-level waste producers. The study referenced in SECY-78-576 is the study "Volume Reduction Techniques in Low-Level Waste Management," being performed by Teknekron, Incorporated. This study is scheduled for completion in May 1980. The technical and economic data generated in this study will provide input into staff decisions regarding if specific techniques should be required to be implemented by waste generators.

There are several volume reduction technologies to reduce the volume of waste generated at various stages of development. The selection of one of these systems is a complex decision. Licensees must evaluate these systems from both a technical and economic standpoint (most systems currently being marketed are complex technologies with some systems having capital costs which exceed $4 million). To date, very few advanced volume reduction systems have been ordered primarily due to a general lack of operating experience, and economic or regulatory incentive.

The selection of a specific volume reduction system must consider the volumes and characteristics of the waste which the licensee generates. Based on the University of Maryland, "Institutional Radioactive Wastes" studies, NUREG/CR-0028 and NUREG/CR-1137, and the Nuclear Power Plant Semi-Annual Release Reports, a wide range of wastes are generated by licensees. Because of these variations,

each facility will have to evaluate a different set of technical and economic considerations. Included in these considerations must be the benefits to be gained, such as lower disposal costs, improved waste forms, etc., against possible costs in terms of occupational radiation exposure, effluents, and operational costs. The selection of a volume reduction system, therefore, is best performed on a case-by-case basis to account for the individual licensee's specific needs and capabilities.

The NRC should establish objectives for the overall reduction of low-level waste that is delivered to disposal sites. Without such clearly defined objectives, there would be little incentive on the part of the waste generators to reduce waste volumes. Based on estimates by experts addressing the problem for NRC, it would appear that OUTRAGE reductions of 25-40 percent are possible through administrative and process controls that would prevent the waste from being generated. Much of the low-level waste now sent to disposal sites contains materials which, if segregated, could have been discarded in ordinary trash. Further reductions in volumes can be affected through some of the available volume reduction technology. Liquid scintillation wastes are a good example of a low-level waste that is particularly susceptible to incineration in industrial burners. Thus, without the need for the more complex systems that are under development, further volume reduction can be achieved with available processing equipment and technology. The staff suggests that it would not be unreasonable to achieve a volume reduction of 50 percent over the next couple of years.

Setting objectives will not be all that is needed on NRC's part. Through an aggressive program of education, review of facility operations, preparation of recommendations to reduce volumes, and licensing actions that will have positive effects, the NRC can not only set the goals, but can see that they can be met. The Waste Products Section within the Low Level Waste Licensing Branch would be the focal point of these activities, enlisting the aid of the other major NRC offices in dealing directly with the major waste generators.

Available shipping records would be used by NRC to identify the major waste generators and the volumes delivered to disposal sites. On-site inspections would be made to assure that volumes of wastes are not being accumulated on site.

Because of the volume limitations at Barnwell and the increasing disposal charges, there has been considerable interest in volume reduction. This volume reduction policy, if implemented by the Commission, will be important guidance for all licensees. It is, therefore, recommended that the policy statement be noticed in the Federal Register. A proposed notice is enclosed (Enclosure 1).

Recommendations:

It is recommended that the Commission adopt the following policy regarding volume reduction of low-level radioactive wastes and that this policy be noticed in the Federal Register.

1. It is the Commission's intent that the volume of low-level radioactive waste presently being generated be reduced by 50 percent over the next 2 years.
2. Each licensed waste generator should make a firm management commitment to meeting the Commission's goal.

3. The NRC will review major waste producers' efforts to meet this goal and will provide them with technical advice, through a variety of means, on methods for achieving the goal.
4. The NRC will take positive actions to identify those wastes currently being disposed of as low-level radioactive wastes that could be disposed of by other means and will take appropriate action to prevent this.
5. Licensees would be allowed to select volume reduction options best suited for the specific wastes generated. Safety evaluations of the volume reduction options chosen by the licensee would be performed by the staff on a case-by-case basis.
6. Records would be maintained by the NRC on volumes and sources and the results of the volume reduction efforts would be published periodically.

Coordination:

This paper has been coordinated with the Offices of Executive Legal Director, Nuclear Reactor Regulation, Inspection and Enforcement, and Standards Development. The Office of Nuclear Reactor Regulation concurs in the recommendations of this paper. The Office of Executive Legal Director has no legal objection.

William J. Dircks, Director
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