

70-687

February 24, 1982

MEMORANDUM FOR: Leland C. Rouse, Chief
 Advanced Fuel & Spent Fuel Licensing Branch
 Division of Fuel Cycle & Material Safety, NMSS

FROM: Guy H. Cunningham III
 Executive Legal Director

SUBJECT: UNION CARBIDE (TUXEDO, N.Y.) RELATIONSHIP OF
 LICENSING AUTHORITIES

In your memorandum of October 21, 1981, you requested the views of this office on the relationship between the licensee, the NRC, and the State of New York with respect to material licensed by the NRC and State at the Tuxedo site. You describe the situation as a classic "mixed bucket" case where radioactive material contains both special nuclear material licensed by NRC and byproduct material licensed by the State.

For purposes of analysis the question regarding materials licensing can be divided into four parts:

(1) Issuance of licensing documents.

It is clear under the Atomic Energy Act of 1954, as amended, and the Agreement State program that the NRC licenses the reactor and all special nuclear material since it is possessed and used in quantities sufficient to form a critical mass. (Under material license SNM-639, Union Carbide is authorized to possess and use up to 13 kg of U²³⁵ of which not more than 5 kg can be unirradiated). See 10 CFR 150.10 and 150.11. The State, on the other hand, issues licenses for all byproduct and source material outside of the reactor being processed for further industrial, medical, or consumer uses.

(2) The scope of NRC safety and health reviews.

Although NRC licensing is limited to the reactor and the special nuclear material, the scope of the health and safety review in the process of licensing is not so tightly bounded. For example, 10 CFR 20.1(b) clearly implies that contribution to dose from unlicensed or non-NRC licensed radioactive materials must be considered in assuring compliance with 10 CFR Part 20 exposure limitations for both occupational and public health and safety. 10 CFR 20.101, 102, 103, 104, 105, and 106, clearly include all sources of radiation in calculation of concentrations of material and consequent exposures of individuals and public.

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Likewise, all radioactive materials are included in the surveys and other precautionary measures required by 10 CFR 20.201, 20.202, and 20.203. Particularly pertinent are the definitions of "radiation area" and "high radiation area" in § 20.202(b) for personnel monitoring. The definitions of these terms include the "mixed bucket" concept and the regulations require counting the whole bucket for compliance, not just the NRC portion.

Thus, the scope of licensing review under 10 CFR Part 70 can legitimately include the health and safety effects of the whole bucket. In particular 10 CFR 70.23(a)(3) requires a finding that the applicant's proposed equipment and facilities are adequate to protect health and minimize danger to life and property. When this requirement is taken together with the requirements in Part 20, it should be obvious that the NRC review for issuance of the special nuclear material license should include evaluation of the additive effects of the associated byproduct material, even though the latter is not licensed by NRC. We suggest that credit may be given for State licensing reviews and would urge that licensing be coordinated with the State to insure that all health and safety considerations are evaluated by the NRC or the State, and to minimize duplication of effort.

(3) The scope of Environmental Reviews.

The scope of environmental reviews should include all environmental effects resulting from the activities undertaken as a result of issuance of the NRC license. These effects can include both radiological and nonradiological environmental consequences. If the licensee's possession and use of State-licensed byproduct material and its environmental effects are in any way dependent upon the NRC special nuclear material license then those effects can be included within the scope of the NRC environmental review. However, NRC may not always be able to condition its licenses to mitigate environmental effects. For example, NRC cannot impose conditions that vary the terms of an NPDES permit for the same effluent stream. See Sec. 511(c)(2) of the Federal Water Pollution Control Act Amendments of 1972, 86 Stat. 893, (33 U.S.C. 1371(c)(2)).

(4) Conditions affecting byproduct material in NRC licenses.

The fact that NRC may include within the scope of its safety and environmental reviews the effects and consequences of related State licensed activities does not generally mean that the NRC license must be conditioned to protect the public health, safety, and the environment from the consequences of the State licensed activities. To the contrary, the Agreement State program authorized by Section 274 of the Atomic Energy Act of 1954, as amended, clearly

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requires an independent state licensing and regulatory structure responsible for protecting public health and safety with respect to source, byproduct, and subcritical qualities of special nuclear material within the State. To the extent possible, clear lines should be drawn between matters of State responsibility and those of NRC responsibility.

In "mixed bucket" cases, however, the facts may warrant a larger NRC role. In these cases special nuclear material (SNM) and by-product material (products of the fissioning of the special nuclear material) are, at times, co-mingled for the purposes of processing or storage. At the point where the byproduct material is "cleanly" separated, processing it should continue under the licensing control of the Agreement State. Other by product material, not "cleanly" separated, which continues in process or storage co-mingled with licensed special nuclear material may be considered to be subject to NRC regulatory authority on the ground that safety of handling of the special nuclear material requires NRC control of the co-mingled byproduct material at these phases of the process.

The activity which seems to create the most difficult problem is that of effluent treatment. Very little special nuclear material may be released as an effluent by the various process activities, but the process involving special nuclear material may cause the release of significant quantities of byproduct material to an effluent treatment system. To the extent that the effluent by-product material can be considered to be "cleanly" separated so that its regulation by a state agency would not impinge upon the safe handling of the special nuclear material it should be considered primarily state regulated material.

Another problem at Tuxedo arises from the fact that byproduct material ultimately licensed by the State is created in the NRC licensed reactor, either by fission in U^{235} targets, or activation of elements in targets composed of non-regulated material. The irradiated targets are moved to the hot cells for further processing and separation of isotopes either through a transfer canal and interlock or by removal from the reactor pool and transfer to the hot cells in a shielded container. The canal is open at the top and therefore exposed to the operating levels in the reactor room. It is contiguous with the reactor pool and canal water is continually mixed with (or an integral part of) a part of the reactor cooling system.

Consistent with part 4 of this memorandum, the handling of irradiated U^{235} targets may be covered in the appropriate NRC license. The byproduct material in the irradiated U^{235} targets in the canal or in shielded containers prior to processing has not been cleanly separated. A further consideration is that the presence of the irradiated targets in the canal, reactor pool, or in containers in the reactor building, is significant from the point of view of health and safety of personnel in reactor operations and

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potentially significant to reactor safety when in the canal or pool -- areas clearly of concern to NRC.

Targets composed of non-regulated material include byproduct material after irradiation. As with the U²³⁵ targets, the health and safety of reactor operating personnel and reactor safety may be affected by the manner of handling these targets within the reactor pool, canal, and containment. Accordingly, under Section 161i(3) of the Atomic Energy Act, the NRC reactor operating license can be conditioned as necessary to protect health and to minimize danger to life or property with respect to operations in these areas. (For the same reasons the conditions of handling and storage of byproduct material in waste temporarily stored within the reactor pool or canal can also be included in the reactor operating license.)

Original signed by
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cc.: Joel Lubenau, OSP

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