RECORD #196

TITLE: Explosive Detectors For Use At Airports

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 17 1987

MEMORANDUM FOR: Richard E. Cunningham, Director
Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards

FROM: Stuart A. Treby
Assistant General Counsel for Rulemaking
and Fuel Cycle
Office of the General Counsel

SUBJECT: EXPLOSIVES DETECTORS FOR USE AT AIRPORTS

In your memorandum on the above subject dated March 19, 1987, you asked our advice on several questions concerned with the use of a byproduct material, californium-252, as a neutron source for the detection of explosives in airline baggage. The responses to your questions are provided seriatim below:

1. We find no direct statutory authority for the NRC to exercise regulatory jurisdiction over material made radioactive through neutron activation where byproduct material is the neutron source. Such radionuclides would not be byproduct material as defined in Section 11e. of the AEA. Apparently, activation using byproduct material was not contemplated by Congress when it defined byproduct material. The NRC does have clear authority under section 81 of the AEA to license and regulate the use of the californium-252 to protect the public health and safety from any radiological hazard present and associated with that use; and it remains the fact that the induced radiation created through the use of the californium-252 in the described manner creates a potential exposure of the public to radiation. NRC regulations require the licensee to consider radiation from all sources in radiation safety in unrestricted areas (see 10 CFR 20.105(a)). Because of this, it is our opinion that the NRC has the authority to take into account all the potential radiation effects associated with the described use of licensed material.

2. It is our understanding from talking to Steve Baggett of your office, that the anticipated exposure levels will be far less than the threshholds of exposure addressed in Part 20. Since the activated material is not "byproduct" material, no regulatory action would be needed for its "possession" by travelers. This would not preclude placing appropriate licensing conditions on the use of the californium-252 so as to insure no harm to the public health and safety.

3. Whether the public should be informed that materials within their luggage may be subject to activation because of the exposure to the calfornium-252 source appears to be more a public relations policy decision rather than a legal question. The desirability of fully informing the public may be offset by the possible unreasonable fear of "radiation exposure." Having said this, in our opinion open candor would be the preferred policy.

4. Agreement States, having been given authority over licensing the use of byproduct material, would have the authority to license the proposed use.

5. The proposed licensing action does not appear to fall within the categorical exclusion contained in 10 CFR 51.22; nor on its face does it appear to meet the criteria requiring an environmental impact statement as set out in section 51.20(b). Therefore, an environmental assessment must be made pursuant to section 51.21 unless the Commission, in the exercise of its discretion, determines that the licensing action should be covered by an environmental impact statement [§ 51.20(a)(2)]. The environmental assessment would be made and further processed in accordance with §§ 51.25 and 51.30, et seq.

Should you have further questions regarding the issue or this response, you may contact Don Smith, X24396, of my staff.

Robert L. Fonner
for Stuart A. Treby
Assistant General Counsel for
Rulemaking and Fuel Cycle
Office of the General Counsel

MAR 19 1987

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FROM: Richard E. Cunningham, Director
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SUBJECT: EXPLOSIVES DETECTORS FOR USE AT AIRPORTS

This is to request your legal advice concerning the proposed use of neutron sources at airports to detect explosives in baggage prior to loading onto aircraft. The neutron sources would be californium-252, a byproduct material. The californium-252 sources would probably be specifically licensed. This use will cause the bags and their contents to become slightly radioactive and result in very low level radiation exposure to the public.

Our early consideration of this proposed use has raised several specific questions on which your advice is requested. We would appreciate your comments on these and other points which you believe we should be considering:

1. Does NRC have regulatory jurisdiction over induced radioactive material that results from neutrons from byproduct material?

2. What particular section(s) of our regulation should be used to authorize distribution of slightly radioactive baggage to the public? (Please note that use of § 32.11 "Introduction of Byproduct Material in Exempt Concentrations into Products..." apparently is precluded by paragraph 32.11(c) because food, drugs and cosmetics may be contained in the bags.)

3. If we issued specific licenses authorizing this proposed use, should we require the licensee to inform the public that the baggage will be exposed to neutrons?

4. Do the Agreement States have authority to license this proposed use?

5. Would Part 51 require the license applicant or us to take any particular action?

In the past, the staff position has been that we could consider the induced radioactivity in products when deciding whether or not to license an activity. For this reason we are considering a requirement for an environmental impact statement per Section 51.20 (a)(2).

Background

The device contains a californium-252 source which meets the definition of byproduct material in section 30.3(d). The californium is used as a source of neutrons to excite nitrogen. Nitrogen is commonly found in explosives. The excited nitrogen-15 undergoes radioactive decay by emission of 10.8 Mev gamma rays. The gamma rays are detected and configured by an array of scintillation type detectors on three sides of the baggage. A microcomputer warns the user(s) of the device that the baggage is likely to contain explosives. During this process some activation of materials both in the baggage and the baggage itself occurs.

Two companies are currently under FAA contract to develop and market the device. One company is located in an Agreement State. The state has contacted the Office of State Programs for assistance in licensing the field testing of the device. The state also has concerns about jurisdiction of the activated materials and the rights of the public to choose a nonradioactive alternative. This company is contracted to start field testing the device in 1987, at airports throughout the United States. This is incident upon the State issuance of a licensing authorizing the proposed activity.

The other company is an NRC licensee who holds a license number SNM-47 which in 1978 authorized the field testing of a device at airports throughout the United States. The report used by the licensee to justify the activity is enclosed. Also enclosed is data about radioactive isotopes and dose rate from activated material in baggage. The data in the enclosed reports does not reflect the activity or dose rates of activated baggage of a frequent traveler. However, the activation products appear to pose minimal hazard to the public as compared to other consumer related products.

The Food and Drug Administration (FDA) allows the use of neutron sources in controlling the processing of some human use food stuffs. The exposure of the human use commodities, such as foods, cosmetics, and drugs, found in baggage appears to need FDA authorization. This may be particularly true for drugs that are activated by the process. As of the date of this memorandum, FDA has not made a formal statement about the proposed activity. We are maintaining contact with FDA during their consideration of the proposed activity.

We would greatly appreciate any suggestions you may have on the topic. If you have any questions, please call Steven Baggett at Ext. 79005.

Original Signed by
Richard E. Cunningham

Richard E. Cunningham, Director
Division of Fuel Cycle and
Material Safety

Enclosures: As stated

cc: Mr. Nussbaumer, SP
Mr. Clyde Takeguchi, FDA

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