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7/31/08
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October 10, 2008

Michael Lesar, Chief
Rulemaking, Directives and Editing Branch
Office of Administration
Mail Stop T-6D59
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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RULES AND DIRECTIVES
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Subject: Request for Comments on the Security and Continued Use of Cesium-137 Chloride Sources (docket ID: NRC-2008-0419)

Dear Mr. Lesar:

Northwestern University hereby provides comments on the proposals contained in Section III of the above-referenced Federal Register notice. The University is a not for profit educational and research institution currently in possession of two Category 1 sources and one Category 2 source. We have implemented all increased controls required by the State of Illinois and feel that those controls are adequate to reduce the potential risk to the public from radiation exposure.

Answers to selected issues:

1.1 Feasibility of the use of other forms of Cs-137.

At present the only chemical form of cesium with high enough specific activity is cesium chloride, all of which is manufactured in Mayak, Russia. The Russians said in a public forum September 29 – 30, 2008 that they were just getting started with theoretical experiments to see if other forms, such as ceramic or glass, can be manufactured with a high enough specific activity for installation into an irradiator. If those experiments are not successful, or the cost of replacement sources are prohibitive, cesium chloride must still be an option.

1.2 Feasibility of the use of isotopes other than Cs-137.

The cesium-137 photon is perfectly suited for many applications and no other radionuclide has the combination of a mid-energy emission and a long half-life. All current research is based on a half-century of data with cesium-137 chloride. Co-60 energies are so high that they create new problems that didn't exist before. Additional shielding must be applied due to the higher energies and the source

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strength varies faster with time due to a half-life that is one sixth of that for cesium-137.

2.0 Use of Alternative Technologies

X-ray generators are available for some applications, but the photon energies will never be able to achieve the energy of a cesium-137 photon. Furthermore, x-ray systems require more expense due to cooling requirements and periodic replacement of x-ray tubes. Also, maintenance costs for x-ray systems are higher than those for cesium irradiators.

3.0 Possible phase-out of cesium chloride sources.

No amount of rulemaking or incentives can force technology to exist that is not economically or technically feasible. Any rulemaking that prohibits the use of cesium chloride sources must be preceded by a proven alternative that can be used without additional cost to the research institution. Research is only funded by grants from charitable organizations and many grants specifically require the use of cesium chloride.

Another serious problem associated with the phase-out of cesium chloride sources is the inability in the US to dispose of civilian waste at or above class C. Most waste compacts still do not have any low level radioactive waste disposal capacity, so the cesium chloride sources must be stored somewhere until a disposal option is developed. If the US Department of Energy is responsible for storage of these sources, they may be creating a more potent threat by storing all the sources in the same area. As difficult as it may be to breach security at a DOE facility, a successful adversary would cause a much larger event there than if a single source was secured under increased controls at the University.

Most people accept that a radioactive source is most vulnerable during carriage from one location to another over public ways. Currently, the sources in our irradiators do not require any replacement and are unlikely to enter the transportation mode. A mass prohibition of cesium chloride sources will require all the sources to be in carriage at the same time, if and when a suitable type B packaging is approved by the NRC. During this period, a radiological event is much more likely, although it would still be extremely improbable.

Export prohibitions are probably futile in view of the fact that these sources are manufactured in the United Kingdom or Argentina with feed material from Russia. Furthermore, if a company decides to convert to an x-ray system, they should be able to recoup some of the original cost of the cesium chloride irradiator. Transfer to a clinic in a region in the developing world without a reliable source of electric power will advance world health considerably.

4.0 Additional Requirements for advanced security of CsCl sources.

If additional engineering upgrades to the irradiators can make the sources harder to remove, those changes should be made unless their cost outweighs the benefit. Additional procedural controls beyond the enhanced security required of all licensees should not be pursued. Entry controls and fingerprinting for criminal background history checks are the limit that a health physicist should have to administer. Radiation safety personnel do not usually have the same instincts and attitudes that a security specialist would have. Burdening them with daily duties in which they are expected to distrust everyone does not lead to an effective radiation safety program that depends on the open exchange of knowledge and information.

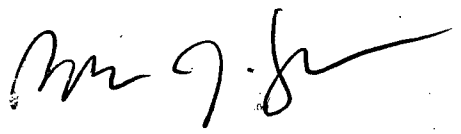
5.0 Role of Risk Analysis in Potential Future CsCl Requirements.

The decision on future rulemaking should depend on many factors, both economic and societal. The probability for a high consequence event can and should never be reduced to zero. Cesium chloride sources have been in use for many decades and contribute greatly to the body of research and medical care in the world. Replacing the powdered sources with a less useful alternative may inhibit valuable research for very little net benefit. Cesium irradiators are relatively inexpensive for the long service time they are capable of delivering. An unproven alternative would place this country at a disadvantage compared to other countries that consider the IAEA code of Conduct to be sufficient.

In conclusion, we feel strongly that the phase-out of cesium chloride sources is neither warranted nor practicable until a proven alternative is commercially available. Incentives to manufacturers would be appropriate to ensure that viable alternatives are pursued, but only for other cesium-137 alternatives. If and when these alternatives to cesium chloride are developed, their distribution should start with new sales until more is known about their performance. Only after their performance in the new units shows they are suitable for an application should an incentive program be implemented to encourage replacement of the existing cesium chloride sources.

Thank you for the opportunity to offer comments on this important topic. Should you have any questions, please contact me by voice at 847-491-5581 or by email at bsanza@northwestern.edu.

Sincerely,



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