

**From:** Christian Einberg  
**Sent:** Thursday, February 19, 2009 6:22 PM  
**To:** rekirk@radsources.com  
**Cc:** John Jankovich; Ashley Tull; Cindy Flannery  
**Subject:** "Advisory Committee on the Medical Uses of Isotopes"  
**Attachments:** CsCl Response to Inquiry.doc

Dear Mr. Kirk,

This is a response to an e-mail you sent to John Jankovich on December 22, 2008, with regard to the Advisory Committee on the Medical Uses of Isotopes (ACMUI) report on cesium chloride (CsCl) irradiators. The ACMUI has provided information in the attached document in response to your inquiries.

For any further questions, please contact Ashley Tull, [ashley.tull@nrc.gov](mailto:ashley.tull@nrc.gov) or (240) 888-7129.

Sincerely,

Chris Einberg

Christian Einberg, Branch Chief  
Radioactive Materials Safety Branch  
U.S. Nuclear Regulatory Commission  
301-415-5422

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**From:** Randol Kirk [mailto:rekirk@radsources.com]  
**Sent:** Monday, December 22, 2008 10:07 AM  
**To:** John Jankovich  
**Subject:** FW: "Advisory Committee on the Medical Uses of Isotopes's"

John Jankovich PhD,

I am the president of Rad Source Technologies, Inc. and I was recently confronted with a reference to your "Advisory Committee on the Medical Uses of Isotopes's Report on 137CsCl Irradiators." This was in conjunction with a public bid at the University of Minnesota. The bid stated that **"Filtering an X-ray beam is standard protocol whether using a low energy (160kV) source or a high energy (320 kV) source. The benefit of using a higher energy source is that you can remove much more of the soft x-rays and still have a large usable dose rate. The maximum RBE of mammalian cells does occur at 100kV, but the energy spectrum of an X-ray tube is heavily skewed towards the lower energy output of the source which must be removed in order to deliver a uniform dose and eliminate superficial radiation burns. The NRC recently released a report in which they stated that 'the higher tube potential of a 320kV unit brings the RBE to the same value as a cesium (Cs) gamma ray beam.'** The new instrument will replace a Cs source that we have used for these purposes for over 15 years."

The quotation appears on page 4, lines 6 and 7, of the "Advisory Committee on the Medical Uses of Isotopes's Report on 137CsCl Irradiators" in a discussion of Precision X-ray as a vendor. Both myself and the other Health Physicists I have consulted can find no scientific support for the quotation. Since the quote is attributed to the NRC in a public document I would like to see the references for that statement. Secondly, on page 2, line 9 and 10, you imply that a self-contained Cesium irradiator irradiates at 662 kV as a monoenergetic source. In fact, encapsulation, scatter and lead fluorescence modify the spectrum to

something much different. While the model is not complete, the comparisons need more data to be defined on the rbe relationships between Cesium and x-ray before any such statements can be accepted.

Since the above concerns have commercial implication and the statements indicate they originated with the NRC a timely response is appreciated.

Randol Kirk  
President and CEO  
Rad Source Technologies, Inc.  
6825 Shiloh Rd  
Alpharetta, GA 30005

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Subject: "Advisory Committee on the Medical Uses of Isotopes"  
Sent Date: 2/19/2009 6:22:11 PM  
Received Date: 2/19/2009 6:22:11 PM  
From: Christian Einberg

Created By: Christian.Einberg@nrc.gov

Recipients:  
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Tracking Status: None  
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Post Office:  
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Files	Size	Date & Time
MESSAGE	66871	2/19/2009
CsCl Response to Inquiry.doc	45766	

Options  
Expiration Date:  
Priority: o!ImportanceNormal  
ReplyRequested: False  
Return Notification: False

Sensitivity: 0Normal  
Recipients received: