



# OHIO DEPARTMENT OF HEALTH

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Ted Strickland/Governor

Alvin D. Jackson, M.D./Director of Health

November 15, 2007

TO: Ohio Medical Licensees

SUBJECT: VARIAN MEDICAL SYSTEMS VARISOURCE HDR EVENTS:  
IRIDIUM-192 SOURCE PULLED FROM SHIELDED POSITION

The U.S. Nuclear Regulatory Commission recently distributed the enclosed information notice to their licensees. The Bureau of Radiation Protection is forwarding this information notice to you for information purposes only. No action or written response is required.

If you have any questions concerning this letter, please call me at 614-644-2727.

Sincerely,

A handwritten signature in black ink that reads 'Mark Light'.

Mark Light  
Medical Licensing and Inspection Supervisor  
Ohio Department of Health  
Bureau of Radiation Protection

Enclosure: USNRC IN 2007-35

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF FEDERAL AND STATE MATERIALS  
AND ENVIRONMENTAL MANAGEMENT PROGRAMS  
WASHINGTON, D.C. 20555

October 17, 2007

NRC INFORMATION NOTICE 2007-35:    VARIAN MEDICAL SYSTEMS  
  VARISOURCE HDR EVENTS:  
  IRIDIUM-192 SOURCE PULLED FROM  
  SHIELDED POSITION

**ADDRESSEES**

All U.S. Nuclear Regulatory Commission (NRC) medical use licensees and NRC Master Materials Licensees authorized to possess or use a Varian Medical Systems VariSource High Dose Rate Remote Afterloader (VariSource HDR). All Agreement State Radiation Control Program Directors and State Liaison Officers.

**PURPOSE**

The NRC is issuing this information notice (IN) to alert addressees to recently reported events where the use of the emergency manual retract hand wheel on the VariSource HDR has caused the active iridium-192 (Ir-192) source to be pulled out of the shielded position. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this IN are not new NRC requirements; therefore, no specific action or written response is required.

NRC is providing this IN to the Agreement States for their information, and for distribution to their medical use licensees, as appropriate.

**DESCRIPTION OF CIRCUMSTANCES**

NRC has received four event reports in the last three years, two of them recently, involving the VariSource HDR Ir-192 source having been pulled out of the shielded position, while using the manual retract hand wheel. The four events occurred in a range of different situations, two occurred during clinical use of the afterloader, one occurred during routine QA/QC checks, and the other occurred during student training. In one of the four incidents reported, while the patient treatment was being planned, the wire containing the dummy (non-radioactive) source did not return during pre-treatment preparations. The manual retract hand wheel, which is intended only for the wire containing the radioactive source and not for the dummy source, was used by the

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physicist in an attempt to retract the dummy source. However, when the physicist turned the hand wheel, the active source was pulled out of the tungsten safe. Two of the events occurred when the operator of the VariSource HDR attempted to retract a “stuck” dummy source with the manual retract hand wheel. Their attempt to manually retract the dummy source caused the active Ir-192 source to be pulled out of the tungsten safe. The remaining event occurred during a training exercise when an instructor asked four students to simulate using the manual retract hand wheel, however, two of the students actually turned the hand wheel and caused the active Ir-192 source to be pulled out of the tungsten safe.

## DISCUSSION

Three of the four events occurred because the operators used the manual retract hand wheel in an attempt to retract the dummy source back into the VariSource HDR unit. The fourth event occurred during a training session. The warning label on the manual retract hand wheel reads “Warning – Active Source Wire Emergency Retract only. Turn the hand wheel for a maximum of 12 turns or until the radiation alarm ceases. Contact Varian Service.” Varian filed an initial notification dated September 17, 2007, with NRC in accordance with 10 CFR 21.21, following the latest event on July 15, 2007. The report delineated the event and the design characteristics of the VariSource HDR unit for safe use.

While potential long-term solutions are being considered, licensees should be aware that consequences of the active Ir-192 source being pulled out of the tungsten safe would result in the following:

1. The source would be contained within the unit, but would be unshielded and could not be returned to the shielded position.
2. The exposure rate for a 10 Curie Ir-192 source that has been pulled out of the tungsten safe would have an exposure rate of 18 R/hr at 50 cm.
3. A recovery operation would be needed to retrieve and secure the source.
4. Treatments could not resume until a new source wire is installed.

This IN serves as a reminder that the manual retract hand wheel on the VariSource HDR units is intended only for the wire containing the Ir-192 source. The manual retract hand wheel does not retract the dummy source. In the event that the dummy source is stuck in the out position, the console displays Error Code 88. The operators should consult the operator’s manual provided by Varian Medical Systems and contact Varian Service. Licensees should also read Varian’s Customer Technical Bulletin (CTB) VS-366A, “Clarification on the Use of the Emergency Retract Hand Wheel to Prevent Accidental Exposure”. The CTB is available at the following website:

[www.varian.com/shared/oncy/pdf/CTB-VS-366a.pdf](http://www.varian.com/shared/oncy/pdf/CTB-VS-366a.pdf)

In addition, in the event of an emergency where an operator needs to use the manual retract hand wheel to return the active Ir-192 source to the shielded position, operators should be aware that the number of turns necessary to return the source to the tungsten safe may vary. The number of turns may vary depending on how extended the source is initially and on any potential for slippage between the pinch rollers and the source wire, especially with a freshly lubricated source wire. The VariSource HDR units are designed

in such a manner that the operator only knows if the source has returned to the shielded position when the audible radiation alarms and red light indicator turn off. Operators should be aware that if the manual retract hand wheel is turned too many times the active Ir-192 source can be pulled out of the tungsten safe. The unit was not designed to have a positive lock to prevent the source from being pulled out of the tungsten safe or to indicate that the source is in the shielded position.

## **CONTACT**

This IN requires no specific action of written response. If you have any questions about this IN, please contact one of the individuals listed below or the appropriate regional office.

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and State Agreements  
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Enclosure: List of Recently Issued FSME/NMSS Generic Communications

Note: NRC generic communications may be found on the NRC public Website, <http://www.nrc.gov>, under Electronic Reading Room/Document Collections.