SSINS No.: 6835
IN 86-95

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

November 10, 1986

IE INFORMATION NOTICE NO. 86-95: LEAK TESTING IODINE-125 SEALED SOURCES IN LIXI, INC. IMAGING DEVICES AND BONE MINERAL ANALYZERS

Addressees:

All NRC licensees authorized to use Lixi, Inc. imaging devices or any other bone mineral analyzer with a sealed source containing iodine-125.

Purpose:

This notice is to alert licensees of a recent incident where the normal means of testing the sealed source in such devices for leakage was ineffective and to suggest alternate means of leak testing. It is suggested that licensees review this information for applicability to their facilities and consider actions, if appropriate, to preclude similar problems at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Lixi, Inc. imaging devices include a sealed source containing 220 to 450 millicuries of iodine-125 and function much like an X-ray fluoroscope. The source has to be tested every 6 months to determine if there is any leakage of iodine-125. Licensees who keep sources longer than 6 months are required by license to perform this test and send the test samples out for analysis. This test is now performed by using an alcohol-moistened Q-tip and a dry Q-tip to wipe certain portions of the source holder as specified in the instructions. The purpose of the test is to determine if any particulate iodine-125 is on the sample Q-tips, which would indicate the source was breached and would have to be replaced to avoid a contamination problem. However, a recent incident at the Lixi, Inc. facility showed that the alcohol and dry wipes are not an adequate means of detecting a leaking source.

During the investigation of the incident, it was found that two sources that had been returned for exchange were leaking. Alcohol and dry wipes did not reveal any removable iodine-125 on the various surfaces because the escaping iodine-125 came out in gaseous form rather than as particulate matter. As a result, about 15 people inhaled small amounts of iodine-125 which deposited in their thyroids.

The iodine-125 was apparently adsorbed on carbon containing material such as cardboard, rubber bands, styrofoam, and charcoal that was near the escaping gas. A survey of these materials revealed elevated radiation levels. Through these direct surveys and a series of air samples using filter media containing charcoal, the ruptured sources were located and the airborne contamination problem was resolved.

Discussion:

Licensees who perform leak tests on their Lixi, Inc. imaging devices should be aware that the current practice of using alcohol and dry wipes is not an adequate means of detecting a leaking iodine-125 sealed source. Lixi, Inc. will be sending a revised leak testing procedure to its customers in the near future. In the meantime, licensees who are returning source heads for exchange should include charcoal in the form of granules or a solid piece in the package with the source head. When Lixi, Inc. receives such packages, it will survey the charcoal for an indication of leakage. A sodium-iodide crystal (thin window) detector (or one of similar sensitivity) is required to detect the low levels of radioactivity that would be encountered in such surveys.

During the incident investigation, granulated charcoal was placed on a Q-tip that was then held for several minutes at the window in the source head to verify leakage. The gaseous iodine-125 that adsorbed onto the charcoal was easily identified with a crystal-detector.

Until the revised procedure arrives from Lixi, Inc., it is suggested that licensees use the above method for identifying a leaking source. The granulated charcoal Q-tip may be placed in the plastic envelope that is included in Lixi's leak test kit and forwarded to a consultant with adequate instrumentation for analysis.

If you have any questions regarding this matter, please contact the Regional Administrator of the appropriate NRC Regional Office or this office.

James G. Partlow, Director
Division of Inspection Programs
Office of Inspection and Enforcement

Technical Contact: J. Metzger, IE
(301) 492-4947

Attachment: List of Recently Issued IE Information Notices

Attachment 1
IN 86-95
November 10, 1986

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
86-94	Hilti Contrete Expansion Anchor Bolts	11/6/86	All power reactor facilities holding an OL or CP
86-93	IEB 85-03 Evaluation Of Motor-Operators Identifies Improper Torque Switch Settings	11/3/86	All power reactor facilities holding an OL or CP
86-82 Rev. 1	Failures Of Scram Discharge Volume Vent And Drain Valves	11/4/86	All power reactor facilities holding an OL or CP
86-92	Pressurizer Safety Valve Reliability	11/4/86	All PWR facilities holding an OL or CP
86-91	Limiting Access Authorizations	11/3/86	All power reactor facilities holding an OL or CP; fuel fabrication and processing facilities
86-90	Requests To Dispose Of Very Low-Level Radioactive Waste Pursuant to 10 CFR 20.302	11/3/86	All power reactor facilities holding an OL or CP
86-89	Uncontrolled Rod Withdrawal Because Of A Single Failure	10/16/86	All BWR facilities holding an OL or CP
86-05 Sup. 1	Main Steam Safety Valve Test Failures And Ring Setting Adjustments	10/16/86	All power reactor facilities holding an OL or CP
86-25 Sup. 1	Traceability And Material Control of Material And Equipment, Particularly Fasteners	10/15/86	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit