Republic of the Philippines
PHILIPPINE NUCLEAR RESEARCH INSTITUTE
Department of Science and Technology
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NRLSD BULLETIN NO. 89-02 LOSS OF RADIUM SEALED SOURCES

A. ADDRESSEES

All licensees with radium sealed sources.

B. PURPOSE

This Bulletin is issued to remind licensees possessing radium sealed sources of the risks posed by improper handling or loss of the sealed sources, and of the regulatory requirements regarding safety in their continued service or storage, as well as in their transfer to unauthorized persons.

C. DESCRIPTION OF CIRCUMSTANCES

It has been noted in a specific instance that radium needles were supposedly stored in a locked room with a radiation warning sign outside the door. Posting of the radiation sign is just one of the required radiological safety measure that are adopted relative to storage of radioactive sources. If other measures, e.g., periodic physical inventory of sources are not undertaken, radiological hazards may result as evidenced by a particular case where a storage room marked with a radiation sign, upon inspection, yielded old records instead of the radioactive material supposedly stored in the room.

D. DISCUSSION

1. **Periodic Physical Inventory**

Radioactive radium needles are very tiny and may be lost during use or while in storage. For instance, while installed in an equipment, the source may be pilfered if proper warning signs and safeguards to prevent access by unauthorized persons are not provided. When the source is detached from the equipment under repair or maintenance, or under continued storage, it may be lost if not secured in a safe place, properly identified and segregated from other material, e.g., scrap metals.

When lost to individuals who are not knowledgeable about radioactive

material and radiation, the source may be forcibly taken out of its shielded container and get damaged. People near the unshielded source get exposed to the radiation and get contaminated by the released radioactive material. Unaware of the contamination, those initially contaminated can spread the contamination to others and other areas.

In case the safety device or container with the tiny source gets inadvertently mixed with scrap materials and melted in a steel plant, the plant equipment and personnel can become contaminated. The end-users of the metal products will be similarly exposed unnecessarily to radiation.

Periodic physical inventory will reveal any lost source. The shorter the interval between the time at which a source is lost and the time at which the loss is reported, the greater is the chance of recovery. Physical inventory should always be accompanied by radioactivity monitoring with appropriate equipment.

2. **Transfer of Radium Sources**

Code of PAEC Regulations Part 2, Section 26 requires each licensee to "keep records showing the receipt, transfer and disposal of radioactive material and shall submit copies of such records to the Institute, as the Institute may require". In the case of radium sources, the licensee must keep a record of the material to ensure their availability for inspection conducted through periodic physical inventory by PNRI. Where the material is to be transferred, it may be received only by a licensee duly authorized to use or handle radium. The validity of the license must be verified with the PNRI which must be informed of such proposed action before transfer is effected. If transfer is to the PNRI for disposal, the licensee must secure a certificate of transport to be issued by PNRI. This is done after complying with shipping requirements concerning packing, crating and radiological safety.

Transfer procedure should ensure that there will be no inadvertent exposure to radiation. It further ensures proper keeping of records on the movement of the sources from one location to another.

E. REQUIRED LICENSEE ACTIONS

This Bulletin requires the licensees to:

1. Conduct physical inventory of all radium sources in use and in storage and to furnish the PNRI a copy of the inventory report. A record of the same should be kept for PNRI inspectors to examine anytime. The licensee shall report to PNRI any chance in the number of radium sources in them to ensure early

detection of possible loss or pilferage.

The inventory report shall show the quantity of radium sources, their type, individual and/or aggregate activity as acquired, including the acquisition date and serial numbers to identify the source. The licensee should prepare a physical inventory form to be used in the inventory process.

2. Ensure proper storage of the radium sources when not in use, or preparatory for their transfer to a licensed recipient or for eventual disposal at the PNRI. For purposes of the Bulletin, proper storage means, an adequately shielded container in a locked storage room, posted with a radiation warning sign, bearing a distance-dependent dose rate warning sign (e.g., 1 mr/hr at 1 meter).

3. Prepare transfer procedure whenever the source is to be moved out of its storage location, whether for re-use by an authorized user or for disposal at the PNRI.

4. Inform the Institute of previous transfer of radium sources during the last five (5) years, if any, and inform the Institute on the legitimacy of the transferee to possess the radium sources, if this has not been done.

5. Review existing procedures on the possession of radium sources, including the radiation protection program for the same, covering among others, procedure for physical inventory of radium sources and their proper storage.

F. COMPLIANCE SCHEDULE

Within 30 calendar days upon receipt of this Bulletin, the licensee shall inform the Institute on what actions have been taken towards its compliance.

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