INTERNATIONAL TECHNOLOGY CORPORATION

IT CORPORATION

STANDARD OPERATING PROCEDURE

NUMBER: RPP-013

TITLE: Handling of Sealed Sources

APPROVED: _____ DATE: 9-27-96
Corporate Director of
Health and Safety

APPROVED: _____ DATE: 9/23/96
Health Physics Professional

APPROVED: _____ DATE: 26Sep96
Corporate Director of
Quality Assurance

CONTROLLED COPY NO. : ____

REVISION NO.	DATE
001	9/23/96

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1 PURPOSE AND OBJECTIVES

This procedure establishes the polices and guidelines for the control, recordkeeping, transportation, testing, inspection, and responsibilities for all radioactive sealed sources used by **IT** employees, visitors, contractors, and other authorized personnel.

2 RESPONSIBILITIES

2.1 ~~Regional~~ Health Physics Professionals (HPP)

2.1.1 Assists Sealed Source Custodians (SSC) and RSOs in planning appropriate monitoring procedures relative to the source.

2.1.2 Provides guidance to the Director, RSO and SSC on license/permit requirements and regulatory issues.

2.1.3 Assists the RSO in determining when sealed sources must be leak tested and in determining appropriate corrective action for leaking sources.

2.1.4 In conjunction with the RSO, obtains/modifies USNRC or State licenses, as necessary.

2.2 Radiation Safety Officer (RSO)

2.2.1 Maintains a registry of sealed sources in their possession.

2.2.2 Approves the purchase/acquisition of all sealed sources.

2.2.3 Reviews the intended use of each sealed source with the HPP in order to determine the necessity for registration and frequency/type of leak testing.

2.2.4 Approves completed Source Registry Form (Attachment 1) and forwards a copy to the Director.

2.2.5 In conjunction with the HPP, obtains/modifies USNRC or State licenses, as necessary.

2.2.6 Performs scheduled inventory and leak testing.

2.3 Sealed Source Custodian (SSC)

2.3.1 Obtains approval for purchase/acquisition of a sealed source from the RSO prior to purchase/acquisition.

2.3.2 Completes a Source Registry Form (Attachment 1) for all radioactive sealed sources in their control.

2.3.3 Forwards completed Source Registry Form to the RSO for approval.

2.4.4 Notifies the RSO of any pending changes in the status of sources with respect to location, transfer, and disposal.

3 REFERENCES

3.1 Requirements and Specifications

3.1.1 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation"

3.1.2 Title 10, Code of Federal Regulations, Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material"

3.1.3 Title 10, Code of Federal Regulations, Part 40, "Domestic Licensing of Source Material"

3.1.4 IT Corporation Policy No. HS-700, "Radiation Protection Program Plan"

3.2 Related Procedures

3.2.1 RPP-002, "External Exposure Control"

3.2.2 RPP-005, "Radiological Areas and Posting"

3.2.3 RPP-007, "Receipt, Handling and Identification of Radioactive Materials"

3.2.4 RPP-010, "Radiation Protection Records"

3.2.5 Others

3.2.6 IT Corporation, Environmental Technology Development Center, "Radiation Safety Guide for Mixed Waste Handling and Analysis".

4 DEFINITIONS

4.1 Approval - An act of endorsing or adding positive authorization or both.

4.2 Health Physics Professionals (HPP) - Individuals who, by virtue of their education, and experience, to approve and provide oversight for work involving or pertaining to radioactivity. The HPP shall be Certified by the American Board of Health Physics (Comprehensive).

4.3 May - The word **may** is used to denote permission.

4.4 Radiation Safety Officers (RSO) - Individuals who, by virtue of training and/or experience, have been authorized to develop, administer and implement a radiation protection program. Fixed facility RSOs are specified by federal or state license requirements, and shall not be changed without notification of the appropriate licensing authority. Project RSOs shall be selected by the HPP.

4.5 Sealed Source - Any radioactive material that is encased in a capsule or container designed to prevent leakage or escape of the material.

4.6 Sealed Source Custodian (SSC) - An individual directly responsible for the control of the radioactive sealed source in an operation or an experiment.

4.7 Shall - The word **shall** is to be understood as a requirement.

4.8 Should - The word **should** is to be understood as a recommendation.

5 EQUIPMENT/MATERIALS REQUIRED

None

6 METHODOLOGY

6.1 Radiation Protection

6.1.1 Basic radiation protection principles of time, distance, and shielding shall be observed at all times.

6.1.2 The RSO and the SSC shall assure that posting and labeling is appropriate pursuant to RPP-015.

6.1.3 The following information shall be posted on each sealed source container:

6.1.3.1 Radionuclide (e.g., ^{137}Cs, ^{60}Co)

6.1.3.2 Radioactivity (in units of μCi, mCi, etc.)

6.1.3.3 Date of assay

6.1.3.4 Other information needed for safe handling.

6.2 Registration of Sealed Sources

6.2.1 The SSC shall obtain approvals from the RSO prior to purchase/acquisition of a sealed source, and shall inform the RSO when such purchase/acquisition is pending.

6.2.2 The SSC shall complete the unshaded sections of the Source Registry Form (Attachment 1) and forward it to the RSO.

6.2.3 The RSO shall complete the shaded sections of the Source Registry Form and counsel with the HPP, as necessary, to determine whether licensing or registration is required.

6.3 Leak Tests

6.3.1 Leak tests shall be conducted for all sealed sources on the registry.

6.3.2 Leak tests for low-energy beta emitters (e.g., ^{3}H, ^{14}C, ^{63}Ni) shall be performed using polyfoam, cotton smears or other sampling media that is readily dissolved for liquid scintillation counting.

6.3.3 Leak tests for alpha and beta/gamma emitters shall be performed with paper or cloth smears.

6.3.4 The appropriate Source Log Form (Attachment 2) shall be completed for each leak test.

6.3.5 A envelope to hold the smear shall be labeled with the source identification number, radionuclide, date, and smear number, if applicable.

6.3.6 Leak tests shall be performed pursuant to license conditions and/or vendor specifications.

6.3.7 Before transferring smears for analysis, a survey shall be performed using a pancake G-M detector.

6.3.8 Smears shall be counted with detectors appropriate for the type and energy of the radiation emitted by the source.

6.3.9 A detection limit of 0.005 microcurie (μCi) shall be specified.

6.3.10 Reporting units shall be "μCi".

6.3.11 When analysis of smears is complete, results shall be entered on the appropriate Source Log Form (Attachment 2).

6.3.12 Sources for which leak tests reveal the presence of greater than 0.005 μCi of removable contamination shall be considered to leak.

6.3.12.1 Leaking sources shall be labeled pursuant to RPP-005.

6.3.12.2 Sources that leak shall be removed from the operating inventory and secured.

6.3.12.3 The storage location shall be surveyed for contamination by the RSO.

6.3.12.4 Corrective action, as determined by the RSO and/or the HPP, shall be implemented.

6.4 Physical Inventory

6.4.1 A physical inventory shall be performed at the time of each leak test.

6.4.2 The location of the sealed source shall be confirmed by visual contact, radiation measurements, or observation of instrument operation (i.e., internal standard counts for liquid scintillation, etc.)

6.4.3 The physical inventory shall be documented on the Source Log form (Attachment 2).

6.4.4 The SCC shall notify the RSO if, at any time, the source cannot be located, has been improperly stored, or if the source appears to be damaged.

7 RECORDS

7.1 Copies of the Source Registry Form shall be maintained by the RSO and the Director.

7.2 Copies of the Source Log Form shall be maintained by the RSO.

7.3 Copies of pertinent radioactive materials license/permit shall be maintained by the RSO and the Director.

7.4 All Records pertinent to this procedure shall be maintained pursuant to RPP-010.

8 ATTACHMENTS

8.1 Attachment 1 - Source Registry

8.2 Attachment 2 - Source Log Form

ATTACHMENT 1

SOURCE REGISTRY

Registry No:	Source No:	Date:
Radionuclide:	No. of Curies:	
Source Type: ☐ Sealed ☐ Unsealed		
Chemical Nature of Material:		
Radiations Emitted: ☐ Alpha ☐ Beta/Gamma ☐ Neutron		
Dose Equivalent Rate (Rem/hour) at 1 meter (unshielded):		
License/Permit Required: ☐ Yes ☐ No		
Shape and Approximate Dimensions of Capsule:		
Source Custodian (SCC):		
Authorized User(s):		
Leak Test Methodology:		
Frequency of Leak Tests:		
Intended Use of Source:		
Description of Safeguards (Source Not in Use):		
Description of Safeguards (Source in Use):		
Description of Source Encapsulation:		
Prepared by (SCC, Name and Signature):		
Approved by (RSO, Name and Signature):		

ATTACHMENT 2

SOURCE LOG FORM

Radionuclide:	Activity:	Date Assayed:	Source No.:	Supplier:
Description/Intended Use:				
Storage Location/Date:				
Exposure Rate at 1 ft (mrem/hr):		Initial Smear Test Results (µCi)		
Surveyed by (signature):				

		Leak Test Results		
Date	Custodian	Test Type	Test Result (µCi)	Inventory Type

Final Disposal: _____

Date of Disposal: _____

By: _____