ATTACHMENT A-15

HANDLING AND CONTROL OF RADIOACTIVE SOURCE ASSEMBLY

1.0 SCOPE:

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1.1 The specification describes the handling procedure and control of the Americium 241 radioactive source assembly used in the Smoke Detector assembly.

2.0 APPLICABLE DOCUMENTS:

- 2.1 The following documents, the issue in effect on the date of issuance of this specification, form part of this specification to the extent specified herein. Subsequent issues of, or amendments to, these documents shall become part of this specification unless otherwise stated.
 - 2.1.1 G.P.I. 1000.01 Incoming inspection and handling procedure of radioactive source assembly.
 - 2.1.2 G.P.I. 350.02 Specification for and regulations governing limited access area.
 - 2.1.3 G.P.I. 350.03 Specificaiton for contamination check by wipe testing.
 - 2.1.4 G.P.I. 350.04 Radiological monitoring of personnel in limited access area.
 - 2.1.5 G.P.I. 350.06 Radiological monitoring of personnel in unrestricted areas.
 - 2.1.6 G.P.I. 1000.02 Procedure for in-process and final inspection of radioactive source assembly.

3.0 DEFINITIONS:

- 3.1 Certified Personnel Personnel instructed in the handling of radioactive material, and who have been issued with a certificate by the R.S.O.
- 3.2 R.S.O. Radiological Safety Officer or his assistant.

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3.3 M.T.O. - Material Transfer Order.

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	CH.ENGR.	C. Draft	12.9.51	RADIOACTIVE SOURCE ASSEMBLY				
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- 4.0 DETAILED HANDLING PROCEDURE:
 - 4.1 Receiving
 - 4.1.1 Source assemblies will be received in special containers marked with the Radiation Hazard symbol or the words, "Caution Radioactive Materials". These special containers will not be opened.
 - 4.1.2 Receiving will process the necessary papers only and will move the special container to the limited access area within 3 hours of receiving the container.
 - 4.2 Receiving Inspection
 - 4.2.1 A certified inspector will move the container into the limited access area and perform a wipe test per G.P.I. 350.03 on the exterior surface of the container.
 - 4.2.2 A certified inspector will open the container, perform a wipe test or request the R.S.O. to perform a wipe test per G.P.I. 350.03 on the boxes and trays or tubes holding the source assemblies.
 - 4.2.3 A certified inspector will inspect and count the parts per Receiving Inspection specification G.P.I. 1000.01.
 - 4.3 Storage
 - 4.3.1 The trays or tubes of source assemblies will be stored in a locked, steel, safety storage cabinet, clearly marked with the Radiation Hazard symbol, and located in the limited access area.
 - 4.3.2 An accurate log of source assemblies received and removed from the locked cabinet will be maintained.
 - 4.3.3 The R.S.O., or anyone designated by the R.S.O., will, at periodic intervals, determined by probabilistic data, but not less than once a month, perform wipe tests on the exterior and interior surfaces of the storage cabinet.

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- 4.0 DETAILED HANDLING PROCEDURE: (cont'd)
 - 4.3.4 The R.S.O., or anyone designated by the R.S.O., may, at any time, check the log of stored source assemblies and compare the number to the actual physical inventory of source assembies.
 - 4.4 General Handling Instructions During Assembly of the Ion Chamber.
 - 4.4.1 The ion chamber will be assembled per Standard Routing Sheets and Process Operation Sheet Procedures and Methods. The R.S. o. will review and sign off on all Standard Routing Sheets.
 4.4.2 Only certified personnel will handle the assembly in the
 - 4.4.2 Only certified personnel will handle the a limited access area.
 - 4.4.3 No one will touch the emitting surface of the radioactive source with bare fingers or sharp or pointed tools. The radioactive source will be manipulated with special tweezers.
 - 4.4.4 The emitting surface of the radioactive source will be examined under a 10X microscope for any scratches, gouges or nicks, prior to assembly of the cover.
 - 4.4.5 prior to assembly of the cover. The quality inspector or the R.S.O., will perform a wipe test per sampling plan defined in G.P.I. 1000.02, on the ion chambers prior to removal of the ion chambers from the limited access area.
 - 4.4.6 The R.S.O. will, at periodic intervals if not more than 2 weeks, perform wipe tests on all tools and fixtures used in the assembly of the ion chamber.
 - 4.5 Storage and Handling of the Assembled Ion Chambers.
 - 4.5.1 For inventory control purposes, assembled ion chambers for the EGD-4I and 4IR will be stored in a secured area per G.P.I. 350.02 and will be requisitioned in compliance with Para. 4.5.2 of this specification.
 - 4.5.2 All ion chamber assemblies will be requisitioned and issued in the following manner.

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- 4.0 DETAILED HANDLING PROCEDURE: (cont'd)
 - 4.5.2 All ion chamber assemblies will be requisitioned and issued in the following manner.
 - 4.5.2.1 The estimated daily production requirement will be given to the R.S.O. or his designate, and he will be responsible for issuing this amount in batch quantities of not more than 1000 units. The quantities will be hand counted by the R.S.O. or his designate and the count will be verified by the supervisor, or his designate, of the requisitioning department.
 - 4.5.2.2 A Material Transfer Order will be filled out indicating the amount of the ion chamber assemblies issued. The R.S.O. or his designate will sign the M.T.O., and the supervisor of the requisitioning department, or his designate, will countersign the M.T.O., verifying that he has received that amount of ion chambers.
 - 4.5.3 At the end of each production shift, all unused ion chambers will be stored in a locked storage cabinet. The shift supervisor has sole responsibility for the ion chambers issued to his department.
 - 4.6 Assembly of Ion Chambers and Test of the Smoke Detector.
 - 4.6.1 The ion chambers or ion sources will be assembled into the Smoke Detector per Standard Routing Sheets and Process Operation Sheet Procedures and Methods. The R.S.O. will review and sign off on all Standard Routing Sheets.
 - 4.6.2 Under no circumstances will anyone in the final assembly or test area open or attempt to open, or in any way destroy the integrity of the ion chambers.
 - 4.7 Return of Defective Ion Chamber Assemblies

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- 4.7.1 When an ion chamber fails a test during the manufacturing process, it will be returned to the assembly area at the end of the shift in which it was discovered.
- 4.7.2 The defective ion chamber assembly for the EGD-4I and 4IR will be removed from the printed wiring board, tagged with a red label indicating it is detective and returned to the limited access area. The EGD-5S and 5B boards with attached chamber will be returned to the limited access area for removal of the source.
- 4.7.3 Disposition of the defective ion chamber assembly will be carried out by the R.S.O. or his designate.
- 4.7.4 The R.S.O. or his designate will sign the M.T.O. and the production supervisor or his designate, who originally signed for the ion chamber assembly, will countersign for verification of the quantities returned.
- 4.7.5 If it has been established during testing, that any component under the chamber cover is defective, then the complete printed wiring board with ion chamber assembly may be returned to the limited access area for removal of the ion chamber cover and replacement of the component.
- 4.7.6 Defective or damaged source assemblies will be stored in the steel storage cabinet per Para. 4.3.1 of this specification. These assemblies will be accumulated and returned to the vendor by licensed carrier for reprocessing or destruction.
- 4.8 Shipping
 - 4.8.1 The completed smoke detector assembly shall be wipe tested for radioactive contamination per G.P.I. 350.03 on a sample basis as defined in MIL-STD-105D, prior to moving the assemblies to packing and shipping.
 - 4.8.2 The Smoke Detectors will be packaged for shipping in compliance with good commercial practices.

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