

## Mobile Hot Cell for Disused Source Recovery

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### 1. Introduction

Mobile hot cell has been developed by India in 2013 for recovery of disused radioactive material from old radiation technology equipment (RTE). The radiation technology equipment like gamma chamber, blood irradiator, teletherapy machine etc. use high activity radiation sources which keeps on decaying by natural means. The rate of decay depends on the half-life of the isotope being used. The isotope becomes disused after its intended life is over. Many such units sometimes become orphan in a course of time which still carry radioactive material sufficient enough to harm a person significantly and can cause life hazard also. The radioactive sources can be misused also when not kept in safe storage. It is always desirable to decommission such machines and remove the radiation sources from them to either long term safe storage or dispose them properly at places where such facilities are available.

As these sources, even after being disused, cannot be handle in open, a temporary shielded structure like Mobile hot cell is need to build to carry out such operation. Mobile Hot cell is built temporary with all radiation source handling facilities and source conditioning facilities if needed. These sources are transferred to long term source storage containers or transportable containers designed to transport such radioactive material.

### 2. Assembly :

Mobile Hot cell contains approximately 100 major components and many small components mainly for assembly. The base plate of mobile hot cell is assembled in five parts to keep its weight low. After assembly a 4.5 x 5 m (approx.) base plate is prepared to work as a base for MHC structure. One additional part is also bolted to one of its side to work as base plate for motorized moving door. On this base plate total structure is assembled on base plates which forms a double wall enclosed structure with an opening for plug door. Radiation shielding window, horizontal sleeve for MHC cask become part of structure become part of the assembly.

The cell top is closed with steel plugs after assembly.

### 3. Our Experience :

BRIT has used MHC (Figure 1) for recovering disused sources from old, discontinued RTEs (GC-900) containing Co-60 radiation sources. Thirteen GC-900 units were unloaded using mobile hot cell. Total 180 pencils were recovered from GC-900 units. Two trained MSM operators were used to carry out radiation handling activities. During active operation, health physicist was available to ensure radiation safety. No source was found leaky from GC-900 on which recovery operations were carried out.



**Figure 1:** Mobile Hot Cell Installed at BRIT Vashi, Navi Mumbai, India

#### **4. Discussion :**

Total process of source recovery using MHC at any location within India will take 18 days (approximately) which may further increase if RTEs to be unloaded are more in number. Though with increasing experience and standardizing process, we may reduce this time further. Using MHC at locations other than India, transportation time need to be added. Coordination with local regulatory authority and IAEA will also be required to carry out radiation activity in that country.