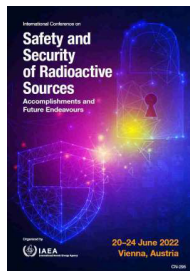


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The improved design for the mobile hot cell for the conditioning of spent high activity radioactive sources

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The stumbling block on the international level was the management of Spent high activity radioactive sources (SHARS) because of its high potential radiological risk. Since 2006, the International Atomic Energy Agency (IAEA), cooperated with its Member States, has developed several mobile technologies and facilities for the conditioning of SHARS. In 2009, IAEA cooperated with China Institute for Radiation Protection (CIRP) to develop a Mobile Hot Cell (MHC) specifically to deal with SHARS. A pilot conditioning operation with an activity of around 1000 Ci Co-60 irradiator sources had been carried out in September, 2010 that the sources were handled and conditioned very successfully. In 2017, the same MHC has been used to realize the conditioning of Co-60 medical source. The performance tests conducted by the team from China Institute for Radiation Protection (CIRP) showed that the mobile hot cell meets all performance requirements.

However, MHC adopt inner and outer carbon steel plates filled with river sand as the shields. It would require about one week to assemble or dismantle, but the actual conditioning operations may only take one to two days, which has severely impacted the popularization and application of MHC.

From the perspective of the structural design of MHC, a design scheme of the combination of fixed concrete wall and metal plate is proposed, which can greatly improve the assemble and dismantle efficiency. After the conditioning is completed, the concrete part can be filled and reserved for other purposes, such as being used as a radwaste receiving and temporary storage warehouse.

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