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Material balance evaluation at bulk-handling facilities in the decommissioning stage or partially shutdown

Currently, several bulk-handling facilities (BHF) in Japan are in the decommissioning stage, in preparation for their planned permanent shutdown, while others have suspended part of their operations. The operational status of these BHF may be different, but the material balance evaluation (MBE) challenges are similar: in both cases, facilities may retain large amounts of static material and/or recovered nuclear material.

During the decommissioning stage and partial shutdown, large amounts of material can remain static; operators can decide not to remeasure it, and base the related declarations on measured values from previous physical inventory takings (PIT) or on estimated values. Facility operators may also clean out, recover and measure (or estimate) material that had not been accessible during operations.

MBE evaluators must carefully assess these situations in order to consider the possible impacts on the MBE. For this, operators need to provide updated information in the design information questionnaires (DIQ), including the actual operational conditions and the sources of measurement uncertainty during the decommissioning and shutdown phases. Evaluation of statistics, such as operator-inspector difference or the D Statistic, may not lead to a sound conclusion if the condition of the facility is not fully understood, hindering a proper estimation of the operator's measurement uncertainties. Furthermore, the MUF evaluation may not be reliable due to the increase of static material (unmeasured items or batches) in the inventory, to the estimated increase in inventory due to recovered material and to the convolution of MUF between shutdown and operating processes.

It is therefore necessary to obtain accurate, detailed and complete information regarding the decommissioning process or shutdown operations, including the operator's nuclear material accounting procedures and other relevant information, such as sampling procedures.

In this paper, we will present a case study of MBE at a BHF under decommissioning, based on NMCC's and the IAEA's experiences. Finally, we will propose a consistent approach to MBE that incorporates the above information for facilities under decommissioning or partially shutdown.

Which "Key Question" does your Abstract address?

SGI1.2

Which alternative "Key Question" does your Abstract address? (if any)

SGI1.1

Topics

SGI1

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