INSPECTION PROCEDURE 85311

PHYSICAL INVENTORY

PROGRAM APPLICABILITY: 2681

85311-01 INSPECTION OBJECTIVE

Confirm that the program for inventorying SSNM is conducted according to required procedures, instructions and frequencies specified in the NRC approved FNMCP. The program must enable a licensee to adjust accounts to accurately reflect the status of SSNM inventory within a facility and should serve as a quality control check on the performance for prompt loss detection provided by process monitoring and items monitoring.

85311-02 INSPECTION REQUIREMENTS

Physical inventories must comply with all applicable NRC regulations and safeguards license conditions. The FNMCP contains general commitments relative to the taking of physical inventories. By inspection determine whether:

02.01 Physical inventories are conducted in accordance with the following frequencies:

a. Notwithstanding 74.59(f)(1), licensees shall perform at least three bimonthly physical inventories after implementation of the NRC approved FNMCP and shall continue to perform bimonthly inventories until performance acceptable to the NRC has been demonstrated and the Commission has issued formal approval to perform semiannual inventories. Licensees who have prior experience with process monitoring and/or can demonstrate acceptable performance against all Plan commitments may request authorization to perform semiannual inventories at an earlier date. [74.51(d)(2)]

b. Except as required by 10 CFR Part 75, a physical inventory should have been performed at least every six calendar months. [74.59(f)(1)]

02.02 Policies, practices and procedures for inventory preparation to ensure the quality of physical inventories have been implemented. These must include:

a. Cutoff procedures for transfers and processing so that all quantities of SSNM are inventoried and none are inventoried more than once, [74.59(f)(2)(v)]

b. Cutoff procedures for records and reports so that all transfers for the inventory and material balance interval and no others are included in the records. [74.59(f)(2)(vi)]

02.03 Policies, practices and procedures include written instructions for conducting physical inventories that detail assignments, responsibilities, and preparation for and performance of an inventory. [74.59(f)(2)(ix)]

02.04 Policies, practices and procedures to ensure the quality of physical inventories have been implemented. These must include:

a. Inventory procedures for sealed sources and containers or vaults containing SSNM that assure reliable identification and quantification of contained SSNM, [74.59(f)(2)(vii)]

b. Inventory procedures for in process SSNM provide for measurement of quantities not previously measured for element and isotope, as appropriate, and include remeasurement of material previously measured but whose validity has not been assured by tamper-safing or equivalent protection. [74.59(f)(2)(viii)]

02.05 The plant and subsidiary book records have been reconciled and adjusted to the results of the physical inventory within 45 days after the start of the ending inventory. [74.59(f)(1)(v)]

85311-03 INSPECTION GUIDANCE

03.01 Regulations. 74.59(f)

03.02 Regulatory Guides and Reports. NUREG-1280, Standard Format and Content Acceptance Criteria for the Material Control and Accounting (MC&A) Reform Amendment, Section 4.5, "Physical Inventory."

03.03 Criteria. The inspector evaluates physical inventory procedures and instructions, audits physical inventory records, observes physical inventory related activities, tests the physical inventory listing, and evaluates the physical inventory reconciliation. Comparison of the book inventory to the physical inventory, the inventory difference (ID), should be viewed as a quality control check on the performance of the material control tests employed for prompt loss detection. The ID should be compared to the sum of the process differences of all process units during the physical inventory period. The subdivision of a facility into multiple process units and the performance of material control tests enhance the resolution of significant IDs through better loss localization capability. Additionally, material control test results should be useful in pinpointing the time when an anomaly likely occurred.

Pre-inspection Activities. To prepare for the inspection, the inspector should review the specific portions of the FNMCP and the safeguards license conditions for the planned inspection activities; review the previous inspection report for the site; review any unresolved or followup items to be addressed during the inspection;

and review any communications (including information notices and bulletins) with the facility since the last inspection.

Post Inspection Activities. Followup is conducted as described in Manual Chapter 92701 and the Inspection Report is generated as described in Manual Chapter 0610.

a. The inspector audits the physical inventory records and the inventory schedule to determine whether the frequency has been met. A measured physical inventory is performed at least every six calendar months and within 45 days of the start of the ending inventory to act as a check on the book inventory and to enable the licensee to adjust the accounts to accurately reflect the status of the SSNM inventory within a facility.

b. Inventory Preparations. The inspector should verify by observation of the physical inventory taking that the periodic physical inventories enable the licensee to adjust accounts to accurately reflect the status of the SSNM inventory within a facility. Procedures for preparing the facility for the physical inventory should include the basic approach to facility preparation (e.g., draindown, cleanout, etc.) and cutoff for SSNM processing, transfers and records adjustments.

   Use of inventory cutoff and cutoff verification procedures, tag procedures, and post-inventory inspections or equally effective measures are used to ensure all quantities are accounted for and not counted more than once. Sufficient information is provided in the plan to show that the inventory process is organized and coordinated. The details of the plan and procedures ensure the use of uniform and consistent practices for checking and recording the SSNM status.

c. Inventory Conducted According to Plans and Procedures. The inspector should determine that procedures for physical inventory taking assure appropriate assignment of responsibility and adequate guidance for inventory of SSNM in containers and in-process equipment.

   The responsibility for planning, organizing, and conducting the physical inventories should be assigned to one primary individual and an alternate who are familiar with overall operation of the facility. The inventory of each plant area should be assigned to individuals who are familiar with but who have no direct responsibility for the material and operations conducted in that area. As a general rule, inventories should be conducted by teams consisting of a minimum of two people who are managerially assigned for the duration of the inventory to the individual primarily responsible for the physical inventory.

   Prior to the inventory, the person with overall inventory responsibility should perform a preliminary inspection of the plant areas to be inventoried, review the inventory procedures and instructions with key individuals, and supervise any needed additional training of inventory personnel. The

inspection of plant areas should focus on assuring that material is measured and properly tamper-safed, packaged, labeled, stored, or otherwise prepared for inventory, and that process equipment is dealt with according to those written procedures and instructions which have been established.

d. Observation of Inventory Taking. The inspector should observe the physical inventory taking to determine whether the physical inventory procedures provide for verifying the location and identity of all quantities of SSNM.

Encapsulated items containing less than 200 grams of SSNM whose presence has been verified during the prior 6 months as part of a statistical sample or handling during routine production need not be reverified for physical inventory. Items whose presence has not been verified in the same time interval should be located by two-person inventory teams.

Generation of Inventory Listing. The inspector should determine that the licensee can quickly generate an inventory listing in response to an alarm situation.

Selection of Items to Check their Presence. A random sample of items on the inventory should be selected by the inspector and found as a check of the accuracy of the inventory.

e. Inventory Reconciliation. Once the inventory taking is accomplished, the inventory records should be checked for correctness and the book records reconciled and adjusted to the results of the inventory. The inspector should verify that the licensee's reconciliation includes both the central accounting records and the subsidiary MBA journals.

The effect of prior period adjustments will be taken into account before the significance of the current period ID is assessed. The appropriate procedure for dealing with these discrepancies is, for the purposes of ID evaluation, to modify the ID quantity by adding or subtracting a quantity of SSNM equivalent to the adjustment prior to assessing the significance of the current period ID. The adjustment to the book records must include the prior period adjustments in order to bring the accounting records into balance.

The ID and SEID should be examined by the inspector to determine whether the estimates are traceable to the accounting and measurement control program records and whether the estimates are generated as approved in the FNMCP. The method used for estimating the SEID for the typical material balance must meet several criteria. All reasonable and probable sources of measurement error for the key measurement systems affecting IDs are included. The selection of the key measurements whose variances are to be included in calculating the standard error is justified by an analysis of the relative magnitudes of the variance components of a typical ID and their comparative effect on the SEID. Any measurement error standard deviations not actually determined by the measurement control program are shown to be reasonable either by compari-

son with published state-of-the-art measurement performance in similar applications or with available records of past performance data from the licensee's facility. The calculation of the SEID is performed in accordance with a recognized error propagation method.

Assessment of the significance of current period material balance results by sequential analysis of prior period ID data requires consideration of the comparability of the sequence of IDs used for analysis and the covariances that exist between adjacent (lag 1) and alternate (lag 2) pairs. When assessing these covariances, the inspector should also consider the effects of processing SSNM generated in prior periods and the time since the material was generated such as might occur in a scrap recovery process that operates in campaigns of different types of material.

The criteria against which the significance of a current period ID should be evaluated can be established by three sigma control limits or control chart limits constructed with current and historical material balance closure data, where such limits for further action should be established at a level of significance of 0.01.

Using a Random Sample to Test Audit Trail Adequacy. The inspector should examine a random sample of items to ensure that there is an adequate audit trail and that adjustments to reconcile the book inventory to the physical inventory will be in accordance with commonly accepted accounting practices, and the adjustments will be traceable and auditable.

The inspector should check the records of tamper-safing devices to assure that continuity of knowledge has been maintained for each item. If an item had a broken TID replaced, the inspector should review the methods used to protect the information on the quantities of SSNM contained in the item.

f. Review of Listing for Reasonableness. The inspector reviews physical inventory records and/or to verify that all SSNM values are based on measurements. The SSNM quantity of each component in the material balance should be based on measurements. By-difference accounting is not acceptable.

All SSNM values on the physical inventory listing must be based on measurements. Prior measurement values may be accepted for inventory provided they were determined by measurement systems subject to the licensee's measurement control program, and the containers were either immediately tamper-safed after the measurement, immediately stored in an area that provided protection equivalent to tamper-safing, or encapsulated.

The SSNM content of groups of like items can be determined by averaging typical contents as determined by measurements of representative item samples of that material at the time of the inventory if the licensee has demonstrated that any

additional uncertainty resulting from this averaging method is included in the SEID estimator.

With respect to the processing of scrap generated in a prior period (which will result in a prior period adjustment to ID), the assigned value must be based on dissolver solution and dissolver residue measurements and not on the product of the scrap plant. This is because losses may occur during the separation and purification stage which should be attributable to current period processing.

03.04 Inspection Activities Flowchart. Figure 1 shows a flow chart of the physical inventory inspection activities.

END

FIGURE 1

EVALUATION OF INVENTORY PRACTICES

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