MC&A Inspection Perspective
Reactors

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10 CFR Part 74 Subpart B

In 10 CFR Part 74 power and non-power reactors are required to:

- 74.11 — Reporting of loss or theft of Special Nuclear Material (SNM)
- 74.13 — Material Status Reports
- 74.15 — Material Transaction Reports
- 74.19 — Recordkeeping (includes records, procedures and inventory)

These requirements are verified through inspection procedure 71130.11. The inspection activities are to determine:

- Are there complete and accurate records of receipts, shipments and internal movements of all SNM?
- Procedures are established that enable the accounting for all SNM?
- A physical inventory of all SNM is conducted every 12 months?
- Are Material Balance and Transaction reports submitted to NMMSS?

Inspection Procedure 71130.11

- Issued 2008
  - Conduct Reactor MC&A Inspection once every three years
  - Temporary Instruction prior to IP 71130.11
  - The regulatory framework for reactor oversight consists of three key strategic performance areas: reactor safety, radiation safety, and safeguards.
    - The NRC's operating reactor oversight process (ROP) provides a means to collect information about licensee performance, assess the information for its safety significance, and provide for appropriate licensee and NRC response. The NRC evaluates plant performance by analyzing two distinct inputs: inspection findings resulting from NRC's inspection program and performance indicators reported by the licensees.
- Primary objective is to determine if the licensee has a program in place to account for all spent fuel and that all SNM in the inventory can be located and accounted for.
- The three basic components of an MC&A program at power reactors are:
  - Record-keeping, which produces the book inventory and NMMSS reporting
  - Written procedures
  - Physical inventory at a frequency not to exceed every 12 months
- IP 71130.11 currently under going revision.

10 CFR 74.11 Reports of Loss or Theft of SNM

10 CFR 74.11

- Each licensee who possesses 1 gram or more of SNM shall notify the NRC Operations Center within 1 hour of discovery of any loss or theft or unlawful diversion of SNM.
  - Regulation established in 1956
  - Theft and unlawful diversion were added in 1974

10 CFR 74.13 Material Status Reports of SNM

10 CFR 74.13

- Each licensee who possessed in the previous reporting period SNM in a quantity totaling 1 gram or more of contained uranium-235, uranium-233, or plutonium shall submit a **Material Balance Report** of SNM that the licensee has received, produced, possessed, transferred, consumed, disposed, or lost. (DOE/NRC form 742)
  - Material status reports added in 1960
  - Physical inventory listing added in 1980
  - Instructions for reporting in NUREG/BR–0007

10 CFR 74.15 Nuclear Material Transaction Reports of SNM

10 CFR 74.15

- Each licensee who transfers or receives SNM in a quantity totaling 1 gram or more shall submit a **Nuclear Material Transaction Report.** (DOE/NRC Form 741)
  - Material transaction reports added in 1960
  - Instructions for reporting in NUREG/BR–0006

10 CFR 74.19 Recordkeeping

10 CFR 74.19(a)

- Same protocol for large and minute quantities of SNM.
  - "all" in 10 CFR 74.19(a)(1)

- Licensees shall keep records showing the receipt, inventory(including location and unique identity), acquisition, transfer and disposal of all SNM in its possession.
  - Regulation established in 1956
  - "All" added in 1967
  - The licensee is required to inventory "all" special nuclear material (SNM) in their possession on site even if the SNM quantity is less than one gram, regardless of whether the quantity of the SNM inventory is required to be reported to NMMSS or not. The typical physical inventory at a power reactor plant consists of an item count (piece count) of SNM in each item control area. An item can refer to a fuel assembly, fuel component container, non-fuel SNM container, sealed container, reassembled reactor vessel, dry storage canister, or a discrete piece of SNM (fuel or non-fuel) that is not stored in a container. The requirement to not report inventory/material balance to NMMSS is only when the aggregate (same material and same enrichment) of the balance is less than one gram.

10 CFR 74.19 Cont.

10 CFR 74.19(b)

- Each licensee shall establish, maintain and follow written MC&A procedures that are sufficient to enable the licensee to account for the SNM in its possession.
  - Written MC&A procedures added in 1967

10 CFR 74.19 Cont.

10 CFR 74.19(c)

- Each licensee shall conduct a physical inventory of all SNM in its possession under license at intervals not to exceed 12 months.
  - Inventory requirement added in 1967
  - “All” added in 1973
  - Access to some areas for inventory may be limited during operation.
  - ANSI N15.8-2009 standard directs licensees to establish administrative procedures and controls for performing inventories of SNM.
  - Regulatory Guide 5.29 “Special Nuclear Material Control and Accounting Systems for Nuclear Power Plants” endorses ANSI N15.8-2009. NRC considers conformance with this ANSI standard as an acceptable approach for complying with NRC regulations regarding material control and accounting at nuclear power plants.

Summary

The inspection goal is to answer the following questions:

- Does the licensee keep records of receipts, shipments and internal movements (including location) of all SNM?
- Does the licensee have written procedures that enable the accounting for all SNM?
- Does the licensee conduct a physical inventory of all SNM at a frequency not to exceed every 12 months?
- Does the licensee submit the required reports to NMMSS?

- Examples of Findings:
  - Mainly non-fuel SNM issues, five examples during 2014 and 2015, all were NCV.

Security Issues Forum:

The purpose of the Security Issues Forum (SIF) is to promote consistent application and resolution of inspection findings by providing a forum for regional and headquarters security inspectors, NSIR personnel and others to solicit input from colleagues and discuss other related security issues.

Questions?

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