

USE OF NUCLEAR MATERIAL CONTROL SPECIALISTS
FOR MATERIAL SURVEILLANCE

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ABSTRACT:

The new Control and Accountability of Nuclear Material Department of Energy (DOE) Order 5633.3 states that "each facility shall establish a graded safeguards program for monitoring nuclear materials and detecting unauthorized activities or anomalous conditions." Rockwell developed a new position description and hired Nuclear Materials Control (NMC) Specialists as a part of the graded materials surveillance program at Rocky Flats (RF). The NMC Specialists provide material surveillance in Material Access Areas (MAA) during all shifts when operations are in progress. By design, NMC Specialists do not handle special nuclear materials (SNM) in accordance with separation of duties and responsibilities requirements. In support of the effort to assure SNM are accessed only by authorized personnel, the NMC Specialists can serve as the second person for those activities that require two persons such as accessing storage areas containing SNM and SNM transfers between MAAs. NMC Specialists respond immediately to material control alarms, assess and document the nature of the alarm, and assist management with resolution. They perform daily administrative inventory checks to determine the integrity of the inventory and advise management daily of the results. NMC Specialists perform confirmation and coordinate verification measurements on the inventory each month utilizing statistical sampling plans. The purpose of this paper is to describe how utilization of NMC Specialists has enhanced the material surveillance program at RF.

DISCUSSION:

The Department of Energy (DOE) adopted regulations (DOE Order 5633.3) effective February 3, 1988 which set forth material surveillance program requirements for DOE facilities. The Order defines surveillance as "the collection of information through devices and/or personnel observation to detect unauthorized movements of nuclear material, tampering with containment, falsification of information related to location and quantities of nuclear material and tampering with safeguards devices." The surveillance program is to provide the mechanism to monitor the nuclear materials and detect unauthorized activities or anomalous conditions. Upon receipt of the new order, Rockwell evaluated the surveillance requirements to determine actions that could be taken to provide an effective material surveillance program with minimal fiscal impact.

It was determined that an organizational change affecting more than half of the existing MBA Custodians at RF and acquisition of additional personnel to perform enhanced surveillance activities was necessary. MBA Custodians responsible for the majority of the production MBAs were members of the Nuclear Materials Control group within the Safeguards organization and did not have hands on material handling responsibilities. The remainder of the MBA Custodians were organizationally responsible to Operations Management and performed MBA custodial duties on a part-time basis along with hands on material handling responsibilities. In accordance with separation of duties

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and responsibility requirements stated in the order, eight of the part-time MBA Custodians were transferred from Operations to the NMC group within Safeguards. They were relieved of all material handling responsibilities and assumed all MBA custodial duties previously held by the part-time custodians. All MBA Custodians of MBAs within the Protected Area at RF that have SNM are now members of the NMC group within Safeguards.

In addition, a new position description was developed and 11 NMC Specialists were hired to support the MBA Custodians with enhanced material surveillance activities. By design, NMC Specialists also do not handle SNM. The primary job responsibilities of NMC Specialists are as follows:

1. Respond to material control alarms.
2. Control access to SNM storage areas.
3. Ensure SNM is accessed by only authorized personnel.
4. Perform confirmation and coordinate verification measurements on the inventory utilizing statistical sampling plans.
5. Provide roving material surveillance.
6. Develop and enforce material control and accountability (MC&A) procedures.
7. Provide on the job MC&A training for operations personnel.
8. Perform daily administrative inventory checks to determine the integrity of the inventory and report findings.

NMC Specialists respond to all material control alarms such as items with broken tamper indicating devices (TID), missing items, violations of the two person rule, etc. They assess and document the nature of the alarm and assist management with resolution.

NMC Specialists serve as one of the two organizationally independent persons required to access storage areas. NMC Specialists have the combination to one of the two locks on the door and operations personnel maintain the combination to the second lock. The NMC Specialist or MBA Custodian must be present during the entire time that the storage area is being accessed. They verify the item identification and TID numbers along with the integrity of the TID on all items moved into or removed from the storage area.

One of the most difficult responsibilities the NMC Specialists and MBA Custodians have is to ensure SNM is accessed by only authorized personnel. Given resource availability and to the extent practicable, material surveillance procedures (MSP) are used during activities involving SNM not in storage areas. To assure the use of the MSP during critical operations, two person rules were established and required in certain cases as follows:

- o MAA-to-MAA transfers of SNM.
- o Transfers of empty shipping containers between MAAs.
- o MBA transfer source documentation.
- o Accessing and securing all storage areas.
- o Application or removal of a TID from nuclear material (NM) containers.
- o Performing SNM bag-in and bag-out operations from a glovebox in SNM areas.
- o Items added to or removed from a white 55-gallon drum or waste crate.

- o Conducting physical inventories.
- o Packing or unpacking NM for shipping/receiving offsite.

In all cases, it is permissible for one of the two persons to be an NMC Specialist or an MBA Custodian.

NMC Specialists and MBA Custodians perform statistical confirmation measurements continuously on the SNM inventory at RF. Confirmatory measurements are made to test if some attribute or characteristic of NM is consistent with the expected response for the material if no change has occurred. A serial number and TID integrity verification is made on items outside the glovebox system; a serial number verification combined with a visual inspection and a net weight check is made on items located within the glovebox system.

Of vital importance is the roving surveillance of the MAAs provided by the NMC Specialist. They perform random material surveillance in that they may appear at any time and any location to observe the activities being performed in their assigned area of responsibility. They are intended to provide that portion of material surveillance to "assure the observation of an area containing SNM by at least two ("Q") cleared and knowledgeable authorized persons who may be doing other work but who can give an alarm in time to prevent the unauthorized removal or diversion of the SNM or an act of sabotage involving SNM."

NMC Specialists help develop and enforce MC&A procedures. They provide on the job MC&A training for operations personnel on a daily basis. The Specialists must use proper judgement to determine apparent violations of MC&A procedures. The protection of the SNM inventory is of paramount consideration when determining whether an incident should be reported. If the observer feels that the violation constitutes a threat of possible theft or diversion, the incident is reported to the plant Shift Superintendent, who contacts Safeguards Planning and Assessment. They will conduct an investigation in cooperation with Security Operations. If the investigation indicates that a potential threat of theft or diversion was caused by the incident, a security infraction would be issued.

NMC Specialists perform documented daily administrative inventory checks in all Category I MBAs to determine the integrity of the inventory. Depending upon the characteristics of the MBA, this may include walkthrough observations to determine that no items are obviously missing and that there is no indication that tampering has occurred, checks to ensure all process drums and waste crates are locked or employ properly installed TIDs, a check of storage areas to ensure they are properly secured and alarmed, container counts, and empty bin checks. The results are telephoned daily to Nuclear Materials Control and Accountability who in turn notifies DOE/RF Safeguards and Security.

The 11 NMC Specialists along with 22 MBA Custodians, 2 NMC Administrators and the manager comprise the NMC group. NMC personnel are stationed in all seven Material Access Areas (MAA) within the Protected Area at RF. They have responsibility for the material control effort for all SNM at RF. NMC Specialists spend their workday in the process areas to control access to, transfer, and use of all SNM in the MAA.

After more than one year of operation, the decision to have all MBA Custodians in the Safeguards organization and the acquisition of the NMC Specialists was a valid one. Operations personnel have accepted the Specialists in a support role for helping them achieve compliance with DOE Order requirements for material control and accountability and material surveillance.

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