

October 31, 2002

MEMORANDUM TO: Chairman Meserve

FROM: Hubert T. Bell
Inspector General */RA/*

SUBJECT: NRC'S REGULATORY OVERSIGHT OVER THE CONTROL OF
SPECIAL NUCLEAR MATERIAL AT MILLSTONE UNIT 1
(CASE NO. 01-03S)

Attached is an Office of the Inspector General (OIG), U.S. Nuclear Regulatory Commission (NRC), Event Inquiry regarding the reported loss of two irradiated fuel rods at the Millstone Nuclear Power Station Unit 1. This Event Inquiry reviewed the NRC oversight of Millstone's accountability program from the late 1970s to the present for special nuclear material generated by the nuclear power plant.

Attachment: As stated

cc w/attachment:
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
W. Travers, EDO

OFFICE OF THE INSPECTOR GENERAL EVENT INQUIRY



**NRC'S REGULATORY OVERSIGHT OVER
THE CONTROL OF SPECIAL NUCLEAR MATERIAL
AT MILLSTONE UNIT 1**

Case No. 01-03S

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NRC'S REGULATORY OVERSIGHT
OVER THE CONTROL OF SPECIAL
NUCLEAR MATERIAL AT MILLSTONE UNIT 1

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BASIS AND SCOPE

The Office of the Inspector General (OIG) initiated this Event Inquiry based on public concerns about the reported loss of two irradiated fuel rods at the Millstone Nuclear Power Station Unit 1. The current U.S. Nuclear Regulatory Commission (NRC) license holder for Millstone Unit 1 is Dominion Nuclear Connecticut (DNC). Prior to DNC becoming the U.S. Nuclear Regulatory Commission (NRC) license holder for Millstone Unit 1 in March 2000, the licensee was Northeast Nuclear Energy Company. In 2000, as part of licensee efforts to decommission Millstone Unit 1, DNC initiated reconciliation and verification of the spent fuel maintained in the spent fuel pool. This process identified that two fuel rods reflected in the former licensee's records could not be located. On November 16, 2000, DNC informed the NRC that two irradiated fuel rods could not be located in the spent fuel pool at Millstone Unit 1. Irradiated fuel rods contain uranium, plutonium, and other radioactive material and must be strictly accounted for in accordance with NRC regulations.

This OIG Event Inquiry reviewed NRC oversight of the former and current licensee's accountability program for special nuclear materials generated by Millstone Unit 1 from the late 1970s to the present.

BACKGROUND

NRC Requirements To Account for SNM

NRC requires licensees to employ stringent accounting and control procedures over grams of uranium and plutonium in their possession. Both uranium and plutonium are referred to as special nuclear material (SNM) in NRC regulations. NRC licensees are required to administratively and physically control SNM in designated areas known as inventory control areas, or ICAs. Generally, nuclear power plants have three ICAs. One is for new fuel not yet used in the reactor, one is for the fuel in the reactor vessel itself, and the third is the spent fuel pool (SFP) for storage of irradiated, or spent, fuel. Also, due to SFP storage limitations, some reactor operators have another ICA for dry cask storage of spent fuel.

Prior to 1994, Title 10 of the Code of Federal Regulations (CFR), Part 74, Material Control and Accounting of Special Nuclear Material, required that each time SNM was received or shipped by a reactor operator, a Nuclear Material Transfer Report, Department of Energy (DOE)/NRC Form 741 (Form 741), had to be generated to document the transfer of SNM. NRC licensees had to submit these forms to the U.S. Nuclear Materials Management and Safeguards System database, which is maintained by DOE. Title 10 CFR, Part 74 also required reactor licensees to semiannually submit a Nuclear Material Status Report, DOE/NRC Form 742 (Form 742), reflecting the calculated total SNM inventory on hand as of September 30 and March 31 of each year. After July 1994, this process became computerized.

Title 10 CFR, Part 70, Subpart G, Special Nuclear Material Control, Records, Reports and Inspections, establishes NRC requirements and procedures for NRC license holders that possess spent nuclear fuel. These requirements include procedures for the material control and accounting of SNM. NRC requires licensees to maintain and follow written procedures to account for all SNM in their possession. Specifically, NRC requires licensees to conduct a physical inventory of all SNM in their possession and to reconcile their inventory records with their physical inventory of SNM every 12 months. In addition, the NRC regulation directs licensees to maintain a recordkeeping system showing the location of all their SNM maintained in discrete items or containers. Title 10 CFR, Part 70, Subpart G serves as the basis for NRC to conduct Material Control & Accounting (MC&A) inspections. During these inspections, NRC determines whether the licensee is maintaining all required records in accordance with the NRC regulation and is performing all required reporting.

Nuclear Power Generation at Millstone Unit 1

Millstone Unit 1, a nuclear power plant located in Waterford, CT, was in operation from October 7, 1970, through November 4, 1995. During this time, the NRC operating license holder for this plant was Northeast Utilities (NU). When Millstone Unit 1 was in operation, the reactor vessel normally contained 580 fuel assemblies or bundles. Each assembly contained 49 fuel elements or rods. The fuel rods, which contained uranium-235 (U-235), were each .57 inches in diameter and 158 inches long (approximately 13 feet). During the fission process, U-235 is used, or 'burned,' to generate electricity. One byproduct of the fission process is plutonium (Pu-239 and Pu-241). Various other radioisotopes are also produced as a result of the fission process and were contained in the fuel rods that had been used in the nuclear

reactor. [NOTE: OIG recognizes that irradiated fuel rods contain uranium and, in much lesser amounts, plutonium and other radioisotopes. However, this OIG report focuses on NRC oversight pertaining to Millstone's accountability for the two missing irradiated fuel rods and the uranium contained therein.]

Licensee Discovers Two Fuel Rods Are Missing

On November 16, 2000, DNC informed the NRC that it was unable to account for two irradiated fuel rods that had previously been reported as stored in the Millstone Unit 1 SFP. On January 11, 2001, after licensee efforts at Millstone Unit 1 to verify records and determine the location of the two unaccounted-for rods failed to locate the rods, DNC submitted a Licensee Event Report (LER) to NRC reporting that the two irradiated fuel rods were missing. NRC requires licensees to submit LERs within 60 days after the discovery of a condition that is prohibited by the plant's technical specifications, for example, the failure of any safety system needed to control the release of radioactive material. The January 11, 2001, LER disclosed that the two irradiated fuel rods had not been tracked in the Millstone Unit 1 SNM records. The LER reported that the two fuel rods, in the year 2000, would have contained 7,732 grams of uranium and 40.2 grams of plutonium.

The January 2001 LER provided a history of the two missing fuel rods at Millstone Unit 1. According to the LER, in 1972, due to a failure of condenser tubes, saltwater entered the reactor coolant system at Millstone Unit 1. The reactor was shut down and a fuel assembly, number MS-557, was placed in the Millstone Unit 1 SFP. Personnel from General Electric (GE), a Millstone contractor, disassembled fuel assembly MS-557 which contained 49 irradiated fuel rods. The 49 rods were placed in seven eight-rod storage containers for temporary storage. In 1974, GE personnel reassembled fuel assembly MS-557 but placed only 47 rods back in the fuel assembly because two fuel rods were damaged. The two damaged rods that were not returned to the fuel assembly remained in an eight-rod storage container in the SFP.

OIG learned that Millstone used a system of index cards and schematic drawings, or maps, to record the location of its SNM inventory. Fuel assembly MS-557 was recorded in the Millstone Unit 1 SNM inventory control system both in a card file and on an SFP map, but no separate entry for the two damaged fuel rods was made in the SNM inventory system. Reportedly, in May 1979, a Millstone Unit 1 reactor engineer found the two fuel rods in the eight-rod container. Assisted by GE personnel, the engineer determined the source of the two rods, created a card file, and recorded the location of the two fuel rods on an SFP map. The card file identified the rods by serial number and specified their storage location in the SFP. The May 1979 entry was the only entry on the card file. The May 1979 SFP map recorded the location of the two fuel rods and all other items of SNM stored in the SFP. The location of the two rods in the SFP was recorded on two additional SFP maps, prepared by the licensee in February and April of 1980. In September 1980, another SFP map was prepared; however, the location of the two rods did not appear on this or any subsequent SFP maps. During the 2000 reconciliation, the licensee found the card file for the two fuel rods created by the Millstone Unit 1 reactor engineer in May 1979 but was unable to locate the two rods.

Licensee and NRC Review Regarding Two Missing Fuel Rods

In October 2001, DNC completed an extensive review to locate the two missing spent fuel rods. As part of this review, DNC reviewed all of its Forms 741 to determine if there was a record of the two missing fuel rods being transferred from the facility. DNC failed to locate a record of the two rods having been transferred but concluded that the low-level radioactive waste (LLRW) disposal facility at Barnwell, SC, “had a significant opportunity to receive the fuel rods....” DNC also concluded that there was a low probability that the two rods were still in the SFP at Millstone Unit 1 or that the rods had inadvertently been shipped to a GE facility in Vallecitos, CA. DNC also noted there was a small possibility that the rods were shipped to a low-level waste facility in Richland, WA.

On September 20, 2001, NRC staff issued SECY-01-0175 to inform the NRC Commissioners about the loss of the two fuel rods, the licensee’s ongoing efforts to locate the rods, and the NRC staff’s actions relative to the missing fuel rods. This SECY included information concerning NRC MC&A inspection procedures and advised the Commissioners that MC&A inspection procedures did not specifically address inspection activities relating to individual fuel rods. In addition, SECY-01-0175 conveyed information based on discussions with NRC staff who performed MC&A inspections at reactors 10 years earlier. According to SECY-01-0175, the inspectors said they would have verified the location of a statistical sample of individual fuel rods had they been aware that any fuel rods existed outside bundles (fuel assemblies). The NRC staff also told the Commissioners that they were not able to locate records of MC&A inspections conducted at Millstone Unit 1.

On February 27, 2002, NRC staff reported the results of a special NRC inspection that reviewed the licensee’s efforts to locate the missing fuel rods. In this report, NRC staff agreed with DNC that the most likely location for the two missing rods was the LLRW facility in Barnwell, but the staff disagreed with the licensee’s conclusion that there was a possibility that the rods had been shipped to the GE Vallecitos facility. According to the report, NRC staff did not believe that the GE Vallecitos was a “plausible location.”

On June 25, 2002, NRC took enforcement action against DNC and issued a Notice of Violation which proposed a fine in the amount of \$288,000 for failure to adequately account for SNM contained in two irradiated fuel rods and for failure to report the missing material to the NRC in a timely manner.

DETAILS

I. NRC MC&A INSPECTION PROGRAM

History of the MC&A Inspection Program

NRC's predecessor, the U.S. Atomic Energy Commission (AEC), started the MC&A program in approximately 1965 to verify SNM inventory information reported to the AEC semiannually by reactor operators. MC&A inspections conducted by the AEC involved an audit of a power reactor operator's records, examination of its physical and documentary procedures used to account for SNM, and a review of the calculations used to estimate the amount of uranium expended to generate electricity. At that time, all SNM was owned by the Federal Government and leased by the AEC to reactor operators. The reactor operators paid the Federal Government use charges for the uranium they had in their inventories, and they also paid for the uranium they expended to generate electricity.

After NRC was established by the Energy Reorganization Act of 1974, it assumed responsibility for regulating the civilian uses of nuclear materials. The NRC MC&A inspection program was initially administered in Atlanta, GA, and later transferred to the individual NRC regional offices where it remained until approximately 1988. In 1988, MC&A inspection program responsibilities were transferred from the NRC Regional Offices to the NRC Office of Nuclear Reactor Regulation (NRR). However, during the late 1980s, the NRC assembled a task force to reformulate the NRC inspection program for nuclear power plants based on a risk-informed approach. The head of the task force told OIG that the issues covered under the MC&A program were not considered significant risk factors. As a result, routine MC&A inspections did not become part of the new risk-informed reactor oversight program and are now performed only in response to specific events. According to a senior NRR manager, NRC has not conducted any routine MC&A inspections at power plants since 1988. Appendix C, "Special and Infrequently Performed Inspections," of the current NRC Inspection Manual, dated March 6, 2001, identifies MC&A inspections as being "performed only when authorized by the Regional Administrator after a review and assessment of plant events or conditions."

NRC MC&A Inspection Procedures

The NRC procedures in effect (described in NRC Inspection Procedure 85102B) when routine MC&A inspections were conducted (prior to 1988) required NRC regional inspectors to ensure that licensees conducted required physical inventories. These procedures required NRC inspectors to verify the total number of irradiated fuel assemblies, their serial numbers, and other supporting documentation. The inspectors were required to use source documents, internal card files, log books, and any other licensee records to verify the identification, quantity, and location of SNM. The inspection procedures also required inspectors to (1) verify that the licensee maintained and followed written procedures to control and account for all items of SNM and (2) examine licensee records to ensure that the recordkeeping system described the current location, quantity, and identity of all items containing SNM.

OIG learned that reconstitution of fuel assemblies was practiced by reactor operators during the late 1970s and 1980s. Reconstitution involved the replacement of individual fuel rods in a fuel assembly, a practice that would have created conditions for individual irradiated fuel rods to be present in a power plant's SFP. OIG learned that one reason a reactor operator may have reconstituted a fuel assembly was to replace a leaking fuel rod.

The MC&A inspection procedures referenced NRC Regulatory Guide 5.29, "Nuclear Material Control Systems for Nuclear Power Plants," which provided guidance to licensees about controlling and accounting for SNM. Regulatory Guide 5.29 adopted the standards identified in the American National Standards Institute (ANSI) standard number N15.8-1974 for reactor operators to control and account for SNM. ANSI standard N15.8-1974 specifically mentioned that SNM contained in isolated fuel rods should be separately identified in all material control records as follows:

"6. Internal Control

6.1 Unit of Control. The basic unit of control for nuclear material shall be the nuclear fuel assembly. Each nuclear fuel assembly shall be identified in the material control records by its serial number and location. Nuclear material contained in fuel elements, not part of an assembly, shall be separately identified on all material control records."

ANSI standard N15.8-1974 also stated that a total count or inventory of irradiated fuel should include both fuel assemblies and fuel rods and should be performed at least every six months. Further, ANSI recommended that material control records be reconciled to physical inventories.

II. NRC MC&A INSPECTION PRACTICES

The NRC inspectors who performed MC&A inspections during the 1970s and 1980s characterized these inspections to OIG as audits of the licensee's records. According to the NRC inspectors and management staff involved with the MC&A inspection program, these inspections typically consisted of a review of a licensee's records to ensure that the licensee was maintaining an adequate system of controls to account for all SNM in its possession. The licensee's SNM shipping and receiving records were also reviewed. After inspecting a licensee's SNM recordkeeping system, NRC inspectors conducted a statistical sampling of all licensee SNM to verify that material contained in a licensee's SNM records was physically located as described in its records. Each fuel assembly bore a unique serial number on the top of the bundle. The licensee's schematic drawings of the SFP and the reactor core reflected the unique serial numbers of the fuel bundles and their specific location in each of these locations. Once an irradiated fuel assembly was removed from the reactor core, it was placed in the SFP. During inspections, NRC inspectors verified the serial numbers of the fuel assemblies in the SFP. According to the NRC staff, to verify the total inventory amount or balance of SNM for which a licensee was responsible, the inspectors began the current inspection by using the last audited balance of SNM from the NRC's previous inspection report. The staff likened this to balancing a checkbook and beginning with the last verified balance amount.

According to one NRC inspector, the first thing he did to prepare for an MC&A inspection was to review the details of the previous MC&A inspection. Another inspector told OIG that he normally obtained a printout from the U.S. Nuclear Materials Management and Safeguards System (NMMSS) database and consulted the previous MC&A inspection to prepare for an MC&A inspection. Based on the last audited balance, inspectors then reviewed records of receipt and shipment of SNM (Form 741) and verified the licensee's calculations of the amount of SNM that had been expended to generate electricity. Using this approach, the inspectors arrived at a new balance figure, which they then compared to the licensee's own SNM inventory balance record (Form 742).

III. OIG REVIEW OF SNM INSPECTIONS AT MILLSTONE UNIT 1

OIG found that the NRC staff conducted one routine MC&A inspection at Millstone Unit 1 in 1978 and one in 1982. OIG also found that in 1980, the staff conducted an inspection in response to an allegation that spent fuel rods from the Pilgrim Nuclear Power Station Unit 1 and Millstone Units 1 and 2 had been buried illegally at the Barnwell LLRW facility in South Carolina. In reviewing these inspection reports, OIG noted that they did not mention any inventory review to ensure that the licensee was accounting for individual fuel rods as recommended in the ANSI standard for control and accounting for SNM. A summary of the three inspection reports is provided below.

1978 MC&A Inspection 50-245/78-16 at Millstone Unit 1

OIG learned that NRC Region I staff conducted a routine, unannounced MC&A inspection at Millstone Unit 1 from May 9 through May 11, 1978, covering the period from January 1, 1976, through March 31, 1978. The inspection report (50-245/78-16) indicated that the staff did not find any items of non-compliance with regulatory requirements. The report indicated that the inspection team reviewed Millstone Unit 1 procedures for control and accountability of SNM and found them to be acceptable. The inspection report also reflected that the licensee maintained a card file for all fuel assemblies and that the spent fuel pool schematic was current. The inspection report did not indicate whether SNM items other than fuel assemblies were controlled in the card file system. According to the inspection report, the inspectors performed a piece count of the fuel in the SFP. The report also indicated that selected spent fuel assemblies were compared to the SFP schematic and the card file for position accuracy. Also, the reactor core schematic for the fuel assembly serial numbers was compared to the card file and internal material transfer forms for position accuracy. OIG noted that this inspection report did not identify the fact that the licensee had no card file record for the two separate fuel elements.

In addition, the Region I inspection team verified procedures used by Millstone Unit 1 to calculate the amount of uranium expended to generate electricity, known as the 'burn rate' and determined that the licensee's 'burn rate' figure closely paralleled its own computation. However, OIG learned that the ending audited balance for this inspection (March 31, 1978), was not consistent with the balance in the NMMSS database for enriched uranium element. Specific SNM balance figures relating to the 1978 inspection report are included in the following table:

1978 Inspection SNM Balance Figures for Millstone Unit 1	
Beginning Balance Enriched Uranium Element January 1, 1976	182,078,418 grams
Ending Balance Enriched Uranium Element March 31, 1978 (Audited by NRC)	225,782,154 grams
NMMSS Database Enriched Uranium Element Balance as of March 31, 1978	226,100,386 grams

1982 MC&A Inspection 50-245/82-18 at Millstone Unit 1

The next routine NRC MC&A inspection at Millstone Unit 1 to verify SNM inventory was performed on September 29 through September 30, 1982, by a Region I inspector. The inspection period covered April 1, 1978 (one day after the ending date of the 1978 inspection), through March 31, 1982. The inspection report (50-245/82-18) reflected that the inspector reviewed the licensee's SNM control and accounting practices and found them to be in compliance with NRC regulations and that no items of non-compliance were identified. According to the inspection report, the inspector also reviewed facility organization and operation, shipping and receiving, storage and internal control, physical inventory, and records and reports. The inspection report did not reflect whether the inspector reviewed fuel assemblies and fuel rods as part of the inventory. Also, while the inspector reviewed the licensee's physical inventory records and audited all material status reports (Forms 741), OIG found no mention in the inspection report regarding a comparison of card file records to either the actual presence of the fuel in the SFP or to the SFP schematic.

In addition, OIG noted that the September 1982 NRC inspection report reflected a beginning enriched uranium element balance that was not the same as the ending balance determined by the 1978 MC&A inspection at Millstone Unit 1, even though the 1982 inspection period began the day after the ending date of the 1978 inspection. The NRC inspector who performed the 1982 inspection told OIG that he used an SNM balance provided by the licensee for the beginning balance of his inspection. OIG learned that this was inconsistent with the inspection practices used by MC&A inspectors during this time period. The MC&A inspection practice called for the inspector to use the ending SNM balance reflected in the 1978 MC&A inspection. Specific SNM balance figures relating to the 1982 inspection report are included in the following table:

1982 Inspection SNM Balance Figures for Millstone Unit 1	
Beginning Balance Enriched Uranium Element April 1, 1978 (Used by NRC Inspector)	225,775,833 grams
Ending Balance Enriched Uranium Element March 31, 1982 (Audited by NRC)	262,010,218 grams
NMMSS Database Enriched Uranium Element Balance as of March 31, 1982	262,491,023 grams

1980 Inspection Regarding Allegation of Illegal Dumping of Spent Fuel at Barnwell

OIG learned that on March 4, 1980, a *Washington Post* article, "S.C. Officials Probe Allegations of Illegal Dumping of A-Waste," reported an allegation that spent fuel rods from the Pilgrim Nuclear Power Station Unit 1 and Millstone Units 1 and 2 had been buried illegally at the Barnwell low-level waste facility in South Carolina. The allegation provided specifics about the number of illegal spent fuel shipments and the type of shipping containers used for the shipments.

In response to the allegation, NRC conducted an investigation of the MC&A program at Pilgrim. The NRC investigative report (50-293/80-12) stated, "Investigators, independent of licensee records, developed a book balance of all SNM units (fuel assemblies, fuel rods and fuel loading chambers) that should have been on the Pilgrim Nuclear Power Station Unit 1 site since March 5, 1980. This balance included shipments and receipts of SNM since prior to initial operation of the reactor." The investigative report looked specifically at when Pilgrim Unit 1 had individual fuel rods in inventory, receipt of individual fuel rods from GE (its fuel manufacturer), and shipment of irradiated fuel rods to GE. The investigative report stated that another investigation was conducted to determine whether spent fuel had been illegally shipped from Millstone Units 1 and 2. This investigation was described in NRC Inspection Report 50-245/80-04 and 50-336/80-03.

OIG reviewed the Millstone inspection report (Combined Inspection 50-245/80-04 and 50-336/80-03) referenced in the Pilgrim investigation and noted that the Millstone inspection was a routine monthly inspection for March 1980 and not specifically focused on SNM accountability. The inspection report reflected that two NRC resident inspectors at Millstone Units 1 and 2 reviewed radioactive material shipment records. According to the inspection report, the resident inspectors found no items of non-compliance in the radioactive material shipment records. However, OIG's review of the report determined that it did not reference any review of the licensee's SNM card file records or whether the licensee maintained individual fuel rods at Millstone. Also, this inspection did not include a review of enriched uranium element inventory balances; consequently, there is no NRC verification of the licensee's SNM inventory at this time. OIG noted that at the time of the March 1980 inspection of Millstone Units 1 and 2, the Millstone Unit 1 reactor engineer had created (in May 1979), a record for the two irradiated fuel rods in the SNM card file system, and the location of these two rods was marked on the SFP schematic dated February 26, 1980. Despite the allegation concerning illegal dumping of

spent fuel, OIG found no documentation indicating that NRC physically verified that the rods were actually in the SFP at that time.

FINDINGS

OIG found that the methodology used by the NRC inspector who performed the September 1982 MC&A inspection at Millstone Unit 1 was flawed. The accepted practice when conducting an MC&A inspection was for the NRC inspector to begin the inventory with the audited SNM ending balance from the last MC&A inspection. However, the inspector who conducted the 1982 NRC inspection began with a licensee-provided SNM balance that differed from the audited ending balance from the preceding 1978 MC&A inspection at Millstone Unit 1. Also, the beginning SNM balance used for the 1982 MC&A inspection was inconsistent with the NMMSS database balance for the same time period.

OIG also determined that the NRC staff did not take advantage of several opportunities to establish an accurate account of the quantity of enriched uranium element maintained by Millstone Unit 1 between 1978 and 1982. These opportunities included the NRC MC&A inspections in 1978 and 1982 and the 1980 NRC inspection activities conducted in response to an allegation that fuel rods had been illegally shipped to Barnwell, SC. The NRC inspection procedures in effect during this time period included a reference to NRC Regulatory Guide 5.29, which adopted the ANSI standards for control and accounting of SNM. The ANSI standards specify that licensees should separately account for fuel elements that were not part of a fuel assembly. However, OIG found that the NRC inspection reports did not document any NRC actions to verify the presence of individual fuel rods to ensure the licensee's records were accurate.

OIG found that since 1988, MC&A inspections of nuclear power reactors are no longer performed as part of the baseline or supplemental inspections at nuclear power plants. As a result of the risk-informed regulatory approach adopted by the NRC, MC&A inspections are now categorized as special or infrequently performed inspections and are implemented only for special situations based on plant events or conditions. Consequently, because routine MC&A inspections are no longer performed at nuclear power reactors, there is no systematic verification of licensee inventories of SNM conducted by the NRC.

LIST OF ACRONYMS

AEC	U.S. Atomic Energy Commission
ANSI	American National Standards Institute
CFR	Code of Federal Regulations
DNC	Dominion Nuclear Connecticut
DOE	U.S. Department of Energy
GE	General Electric
ICAs	inventory control areas
LER	Licensee Event Report
LLRW	low-level radioactive waste
MC&A	Material Control & Accounting
NMMSS	U.S. Nuclear Materials Management and Safeguards System
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NU	Northeast Utilities
OIG	Office of the Inspector General
SFP	spent fuel pool
SNM	special nuclear material