

Material Control and Accounting at Nuclear Power Plants and Wet Storage Sites

In June 2000, during records reconciliation and verification of the spent fuel pool inventory, the licensee for Millstone Unit 1 identified that two full-length irradiated fuel rods, which had been separated from their parent assemblies and placed in a container for individual rods in the spent fuel pool, were not in the location specified in the special nuclear material (SNM) accounting records. The licensee conducted an extensive investigation, which concluded that the missing fuel rods had very likely been transported to a licensed low-level radioactive waste disposal facility. The NRC conducted a special inspection that reviewed the results of the licensee's investigation and concurred with the licensee's conclusions regarding the location of the two rods. The licensee for Millstone Unit 1 received a violation for failure to adequately control and account for the SNM contained in the two rods. The violation was categorized at Severity Level II with a \$288,000 civil penalty. The violation was cited against Title 10 of the *Code of Federal Regulations* (10 CFR Sections 70.51(b), (c), and (d)).

MC&A Requirements

The material control and accounting (MC&A) rule was established by the Atomic Energy Commission in the *Federal Register* of February 3, 1956, and required all licensees possessing SNM to "keep records showing receipt, inventory and transfer" of SNM. The requirement was located in 10 CFR 70.51. In 2002 all MC&A requirements were moved to Part 74 of 10 CFR. The three basic MC&A requirements that apply to power reactors were moved from 10 CFR 70.51 Sections (b), (c), and (d) to 10 CFR 74.19 Sections (a), (b), and (c). They can be summarized as follows:

- (a) Establish, maintain, and follow written procedures sufficient to account for all SNM possessed under license;
- (b) Keep records concerning receipt, inventory (including location and unique identity), acquisition, transfer, and disposal of all SNM possessed; and
- (c) Perform physical inventories of all SNM possessed at least every 12 months.

In addition to the three requirements summarized above, power reactors are also subject to the MC&A reporting requirements in 10 CFR Sections 74.11, 74.13, and 74.15.

Temporary Instruction

In response to the issues identified at Millstone Unit 1, on November 26, 2003, NRC issued Temporary Instruction (TI) 2515/154, "Spent Fuel Material Control and Accounting at Nuclear Power Plants." The TI objective was to gather site-specific information concerning MC&A of spent fuel at all power reactors and to assess whether similar problems existed at other sites. The TI was conducted in three phases. Phases I and II of the TI were to be conducted at each site by the Regions (e.g., by Resident Inspectors). Phase I was designed to determine if the licensee had ever reconstituted fuel or removed rods from an assembly. Phase II was designed

Enclosure

to gather general information about the licensee's MC&A program. Phase III required that thorough inspections be conducted by qualified MC&A inspectors at a minimum of 12 sites. Resident inspectors were trained on the TI by qualified Headquarters-based MC&A inspectors in December 2003, and conducted Phases I and II between December 2003 and June 2004.

Issues Identified at Vermont Yankee and Humboldt Bay

During the conduct of the first two phases of the TI, control and accounting problems similar to those identified at Millstone Unit 1 were identified at Vermont Yankee and Humboldt Bay.

In March 2004, the NRC resident inspectors at Vermont Yankee performed Phase II of the TI. On April 20, 2004, in response to concerns from the resident inspectors regarding the effectiveness of the spent fuel pool inventory methods at Vermont Yankee, the licensee found that two spent fuel rod pieces were not in their documented locations in the spent fuel pool. The licensee assembled an investigation team in an attempt to locate the two missing fuel rod pieces, and the NRC initiated a special inspection. On July 13, 2004, after an extensive search, the pieces were located in the spent fuel pool. The licensee was cited for failure to control and account for the two rod segments, which were eventually found, and was issued a Severity Level III violation with no civil penalty.

On June 25, 2004, NRC issued Information Notice 2004-12, "Spent Fuel Rod Accountability," (ADAMS Accession No. ML041530106) to inform all licensees for operating power reactors, research and test reactors, decommissioned sites storing spent fuel in a pool, and other sites with wet spent fuel storage of the issues at Millstone and Vermont Yankee regarding MC&A program effectiveness and loss of control over items containing SNM.

In July 2004, the licensee for Humboldt Bay notified the NRC of a discrepancy between inventory records and the location of three fuel rod segments. Subsequent investigation at Humboldt Bay identified that one incore detector and parts of three other incore detectors containing SNM were also missing. The NRC conducted a special inspection and determined, based on the conclusion of the licensee's investigation, that although the missing SNM could not be located onsite, it was very likely in a licensed low-level radioactive waste disposal facility. The licensee was cited for failure to control and account for the three rod segments and incore detectors and was issued a Severity Level II violation with a \$96,000 civil penalty.

Responses taken by the NRC to these and other MC&A events are depicted chronologically in Attachment 1 to this Enclosure.

Report of Phase I and II Results

In a memorandum to the Office of the Executive Director for Operations dated September 17, 2004 (ADAMS Accession No. ML041940411), the staff reported the results of Phases I and II of the spent fuel MC&A inspections. Information collected from licensees during the conduct of Phase I of TI 2515/154 indicated that over 90 percent of reactor sites had reconstituted irradiated fuel assemblies (that is, they had removed individual rods from assemblies and replaced them with other rods). Information collected during Phase II identified facilities with concerns in the following programmatic areas: visual verification of stored rods and pieces,

tracking of individual rods and pieces, spent fuel pool practices and activities, written procedures, roles and responsibilities, physical inventory practices, and accounting records.

Based on the initial evaluation of Phase I and II inspection results and recommendation of the Regions, the staff recommended that Phase III inspections be conducted at 19 sites, which was more than the 12 Phase III inspections originally called for in the TI.

In the memorandum, the staff indicated the intent to develop a bulletin, requesting power reactor licensees and wet storage sites to review the accuracy of their accounting records, visually confirm that all SNM items in their accounting records were in their specified spent fuel pool locations, provide a description of their control and accounting programs, and report the results to the NRC. In August, the staff had verbally informed the Commission of the intent to issue a bulletin and on January 13, 2005, in SECY-05-0015 (ADAMS Accession No. ML043130451), the staff informed the Commission in writing of intent to issue a bulletin.

Bulletin Issued

On February 11, 2005, the NRC issued Bulletin 2005-01, "Material Control and Accounting at Reactors and Wet Spent Fuel Storage Facilities" (ADAMS Accession No. ML050390228). The Bulletin notified licensees about concerns with control and accounting of SNM at power reactors and wet spent fuel storage facilities and requested licensees to:

- Provide a description of their physical inventory and accounting processes to the NRC within 30 days of the date of the bulletin; and
- Confirm the accuracy of their accounting records, visually confirm all SNM items in their spent fuel pools, and report the results to the NRC within 90 days.

The Bulletin gave licensees the option of proposing an alternative course of action or completion date, along with the safety basis for determining the acceptability of the planned alternative course of action or completion date. Following receipt of the licensee responses to the Bulletin, the NRC staff reviewed them to assess the general condition of licensee MC&A programs and to inform the decision as to which facilities would be selected for inspection in accordance with the requirements for Phase III of TI 2515/154.

Evaluation of Bulletin Responses

In order to facilitate assessment of the large amount of information from licensees and Regional inspectors, the NRC staff developed an assessment process to evaluate the Bulletin responses. The evaluation considered the following areas, based on the licensee's responses: the licensee's MC&A program; site activities, such as reconstitutions and fuel failures; and risk, in that risk of loss-of-control was lower for licensees that possessed only intact assemblies and had never reconstituted fuel or experienced fuel failure. The evaluation also considered whether or not the licensee's 30-day and 90-day responses were consistent, whether or not the licensee's responses were consistent with the resident inspector's Phase II inspection results, and whether or not the Region or resident inspector had recommended additional inspections. Information gathered during the conduct of Phase I and II inspections and responses to the Bulletin on MC&A of spent fuel was used by the staff to prioritize sites for Phase III inspections.

Initial Phase III Inspections

Based on the analysis of the Bulletin responses, the staff selected 10 sites for Phase III inspections: V.C. Summer, Millstone, Palisades, D.C. Cook, Farley, South Texas, Prairie Island, Beaver Valley, Hatch, and Palo Verde. The 10 inspections plus the two Phase III inspections conducted at Vermont Yankee and Humboldt Bay, which were conducted in response to issues identified at those sites, satisfied the TI requirement for 12 Phase III inspections. These 10 additional inspections were completed prior to November 26, 2005, the original expiration date of the TI. In response to a licensee report of unaccounted for fuel, an additional inspection was scheduled for December 2005 at Oconee. This brought the total number of the initial Phase III MC&A inspections to 13, with 12 at operating reactor sites and 1 at a decommissioning power reactor site (Humboldt Bay). The initial Phase III inspections were conducted by four qualified MC&A inspectors from the Office of Nuclear Security and Incident Response (NSIR) and two from Region II, who were temporarily assigned to NSIR.

A typical Phase III inspection involved two inspectors at 32 hours onsite for each inspector and included the following activities:

- Review of selected MC&A records, including records of receipt, transfer within the spent fuel pool, storage, physical inventory, and shipment off-site (to laboratories or the West Valley reprocessing facility) of items containing SNM;
- Review of records of all activities that involved separation of rods or pieces from the “parent” assembly, such as reconstitution (the process of removing damaged rods from an assembly and replacing them) and fuel failure;
- Review of written material control procedures, both those currently in use and historical procedures, and other related procedures;
- Review of accounting records and comparison with records provided by the Nuclear Material Management and Safeguards System (NMMSS);
- Visual verification that the location recorded in the accounting records was correct for a sample of intact assemblies and 100 percent of “orphan” rods and pieces; and
- Review of licensee self-assessments of their MC&A programs and actions taken in response to recommendations.

Each inspection was documented in an inspection report. The Vermont Yankee, Humboldt Bay, and Hatch inspection reports were issued by the Regions with assistance from NSIR, while the remaining reports were issued by NSIR. (In accordance with 10 CFR 2.390(d), the reports were not released to the public.)

Results of Initial Phase III Inspections

On April 4, 2006, in SECY-06-0079, "Results of Material Control and Accounting (MC&A) Inspections Conducted at Power Reactors" (ADAMS Accession No. ML060410190), the staff informed the Commission of the results of the 13 power reactor MC&A inspections. General observations reported in SECY-06-0079 were as follows:

- Licensees stored rods and pieces in many different container types (e.g., open failed rod storage baskets; open and lidded consolidation canisters; and skeleton assemblies) and configurations (e.g., tubes specially designed to hold individual rods; specially constructed sheaths or cylinders; and open water tubes and guide tubes of assemblies).
- For most licensees inspected, physical inventories did not include visual observation or other confirmation of all SNM, in particular, rods and pieces.
- Many licensees limited physical inventory of open rod storage containers to observing the presence of the containers, not the contents.
- Fuel failures and reconstitutions did not always imply that the licensee had lost control of rods or pieces. Some licensees had complied adequately with the requirement to keep complete records concerning all SNM activities (in particular, of activities involving spent fuel rods and pieces) and had not experienced loss of control, even when physical inventory was not used to confirm recorded locations.
- Some licensees did not recognize that record-keeping and physical inventory were separate requirements and assumed that review of records was sufficient confirmation that an item was physically located where the records indicated it was located.

No problems were identified with record-keeping and physical inventory of intact assemblies. However, experiences at Millstone Unit 1, Vermont Yankee, Humboldt Bay, Hatch and Oconee showed that failure to keep adequate records of the physical movement of rods and pieces within the spent fuel pool and to visually confirm their recorded locations during the periodic physical inventories could result in loss of control.

Enforcement actions were taken at 12 of the 13 sites inspected under Phase III with 4 of the 12 identified for escalated enforcement. Vermont Yankee (where two missing fuel rods segments were found following a lengthy search) received a Severity Level III Violation; Humboldt Bay (where 3 rod segments were missing) received a Severity Level II Violation with a \$96,000 civil penalty; Oconee (where the missing fuel was found after a lengthy search) received a Severity Level III Violation; and Hatch (where approximately 18 inches of irradiated fuel rod fragments were unaccounted for) received a Severity Level II Violation with a \$104,000 civil penalty.

All findings were reviewed by the Region and the Security Findings Review Panel. In cases where a finding resulted in a Severity Level II or III violation, enforcement action was taken by the Region. All findings were dispositioned using traditional enforcement as approved in the

June 15, 2005, Staff Requirements Memorandum that responded to SECY-05-0080, "Proposed Use of Traditional Enforcement for Vermont Yankee's Spent Fuel Pool Issues," (ADAMS Accession No. ML051660263).

Based on the results of the first 13 inspections, staff informed the Commission in SECY-06-0079 of plans to conduct inspections under Phase III of TI 2515/154 at all remaining power reactors, decommissioning reactors with wet storage, and other facilities with wet storage of spent or irradiated fuel.

Phase III Extended to Cover All Power Reactors and Wet Storage Sites

Revisions to TI 2515/154, issued on November 28, 2005, and January 12, 2007, extended the expiration date of the Phase III inspections and expanded the scope to require inspections at all nuclear power plants (as opposed to the 12 inspections required by Revision 0) and all wet storage sites. By the end of 2006, Phase III inspections had been conducted at eight additional sites, including reactive inspections of MC&A issues identified at two laboratories with wet storage of irradiated fuel. By the end of 2006, a total of 22 power plants and sites with wet storage had been inspected:

- 2001 Millstone Unit 1 (pre TI 2515/154)
- 2004 Vermont Yankee, Humboldt Bay
- 2005 V.C. Summer, Millstone, Palisades, D.C. Cook, Farley, South Texas, Prairie Island, Beaver Valley, Hatch, Palo Verde, Oconee
- 2006 LaCrosse, H.B. Robinson, Pilgrim, Lynchburg Technology Center (at BWXT), Brunswick, Hope Creek, Salem, GE-Vallecitos

In summer 2006, the decision was made to accelerate the schedule for the remaining 51 MC&A spent fuel inspections. In order to accommodate this increased activity, NSIR obtained the services of annuitants with inspection experience and worked with the Regions to develop an accelerated schedule. On November 14, 2006, NSIR issued Information Notice 2006-25, "Lessons Learned from NRC Inspection of Control and Accounting of Special Nuclear Material at Commercial Nuclear Power Plants" (ADAMS Accession No. ML063170234), to inform licensees for power plants, decommissioning sites storing SNM, and wet storage sites of occurrences of inadequate MC&A practices and programs at the reactor sites inspected. The Information Notice alerted licensees that NRC staff expected to accelerate these inspections during 2007.

In order to cross-qualify inspection staff on MC&A requirements and inspection details, the NSIR MC&A team developed a two-day training course for the Regional inspectors, re-hired annuitants, and Regional managers who would be involved in the MC&A inspections under the accelerated schedule. The new MC&A inspectors also received a Compact Disc with the information presented in the training course, and examples of inspection reports and inspection plans. The training course was conducted at Headquarters December 12-13, 2006, and January 17-18, 2007.

Workshop and Enforcement Guidance Memorandum (EGM)

On January 16, 2007, the staff conducted a one-day workshop in cooperation with the Nuclear Energy Institute to bring to the attention of industry the problems identified during the Phase III inspections that had been conducted thus far. The MC&A team presented "Lessons Learned from NRC Inspection of MC&A at Commercial Power Reactors," which covered the MC&A regulations, Phase III inspections and inspection results, inspection findings and enforcement, factors that contributed to identified violations, and the NRC plan to accelerate the inspection schedule. NRC staff and power industry representatives presented the results of a series of meetings between the NRC and industry to revise and re-issue a revision of American National Standards Institute (ANSI) N15.8, "Special Nuclear Material Control and Accounting Systems for Nuclear Power Plants." This provided an opportunity for other power industry representatives to comment on the draft standard and ask questions about MC&A inspections.

On January 26, 2007, the NRC distributed Enforcement Guidance Memorandum (EGM) 07-002, providing "Interim Guidance for Dispositioning Violations of 10 CFR 74.19(c)," (ADAMS Accession No. ML063180178). The EGM stated that no enforcement action would be taken for violations of 10 CFR 74.19(c), which requires physical inventory of all SNM at least every 12 months, in cases that met the following conditions: the violation was self-identified and corrected by the licensee, and all physical inventories of SNM after November 26, 2005, the original expiration date of TI 2515/154, were adequate.

Accelerated Inspection Schedule

The first two inspections under the accelerated schedule were conducted by NSIR MC&A inspectors during the weeks of January 25, and January 29, 2007, and included "on-the-job" training for the eight re-hired annuitants, who accompanied the MC&A inspectors.

The accelerated schedule inspections were conducted at 51 sites between January 2007 and July 2007. The 51 sites included 48 operating power reactors, 1 decommissioning reactor, and 2 wet storage sites. Inspections had been conducted earlier at 17 power reactors, 2 decommissioning reactors and 2 wet storage sites (reactive inspections). Including the inspection conducted at Millstone Unit 1, a total of 73 inspections were conducted at 65 operating power reactor sites, 4 decommissioning reactor sites with fuel remaining in the spent fuel pool, and 4 other sites storing spent or irradiated fuel. Attachment 2 illustrates the TI 2515/154 MC&A inspection activities during 2007, including the order in which the inspections were conducted.

TI 2515/154 Phase III, Inspection Findings

In total, TI 2515/154 Phase III inspections were conducted at 65 operating power reactor sites, 3 decommissioning reactor sites with fuel remaining in their spent fuel pools, and 4 other sites storing spent or irradiated fuel. The MC&A inspection conducted at Millstone Unit 1, prior to the TI, brings the total number of MC&A inspections conducted to 73. There were no findings at 17 of the sites inspected (15 power reactors and 2 wet storage sites). Violations were identified either by the inspectors or by the licensees at the remaining sites, which is approximately 77% of the sites. Numbers of sites inspected (inspection reports) and the severity levels (SL) of inspection findings are summarized in the following table:

Operating Power Reactors	15	No Findings
	31	One SL IV Violation
	14	Two SL IV Violations
	1	Three SL IV Violations
	2	SL III Violation without Civil Penalty
	1	SL III Violation with Civil Penalty
Decommissioning Power Reactors	1	SL II Violation with Civil Penalty
	2	SL IV Violation
Other Wet Storage	2	SL II Violation with Civil Penalty
	2	No Findings
	2	SL IV Violation

Because no Significance Determination Process (SDP) existed for the MC&A area, any violations of the MC&A regulations (10 CFR 74) applicable to power reactors and wet storage sites were assigned severity levels in accordance with the NRC Enforcement Policy using traditional enforcement as approved in the Staff Requirements Memorandum (SRM) to SECY-05-0080.

Findings were in three general areas:

- Failure to keep and maintain records;
- Failure to establish and follow procedures adequate to control and account for SNM; and
- Failure to conduct physical inventory of all SNM at least every 12 months.

Consistent with the guidance in the Enforcement Manual, violations such as failure to conduct physical inventory within the required 12 months, when the inventory was conducted within 13 months and there was agreement between the accounting records (book inventory) and physical inventory list, were identified in the inspection reports as violations of minor significance. Violations of minor significance are not included in the table above.

Escalated enforcement action was taken in the following 6 cases: Oconee, SL III Violation without Civil Penalty; Vermont Yankee, SL III Violation without Civil Penalty; Dresden, SL III Violation with Civil Penalty; Humboldt Bay, SL II Violation with Civil Penalty; Hatch, SL II Violation with Civil Penalty; Millstone Unit 1, SL II Violation with Civil Penalty. In the cases of Vermont Yankee and Oconee, the missing items were found, while in the remaining cases the missing items were not found.

Failure to conduct physical inventory of all SNM, which was a contributing factor to the loss of accountability for the two rods at Millstone Unit 1, was a violation at every site with a violation. Of the 66 total SL IV violations, 60 met the criteria for non-cited violations, while 6 did not. Of the 66 SL IV violations, 35 were identified by the licensee, while 31 were identified by the inspectors. Included in the total number of SL IV violations in the table are nine violations that met the criteria of EGM 07-002 and, therefore, were not cited. All findings identified during inspections conducted under the accelerated schedule were reviewed by the NSIR MC&A inspection team and the Security Findings Review Panel, whose members represented the Office of Nuclear Reactor Regulation (NRR), Office of Nuclear Material Safety and Safeguards

(NMSS), Office of the General Counsel (OGC), Office of Enforcement (OE), NSIR, and the Regions.

Complete details of the inspection findings are presented in Attachment 3, "TI 2515/154 Inspection Findings." Attachment 3 also lists ADAMS ML numbers for the inspection reports (package numbers, cover letter numbers, and/or report numbers) and Notices of Violations (NOV) in cases where NOV's were required.

Independent Reviews of NRC's Oversight of SNM

Concurrent with NRC's MC&A inspection activities under TI 2515/154, three independent reviews were conducted of NRC's oversight of SNM:

- In 2001-2002, the NRC Office of the Inspector General performed an "Audit of NRC's Regulatory Oversight of Special Nuclear Materials," OIG-03-A-15 (ADAMS Accession No. ML031550068). The report found that the NRC's "current levels of oversight of licensees' MC&A activities do not provide adequate assurance that all licensees properly control and account for SNM," and noted that in 1988 the NRC had discontinued routine MC&A inspections at power reactors.
- In 2003, the NRC engaged the Oak Ridge National Laboratory (ORNL) to perform a thorough review of the NRC's program to control and account for SNM, which was conducted in 2003-2004 (ADAMS Accession No. ML043100161). With respect to MC&A at power reactors, the ORNL report recommended that the NRC "consider increasing the MC&A requirements, including inspections, for power reactors to address disassembled fuel assemblies."
- In 2004-2005, the U.S. Government Accountability Office (GAO) reviewed the effectiveness of NRC's regulations and oversight of nuclear power plants' performance in controlling and accounting for their spent fuel. In a report (GAO-05-339, accessible on the web at www.gao.gov/new.items/d05339.pdf) issued in April 2005, the GAO recommended that the NRC aim at improving its regulation and oversight of spent fuel.

In response to the recommendations of the GAO report, the NRC committed to revise the inspection procedure for MC&A at power reactors, work with power reactor representatives (with the support of the Nuclear Energy Institute and the Department of Energy) to revise the MC&A guidance in ANSI N15.8, "Nuclear Material Control Systems for Nuclear Power Plants," and revise the regulatory guides for MC&A at power reactors (Regulatory Guide (RG) 5.29 and RG 5.49) to clarify that the regulations apply to separated rods and pieces.

Development of the revised inspection procedure and regulatory guidance is in progress. The inspection procedure (IP) 71130.11, will replace IP 85102, "Material Control and Accounting – Reactors," for operating power reactors.

The ANSI N15.8 working group, comprised of NRC staff and power reactor representatives, held their final meeting on October 2, 2007. The agreed-upon draft version of N15.8 prepared by the working group was submitted to the ANSI committee on October 23, 2007, for final review and approval by N15 Committee Ballot Vote.

In addition, on April 5, 2007, staff incorporated MC&A into the security cornerstone baseline inspection program of the Reactor Oversight Process (ROP) in accordance with SRM SECY-05-0082. Inspection Manual Chapter 2201, "Security and Safeguards Baseline Inspection Program," requires that IP 71130.11 be conducted biennially as part of the baseline security and safeguards inspection program for commercial power reactors. The staff is working to develop an SDP for MC&A inspection findings, using information gathered during conduct of the Phase III inspections.

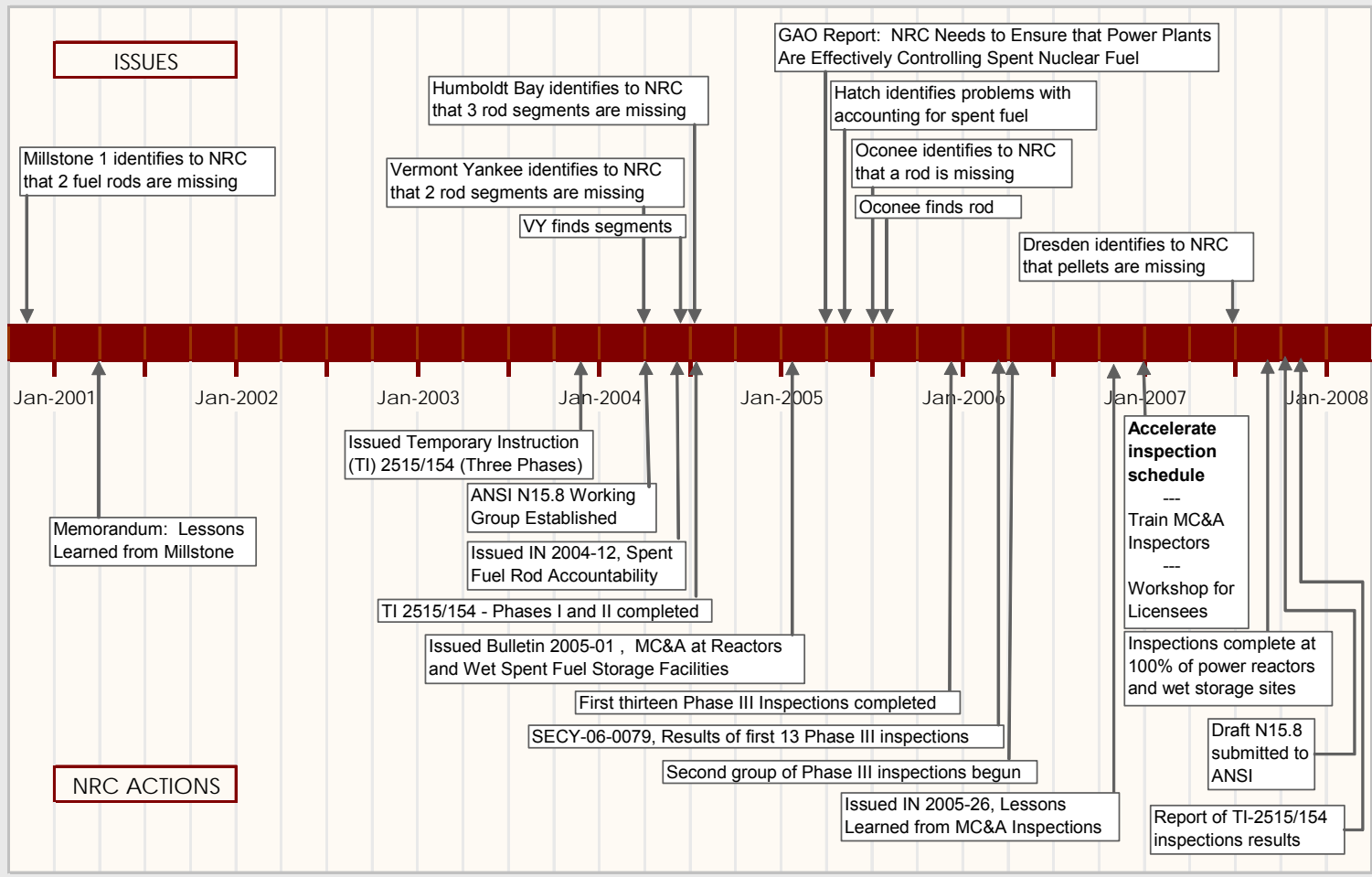
Conclusion

The inspection results support the decision to continue implementation of this inspection program.

Attachments:

1. Timeline – MC&A at Power Reactors
2. Accelerated Inspections - MC&A at Power Reactors and Wet Storage Sites
3. TI-2515/154 Inspection Findings

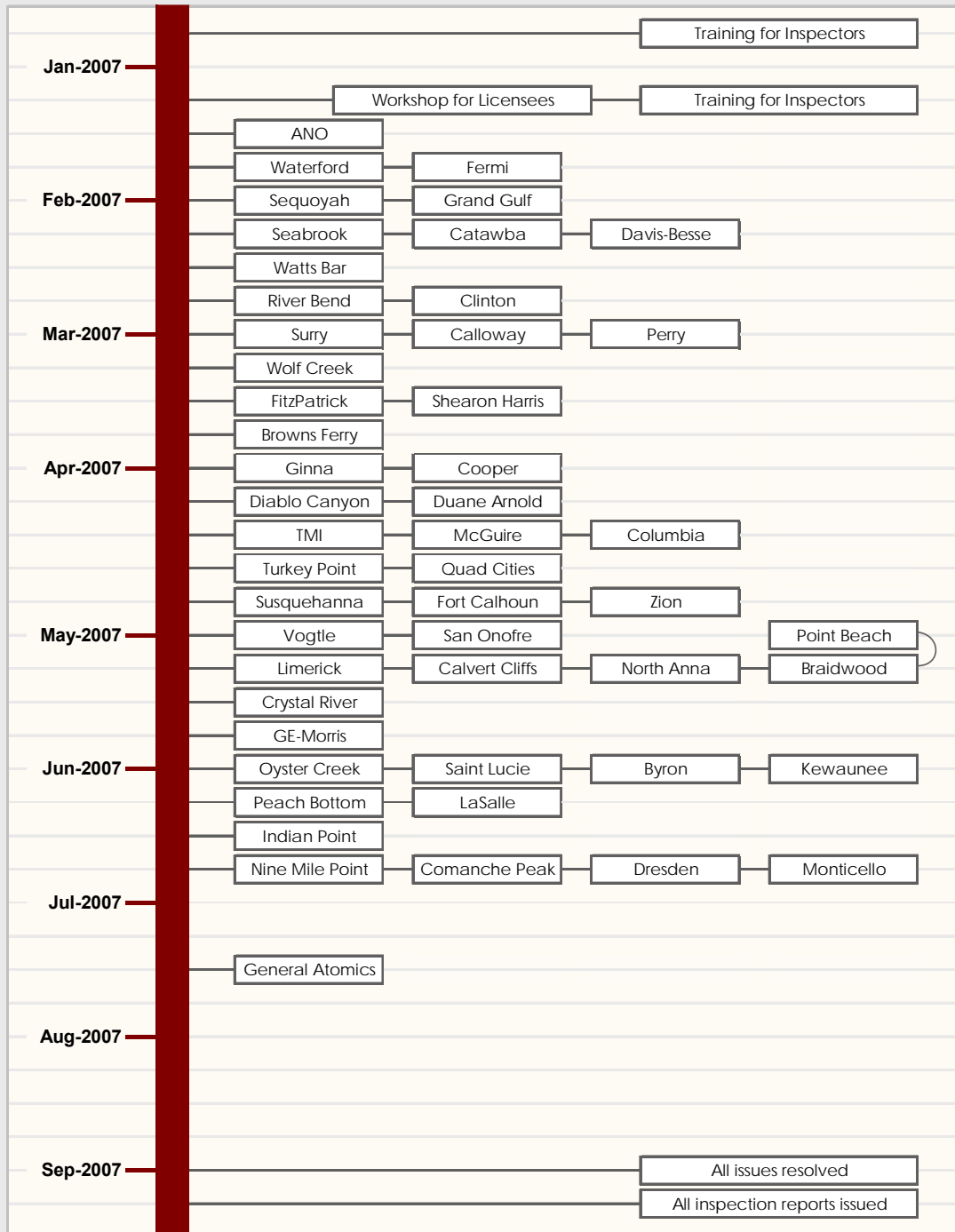
Timeline - MC&A at Power Reactors



Significant Events

Accelerated Inspections

MC&A at Power Reactors and Wet Storage Sites



TI-2515/154 INSPECTION FINDINGS

R Site	Licensee	Docket	Rpt No.	Inspection Start Date	Inspection Exit Date	Report Date	Report ML Nos.	Findings	Description of Findings	10 CFR Reference	
OPERATING REACTORS:											
4	Arkansas Nuclear 1-2	Entergy Nuclear Operations	05000313 05000368	2007201	Jan 25, 2007	Apr 23, 2007	May 11, 2007	ML070580371 ML070580384	2 Severity Level (SL) IV non-cited violations (NCVs)	Failure to follow the written material control and accounting (MC&A) procedure and failure to physically observe all items during physical inventories of special nuclear material (SNM)	74.19(a)&(b) 74.19(c)
1	Beaver Valley 1-2	FirstEnergy	05000334 05000412	2005201	Oct 24, 2005	Oct 28, 2005	Nov 28, 2005	ML072740223 ML053260092	SL IV NCV	Failure to conduct adequate physical inventories	74.19(c)
3	Braidwood 1-2	Exelon Generation Company	05000456 05000457	2007402	May 14, 2007	May 30, 2007	Jun 29, 2007	ML071830490 ML071830485	2 SL IV NCVs (both licensee identified)	Failure to follow the written MC&A procedure and failure to physically observe all items during physical inventories of SNM	74.19(b) 74.19(c)
2	Browns Ferry 1-2-3	Tennessee Valley Authority	05000259 05000260 05000296	2007401	Mar 26, 2007	Mar 30, 2007	Apr 30, 2007	ML071210490 ML071210419	--	No findings of significance	--
2	Brunswick 1-2	Carolina Power and Light	05000325 05000324	2006202	Jul 10, 2006	Aug 02, 2006	Aug 15, 2006	ML062130278 ML062130206	--	No findings of significance	--
3	Byron 1-2	Exelon Generation Company	05000454 05000455	2007402	Jun 04, 2007	Jun 27, 2007	Aug 8, 2007	ML072211001 ML072210973	SL IV NCV (licensee id'd)	Failure to establish and follow an adequate inventory procedure and conduct adequate physical inventories of all SNM	74.19(b)&(c)
4	Callaway	AmerenUE	05000483	2007201	Mar 05, 2007	Mar 28, 2007	Apr 27, 2007	ML070880216 ML070880249	2 SL IV NCVs (licensee id'd) one subject to Enforcement Guidance Memorandum (EGM) 07-002	Failure to conduct physical inventory of all SNM	74.19(c) 74.19(c)
1	Calvert Cliffs 1-2	Constellation Generation Group	05000317 05000318	2007403	May 14, 2007	May 17, 2007	Jun 15, 2007	ML072200203 ML071690158	--	No findings of significance	--
2	Catawba 1-2	Duke Energy	05000413 05000414	2007402	Feb 12, 2007	Feb 16, 2007	Mar 12, 2007	ML070720548 ML070720543	--	No findings of significance	--
3	Clinton	Exelon Generation Company	05000461	2007402	Feb 26, 2007	Mar 02, 2007	Apr 10, 2007	ML071010402 ML071010390	SL IV NCV (licensee id'd)	Failure to conduct physical inventory of all SNM	74.19(c)
4	Columbia Gen Station	Energy Northwest	05000397	2007201	Apr 16, 2007	May 22, 2007	Jun 22, 2007	ML071450363 ML071450367	--	No findings of significance	--
4	Comanche Peak 1-2	TXU Generation Company	05000445 05000446	2007403	Jun 25, 2007	Jul 18, 2007	Jul 30, 2007	ML072120179 ML072120186	SL IV NCV (licensee id'd)	Failure to conduct physical inventory of all SNM	74.19(c)
4	Cooper	Nebraska Public Power District	05000298	2007201	Apr 02, 2007	Jul 11, 2007	Aug 9, 2007	ML072070573 ML072070581	--	No findings of significance	--
2	Crystal River 3	Progress Energy	05000302	2007201	May 21, 2007	May 24, 2007	Aug 7, 2007	ML072050390 ML072050420	--	No findings of significance	--
3	D.C. Cook 1-2	Indiana Michigan Power	05000315 05000316	2005201	Aug 19, 2005	Sep 22, 2005	Oct 24, 2005	ML072740235 ML052970090	--	No findings of significance	--
3	Davis-Besse	FirstEnergy Nuclear Operating Company	05000346	2007402	Feb 12, 2007	May 04, 2007	May 30, 2007	ML071520433 ML052970090	SL IV NCV (licensee id'd) w EGM	Failure to conduct physical inventory of all SNM	74.19(c)
4	Diablo Canyon 1-2	Pacific Gas and Electric Company	05000275 05000323	2007201	Apr 09, 2007	Apr 13, 2007	May 14, 2007	ML071280119 ML071280122	SL IV NCV (licensee id'd) w EGM	Failure to conduct physical inventory of all SNM	74.19(c)

TI-2515/154 INSPECTION FINDINGS

R Site	Licensee	Docket	Rpt No.	Inspection Start Date	Inspection Exit Date	Report Date	Report ML Nos.	Findings	Description of Findings	10 CFR Reference
3 Dresden 2-3	Exelon Generation Company	05000010 05000237 05000249	2007401	Jun 25, 2007	Aug 15, 2007	Sep 2, 2007	ML072470484 ML072470474 ML072480431	SL III violation (VIO) with \$65K civil penalty (CP)	Failure to keep adequate records, establish adequate procedures, and conduct adequate physical inventories	74.19(a),(b)&(c)
3 Duane Arnold	FPL Energy	05000331	2007401	Apr 09, 2007	Apr 12, 2007	May 25, 2007	ML071500262 ML071500256	SL IV NCV	Failure to physically all SNM	74.19(c)
2 Farley 1-2	Southern Nuclear Operating Company	05000348 05000364	2005204	Aug 29, 2005	Sep 02, 2005	Oct 3, 2005	ML072740402 ML052590062 ML061360257	SL IV NCV	Failure to conduct adequate physical inventories	74.19(c)
3 Fermi 2	Detroit Edison Company	05000341	2007402	Jan 29, 2007	Feb 01, 2007	Mar 16, 2007	ML070750282 ML070750290	--	No findings of significance	--
1 FitzPatrick	Entergy Nuclear Operations	05000333	2007201	Mar 19, 2007	Mar 22, 2007	Apr 23, 2007	ML070950306 ML070950330	SL IV NCV (licensee id'd) receiving EGM	Failure to conduct adequate physical inventories	74.19(c)
4 Fort Calhoun	Omaha Public Power District	05000285	2007401	Apr 30, 2007	May 04, 2007	May 17, 2007	ML071370734 ML071370738	--	No findings of significance	--
1 Ginna	Constellation Energy	05000244	2007201	Apr 02, 2007	Apr 05, 2007	May 4, 2007	ML071090274 ML071090285	SL IV NCV (licensee id'd) receiving EGM	Failure to conduct adequate physical inventories	74.19(c)
4 Grand Gulf 1	Entergy Nuclear Operations	05000416	2007401	Feb 05, 2007	Mar 21, 2007	Apr 9, 2007	ML071000236 ML071000247	SL IV NCV + SL IV NCV (licensee id'd)	Failure to physically inventory all SNM; failure to keep records, follow procedures and physically inventory all SNM	74.19(c) 74.19
2 Shearon Harris 1	Nuclear Generation Group	05000400	2007201	Mar 19, 2007	May 09, 2007	Jun 6, 2007	ML071520331 ML071520363	SL IV NCV (licensee id'd)	Failure to conduct adequate physical inventories	74.19(c)
2 Hatch 1-2	Southern Nuclear Operating Company	05000321 05000366	2005201 2006401	Nov 07, 2005	Oct 27, 2006	Jan 17, 2006 Nov 20, 2006 Dec 29, 2006	ML063250191 ML053330381 ML063250206 ML070090039	SL II VIO with \$104K CP (1 violation, 3 examples)	Failure to keep adequate records, establish adequate procedures, and conduct adequate physical inventories	74.19(a),(b)&(c)
1 Hope Creek 1	Public Service Enterprise Group Nuclear	05000354	2006201	Aug 28, 2006	Aug 31, 2006	Sep 29, 2006	ML062560009 ML062560008	--	No findings of significance	--
1 Indian Point 2-3	Entergy Nuclear Operations	05000247 05000286	2007201	Jun 18, 2007	Sep 18, 2007	Sep 25, 2007	ML072430728 ML072430755	2 SL IV NCVs (licensee id'd)	Failure to follow written MC&A procedures and failure to conduct adequate physical inventories:	74.19(b) 74.19(c)
3 Kewaunee	Dominion Energy Kewaunee	05000305	2007402	Jun 04, 2007	Jul 31, 2007	Aug 17, 2007	ML072320367 ML072320361	SL IV NCV + SL IV NCV (licensee id'd)	Failure to have adequate procedures to physically inventory all SNM and failure to conduct a physical inventory of all SNM in its possession at intervals not to exceed 12 months	74.19(b)&(c) 74.19(c)
3 LaSalle 1-2	Exelon Generation Company	05000373 05000374	2007403	Jun 11, 2007	Jun 15, 2007	Jul 23, 2007	ML072050244 ML072050276	--	No findings of significance	--
1 Limerick 1-2	Exelon Generation Company	05000352 05000353	2007201	May 14, 2007	Jun 11, 2007	Jul 5, 2007	ML071660309 ML071660318	SL IV NCV	Failure to conduct adequate physical inventories	74.19(c)

TI-2515/154 INSPECTION FINDINGS

R Site	Licensee	Docket	Rpt No.	Inspection Start Date	Inspection Exit Date	Report Date	Report ML Nos.	Findings	Description of Findings	10 CFR Reference
2 McGuire 1-2	Duke Power	05000369 05000370	2007402	Apr 16, 2007	Aug 06, 2007	Aug 30, 2007	ML072430007 ML072430006	SL IV NCV + 2 SL IV NCVs (licensee id'd) with one receiving EGM	Failure to follow written MC&A procedures and two failures to conduct adequate physical inventories	74.19(b) 74.19(c)
1 Millstone 2-3	Dominion Nuclear Connecticut	05000336 05000423	2005202	Jul 18, 2005	Jul 22, 2005	Aug 19, 2005	ML072740247 ML052340059	SL IV NCV	Failure to conduct adequate physical inventories	74.19(c)
3 Monticello	Nuclear Management Company	05000263	2007402	Jun 25, 2007	Jun 29, 2007	Aug 8, 2007	ML072220467 ML072220492	SL IV NCV	Failure to physically inventory all SNM	74.19(c)
1 Nine Mile Point 1-2	Constellation Energy	05000220 05000410	2007201	Jun 25, 2007	Jul 19, 2007	Aug 14, 2007	ML072080440 ML072080450	SL IV NCV (licensee id'd)	Failure to conduct adequate physical inventories	74.19(c)
2 North Anna 1-2	Virginia Electric and Power Co	05000338 05000339	2007401	May 15, 2007	May 17, 2007	Jul 9, 2007	ML071800342 ML071800358	--	No findings of significance	--
2 Oconee 1-2-3	Duke Energy Corporation	05000269 05000270 05000287	2005202 2006201	Dec 12, 2005	Feb 23, 2006	Jan 19, 2006 Mar 23, 2006 Apr 6, 2006	ML072740256 ML060100274 ML061240265 ML060750013	SL III VIO with no CP (3 violations, 1 issue)	Failure to keep adequate records, establish adequate procedures, and conduct adequate physical inventories	74.19(a),(b)&(c)
1 Oyster Creek	AmerGen Energy Company	05000219	2007403	Jun 04, 2007	Aug 08, 2007	Sep 11, 2007	ML072540594 ML072600196	SL IV NCV (licensee id'd)	Failure to conduct adequate physical inventories	74.19(c)
3 Palisades	Nuclear Management Company	05000255	2005202	Aug 08, 2005	Aug 12, 2005	Sep 12, 2005	ML072740269 ML052520367	SL IV NCV	Failure to conduct adequate physical inventories	74.19(c)
4 Palo Verde 1-2-3	Arizona Public Service Company	05000528 05000529 05000530	2005201	Nov 14, 2005	Nov 17, 2005	Dec 21, 2005	ML072740348 ML053480422	SL IV NCV	Failure to implement adequate procedures and to conduct adequate physical inventories	74.19(b)&(c)
1 Peach Bottom 2-3	Exelon Generation Company	05000277 05000278	2007201	Jun 11, 2007	Jun 14, 2007	Jul 18, 2007	ML071920036 ML071920066	--	No findings of significance	--
3 Perry 1	FirstEnergy Nuclear Operating Company	05000440	2007401	Mar 05, 2007	Mar 21, 2007	Apr 6, 2007	ML070990225 ML070990272	SL IV NCV (licensee id'd)	Failure to conduct adequate physical inventories	74.19(c)
1 Pilgrim 1	Entergy Nuclear Operations	05000293	2006201	Jun 05, 2006	Aug 16, 2005	Sep 11, 2006	ML062260184 ML062260216 ML062260201	SL IV VIO	Failure to keep adequate records and conduct adequate physical inventories	74.19(a)&(c)
3 Point Beach 1-2	Nuclear Management Company	05000266 05000301	2007402	May 14, 2007	Jul 30, 2007	Aug 9, 2007	ML072220580 ML072220600	SL IV NCV (licensee id'd) receiving EGM	Failure to conduct physical inventories of all SNM possessed	74.19(c)
3 Prairie Island 1-2	Nuclear Management Company	05000282 05000306	2005202	Oct 10, 2005	Oct 13, 2005	Nov 14, 2005	ML072740366 ML053120064	SL IV NCV	Failure to implement adequate procedures and to conduct adequate physical inventories	74.19(b)&(c)
3 Quad Cities 1-2	Exelon Generation Company	05000254 05000265	2007402	Apr 23, 2007	May 22, 2007	Jul 5, 2007	ML071870250 ML071870384	2 SL IV NCVs (licensee id'd)	Failure to keep adequate records of inventory all SNM and failure to conduct physical inventories of all SNM	74.19(a) 74.19(c)
4 River Bend 1	Entergy Nuclear Operations	05000458	2007402	Feb 26, 2007	Mar 28, 2007	Apr 18, 2007	ML071090046 ML071090041	SL IV NCV + SL IV NCV (licensee id'd)	Failure to physically inventory all SNM and failure to keep adequate records and conduct physical inventories of all SNM	74.19(c) 74.19(a)&(c)
2 H.B. Robinson 2	Carolina Power and Light	05000261	2006201	Apr 17, 2006	May 22, 2006	Jul 13, 2006	ML061360294 ML061360301	2 SL IV NCVs	Failure to keep records and to conduct adequate physical inventories	74.19(a) 74.19(c)

TI-2515/154 INSPECTION FINDINGS

R Site	Licensee	Docket	Rpt No.	Inspection Start Date	Inspection Exit Date	Report Date	Report ML Nos.	Findings	Description of Findings	10 CFR Reference	
2	Saint Lucie 1-2	Florida Power and Light	05000335 05000389	2007201	Jun 04, 2007	Jun 07, 2007	Jul 9, 2007	ML071870276 ML071870286	--	No findings of significance	--
1	Salem 1-2	PSEG Nuclear	05000272 05000311	2006201	Aug 28, 2006	Aug 31, 2006	Oct 4, 2006	ML062560220 ML062560255	SL IV NCV	Failure to conduct adequate physical inventories	74.19(c)
4	San Onofre 2-3	Southern California Edison Company	05000361 05000362	2007201	May 07, 2007	Aug 27, 2007	Sep 25, 2007	ML072430485 ML072430518	SL IV NCV + SL IV NCV (licensee id'd)	Failure to conduct adequate physical inventories of non-fuel SNM and failure to conduct inventories of all SNM	both 74.19(c)
1	Seabrook 1	FPL Energy Seabrook	05000443	2007201	Feb 12, 2007	Mar 12, 2007	Mar 30, 2007	ML070680096 ML070680112	SL IV NCV (licensee id'd)	Failure to conduct adequate physical inventories	74.19(c)
2	Sequoyah 1-2	Tennessee Valley Authority	05000327 05000328	2007201	Feb 05, 2007	Mar 13, 2007	Apr 5, 2007	ML070680190 ML070680193	SL IV NCV	Failure to follow written MC&A procedure to produce a record of inventory, including location	74.19(a)&(c)
4	South Texas 1-2	STP Nuclear Operating Company	05000498 05000499	2005201	Sep 19, 2005	Oct 05, 2005	Nov 5, 2005	ML072740382 ML052920845	SL IV NCV	Failure to conduct adequate physical inventories	74.19(c)
2	V.C. Summer	South Carolina Electric and Gas	05000395	2005201	Jun 27, 2005	Aug 02, 2005	Aug 30, 2005	ML072740391 ML052430244	SL IV NCV	Failure to conduct adequate physical inventories	74.19(c)
2	Surry 1-2	Dominion Generation	05000280 05000281	2007201	Mar 05, 2007	May 09, 2007	Jun 6, 2007	ML071140073 ML071140076	SL IV NCV (licensee id'd)	Failure to conduct adequate physical inventories	74.19(c)
1	Susquehanna 1-2	PPL Susquehanna	05000387 05000388	2007201	Apr 30, 2007	Jun 07, 2007	Jul 5, 2007	ML071350612 ML071350623	SL IV NCV (licensee id'd)	Failure to follow written MC&A procedures	74.19(b)
1	Three Mile Island 1	Exelon Corporation	05000289	2007201	Apr 16, 2007	Apr 19, 2007	May 21, 2007	ML071310044 ML071310054	SL IV NCV (licensee id'd)	Failure to conduct adequate physical inventories	74.19(c)
2	Turkey Point 3-4	Florida Power and Light	05000250 05000251	2007201	Apr 23, 2007	May 24, 2007	Jun 25, 2007	ML071450336 ML071450353	SL IV NCV + SL IV NCV (licensee id'd) receiving EGM	Failure to conduct adequate physical inventories	both 74.19(c)
1	Vermont Yankee	Entergy Nuclear Operations	05000271	2004007	Apr 22, 2004	Nov 23, 2004	Dec 2, 2004 June 22, 2005	ML043340149 ML051730155	SL III VIO with no CP (1 violation, 3 examples)	Failure to keep adequate records, establish adequate procedures, and conduct adequate physical inventories	74.19(a),(b)&(c)
2	Vogtle 1-2	Southern Nuclear Operating Company	05000424 05000425	2007201	May 07, 2007	Aug 16, 2007	Aug 31, 2007	ML072220131 ML072220138	SL IV NCV + SL IV NCV (licensee id'd) receiving EGM	Failure to conduct adequate physical inventories	both 74.19(c)
4	Waterford 3	Entergy Nuclear Operations	05000382	2007202	Jan 29, 2007	Mar 22, 2007	Apr 18, 2007	ML070950375 ML070950391 ML070950387 ML071410413 ML070950382 ML072140389	SL IV VIO + SL IV NCV (licensee id'd)	Failure to keep adequate records of all SNM possessed, maintain written procedures sufficient to account for all SNM, and conduct an adequate physical inventory of all SNM possessed.	74.19(a)(b)&(c) 74.19(c)
2	Watts Bar 1	Tennessee Valley Authority	05000390	2007202	Feb 20, 2007	Mar 21, 2007	Apr 23, 2007	ML071020222 ML071020240	2 SL IV NCVs (licensee id'd)	Failure to perform an adequate physical inventory of all SNM possessed and failure to keep adequate records	74.19(c) 74.19(a)
4	Wolf Creek 1	Wolf Creek Nuclear Operating Company	05000482	2007201	Mar 12, 2007	Apr 11, 2007	May 11, 2007	ML071100119 ML071100127	SL IV NCV	Failure to perform an adequate physical inventory of all SNM possessed	74.19(c)

TI-2515/154 INSPECTION FINDINGS

R Site	Licensee	Docket	Rpt No.	Inspection Start Date	Inspection Exit Date	Report Date	Report ML Nos.	Findings	Description of Findings	10 CFR Reference
DECOMMISSIONING REACTORS:										
4	Humboldt Bay 3	Pacific Gas and Electric Company	05000133 2005001 2005002	Nov 02, 2004	Apr 16, 2004	Apr 6, 2005 Aug 19, 2005 Dec 20, 2005	ML050960069 ML052310593 ML053540386	SL II VIO with \$96K CP (3 violations)	Failure to keep adequate records, establish adequate procedures, and conduct adequate physical inventories	74.19(a),(b)&(c)
3	LaCrosse	Dairyland Power Cooperative	05000409 2006201	Mar 27, 2006	May 19, 2006	Jun 16, 2006	ML061560040 ML061560049	SL IV VIO	Failure to prepare and maintain adequate procedures and to conduct adequate physical inventories	74.19(b)&(c)
1	Millstone Unit 1 pre TI-2515/154	Dominion Nuclear Connecticut	05000245 2001013	Oct 09, 2001	Jan 15, 2002	Feb 27, 2002 Jun 25, 2002 (NOV)	ML020580132 ML021760787	SL II VIO with \$288K CP (1 violation, 3 examples) + SL IV VIO	Failure to keep adequate records, establish adequate procedures, and conduct adequate physical inventories; failure to notify NRC within 30 days of discovery that an item had been lost or missing	70.71(b)(c)(d) 20.2201(a)(1)(ii) [70.71 became 74.19]
3	Zion 1-2	Exelon Generation Company	05000295 2007201	Apr 30, 2007	May 16, 2007	Jun 18, 2007	MI071520166 ML071520220 ML071520217	SL IV VIO	Failure to keep adequate records; failure to maintain and follow written procedures	74.19(a)&(b)

TI-2515/154 INSPECTION FINDINGS

R Site	Licensee	Docket	Rpt No.	Inspection Start Date	Inspection Exit Date	Report Date	Report ML Nos.	Findings	Description of Findings	10 CFR Reference	
WET STORAGE FACILITIES:											
4	General Atomics	05000163 05000089	2007201	Jul 16, 2007	Jul 17, 2007	Aug 16, 07	ML072140356 ML072140367	--	No findings of significance	--	
3	GE-Morris	07200001	2007201	May 29, 2007	May 30, 2007	Jun 29, 2007	ML071640316 ML071640323	--	No findings of significance	--	
4	GE-Vallecitos	07000754	2006003 2006004	Sep 05, 2006	Dec 14, 2006	Oct 20, 2006 Dec 15, 2006	ML062960078 ML062960089 ML063490297	SL IV VIO	Failure to keep records, maintain adequate procedures, and conduct adequate physical inventories	74.19(a),(b)&(c)	
2	Lynchburg Technology Center	BWX Technologies Inc	07000027	2006205	Jun 24, 2006	Sep 08, 2006	Sep 22, 2006	ML062490450 ML062500012 ML062500044	SL IV VIO	Failure to conduct adequate physical inventories	74.19(c)