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April 10, 2007

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION NRC MATERIAL CONTROL
AND ACCOUNTING TI 2515/154 PHASE III INSPECTION
REPORT 05000461/2007402

Dear Mr. Crane:

From February 26 through March 2, 2007, the U.S. Nuclear Regulatory Commission (NRC) conducted a material control and accounting safeguards program inspection at your Clinton Power Station. The inspection was conducted under Phase III of Temporary Instruction (TI) 2515/154. The enclosed report documents the inspection results, which were discussed on with Mr. F. Kearney and other members of your staff during the exit meeting on March 2, 2007.

This inspection examined activities conducted under your license as they relate to safety and to compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed storage of special nuclear material in the spent fuel pool, and interviewed personnel. Areas examined during the inspection included physical inventory and accounting records.

Based on the results of this inspection, no findings of significance were identified. However, a licensee identified violation which was determined to be of very low safety significance, is listed in this report. The violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the Enforcement Policy. If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with

<p>EXEMPT FROM PUBLIC DISCLOSURE May be exempt from public release under the Freedom of Information Act (5 U.S.C. 552)</p> <p>Exemption number: <u>5</u> Nuclear Regulatory Commission review required before public release.</p> <p><u>Christine A. Lipa, RII/DRP/BR4</u> Name and organization of person making determination.</p> <p>Date of determination: <u>03/26/2007</u></p>

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A/2

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-2-

the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Clinton Nuclear Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), which is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). However, because of the sensitive information contained in the enclosure, and in accordance with 10 CFR 2.390, a copy of this letter's enclosure will not be available for public inspection.

In accordance with 10 CFR 2.390(b)(1)(ii), the NRC is waiving the affidavit requirements for your response, if any. This practice will ensure that your response will not be made available electronically for public inspection in the NRC Public Document Room or from NRC's document system ADAMS. If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21. Otherwise, mark your entire response "Security-Related Information - Withhold Under 10 CFR 2.390" and follow the instructions for withholding in 10 CFR 2.390(b)(1).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

Christine A. Lipa, Chief
Branch 4
Division of Reactor Projects

Docket No. 50-461
License No. NPF-62

Enclosure: Inspection Report No. 05000461/2007402
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Clinton Power Station
State Liaison Officer, State of Illinois

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-2-

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Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Christine A. Lipa, Chief
Branch 4
Division of Reactor Projects

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cc w/encl: Site Vice President - Clinton Power Station
State Liaison Officer, State of Illinois

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-3-

cc wo/encl:

Plant Manager - Clinton Power Station

Regulatory Assurance Manager - Clinton Power Station

Chief Operating Officer

Senior Vice President - Nuclear Services

Vice President - Operations Support

Vice President - Licensing and Regulatory Affairs

Manager Licensing - Clinton Power Station

Senior Counsel, Nuclear, Mid-West Regional Operating Group

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Assistant Attorney General

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-4-

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 05000461

License No: NPF-62

Report No: 05000461/2007402

Licensee: AmerGen Energy Company

Facility: Clinton Power Station

Location: Clinton, IL

Dates: February 26 through March 2, 2007

Inspectors: R. Lerch, Project Engineer
R. Ng, Resident Inspector - Byron
M. Parker, Inspector

Approved by: C. Lipa, Chief
Branch 4
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000461/2007402; 02/26/07-03/02/07; Clinton Power Station; Material Control and Accounting Program

This inspection report covers a week-long, announced inspection that examined the adequacy of measures taken by the licensee to control the risk of loss, theft, or diversion of Special Nuclear Material (SNM). The inspection was conducted under Phase III of Temporary Instruction (TI) 2515/154, "Spent Fuel Material Control and Accounting at Nuclear Power Plants." One licensee identified violation of NRC requirements was reviewed. Based on direct observation and piece count of SNM, and other positive means of verification, the inspectors concluded that there was reasonable assurance that the licensee had adequately accounted for its SNM.

A. NRC Identified and Self-Revealed Findings

No findings of significance were identified.

B. Licensee Identified Violations

A violation of very low safety significance, which was identified by the licensee, was reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and the corrective actions are discussed in Section 4OA7.

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REPORT DETAILS

40A5 Other

Implementation of Phase III of Temporary Instruction (TI) 2515/154, "Spent Fuel Material Control and Accounting at Nuclear Power Plants"

.1 Material Control and Accounting (MC&A) Management Structure (III.a)

a. Inspection Scope

The inspectors reviewed licensee documentation for site MC&A activities, including site organization charts; fuel handling and engineering procedures that related to MC&A; and approved vendor procedures for fuel inspection and repair. The inspectors reviewed the site MC&A Procedure NF-AA-30, Special Nuclear Material Control Process Description, Revision 1. The inspectors interviewed licensee staff concerning roles and responsibilities for the control of special nuclear material (SNM).

b. Observations

The requirements, overall responsibilities, and program for receipt, transfer, storage, shipment, and physical inventory of SNM were described in the implemented procedure, NF-AA-30. Specific duties, assignments and actions were contained in other procedures referenced in NF-AA-30. Procedures appeared to adequately control activities involving SNM, however the licensee had plans to improve the organization of the procedures.

The inspectors verified, through interviews, that licensee appointed Special Nuclear Material Custodians were trained and knowledgeable of their SNM responsibilities.

c. Findings

No findings of significance were identified.

.2 Spent Fuel Movement, Bundle Disassembly Operations, Fuel Rod Storage, and Rod Activities (III.b,c,d)

a. Inspection Scope

The inspectors reviewed the licensee's procedures covering movement of spent fuel, documentation of movements of spent fuel, documentation of select spent fuel bundle disassembly operations, and storage of fuel rods removed from assemblies. The inspectors also reviewed the documentation and tracking for non-fuel SNM movements.

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The inspectors reviewed records documenting fuel inspection and repair campaigns in which individual fuel rods were removed from their assemblies and shipped offsite. The inspectors reviewed records of rod movement and shipment for the individual fuel rod reconstitution conducted in 1988.

The inspectors reviewed licensee documentation of receipts and shipments offsite, including reports to the National Nuclear Materials Management and Safeguards System (NMMSS) concerning NRC/DOE Forms 741 and 742.

b. Observations

The inspectors verified that each fuel movement was documented and tracked using a Move Sheet (Core Component Movement Sheet) form, which was provided as an attachment to Procedure NF-AA-310, Special Nuclear Material and Core Component Movement, Revision 10. The inspectors reviewed historical component movement sheets that documented fuel assembly movement of fuel into and within the spent fuel pool and verified that the sheets had been completed correctly.

The inspectors verified that the licensee's Procedure NF-AA- 325, Controlling Receipts and Shipments of Non-Fuel SNM, Revision 2, documented requirements for receipt, transfer, and shipment of non-fuel SNM. The inspectors verified that a selection of transfer and shipment forms was completed in accordance with the procedure.

Review of records indicated that the licensee had not encountered any failed fuel and had; therefore, not conducted a reconstitution campaign. However, during receipt inspection of new unirradiated fuel in 1988, the licensee identified a defect in a tie rod (fuel pin). The licensee subsequently turned the fuel assembly back over to the fuel vendor to replace the defective fuel pin in the fuel assembly. The reconstitution effort was conducted under the control of the fuel vendor on the licensee's premises. The activity was conducted utilizing vendor procedures with the licensee's Move Sheets (SNM Transfer Checklist from CPS No. 1898.00C001). The records for the campaign were sufficiently detailed to demonstrate that all of the fuel rods removed from their assemblies were either returned to their parent assembly or shipped offsite to the fuel vendor.

The inspectors also reviewed reports from NMMSS with the licensee. The licensee had no open transactions and no open adjustments.

c. Findings

No findings of significance were identified.

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3. Self-Assessment Program (III.e)

a. Inspection Scope

The inspectors reviewed the licensee's self-assessment program related to MC&A.

b. Observations

The inspectors reviewed the licensee's most recent self-assessments of the site MC&A program which were conducted in 2000, 2003 and 2007. In addition, the inspectors reviewed the licensee's Nuclear Oversight (NOS) (Quality Assurance) audit conducted in 2005 for the Nuclear Fuels functional area for all Exelon facilities.

The 2003 and 2007 audits were conducted by Exelon corporate and the 2000 audit was conducted prior to the Clinton station being integrated into the Exelon corporation.

The 2000 audit was conducted to verify that Clinton SNM was properly accounted for and adequately controlled. The audit covered all SNM-containing articles on-site, including fuel assemblies, instruments and sources. The 2003 multi-site corporate assessment was conducted to evaluate the effectiveness of the following attributes of the SNM program: site inventories, Move Sheets, procedure adherence, SNM accountability, corporate/site procedure conflicts, and records management. The 2007 assessment was conducted to evaluate the SNM control program at the Clinton facility with the goal to demonstrate that the people, processes and procedures formed a sound program supporting both internal and external compliance expectations. Activities related to this program included both physical and administrative control and accounting of items containing SNM, including nuclear fuel, orphaned fuel rods, fuel rod pieces, fuel pellets, and certain nuclear instrumentation.

The licensee had initiated action requests to track followup and resolution of all findings and recommendations identified in the audits. One of the issues identified in the 2007 assessment was the licensee identified violation of 10 CFR 74.19 discussed in Section 4OA7 of this report.

c. Findings

No findings of significance were identified.

4. Configuration Control Over MC&A Procedures (III.f)

a. Inspection Scope

The inspectors reviewed the site program for use and revision of the written MC&A procedures. The inspectors also interviewed the licensee staff concerning the use of vendor procedures.

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b. Observations

The inspectors observed that the licensee utilized an electronic document management system to control procedure use. All approved current procedures were stored and available for use through this system. Licensee personnel were expected to obtain their procedures through this system. Revisions to the procedures were reviewed and approved by qualified personnel before they were available for use.

Contractors were required to use the current revision of and adhere to the licensee procedures approved at the facility. If contractor work procedures were to be used to complete the work activity, they were reviewed and approved in accordance with the applicable licensee procedure.

The inspectors noted that the licensee reviewed and revised their MC&A procedures in accordance with their Quality Assurance Topical Report. In practice, since the majority of the MC&A procedures were corporate procedures, they were reviewed and revised frequently due to needs from other stations.

c. Findings

No findings of significance were identified.

5. Management Oversight of Spent Fuel Pool Operations (III.g)

a. Inspection Scope

The inspectors reviewed written procedures and documentation of spent fuel pool operations to verify that the licensee provided management oversight of all spent fuel pool operations. The inspectors also interviewed licensee staff concerning the oversight process and procedures.

b. Observations

Procedure NF-AA-30, Special Nuclear Material Control Process Description, required that the special nuclear material custodian direct any movement of SNM, including that performed by contractors. The special nuclear material custodian was responsible to provide approved move sheets for movement of SNM in the spent fuel pool.

Procedure MA-AA-1010, Oversight of Contractors, governed management oversight of the contractor activities. Per this procedure, the licensee designated a task manager to oversee contractors' work activities and this task manager had ultimate responsibility for those activities. The task manager ensured that contractors performed work in

Enclosure

accordance with the licensee's policies, procedures, standards and expectations. For activities in the spent fuel pool, the special nuclear material custodian was heavily involved in the oversight process, such as participating in the pre-job briefs and conducting periodic observations of the activities, to ensure that SNM control requirements were met.

c. Findings

No findings of significance were identified.

.6 Physical Inventory and Verification of Inventory (III.h.i)

a. Inspection Scope

The inspectors reviewed physical inventory reports for the years 2002, 2003, 2004, 2005, and the most recent physical inventory conducted in July 2006.

The inspectors selected a random sample of 20 spent fuel pool location cells and compared the contents of the locations with the spent fuel pool map to verify the spent fuel pool map's accuracy. The inspectors used an underwater video camera operated by the licensee to verify the contents of each cell.

The inspectors also conducted plant walkdowns of the warehouse and radiation protection calibration facility that store non-fuel special nuclear materials such as nuclear instrumentation detectors and check sources.

b. Observations

The inspectors verified that inventories were performed at periods not exceeding 12 months, as required. Procedure NF-AA-330, Special Nuclear Material Physical Inventories, specified that SNM, including non-fuel SNM, should be physically inventoried at intervals not to exceed 12 months. The inspectors verified that the procedure required that the inventory results be used to validate that no discrepancies existed between site records and the SNM database.

The locations and serial numbers of the 10 assemblies chosen by the inspectors were in agreement with the most recent spent fuel pool maps. The inspectors visually verified that the contents of 20 spent fuel pool locations adjacent to the randomly selected locations were consistent with the licensee's spent fuel pool maps.

During a self assessment in January 2007, the licensee identified that during the physical inventories of SNM prior to 2007, it had not physically inventoried cut-up local power range monitors stored in the canisters and placed in a 55-gallon drum in the cask loading pool. Instead, the physical inventory consisted only of a visual confirmation

Enclosure

that the 55-gallon drum was in the cask loading pool. With the exception of one canister, the canisters were all numbered. The licensee had documentation of which monitors were placed in each canister, but during each inventory had not verified that the canisters were in the drum. This was a licensee identified violation as discussed in Section 4OA7, "Licensee Identified Finding," of this report.

The inspectors verified that nuclear instrumentation detectors that contain special nuclear material were controlled according to licensee procedures and that the quantities agreed with the inventory on record. The inspectors also verified that the check sources kept in the radiation protection calibration facilities were controlled by procedures.

c. Findings

No inspector identified findings of significance were identified, however, a licensee identified violation is listed in Section 4OA7 of this report.

4OA6 Meetings

On March 2, 2007, the inspectors presented the preliminary inspection results to Mr. F. Kearney and other licensee staff members. The licensee acknowledged that information gathered during the inspection concerning the licensee's MC&A program was not proprietary.

4OA7 Licensee Identified Finding

The following finding of very low safety significance (Green) was identified by the licensee and was a violation of NRC requirements which met the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a Non-Cited Violation.

NRC regulation 10 CFR 74.19(c) requires licensees to conduct a physical inventory of all SNM in its possession. Contrary to the above, physical inventories conducted before January 2007 failed to physically inventory canisters containing SNM in the form of local power range monitors, stored in a 55-gallon drum at the bottom of the cask loading pool (part of the spent fuel pool). The licensee had entered the item into its corrective action program as CR 07-13163, "Failure to Perform Physical Inventory on Spent Neutron Detectors," dated 1/16/2007. Corrective actions included taking an inventory of the canisters and revising the procedures that will be used for future inventories. This violation was of very low safety significance because at the time of the inspection there was reasonable assurance that all SNM was accounted for and stored in a safe location.

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

F. Kearney	Plant Manager
C. Vandenburg,	Nuclear Oversight Manager
D. Schavey,	Operations Director
J. Stovall,	Work Management Director
G. Mosley	Operations Support/Services Manager
M. Vandermyde	Reactor Engineering Manager
G. Vickers	Radiation Protection Manager
R. Frantz,	Regulatory Assurance Representative
J. Dunlap	Corporate Fuels

NRC Personnel

B. Dickson	Sr. Resident Inspector
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LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

SNM	Special Nuclear Material
MC&A	Material Control & Accounting
CFR	Code of Federal Regulations
TI	Temporary Instruction
NCV	Non-cited Violation
NMMSS	National Nuclear Materials Management and Safeguards System
NOS	Nuclear Oversight
DOE	Department of Energy
NRC	Nuclear Regulatory Commission

LIST OF DOCUMENTS REVIEWED

Procedures

AD-AA-101, Processing of Procedures and T&RMs; Revision 17
AD-AA-102, Station Qualified Review; Revision 5
AD-AA-2004, Conduct of corporate Oversight; Revision 1
LS-AA-126, Self-Assessment Program; Revision 5
LS-AA-126-1001, Focused Area Self-Assessments; Revision 4
LS-AA-126-1002, Management Observation of Activities; Revision 1
LS-AA-126-1005, Check-In Self-Assessment; Revision 3
LS-AA-126-1006, Benchmarking Program; Revision 1
MA-AA-1010, Oversight of Contractors; Revision 7
MA-CL-716-100, Fuel Receipt and Storage at CPS; Revision 3
NF-AA-30, Special Nuclear Material Control Process Description; Revision 1
NF-AA-300, Special Nuclear Material Control; Revision 8
NF-AA-310, Special Nuclear Material and Core Component Movement; Revision 10
NF-AA-320, Controlling Nuclear Fuel Receipt, Movement to Dry Storage and Shipment;
Revision 6
NF-AA-325, Controlling Receipts and Shipments of Non-fuel SNM; Revision 2
NF-AA-330, Special Nuclear Material Physical Inventories; Revision 4
NF-AA-390, Spent Fuel Pool Material Control; Revision 2
NF-AA-412, Inspection of Irradiated Fuel; Revision 2
NF-AA-300-1000, Special Nuclear Material Control and Periodic Reporting; Revision 4
NF-AA-320-1000, Irradiated fuel Shipment as Shipper of Record; Revision 0
NF-AA-330-1001, Core Verification Guideline; Revision 2
NF-CL-300-2000, Processing NI Detectors for Disposal; Revision 1
RP-AA-800, Control, Inventory, and leak Testing of Radioactive Sources; Revision 4
CPS 1907.20, Radioactive source control, Leak Testing, and Accountability; Revision 14e
CPS 3703.01, Core Alterations; Revision 25c
CPS 3703.02, Fuel Handling Platform (F11) Operations; Revision 16c

Records

Move Sheet 2005-63, C1R10 fuel Receipt - Re-Inspect Bundles JLV248 and JLV273; dated
December 22, 2005
Move Sheet 2006-0265 through 2006-302, Post C1R10 Dispersal in Spent Fuel Pool;
April 19, 2006
LPRM Canister Loading Material Transfer Form
Pool Materials Log; dated February 16, 2007
Special Nuclear Materials (SNM) Inventory; January 25, 2002
Special Nuclear Materials (SNM) Inventory; July 25, 2002
Special Nuclear Materials (SNM) Inventory; July 9 and 10, 2003
Special Nuclear Materials (SNM) Inventory; July 9 and 10, 2004
Special Nuclear Materials (SNM) Inventory; July 7 through 10, 2005
Special Nuclear Materials (SNM) Inventory; July 10, 2006

Audits & Assessments

Audit Report NOSA-NCS-05-09, Corporate Cantera and Kennett Square Nuclear Fuels; dated June 5, 2005

Memo, J. Dolter to J. Malone, Technical Audit of Special Nuclear Material at Clinton Station; dated December 7, 2000

FASA 161618-01, Special Nuclear Material (SNM) Control and Accountability; dated January 12, 2004

Corporate Program Assessment 569223-03, Oversight of Clinton Special Nuclear Material (SNM) Control Program; dated February 16, 2007

Miscellaneous Documents

Letter RS-05-034, K. Jury to NRC, 30-day Response to NRC Bulletin 2005-01, "Material Control and Accounting at Reactors and Wet Spent Fuel Storage Facilities," March 21, 2005

Letter RS-05-057, K. Jury to NRC, 90-day Response to NRC Bulletin 2005-01, "Material Control and Accounting at Reactors and Wet Spent Fuel Storage Facilities," May 12, 2005

Email, M. Walther to M. Vandermyde, SNM Drum in CLP; dated March 1, 2007

Exelon Nuclear Standard Records Retention Schedule; Revision 6

Issue Reports

IR 590955, Enhancements to Special Nuclear Material Control at Clinton; dated February 13, 2007

IR 194242-06, Resolve Problem with Tamper Evident Tape Used on LPRM Box; dated October 15, 2004

IR 536476, Periodic Review of Procedures not Consistent at CPS; dated September 26, 2006