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Energy to Serve Your WorldSM

December 9, 2005

Docket No.: 50-321

NL-05-2262

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant
Licensee Event Report
Discrepancy in Special Nuclear Material Inventory

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 20.2201(b)(1), and in accordance with the procedures described in 10CFR50.73(b), Southern Nuclear Operating Company is submitting the enclosed follow-up report on a discrepancy in special nuclear material inventory using the Licensee Event Report format and content as specified in 10 CFR 20.2201(b)(2)(i).

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,



H. L. Sumner, Jr.

HLS/PAH/daj

Enclosure: LER 1-2005-003

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. G. R. Frederick, General Manager – Plant Hatch
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Dr. W. D. Travers, Regional Administrator
Mr. C. Gratton, NRR Project Manager – Hatch
Mr. D. S. Simpkins, Senior Resident Inspector – Hatch

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)

Edwin I. Hatch Nuclear Plant - Unit 1

DOCKET NUMBER (2)

05000-321

PAGE (3)

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TITLE (4)

Discrepancy in Special Nuclear Material Inventory

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)	
11	10	2005	2005	003	00	12	09	05		05000	
										DOCKET NUMBER(S)	
										05000	
OPERATING MODE (9)		4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § : (Check one or more) (11)								
POWER LEVEL (10)		0%	<input checked="" type="checkbox"/> 20.2201(b)			20.2203(a)(3)(ii)			50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)	
			20.2201(d)			20.2203(a)(4)			50.73(a)(2)(iii)	50.73(a)(2)(x)	
			20.2203(a)(1)			50.36(c)(1)(i)(A)			50.73(a)(2)(iv)(A)	73.71(a)(4)	
			20.2203(a)(2)(i)			50.36(c)(1)(ii)(A)			50.73(a)(2)(v)(A)	73.71(a)(5)	
			20.2203(a)(2)(ii)			50.36(c)(2)			50.73(a)(2)(v)(B)	OTHER	
			20.2203(a)(2)(iii)			50.46(a)(3)(ii)			50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)			50.73(a)(2)(i)(A)			50.73(a)(2)(v)(D)		
			20.2203(a)(2)(v)			50.73(a)(2)(i)(B)			50.73(a)(2)(vii)		
			20.2203(a)(2)(vi)			50.73(a)(2)(i)(C)			50.73(a)(2)(viii)(A)		
			20.2203(a)(3)(i)			50.73(a)(2)(ii)(A)			50.73(a)(2)(viii)(B)		

LICENSEE CONTACT FOR THIS LER (12)

NAME

K. A. Underwood, Performance Analysis Supervisor, Plant Hatch

TELEPHONE NUMBER (Include Area Code)

(912) 537-5931

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)

☒ YES
(If yes, complete EXPECTED SUBMISSION DATE)

NO

EXPECTED
SUBMISSION
DATE (15)

MONTH	DAY	YEAR
4	14	2006

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-space typewritten lines) (16)

During a review of Special Nuclear Material (SNM) inventory and accounting records initiated in response to industry events, a licensee-initiated corrective action, and Nuclear Regulatory Commission (NRC) Bulletin 2005-01, it was determined that a discrepancy existed between the amount of spent fuel that exists in the Spent Fuel Pool (SFP) and the amount recorded within the SNM physical inventory records. This was reported as NRC Event Number 42135 on November 10, 2005 pursuant to 10CFR20.2201(a)(1)(ii) and 10CFR50.72(b)(2)(xi). Southern Nuclear Operating Company (SNC) believes the SNM in question, consisting of fuel rod segments/fragments from five (5) fuel rods, and some pellets from a sixth rod, are either in an area of the SFPs that have not yet been inspected or were mistakenly shipped to a facility licensed to receive radioactive waste material. The possibility of theft or diversion is not considered plausible because of the plant's radiation monitoring instrumentation, physical security measures, and the size and type of container required for transporting nuclear material of this nature. From a material accounting and control perspective, Plant Hatch did not maintain accountability of these fuel segments/fragments from five (5) fuel rods that broke during the fuel reconstitution and inspection activities in the early 1980s. Additionally, a sixth broken rod has some missing pellets or pellet fragments.

This event was most likely caused by fuel rod segments/fragments not being tracked as separate, individual items in the SNM inventory. The applicable plant procedure has been revised to prevent this problem from recurring. Inventory verification activities in response to the NRC Bulletin continue. A root cause investigation is underway.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System codes appear in the text as (EIS Code XX).

DESCRIPTION OF EVENT

At approximately 1528 EST, on November 10, 2005, with Unit 1 in Mode 4, a notification was made to the Nuclear Regulatory Commission (NRC) of a Special Nuclear Material (SNM) accounting discrepancy. This was a non-emergency event notification, made in accordance with 10 CFR 20.2201(a)(1)(ii) and 10CFR50.72(b)(2)(xi), to inform the NRC of an SNM accounting discrepancy. The discrepancy is believed to be segments of five (5) rods from five (5) fuel bundles/assemblies, amounting to, in the aggregate, less than one spent fuel rod. Additionally, a sixth broken rod has some missing fuel pellets or pellet fragments. In the process of reviewing records and physically verifying the contents of the Spent Fuel Pools (SFPs) as part of activities associated with corrective action [Condition Report 2005105177] and preparing Southern Nuclear Operating Company's (SNC) response to NRC Bulletin 2005-01, material control and accounting discrepancies related to fuel segments/fragments located in the SFP and physical inventories records were identified. The Spent Fuel Pool Item Control Area (ICA) includes both spent fuel pools for Units 1 & 2. Based on record reviews, the segments/fragments are believed to have originated during fuel reconstitution and inspection activities during the early 1980s. Previous physical inventory procedures performed at the plant did not track individual fuel segments/fragments that were separate from fuel bundles.

It is believed that the fuel segments/fragments still reside within the SFP or were mistakenly shipped to a facility licensed to receive radioactive waste material. Physical searches of the SFPs in Summer, 2005 and Fall, 2005 identified individual segments in the SFPs separate from their original bundles. Retrieval of several potential short segments and/or pellet fragments, including at least one 5 inch segment, is ongoing. Inventory verification in response to the NRC Bulletin is in progress. A root cause investigation is underway.

10 CFR 20.2201(b) requires a written report within 30 days after the initial notification for the occurrence of any lost, stolen, or missing licensed material that was reported under 10 CFR 20.2201(a)(1)(ii) for licensed material in a quantity 10 times greater than the quantity specified in Appendix C to Part 20. The following topics are required to be addressed:

- (i) A description of the licensed material involved, including kind, quantity, and chemical and physical form:
Segments/fragments of irradiated fuel rods, approximately 1/2 inch in diameter, consisting of fuel pellets and pellets contained within metal cladding. The fuel material is irradiated, low-enrichment uranium dioxide.
- (ii) A description of the circumstances under which the loss or theft occurred:

Fuel rods were broken during inspection and reconstitution activities in the early 1980s. The location of the resulting segments/fragments was not recorded in the SNM inventory records. The possibility of theft or diversion is not plausible because of the plant's radiation monitoring instrumentation, physical security measures, and the size and type of container required for transporting nuclear material of this nature. It is believed that the fuel fragments either still reside within the SFPs or they were mistakenly shipped to a facility licensed to receive radioactive waste material.

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(iii) A statement of disposition, probable disposition, of the licenses material involved:

A final statement of disposition is not available at this time; further evaluations are ongoing. However, it is believed that the fuel segments/fragments either still reside within the SFP or they were mistakenly shipped to a facility licensed to receive radioactive waste material. A final disposition or probable disposition will be determined through the use of the root cause investigation which will be completed in early 2006.

(iv) Exposures of individuals to radiation, circumstances under which the exposures occurred, and the possible total effective dose equivalent to persons in unrestricted areas:

No exposure to radiation occurred to the plant staff or members of the public, since the fuel segments/fragments either remain in the SFPs or were mistakenly shipped in a licensed protective container to a facility licensed to receive radioactive waste material. This facility possesses monitoring equipment to prevent unauthorized exposure.

(v) Actions that have been taken, or will be taken, to recover the material:

The location of the fuel segments/fragments has yet to be determined. A root cause investigation is underway. A team is currently completing a detailed physical inspection of the SFPs, collecting records, performing document reviews, and interviewing present and former employees and vendors who have been associated with SFP activities, irradiated fuel inspections and reconstitutions, and radioactive material shipments at Plant Hatch.

The following specific actions have been performed or are in progress:

- (1) Visual inspection of accessible areas of the Spent Fuel Pool is almost complete. Special cameras and robotic equipment are being used to perform this inspection.
- (2) Additional review of selected vendor fuel and shipping records is in progress.
- (3) Additional review of selected SNC fuel and shipping/receipt records is in progress.
- (4) Inspection of selected fuel assemblies in the SFP is in progress.
- (5) Records are being reviewed to identify any information which might be pertinent to the on-site investigation.
- (6) The number of fuel bundles/assemblies within the SFP has been verified.
- (7) The records of offsite shipments are being reviewed to determine if any fragments were sent directly to off-site locations for analysis or testing.
- (9) Inspection of selected cells and accessible areas in, around, and under fuel storage racks is in progress.
- (10) Inspection of baskets, pails, and other containers within the SFP is in progress.
- (11) Inspection of open spaces and locations under equipment stored on the bottom of the SFP is in progress to ensure all areas are inspected.
- (12) State of Georgia and South Carolina representatives and the operator of the Barnwell facility were notified of the discrepancy.

(vi) Procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of licensed material:

Corrective actions to prevent recurrence of this event will be developed through the root cause investigation process. Additionally, plant procedure 42FH-ENG-030-0, "Special Nuclear Material Inventory & Transfer Control," has been revised. The procedure now establishes requirements that will ensure that the storage and inventory of individual fuel rods, fuel rod pieces, and other SNM fuel fragments will be properly documented and accounted for in the plant's physical inventories.

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CAUSE OF EVENT

This event was apparently caused by fuel rod segments/fragments not being tracked as separate items on the SNM inventory when segments/fragments could not be returned to their bundles from which they originated during reconstitution and inspection activities. A supplement to this LER will be issued to provide this information when the root cause investigation has been completed.

REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This report is required by 10 CFR 20.2201(b) because of a nuclear material accountability discrepancy. Portions of five (5) spent fuel rods, amounting to less than a fuel rod in the aggregate, were not located as part of the SNM inventory performed in response to Bulletin 2005-01. Additionally, a sixth broken rod has some missing pellets or pellet fragments. The discrepancy involved segments/fragments of irradiated fuel rods, approximately 1/2 inch in diameter, consisting of fuel pellets and pellets contained within metal cladding. The fuel material is irradiated, low-enrichment uranium dioxide.

The possibility of theft or diversion is not plausible because of radiation monitoring instrumentation, the plant's physical security measures, and the size and type of container required for transporting nuclear material of this nature.

No exposure to radiation occurred to plant staff or to the public, since the fuel fragments either remain in the SFPs or were mistakenly shipped in a licensed protective container to a facility licensed to receive radioactive waste material, which possesses monitoring equipment to prevent unauthorized exposure.

A final statement of disposition is not available at this time. However, it is believed that the fuel segments/fragments either still reside within the SFP or they were mistakenly shipped to a facility licensed to receive radioactive waste material. A final disposition or probable disposition will be determined through the use of the root cause investigation methodology. This disposition should be available in early 2006.

Based upon the preceding analysis, it is concluded this event had no adverse impact on nuclear safety. The analysis is applicable to all power levels.

CORRECTIVE ACTIONS

Procedure 42FH-ENG-030-0, "Special Nuclear Material Inventory & Transfer Control" has been revised. The procedure now establishes requirements that will ensure that the storage and inventory of individual fuel rods, fuel rod pieces, and other SNM fuel part fragments will be properly documented and accounted for in the plant's inventory.

Procedure 62RP-RAD-055-0, "Underwater Storage and Inventory of Radioactive Materials in the Spent Fuel Pool" was developed as a response to industry events and to increase SFP inventory control and to ensure valid item location.

Additional corrective actions will be completed based on the results from the root cause investigation. A supplement to this LER will be issued to provide these corrective actions when the root cause investigation has been completed.

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ADDITIONAL INFORMATION

No systems other than those already mentioned in this report were affected by this event.

This LER does not contain any permanent licensing commitments.

LER 50-321/1982-097, dated November 30, 1982, reported the separation of a fuel rod into two (2) segments/fragments during fuel rod inspection.

NRC Inspection Report 50-321/88-10, dated April 27, 1988, addressed material accountability and control procedures at Plant Hatch. NRC Inspection Report 50-321/87-27, dated November 18, 1987, includes an NRC finding related to material control and accountability. NRC Inspection Report 50-321/83-31, dated December 9, 1983, includes NRC observations of fuel bundle reconstitution activities.

A supplement to this LER will be issued in early 2006 to provide this final disposition when the root cause investigation has been completed.