U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket No. 50-322

Report No. 50-322/94-01

License No. NPF-82 (Possession Only)

Licensee: Long Island Power Authority
P. O. Box 628, North Country Road
Wading River, New York 11792

Facility Name: Shoreham Nuclear Power Station

Inspection At: Wading River, New York

Inspection Period: January 1 - April 8, 1994

Inspector: R L Nimitz 4/21/94
R. L. Nimitz, CHP date
Senior Radiation Specialist, RI

R L Nimitz for 4/21/94
L. Eckert, Radiation Specialist, RI date

Edw C. McCabe, Jr., for 4/21/94
G. Smith, Senior Physical Security Inspector, RI date

Edw C McCabe, Jr., for 4/21/94
R. Albert, Physical Security Inspector, RI date

R L Nimitz for 4/21/94
F. Bower, Reactor Engineer, RI date

Approved by: Robert J Boros 4/21/94
R. J. Boros, Chief date
Facilities Radiation Protection Section

Areas Inspected: The inspection consisted of on site and in-office inspection by Region I staff during facility tours, observation of work-in-progress, and review of various licensee procedures and reports. Areas reviewed during the inspection included action on previous inspection findings; decommissioning status and activities; fuel shipping activities; termination surveys; organization, staffing, training, and qualifications; radiological controls; radioactive waste activities; maintenance and surveillance activities; sewage disposal; quality assurance; and fire protection and security.

The inspector also reviewed the corrective actions associated with a fire that occurred in the drywell on December 28, 1993; the similarity analysis of recent events involving cranes or lifts; and the evaluation of the release of sewage sludge, that may have been slightly contaminated, from the sewage system to an off-site landfill.

Findings: The inspector's review indicated that, overall, decommissioning and termination survey activities were conducted in accordance with the approved Decommissioning and Termination Survey Plans. Radiological controls provided for decommissioning activities were very good. The inspector verified that appropriate corrective actions were taken for the drywell fire event and no fire safety concerns were identified during review of on-going work activities. The similarity analysis of recent crane/lift events was of good quality and the inspector did not identify any concerns. The evaluation of the release of sewage sludge, that may have been slightly contaminated, did not identify any concerns. The evaluation was of excellent quality. Three apparent violations (associated with fire protection activities), identified by the licensee, were reviewed. The violations were reviewed relative to the criteria for non-issuance of a Notice of Violation outlined in the NRC's Enforcement Policy. The applicable criteria were met and the violations were not cited.

DETAILS

1.0 Individuals Contacted

1.1 Licensee Personnel

The inspector met with cognizant licensee personnel periodically throughout the inspection period. In addition the inspector periodically held telephone discussions with licensee personnel during the inspection period. Individuals contacted included the following who also attended the exit meeting at the conclusion of the inspection on April 8, 1994.

- A. Bortz, Resident Manager
- L. Britt, Nuclear Operations Support Department Manager
- A. Downs, Security and Training Division Manager
- T. Garvey, Decommissioning Department Manager
- R. Petrone, Nuclear Quality Assurance Department Manager
- R. Pauly, Compliance Engineer
- F. Petschauer, Radiological Controls Division Manager and Acting Manager, Operations and Maintenance Division
- S. Schoenwiesner, Licensing and Regulatory Compliance Department Manager
- J. Wynne, Operations Manager

The inspector also contacted other personnel during the inspection.

1.2 NRC Personnel

- R. Bores, Chief, Facilities Radiation Protection Section, NRC Region I

2.0 Scope of Areas Reviewed

During the inspection period, the inspector reviewed the following activities.

- previous findings
- status of decommissioning
- transfer of slightly irradiated fuel
- termination survey program
- organization, staffing (including maintenance of staff), training and qualifications
- fuel handling activities
- radiological controls
- security, safeguards, and fitness for duty
- maintenance and surveillance activities
- disposal of sewage sludge
- fire protection activities
- radioactive waste shipping activities
- quality assurance activities

3.0 Previous Findings

(Closed) Unresolved item. (50-322/93-04-01)
On December 28, 1993, the licensee experienced a fire inside the drywell of the Shoreham Station. The fire occurred inside the biological shield wall of the drywell at the 78-foot elevation. The fire was attributed to hot slag from a metal cutting operation at the 137-foot elevation of the drywell (outside the biological shield wall) igniting combustibles (which had been brought into the area) at the 102-foot elevation. The ignited combustibles then dropped inside the biological shield wall to the 78-foot elevation. The fire and the licensee's immediate corrective actions were discussed in NRC Inspection Report No. 50-322/93-04, dated February 4, 1994. The inspector's preliminary review, during the aforementioned inspection, indicated that it was not apparent that fire watch personnel performed an adequate review of potential combustibles within proximity of the planned cutting location. The licensee's review indicated that a fire watch was positioned on the 78-foot elevation and did not notice the hemp rope and paper towels at the biological shield penetration located at the 102-foot elevation. The licensee took the following immediate corrective actions.

- All cutting and burning activities throughout the station were suspended. No burning and cutting work was to be resumed until the fire permit for the activity was reviewed.

- A site directive was issued by the Resident Manager indicating that all fire permits were to be authorized by the Resident Manager until further notice.

- Two independent investigations were initiated. An Incident Review Team was established to review the event. Also, an investigation by a Quality Assurance Group Team was initiated. Work was permitted in portions of the station after review of each fire permit.

The licensee issued a Licensee Event Report (LER) for this matter (LER No. 93-002, dated January 25, 1994).

Subsequent inspector review indicated the licensee performed an excellent root cause analysis of the event. As a result of the root cause analysis, the licensee took a number of additional corrective actions to preclude recurrence. The licensee corrective actions and recommendations (twenty four total) were tracked in a consolidated report. The corrective actions, among others, included the following.

- Work planning was improved to properly sequence work activities.
- Fire protection procedures were revised to include an evaluation of job locations prior to issuing fire permits.
- Preshift walkdowns were established for fire permits.
- Fire protection authorities and responsibilities were clarified.

- A drywell coordinator position was established.
- Management fire safety tours were established.

The inspector's review indicated the corrective actions were comprehensive.

The inspector's review of this event identified the following three examples of failure to adhere to station procedures.

The inspector noted that Technical Specification 6.7.1 requires that the procedures outlined in Revision 2 of Regulatory Guide 1.33 be established, implemented, and maintained. Regulatory Guide 1.33 requires procedures for procedure adherence, review, approval and temporary change. The inspector noted that Station Procedure SP 12X006.01, "Station Procedures-Preparation, Review, Approval, Change, Revision, and Cancellation, Revision 4, requires adherence to procedures.

- The inspector noted that personnel performing metal cutting operations on the 137-foot elevation of the drywell did not adhere to Procedure SP F1X501.01, Revision 3, "Fire Protection Permits". Although the personnel had a fire permit (No. 93-0324-1), as required by Section 8.15 of Procedure SP F1X501.01, the licensee did not adhere to the permit. The inspector noted that combustibles were located within 35 feet of the cutting operation (at the 102-foot elevation) contrary to the requirements of fire permit Special Precaution No. 1. In addition, the 102-foot elevation opening (penetration), in the biological shield wall, was not covered with fire retardant material as required by fire permit Special Precaution No. 3. These matters were considered an apparent violation of Technical Specification 6.7.1.

- The inspector noted that personnel had constructed a slurry water collection system inside the biological shield at about the 78-foot elevation in December 1993 to provide for collection of water slurry during cutting of the biological shield wall. The water collection system was installed under MWR No. 93-204, dated December 9, 1993. A fire permit was determined, at that time, not to be needed. The inspector noted that Station Procedure 12X013.01, Revision 5, Maintenance Work Request, was not followed in that the fire permit, issued in accordance with the MWR, was not completed by a properly qualified individual. Specifically, Step 28 of the MWR, regarding determination of the need for a fire permit, was completed by an individual who had not completed the "Fire Protection Technology" course as specified by Step 28. This matter was considered an apparent violation of Technical Specification 6.7.1.

  Note: The individual who completed Step 28 was notified of the error. In addition, applicable station personnel received training on proper completion of an MWR and the fire protection program.

The inspector noted that the failure to detect the combustibles at the 102-foot elevation during cutting at the 137-foot elevation and the failure to control accumulation of combustibles and/or the re-evaluation of the need for a fire permit when combustibles were brought into the area at the 102 foot elevation, contributed to the cause of the fire in the drywell on December 28, 1993.

The inspector reviewed these matters with respect to 10 CFR Part 2, Appendix C, General Statement and Policy and Procedure for NRC Enforcement Actions. As part of this review, the inspector reviewed fire protection audit findings and deficiency reports back through early 1992. The inspector concluded that the apparent violations meet the criteria for non-issuance of a Notice of Violation specified therein (Section VII.B.(2)). The inspector noted that the three examples of failure to adhere to station procedures were identified by the licensee, the violations were promptly corrected, the violations were not willful, and the violations would not have been prevented by corrective action for a previous violation.

This item is closed.

4.0 Decommissioning Status

The Shoreham Nuclear Power Station (Shoreham) was shut down in 1989. The maximum power attained was 5% reactor power, with a total core history of 2 megawatt (MW) days. In June 1991, a Possession Only License (POL) (effective July 19, 1991) was issued to Long Island Lighting Company (LILCo). On February 29, 1992, the NRC approved the transfer of the license to the Long Island Power Authority (LIPA). On June 11, 1992, the NRC issued an Order authorizing the decommissioning of Shoreham.

Since issuance of the Order, the licensee has been aggressively decommissioning the facility to ultimately release it as an unrestricted area. To this end, the licensee was decontaminating the facility in accordance with the Decommissioning Plan and was aggressively removing and disposing of hardware that could not be readily decontaminated. Since the facility operated at a maximum of 5% reactor power, radiation and contamination levels were low. Consequently, large portions of the facility exhibit minimal or non-detectable radiation or contamination levels.

A major step in the decommissioning process is the removal of reactor fuel from Shoreham. On February 25, 1993, LIPA reached an agreement with the Philadelphia Electric Company (PECO) to transfer the slightly irradiated fuel from Shoreham to PECO for use at PECO's Limerick Nuclear Power Station (Limerick). The agreement provided for transport of Shoreham's fuel (560 fuel elements representing the reactor's initial core load) to Limerick in special NRC approved shipping casks. As of April 8, 1994, the licensee had completed 23 of a planned 33 separate shipments in the NRC approved transport casks. An inter-modal transport route (i.e., barge and train transport) was used.

The fuel remaining at Shoreham continues to be stored in the spent fuel storage pool and is maintained in accordance with license requirements. All fuel is expected to be removed from the station by mid-May 1994.

The main portions of the reactor vessel were segmented and the segments have been disposed. The reactor vessel bottom head was left intact and the licensee was decontaminating it in order to leave it in place.

Essentially all contaminated systems were removed and disposed with the exception of the liquid radwaste system and the fuel pool clean-up system which were needed to support decommissioning activities and maintain fuel pool water quality. The licensee was in the process of removing portions of these remaining systems during the inspection period. A temporary fuel pool filter demineralizer was installed to allow for removal of portions of the spent fuel pool clean-up system and provide for maintenance of spent fuel pool water quality. All waste water in the radiological controlled area is collected and analyzed, as appropriate, for potential contamination.

In mid-March 1994, the licensee placed in service an industrial waste system which collects all liquid wastes, with the exception of sewage wastes, through out the facility. Although not radioactive, the wastes are analyzed for any trace radioactivity. The samples are analyzed to radiological environmental monitoring program (REMP) lower limits of detection (LLD). Sewage waste is routinely analyzed for trace radioactivity to the same LLDs.

As of April 8, 1994, the licensee had segmented four large segments (rings) of the biological shield wall and had removed them from the drywell. The ring segments were cut into from 12 to 16 blocks, each weighing between 2,000 to about 15,000 pounds. The licensee was in the process of performing a 10 CFR Part 61 analysis of the blocks for disposal purposes. Three rings remained to be segmented and removed. The cutting of the biological shield wall was consistent with information provided in the licensee's October 8, 1993, Decommissioning Plan Change Notice.

Overall, review of the on-going decommissioning process indicated the licensee was complying with the approved Decommissioning Plan and seeking NRC approval of any changes to the Plan, if appropriate.

The following table provides system removal status as of April 8, 1994.

Table 1		
System Removal Status		
Area	**Quantity of Material Removed (lbs.)**	**Removal Status**
Reactor Building	2,675,000	80%
Radwaste Building	820,000	90%
Turbine Building	72,000	100%

Note: A total of 3,567,000 pounds of material was removed from the Shoreham Station and disposed as of April 7, 1994.

5.0 Transfer of Slightly Irradiated Fuel To Limerick

The inspector reviewed, on an on-going basis, the shipment of slightly irradiated fuel from the Shoreham Nuclear Power Station (Shoreham) to the Philadelphia Electric Company's (PECO's) Limerick Nuclear Generating Station (Limerick). The licensee's program was reviewed with respect to 10 CFR Parts 20, 71, and 73; and 49 CFR 171 - 178. Special emphasis was placed on review relative to 49 CFR Part 174, Carriage by Rail, and 49 CFR Part 176, Carriage by Vessel.

The inspector reviewed, on a selected basis, the current organizational structure, training and qualifications, procedures, audits and surveillances, and documents. Shipping records for all fuel shipments during the inspection period were reviewed. The licensee had suspended fuel shipments in late December 1993, as a result of outage activities at the Limerick Nuclear Generating Station. Fuel shipments resumed on March 23, 1994, with Shipment No. 20.

The inspector made independent observations of on-going activities in the following areas.

- fuel handling operations
- cask handling activities
- radiological surveys of shipping casks
- QA oversight.

As of April 8, 1994, the licensee made four additional shipments (Nos. 20-23) since resumption of shipping activities. The inspector inspected shipment Nos. 20 and 23 on

March 23 and April 8, 1994, respectively, prior to their departure from the Shoreham Station. For Shipment No. 20, that inspection included the radioactive materials shipment record; notification of the states of New Jersey, Delaware, and Pennsylvania; and the Bill of Lading. No concerns were identified.

The inspector concluded that, overall, the licensee implemented an effective program for transfer of the slightly irradiated fuel.

No safety concerns or violations were identified.

6.0 Termination Survey Reviews

The inspector reviewed on-going termination survey activities as outlined in the licensee's Shoreham Decommissioning Project Termination Survey Plan (Survey Plan). The inspector directly observed technicians performing surveys, reviewed selected instrument calibration records and quality control charts, and verified adherence to the Survey Plan.

The inspector observed in-progress termination surveys in the radioactive waste building. Activities associated with Survey Units RWO22 (storage vaults) and RWO43 (laundry room) were also reviewed. Calibration and control chart records for the instruments used on the survey units noted above were reviewed.

The inspector reviewed the licensee's use and control of the survey instrumentation used during termination surveys. The inspector noted that in following the Termination Survey Plan, the licensee accumulated history files for each detector and probe being used for termination surveys. No safety concerns were noted by the inspector as a result of review of the history files.

The inspector did note, however, that in several instances, the FT-126BH GM tubes, used by the licensee, failed the established acceptance source check criteria (plus or minus three-standard deviations). When an instrument or a probe failed it's acceptance criteria it was taken out-of-service and the licensee conducted an informal root cause analysis. The most common root cause of failure noted by the licensee, in the analyses reviewed by the inspector, was quench gas depletion and/or source decay. The inspector questioned the licensee on whether some of these failures were due to other possible failure modes (for example, anode degradation or a tube leak). The inspector also discussed with the licensee the feasibility of conducting a more thorough periodic review of instrument histories now that operating experience has been developed for each detector/probe. In response, the licensee has initiated an in-depth review of failure cause of several FT-126BH GM tubes. This review will be evaluated in a future inspection. The inspector also requested the licensee to evaluate a need to re-perform selected previous surveys in light of the inspector's observation. The inspector's preliminary review did not identify any apparent concern in this area, however, the licensee indicated this matter would also be reviewed.

The inspector reviewed the training records of three technicians who were conducting termination surveys for the termination survey units noted above. The inspector also interviewed these technicians. The inspector determined that the individuals were appropriately qualified.

No discrepancies were noted with the licensee's established training program for termination survey technicians, existing station procedures or the Termination Survey Plan. The licensee effectively implemented the Termination Survey Plan.

On February 4, 1994, the licensee submitted Phase 2 of the Termination Survey Plan (LSNRC-2144). The submittal provided survey results for the suppression pool, pipe tunnels, various piping systems and 12 plant systems. The licensee requested that portions of the submittal be withheld from public disclosure in accordance with 10 CFR Part 2.790. The report and licensee request were under NRC review at the time of this inspection.

Attachment 1 to this report provides the licensee's summary of Termination Survey Phases I and II survey results. Attachment 2 to this report provides the licensee's status of Phase III termination surveys. Attachment 3 provides the licensee's proposed schedule for completion of Phases III and IV of the Termination Survey Plan. The attachments were provided by the licensee.

No safety concerns or violations were identified.

7.0 Organization, Staffing, Training and Qualifications

The inspector reviewed the on-site organization, staffing, and the training and qualifications of personnel. The review was with respect to the following Possession Only License Technical Specifications.

- Technical Specification 6.2, Organization
- Technical Specification 6.3, Unit Staff Qualifications

The inspector reviewed matters such as staffing, use of overtime, and training and qualification of radiological controls personnel. The maintenance of sufficient numbers of qualified personnel to oversee and perform on-going decommissioning activities was also reviewed.

The inspector's review indicated that the licensee continues to maintain and reduce, as appropriate, staffing consistent with the licensee's staffing reduction plan. No indications of unqualified staff (per NRC requirements) were identified during review of recent organization changes. Since January 1, 1994, key individuals left the organization. Both the Quality Assurance Department Manager and the Operations and Maintenance Department Manger left the on-site organization. The inspector's review indicated the

individual selected to fill the position of Nuclear Quality Assurance Department Manager was properly qualified. The individual acting in the capacity of Operations and Maintenance Department Manager also met applicable license qualification requirements.

The licensee was very sensitive to the need to maintain adequate numbers of technically qualified personnel to oversee and perform on-going decommissioning activities.

The inspector also reviewed the re-training and qualification of certified and senior certified fuel handling personnel. The inspector compared applicable licensee submittals sent to the NRC, regarding this program, to the current re-training and qualification program in place. The inspector reviewed shift manning schedules and selectively reviewed re-training and qualification documents, lesson plans and qualification records. No concerns were noted.

The inspector also reviewed licensee training efforts to support resumption of fuel shipping activities. The inspector noted that the licensee provided re-fresher training to appropriate personnel on fuel movement activities and procedures and also provided training on NRC Information Notice No. 94-13, "Unanticipated and Unintended Movement of Fuel Assemblies and Other Components Due to Improper Operation of Refueling Equipment".

No safety concerns or violations were identified.

8.0 Radiological Controls

The inspector reviewed the implementation and adequacy of radiological controls. The evaluation of the licensee's performance was based on discussions with cognizant personnel and independent inspector observations during tours. The following elements of the program were reviewed.

- posting, barricading and access control (as appropriate) to Radiation, High Radiation, and Airborne Radioactivity Areas
- personnel adherence to radiation protection procedures, radiation work permits, and good radiological control practices
- maintaining occupational radiation exposure as low as reasonably achievable (ALARA)
- use of dosimetry devices
- airborne radioactivity sampling and controls, including installation and use of engineering controls to minimize airborne radioactivity
- adequacy of radiological surveys to support pre-planning of work and on-going work
- calibration and checking of radiological survey instrumentation, and
- contamination controls, including hot particle controls.

As part of the review effort, the inspector reviewed radiological controls associated with biological shield wall removal and associated tasks. The inspector entered the drywell and observed on-going cutting of biological shield wall blocks. The inspector also reviewed collection and control of potentially contaminated water used as a lubricant for diamond wire cutting of the blocks. The inspector also entered the bottom bowl of the reactor vessel and reviewed planning and work controls for grinding of the contaminated surfaces. In addition, the inspector also reviewed contamination controls at egress points from the radiological controlled areas.

The inspector's review indicated that, overall, very good radiological controls were implemented for the work activities reviewed. Radiation, contamination, and airborne radioactivity surveys were appropriate for the conditions encountered.

During the inspection, the inspector reviewed radiological controls provided for incoming shipments of potentially contaminated equipment (e.g., fuel handling equipment). The inspector reviewed surveys and controls for incoming shipments for the period July 1993-March 1994. The inspector noted that potentially contaminated material was received on August 23, 1993 (refueling equipment). The shipment was properly controlled in accordance with the licensee's procedures. The packages were opened within a posted contamination area to preclude spread of contamination. The packages did not exhibit external contamination or significant radiation levels. The inspector concluded that the licensee was properly controlling incoming shipments of potentially contaminated equipment in order to minimize the spread of contamination and preclude personnel radiation exposures.

On February 28, 1994, the licensee submitted the Annual Man-rem Report (LSNRC-2157) for the Shoreham Nuclear Power Station, as required by Technical Specification 6.8. For the reporting period January 1, 1993 through December 31, 1993, no individual received a measurable exposure greater than 100 millirem. Total personnel radiation exposure for 1993 was 337 person-millirem. Only 20 individuals out of a population of 586 monitored personnel sustained measurable exposure. The inspector noted that personnel monitoring is performed by use of dosimetry devices appropriately accredited by the National Voluntary Accreditation Program.

There were no unplanned exposures (external or internal) in 1994 as of April 8, 1994.

No safety concerns or violations were identified.

9.0 Security, Safeguards, and Fitness for Duty

The inspector toured the protected area during the inspection period and observed security controls. The inspector also reviewed security compensatory measures (as appropriate) and discussed these measures with appropriate security personnel. The inspector also reviewed applicable security logs. The inspector observed implementation

of proper security controls for entry into controlled locations. The inspector also reviewed fitness for duty testing of individuals involved with fuel transfer activities. The licensee continued to implement the fitness for duty program.

During the inspection period, the inspector verified completion of Nuclear Material Transaction Reports (Form NRC-741) for transfer of fuel to the Limerick Nuclear Generating Station. The inspector noted that copies of the Form NRC-741, included with the shipping packages were difficult to read. The licensee indicated this matter would be reviewed. The inspector noted that the licensee was preparing and planning to phase in an industrial security program once all fuel was removed from the station.

No safety concerns or violations were identified.

10.0 Surveillance and Maintenance

The inspector reviewed on-going work activities, reviewed procedures, and discussed on-going activities with cognizant personnel. The inspector reviewed personnel adherence to procedures, industrial safety matters, and housekeeping. The inspector reviewed use of cranes relative to guidance contained in NUREG 0612, "Control of Heavy Loads at Nuclear Power Stations." The inspector also physically observed the removal of the reboiler vessel in the radwaste building.

The inspector verified implementation of Technical Specification surveillance requirements. Principal focus was on safety related equipment. The inspector also reviewed implementation of surveillances specified in the Fire Hazards Analysis Report (FHAR) and the Off-site Dose Calculation Manual (ODCM). Surveillances of the following items were reviewed.

- Polar Crane Travel
- Fuel Handling Platform
- Fuel Pool Water Chemistry
- Fire Detection and Suppression Equipment
- Criticality Monitors

The licensee properly performed the surveillances.

No safety concerns or violations were identified.

11.0 Planning for Disposal of Spent Fuel Storage Pool Water

The inspector reviewed the licensee's plans for draining of the spent fuel pool following removal of fuel. The pool contains about 350,000 gallons of water. The drain down will occur in two phases. Phase 1 will result in drain-down of the pool to approximate

the top of the fuel racks. Phase 2 will completely drain the pool. The pool water represents the remaining major source of liquid waste at the station.

The licensee plans to release the pool in a batch release mode. This release mode is permitted by Footnote G to Technical Specification Section 3/4.11.1, Liquid Effluents (Revision 1, dated February 1993). The waste water will be sampled and analyzed in accordance with Off-site Dose Calculation Manual (ODCM) requirements (including recycling of pool contents to obtain a representative sample). Discussions indicated the radioactivity concentration of the water is expected to be below ODCM lower limits of detection.

The pool will be drained to the salt water drain tank (TK-190) elevation 8' via a temporary modification. The description of the proposed release method was discussed in the licensee's April 6, 1993, submittal (LSNRC-2053) to the NRC ("Clarification of Request for Approval of Temporary Liquid Radwaste Processing System Design"). The submittal was approved in a letter dated May 26, 1993. The NRC included stipulations regarding discharge of the water as follows.

- Operators were to be placed at the radiation monitor of the tank discharge radiation monitor to close the discharge valve in the event of an alarm.

- A system was to be installed to allow for pump-back of water to the spent fuel pool in the event that the discharge monitor alarmed.

The licensee planned to implement these stipulations.

The following matter was brought to the licensee's attention.

- The inspector noted that the drain down will involve pumping the liquid from the 175' elevation to the 8' elevation. The inspector noted that any potential leaks would result in potential introduction of fluids into the industrial waste system which is a non-contaminated system. The licensee indicated that special pressure-tested hoses were obtained for the draindown. However, the licensee indicated the inspector's observation would be reviewed.

No safety concerns or violations were identified.

12.0 Release of Sewage

In October of 1992 the contents of a septic tank (part of the licensee's on-site sewage disposal system), was pumped out by a commercial vendor for disposal. Prior to the disposal, the licensee sampled and analyzed the septic tank contents. Samples taken were analyzed to lower limits of detection (LLD) which were consistent with the licensee's liquid radioactive effluent release requirements (i.e., ODCM LLDs) of 500 picoCuries

per liter (pCi/l)). No radioactivity was detected in the septic tank sample at that time. The inspector noted that the samples should have been (as discussed in NRC Information Notice No. 88-22, dated May 12, 1988) analyzed to LLDs specified in the Radiological Environmental Monitoring Program (REMP) (i.e., 15 pCi/l, the REMP LLD). Subsequent to that disposal, in January 1993, the licensee sampled the septic tank and measured (in a January 1993 sample of sewage sludge) the presence of cobalt-60 (Co-60) at a concentration of about 60 pCi/l in sewage sludge. Consequently, the licensee may have inadvertently disposed of slightly contaminated sewage sludge. This matter was extensively discussed in NRC inspection Report 50-322/93-04, dated February 4, 1994.

The licensee subsequently performed an evaluation of the off-site radiological consequences of the release of the sewage. The licensee's evaluation, dated March 4, 1994, did not identify any off-site impact. The licensee's off-site dose assessment was considered of excellent quality.

No safety concerns or violations were identified.

13.0 Fire Protection Activities

The inspector made periodic reviews of station housekeeping and fire protection activities during the inspection. Extinguishers were checked during station tours to determine charge levels and completion of surveillances. The inspector also reviewed burning and cutting operations to evaluate fire protection controls.

The inspector's reviews identified generally good housekeeping and fire protection activities throughout the station.

No safety concerns or violations were identified

14.0 Radwaste Shipping Activities

The inspector reviewed radioactive waste shipping activities for the period 1993 and 1994 through April 8, 1994. The review was with respect to the criteria contained in 10 CFR 71, "Packaging and Transportation of Radioactive Material", and applicable licensee procedures. The inspector reviewed applicable documents and discussed the shipping program with cognizant personnel. The inspector selectively verified, by review of documents, that the licensee was authorized to use the shipping casks in use. The inspector reviewed the licensee's shipment of irradiated zirconium fuel channels. The inspector also selectively reviewed licensee training of personnel relative to NRC Inspection and Enforcement (IE) Bulletin 79-19.

The inspector also visually inspected out-going fuel shipments (Nos. 20 and 23).

The following radioactive waste/material shipment records were reviewed.

Table 2

Radioactive Shipping Information Reviewed

Shipment Number	Description	Total Activity	Shipping Name and Hazard Class
NPF-82-SFS-20	Fuel - metal oxides	3.6 E+06 mCi	Radioactive material, Fissile, NOS[1], Class 7, RQ[2], HRCQ[3], UN2918
NPF-82-SFS-22	Fuel - metal oxides	4.1 E+06 mCi	Radioactive material, Fissile, NOS, Class 7, RQ, HRCQ, UN2918
94-27	Irradiated fuel channels	2.5 Ci	Radioactive material, LSA[4], UN2912
94-30	Irradiated fuel channels	2.4 Ci	Radioactive material, LSA, UN2912
94-31	2 Seavans to SEG[5] - metal oxides on piping and hardware	27 mCi	Radioactive material, LQ[6], UN2910
93-25	Spent filter media and scrap metal - metal oxides	284 mCi	Radioactive material, LSA, UN2912
93-38	2 Seavans to SEG - metal oxides on piping and hardware	41 mCi	Radioactive material, LSA, UN2912
93-46	2 Seavans to SEG - metal oxides on piping and hardware	59 mCi	Radioactive material, LSA, UN2912

These records were found complete. The licensee maintained copies of the consignee's licenses as required. The inspector verified that the licensee was a registered user of the shipping casks (if applicable) used for the shipments noted above.

No safety concerns or violations were identified.

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[1]Not Otherwise Specified

[2]Reportable Quantity

[3]Highway Route Controlled Quantity

[4]Low Specific Activity

[5]Scientific Ecology Group, Incorporated

[6]Limited Quantity

15.0 Quality Assurance (QA) Oversight

The inspector reviewed the implementation and adequacy of the Quality Assurance Program audit and surveillance activities. The review was with respect to criteria contained in Technical Specifications (TS), the Defueled Safety Analysis Report (DSAR), and the Shoreham Decommissioning Plan.

The inspector reviewed completed audits, surveillance reports, deficiency reports and corrective action reports. The inspector also observed quality assurance oversight activities during station tours and discussed quality assurance activities with cognizant personnel.

The inspector reviewed a similarity analysis performed by the licensee's Quality Assurance Group. The purpose of the similarity analysis was to identify any apparent commonalities between recent crane/lifting problems encountered by the licensee in 1993. The analysis was considered of excellent quality. The analysis identified weaknesses in attention to detail and work planning as contributors to the event. The licensee has taken action to improve performance in these areas through improved work planning and enhancement in management oversight of work activities.

The inspector reviewed the root cause analysis of the drywell fire performed by the Quality Assurance Group. The analysis was considered of very good quality. This matter is further discussed in Section 3.0 of this report.

The inspector noted that the licensee's Quality Assurance Group performed a readiness assessment for resumption of fuel shipping activities. The assessment was considered a very good initiative.

The inspector's review indicated the licensee continued to implement an overall effective QA program. QA findings were appropriately dispositioned when identified.

The inspector noted that the Quality Assurance Group performed an evaluation of the licensee's radwaste shipping truck inspection program (specifically brake inspections) when the inspector identified an apparent concern during review of shipping activities. The license's review did not identify any apparent concerns.

The inspector also reviewed oversight of activities by the licensee's Independent Review Panel. The oversight was considered of good quality.

No safety concerns or violations were identified.

16. Licensing Activities

The inspector reviewed various licensing activities (e.g., requests for Decommissioning Plans) which occurred during the period. The following was noted.

- The licensee submitted supplements dated January 20, 1994, (LSNRC-2134) and March 8, 1994, (LSNRC-2148) to a license change application dated November 4, 1993 (LSNRC-2115). The November 4, 1993 submittal was a license change application to delete Appendix A of the Technical Specifications and other documents associated with the operation of the station. The request was initiated due to the planned removal of fuel from the station. The November 4, 1993, request was noted in the March 30, 1994 Federal Register.

- On January 5, 1994, (LSNRC-2132) the licensee provided updated decommissioning cost estimates for Shoreham. The licensee expects to complete the decommissioning within the originally estimated $186 million (excluding fuel disposition costs).

- On January 2, 1994, the licensee submitted (LSNRC-2133) Revision 2 to the Termination Survey Plan.

No safety concerns or violations were identified.

17.0 Exit Meeting

The inspector discussed the scope and purpose of the inspection activities periodically during the inspection period. On April 8, 1994, the inspector summarized the results of the inspection. The licensee acknowledged the inspection findings.

SUMMARY OF PHASES I & II SURVEY RESULTS

- **Total Number of Survey Units: 213**

- **Direct Beta-Gamma (dpm/100 cm^2):**

Number of Measurements	Max. Value (15,000)	Max. Average (5,000)	Grand Mean
44,800	6147	1348	116

- **Removable Activity (dpm/100 cm^2):**

Number of Measurements	Max. Value (1,000)	Max. Average (1,000)	Grand Mean
40,300	953	76	6

- **Gamma Exposure Rate (uR/hr):**

Number of Measurements	Max. Value (10)	Max. Average (5)	Grand Mean
13,900	5.6	2.3	0.5

Phase II Final Report Submitted to NRC on February 4, 1994.

STATUS of PHASE III SURVEY

Phase III Report Contents:

Type of Survey Unit	Survey Total	Survey Complete	Rel Rec Complete
Systems	14	5	4
Structures (RadWaste)	50	14	1
Bldg Exterior	1	0	0
Totals	65	19	5

SCHEDULE of PHASE III & IV

PHASE III:

- 65 Survey Units; Radwaste Building
  50 Structural; 1 Exterior; 14 Systems
- Survey Effort - 2/15/94 through 5/6/94
- Final Report - 6/15/94
- NRC Confirmation Expected 8/94

PHASE IV:

- 125 Survey Units; Reactor Building
  87 RB Structural; 21 Drywell; 17 Systems
  Also: Repeat 2 Turbine Bldg areas
- Survey Effort - 11/1/93 through 8/31/94
- Final Report - 10/1/94
- NRC Confirmation Expected 11/94