

U. S. Nuclear Regulatory Commission
Region I

Docket No. 50-322

Report No. 50-322/92-05

License No. NPF-82 (Possession Only License)

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: October 13 - December 31, 1992

On-site Inspection Visits: October 23, 1992
November 16 and 23-25, 1992
December 21-22, 1992

Inspector:

R. L. Nimitz
R. L. Nimitz, CHP
Senior Radiation Specialist
Project Manager

2/3/93
date

Approved by:

W. J. Paschak
W. J. Paschak, Chief
Facilities Radiation Protection Section

2-3-93
date

Areas Inspected: On-site and in-office inspection by Region I staff, consisting of facility tours, observation of work-in-progress, and review of various licensee procedures and reports. The areas reviewed were decommissioning status and activities; action on previous findings; organization, staffing, training and qualifications; radiological controls; radioactive waste activities; maintenance and surveillance; quality assurance; fire protection; and security.

Findings: The inspector's review indicated that, overall, decommissioning activities were generally well managed. The performance of the readiness assessment for termination survey plan implementation was considered a very good initiative. The inspector identified areas for improvement. These areas were lack of load paths for and improper movement of the polar crane, examples of poor industrial safety practices, and improper sign-offs of procedure checklists. The licensee promptly addressed the immediate issues associated with the areas for improvement. The licensee also initiated evaluations of the specific areas. No violations of regulatory requirements were identified, but one unresolved item, as described on page 10 of the inspection report, was noted. Additional inspection is required to resolve this matter.

DETAILS

1.0 Individuals Contacted

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:

- L. Hill, Resident Manager
- A. Bortz, Operations and Maintenance Department Manager
- F. Petschauer, Radiological Controls Division Manager
- R. Grunseich, Fire Safety and Administration Division Manager
- N. Nilsen, Decommissioning Department Manager
- R. Patch, NQA Department Manager
- J. Welsh, Security Operations Supervisor
- L. Britt, Nuclear Licensing and Regulatory Compliance Manager

The inspector also contacted other personnel during the inspection.

2.0 Scope of Areas Reviewed

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

- previous findings
- status of decommissioning
- organization, staffing (including maintenance of staff), and training and qualifications
- audit and surveillance activities
- radioactive waste shipping activities
- radiological controls
- maintenance and surveillance activities
- security controls
- general plant conditions including housekeeping, fire protection, and industrial safety

3.0 Previous Findings

3.1 (open) Unresolved Item (50-322/92-04-02)

During a previous inspection (Reference NRC Inspection No. 50-322/92-04), the inspector noted that the limiting conditions and surveillance requirements for fire protection equipment in the vicinity of the emergency diesel generators (EDGs), the emergency switchgear, and the batteries had been deleted from the Fire Hazards Analysis Report (FHAR). The inspector also noted during the previous inspection that the Technical Specifications (TSs) required that the fire protection equipment be operable to

support fuel handling. The inspector indicated during the previous inspection that the level of fire protection provided for an area, including limiting conditions, compensatory actions, and surveillance requirements, should be commensurate with the equipment operability requirements. The licensee's management noted and agreed to evaluate this concern and provide the results of this evaluation to the NRC.

During the current inspection, the inspector discussed the licensee's actions on this matter. The inspector noted that the licensee submitted, in a letter dated December 14, 1992, a license change application to delete the TS requirements for ac power sources and on site power distribution systems. The licensee's basis, in-part, for deleting the fire protection equipment limiting conditions and surveillances requirements was that the EDGs were not needed to maintain the fuel in a safe condition in the event of a fire, and that the ac sources do not perform safety related functions. The licensee did include the fire protection equipment in the routine preventative maintenance program. This matter remains unresolved pending NRC review and evaluation of the licensee's December 14, 1992, submittal.

3.2 (Open) Unresolved Item (50-322/92-C4-03)

During a previous inspection (Reference NRC Inspection No. 50-322/92-04), the inspector noted during review of radwaste shipping documentation for planned Shipment No. RWS-92-31 that portions of a shipping checklist, used for documenting completion of marking, labeling and placarding, had been signed-off even though certain activities had not been performed. Specifically, the sealing of the package with a non-removable (tamper proof) seal had not been performed. The documentation was being prepared for disposal of irradiated control rod blades. The inspector's discussions with licensee representatives during the previous inspection indicated that the applicable paper work would be re-done and that this concern would be reviewed.

The inspector's review during the current inspection indicated that the documentation had been re-done and that the individual had been informed to sign-off checklist steps after completion of the step. The inspector also noted that station procedures apparently did not provide guidance regarding when procedure steps should be signed off. The licensee's personnel indicated that the extent and adequacy of guidance relative to signing-off procedure steps would be reviewed. The inspector indicated that the completion of sign-offs of shipping paper checklist steps in advance of completing the actual activity and the corrective actions taken to preclude recurrence remained an unresolved item.

4.0 Facility Status

The Shoreham Nuclear Power Station was shut down in 1989. The maximum power attained was 5% reactor power, with a total core history of 2 effective full power 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.

Subsequent to issuance of the order, the reactor was defueled and drained. The reactor fuel was placed in the fuel pool. As of the end of this inspection period, the licensee was evaluating options for handling the reactor fuel. These options included on site storage of the fuel and transfer of the fuel to an authorized recipient. The LIPA Board of Trustees voted on November 30, 1992, to award a fuel disposition contract to *Compagnie General des Matieres Nucleaires* (COGEMA). The contract was signed on December 1, 1992, and would involve transport of the fuel to France for eventual reprocessing. As of the end of this inspection period, the licensee was still evaluating available fuel disposition options.

The reactor vessel has been segmented and disposal of several segments completed. The reactor vessel bottom head was left intact and the licensee was attempting to decontaminate and leave it in place. The reactor vessel head remains on site.

Contaminated systems were being removed, segmented and shipped off-site for burial. A total of about 1.4 million pounds of material have been removed from the facility. Essentially all contaminated systems were removed and disposed of with the exception of the liquid radwaste system and the fuel pool clean-up system. These systems were needed to support decommissioning activities and maintain fuel pool water quality, respectively. The licensee plans to install temporary facilities to replace these latter systems which would allow their removal. The licensee will obtain NRC approval prior to installation of the temporary systems. The licensee was conducting activities in accordance with the Decommissioning Plan or requesting changes as appropriate.

Regarding termination surveys, the licensee commenced the termination survey program at the end of the inspection period.

Attachment 1 to this inspection report provides decommissioning status as of December 21, 1992.

5.0 Termination Survey Planning

On December 2, 1992, the licensee formally submitted the Shoreham Decommissioning Project Termination Survey Plan (Survey Plan), Revision 0, to the NRC for review and approval. The Survey Plan describes the methodology and techniques to be used by the licensee to survey the site for unrestricted access. The NRC reviewed the Survey Plan and provided comments to the licensee in a letter dated December 16, 1992. At the close of this inspection period, the licensee was reviewing and evaluating the comments. The inspector noted that the licensee was using NUREG/CR-5849, Manual for Conducting Radiological Surveys in Support of License Termination, dated June 1992, as review criteria, and that the licensee had questions on certain recommendations contained therein. The NRC letter (discussed above) responded to those questions.

The inspector reviewed the licensee's on-site planning for termination surveys and noted that the licensee performed a termination survey readiness assessment. It was noted that the licensee contracted recognized experts in the area of site decommissioning and termination surveys. These efforts were considered excellent initiatives by the licensee to evaluate the readiness to implement the Termination Survey Plan. The inspector further noted that the licensee was designing and manufacturing sophisticated internal pipe crawlers. The crawlers were equipped with radiation detectors and cameras to be used to survey the internals of piping systems. The inspector noted that the radiation detectors were being tested and calibrated with radioactive contamination calibration sources directly traceable to the National Institute of Standards Technology (NIST).

The inspector concluded, based on observations during station tours, and discussions with cognizant personnel that the licensee was taking care to ensure termination survey planning and performance activities were properly performed with appropriate management reviews.

6.0 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 use of overtime, training and qualification of radiological controls personnel overseeing radiological work activities, and maintenance of sufficient numbers of qualified personnel to oversee and perform on-going decommissioning activities.

No safety concerns or violations were identified. The licensee was very sensitive to the need to maintain adequate numbers of technically qualified personnel to oversee and perform on-going decommissioning activities. Inspector observations indicated overall morale was good.

The licensee informed the NRC in a letter dated December 9, 1992, that effective November 19, 1992, Mr. Stan Klimberg was appointed to the position of President of Shoreham Gas Conversion Project and Special Counsel to the Chairman. Also, Mr. Carl Giacomazzo was promoted to the position of President of the Shoreham Decommissioning Project. Lastly, Mr. Richard Bonnifield was promoted to General Counsel and would assume the responsibilities previously held by Mr. Klimberg.

7.0 Quality Assurance

The inspector reviewed quality assurance activities. Areas reviewed included audits, assessments, and surveillance activities. The reviews in this area were relative to criteria contained in Possession Only License Technical Specification Section 6.5, Review and Audit. The inspector also discussed independent oversight efforts performed by the Independent Review Panel.

The following audits and assessments were reviewed:

- LIPA NQA Audit NQA-92X06, Industrial Safety Program, dated November 4, 1992
- LIPA NQA Audit NQA-92X07, Radiological Controls, dated October 21, 1992
- LIPA NQA Termination Survey Readiness Report (draft), dated November 9, 1992
- LIPA NQA Audit NQA-92X08, Fitness for Duty, dated November 25, 1992
- LIPA NQA Audit NQA-92X09, Defueled Emergency Preparedness, dated December 11, 1992
- LIPA NQA Audit NQA-92X12, Reactor Building Polar Crane, dated December 16, 1992

The inspector's review identified generally very good audit and assessment activities and initiatives.

The inspector's review of the termination survey plan assessment indicted that the assessment was comprehensive and of excellent technical depth. The plan was evaluated relative to current NRC criteria. The assessment also evaluated the licensee's efforts to maintain an adequate technical staff to support decommissioning.

No safety concerns or violations were identified.

8.0 Emergency Planning Activities

On October 25, 1992, the licensee held an annual emergency exercise. The objective and scope of the exercise were based on the licensee's De-fueled Emergency Preparedness Plan. The objectives and exercise scenario package was provided to the NRC in a letter dated September 4, 1992. The inspector reviewed the exercise with respect to Section 8, Maintaining of Emergency Preparedness, of the Plan.

Prior to the drill, the inspector reviewed the scope of the exercise. The drill involved transportation of a contaminated injured individual to an off-site medical facility and a spill of contaminated liquid. The exercise scenario contained clearly defined objectives in areas such as event classification, communications, command and control, and facilities and equipment. The inspector reviewed exercise performance with cognizant members of the licensee's organization. The inspector noted that all objectives had been satisfactorily met. The inspector's discussions indicated downgrading of the event classification was delayed slightly due to a technician, who had accompanied the contaminated and injured (both simulated) worker to the hospital, not calling the station in a timely fashion upon his arrival at the hospital. The licensee was reviewing this area for improvement.

No safety concerns or violations were identified.

9.0 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
- contamination controls, including hot particle controls.

The inspector entered the drained reactor vessel and observed and reviewed the following activities:

- cutting of control rod guide tubes in the reactor vessel
- drilling and cutting of the reactor vessel

No airborne radioactivity concerns or external exposure concerns were identified.

The inspector's review indicated that very good radiological controls were implemented for the work activities reviewed. ALARA controls were commendable. The inspector noted that there were only three minor personnel contaminations during 1992. The inspector reviewed documentation associated with the personnel contaminations. No concerns were noted. The inspector noted that the few personnel contaminations were indicative of very good contamination control practices during decommissioning. Radiation, contamination, and airborne radioactivity surveys were appropriate for the conditions encountered.

No safety concerns or violations were identified.

10.0 Radwaste Shipping Activities

The inspector reviewed radioactive waste shipping activities. 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 had appropriate authorization for the shipping casks that were being used. The following shipping activities were reviewed:

- On November 23, 1992, the inspector reviewed the preparation for shipment of four control rod blades. The blades were contained in a shielded liner (Radioactive Shipment No. 92-157). The inspector independently visually inspected the transport vehicle and the shipping package, and reviewed shipping documentation. The inspector also made independent radiation measurements of the shipment.
- On December 22, 1992, the inspector observed licensee efforts to transfer to the refueling floor a shipping cask to be loaded with irradiated hardware. The inspector noted very good quality assurance and supervisory oversight of this activity. Approved procedures, including applicable check lists, were present at the work location and frequently used. Proper care was taken to ensure applicable tools were within calibration.

No safety concerns or violations were identified.

11.0 Security/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 the Security Operations Supervisor.

The inspector noted that the LIPA Fitness for Duty Program replaced the LILCo Fitness for Duty Program on October 21, 1992. No significant program changes were made.

No safety concerns or violations were identified.

12.0 Surveillance and Maintenance

The inspector reviewed on-going work activities, reviewed procedures, and discussed activities with cognizant personnel. In particular, the inspector reviewed reactor vessel cutting activities and reviewed general activities throughout the station. The inspector reviewed personnel adherence to procedures, industrial safety matters, and housekeeping.

The inspector physically entered the reactor vessel and independently observed drilling and welding operations. The inspector independently observed the transport of 33,000 pound reactor vessel segments.

The inspector also reviewed periodic surveillances required by the Technical Specifications. In particular, the inspector reviewed implementation of spent fuel pool Technical Specification surveillance requirements for the period January - November 1992. Observations indicated surveillance activities met Technical Specification requirements.

The inspector's observations of on-going activities and discussions with cognizant personnel identified that overall conduct of activities, including housekeeping was good. However, the following matters were brought to the licensee's attention:

- The inspector noted on November 24, 1992, that load paths for transferring reactor vessel segments from the dry cutting station to a Sea Van were not included in procedures. The load paths for other transfer routes were included. The transfer activity was halted and paths were included in procedures via a procedure change on November 24, 1992. The inspector noted that procedures stated that heavy loads were not to be transported over fuel and heavy loads were not so transported.

- A ladder to access the reactor vessel was tied off in an awkward manner requiring personnel to crawl over hand rails to access the ladder. Also, personnel were not consistently using safety belts. The observations were immediately corrected. Station management held meetings with all affected personnel to clarify expectations in the area of safety.
- An isolated occurrence of storage of combustibles at the 15' outside entrance to the machine shop was noted. The matter was corrected when brought to the licensee's attention.

The following good initiative was noted:

- The inspector noted that the licensee became aware of an industry concern involving potential worker exposure to gaseous by-products generated during metal cutting. As a result, the licensee performed an extensive study in October 1992 of possible airborne contaminants in the dry cutting station. The station is an enclosed structure in which metal is cut using various gas cutting methods. The reactor vessel segments were cut in the dry cutting station. The principal concern appeared to be the potential for elevated levels of nitrogen dioxide. The licensee notified all appropriate personnel about the potential concerns. The licensee's review indicated that the short term exposure value (1 part per million (ppm)) for nitrogen dioxide may have been exceeded for a short period (maximum value 1.9 ppm) of time but no adverse health effects were anticipated based on levels identified. The licensee did receive complaints from personnel after the study. These individuals were offered physical exams. The licensee was continuing to review the matter at the close of the inspection period. The inspector will review the licensee's conclusions during a future inspection.

The following additional matter was noted:

- The inspector noted, based on discussions with cognizant licensee personnel and review of documents that, on or about November 19, 1992, I & C technicians moved the refueling floor polar crane and damaged about 20 feet of a 400 volt service line on the refueling floor. The individuals moved the crane to allow their access to the trolley area. The inspector noted that procedure SP32X002.01, Revision 2, required that only qualified personnel operate the crane. The individual who operated the crane was apparently not qualified. The licensee held meetings with personnel to inform them that only qualified operators were to operate the crane and issued a Deficiency Report. The inspector did not fully review the circumstances surrounding this event or the corrective actions for this matter. This item is unresolved (50-322/92-05-01).

The inspector discussed the above observations (i.e., lack of load paths in procedures, improper movement of crane, and industrial safety practices) in a November 30, 1992, telephone discussion with the Resident Manager. The inspector indicated that it appeared that personnel may be under perceived schedule pressure. The Resident Manager stated that meetings would be held with work crews to inform them that safety practices and procedure adherence were priority matters. The QA group initiated a review of the matters. Also, the observations were brought to the attention of the Independent Review Panel.

13.0 Meetings

13.1 Management Meetings

- On October 22, 1992, NRC Headquarters management and staff personnel and NRC Region I management and staff met with licensee representatives for the purposes of introduction. The meeting was held to allow NMSS management the opportunity to visit the station and meet station management since NMSS had recently assumed responsibilities for oversight of Shoreham activities.
- On October 23, 1992, NRC headquarters staff and NRC Region I management and staff met with licensee representatives at the Shoreham Station to discuss the licensee's termination survey program. Attachment 2 to this report is the handout provided by the licensee.
- On November 16, 1992, NRC Region I management and staff met with licensee representatives at the Shoreham Station to discuss the decommissioning efforts. Attachment 3 is the handout provided by the licensee.

13.2 Exit Meeting

The inspector discussed the scope and purpose of the inspection during on-site visits by the inspector. The inspection findings were also discussed with licensee personnel periodically during the inspection. On December 22, 1992, the inspector provided a general summary of findings to licensee personnel.



SHOREHAM DECOMMISSIONING STATUS

WEEK OF DECEMBER 21ST, 1992

VESEL SEGMENTATION CUT LOCATIONS		DRY CUTTING STATION ACTIVITIES		ACTIVITY	ELEVATION DTS WORK						
		TASK	STATUS		DECEMBER						
		SEGMENT MOD/LINE SEPARATOR	COMPLETE		M	T	W	TH	F	S	SA
		SEGMENT STEAM DRYER	COMPLETE		21	22	23	24	25	26	27
		SEGMENT VESSEL RING SECTIONS	COMPLETE								28
VESEL SEGMENTATION		TASK	STATUS								
VESEL SEGMENTATION START (7 RING SECTIONS)			NOV 4								
RING 1 CUTTING COMPLETE			NOV 8								
RING 2 CUTTING COMPLETE			NOV 10								
RING 3 CUTTING COMPLETE			NOV 17								
RING 4 CUTTING COMPLETE			NOV 20								
RING 5 CUTTING COMPLETE			NOV 25								
RING 6 CUTTING COMPLETE			DEC 4								
RING 7 CUTTING COMPLETE			DEC 10								
				RYV SEGMENTATION							
				DRY CUTTING STATION DDCD							
				LYRM / DRY TUBE REMOVAL							

SHOREHAM TERMINATION SURVEY PLAN

- Approved 10/20/92 by LIPA Site Review Committee

Development of Plan

- Two previous drafts
- Two meetings with NRC staff
- Draft NUREG/CR-5849 issued

Contents of Plan

- Modeled after NUREG/CR-5849
- Reflects Shoreham Characterization data and final configuration of station

SHOREHAM TERMINATION SURVEY PLAN

Details of Plan

- Boundary of survey defined as the "Secured Area"
 - 527 Survey Units presently identified
 - Expandable to accomodate fuel movements
 - Initial Number of Survey Units
 - 403 structures (233 "affected")
 - 42 outside areas (none "affected")
 - 82 systems (38 "affected")
- (Controlled by SP67X001.08)
- Outlines General Survey Plan for a survey unit
- Quality Assurance measures
 - Personnel Training
 - Instrumentation Calibration and Control
 - QC Verification Measurements
 - Records
 - Independent Verification
 - Control of Survey Units

SHOREHAM TERMINATION SURVEY PLAN

Details of Plan (cont'd)

- Instrumentation Requirements
 - Selection of Instruments
 - Sensitivity (MDA) determination
 - Background measurements and documentation
- Requirements for Data Interpretation
 - Unit conversion
 - Demonstration of Release Criteria
 - Individual measurements
 - Random Populations
 - Biased Populations
 - Evaluation of Soil Sampling
- Final Report Requirements & Format

SHOREHAM TERMINATION SURVEY PLAN

Survey Design Guidelines: Appendix A

- Survey Unit Classification
 - Establish Survey Unit boundary
 - Designation as "Affected" or "Unaffected"
 - Survey Design may establish Subunits
 - Subunits further classified ("affected"/"unaffected")
 - Alpha "Affected" areas
 - Guidelines for Reclassification
- Gridding Reference
- Measurement Frequency
 - Adopted NUREG/CR-5849 methodology to maximum extent practical
 - Suspect level for "Affected" upper walls & ceilings set a 75% of release criteria
 - Sufficient soil samples in open areas to validate results of Site Characterization Program
 - Developed methodology for survey of systems

Attachment 3

NRC BRIEFING MEETING - MONDAY, NOVEMBER 16, 1992
11:00 A.M. Main Conference Room

AGENDA

- 1) Organization & Staffing
 - Future Plans - Key Personnel
 - Any Re-organization Plans
 - Increase in the number of Contractors (Plans)
 - Incentives (if any)
- 2) Fuel Status
- 3) Union Contract (Negotiation/Settlement)
- 4) Industrial Safety
- 5) Fitness-For-Duty
- 6) Security Plan
 - Changes to Plan that would require NRC approval prior to implementation.
- 7) Termination Survey Plan
 - Plans for Submittal to the NRC of the Termination Survey Plan (approval requirements)
 - Parallel Decommissioning work and Termination Survey Work - Discussion of area control.
- 8) NRC open item related to Fire Protection in the Emergency D.G. area.

9) *Decommissioning Status*