April 11, 1985

Docket No. 50-219
LS05-85-04-012

LICENSEES: GPU Nuclear Corporation
Jersey Central Power and Light Company

FACILITY: Oyster Creek Nuclear Generating Station

SUBJECT: MEETING WITH GPU NUCLEAR ON NUREG-0737, II.B.2, PLANT SHIELDING STUDY

On Tuesday, January 8, 1985, a meeting was held at GPU Nuclear's (the licensee's) contractor's place of business. Enclosed is the inspection report which documents what happened at this meeting.

Jack N. Donohew, Jr., Project Manager
Operating Reactors Branch #5
Division of Licensing

Enclosure:
NRC Inspection Report
50-219/85-03

cc: G. Kelly (Region I)
M. Laggart (GPU Nuclear)

DISTRIBUTION

Docket File	EJordan
NRC PDR	BGrimes
Local PDR	ACRS (10)
ORB #5 Reading	NRC Participants
JZwolinski	
JDonohew	
CJamerson	
OELD	

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04/10/85	04/11/85	04/11/85

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cc
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

MAR 27 1985

Docket No. 50-219/DPR-16

GPU Nuclear Corporation
ATTN: Mr. P. B. Fiedler
Vice President and Director
Oyster Creek Nuclear Generating Station
P. O. Box 388
Forked River, NJ 08731

Gentlemen:

Subject: Inspection 50-219/85-03

This letter refers to the special safety inspection by Mr. E. Kelly on January 8, 1985, at the United Engineers and Constructors, Inc. Philadelphia, Pennsylvania office. The inspection consisted of a review of calculations and the results of your shielding study in response to NUREG-0737, Item II.B.2 for Oyster Creek. The findings were discussed with Mr. M. Laggart of your staff at the conclusion of the inspection.

With the exception of one item, your shielding study was found to meet the requirements of TMI Item II.B.2. Therefore, all open items associated with your study, previously documented in Inspection Report-83-13, have been closed. However, the results of your study predict a whole body dose of 62 Rem inside of the main security building. This will be carried as an open item until you propose an acceptable resolution.

No reply is required, and your cooperation with us in this matter is appreciated.

Sincerely,

Harry B. Kister

Harry B. Kister, Chief
Projects Branch No. 1
Division of Reactor Projects

Enclosure:
NRC Region I Report 50-219/85-03

cc w/encl:
M. Laggart, BWR Licensing Manager
Licensing Manager, Oyster Creek
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
State of New Jersey

ANC ~~8504080076~~

bcc w/encl:
Region I Docket Room (with concurrences)
Senior Operations Officer (w/o encl)
E. Tourigny, NRR
J. Donahew, NRR
Director, DRS
Director, DRSS
DRP Section Chief

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-219/85-03

Docket No. 50-219

License No. DPR-16 Priority -- Category C

Licensee: GPU Nuclear Corporation
100 Interpace Parkway
Parsippany, New Jersey 07054

Facility Name: Oyster Creek Nuclear Generating Station

Inspection At: United Engineers and Constructors, Inc. Philadelphia, Pa. Office

Inspection Conducted: January 8, 1985

Inspector: Eugene M. Kelly 3/25/85
E. M. Kelly, Project Engineer, RPS 1B Date
Division of Reactor Projects

Approved By: W. Baunack 3/26/85
Walter Baunack, Acting Chief Date
Reactor Projects Section No. 1A,
Division of Reactor Projects

Inspection Summary:

This special inspection by one region-based inspector (five hours) reviewed the re-analyses of shielding requirements at Oyster Creek in response to NUREG-0737, Item II.B.2, Design Review of Plant Shielding. Four previous open items, from the initial review of the required analyses during Inspection 50-219/83-13, were closed.

One open item was identified: an unacceptably high integrated whole body dose of 62 Rem predicted at the main security building. The licensee has committed to have their contractor re-analyze this location, using more realistic assumptions regarding occupancy and drywell leakage.

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DETAILS

1. Persons Contacted

M. Laggart, GPU Licensing
B. Hohman, GPU Licensing
J. Boorboor, UE&C Nuclear Analysis Group Manager
A. Friedman, UE&C Licensing Manager
R. Siu, UE&C Senior Engineer

2. Background and Scope

Item II.B.2 of NUREG-0737 required a radiation and shielding design review of spaces near systems that may become contaminated during the course of an accident. That review was intended to identify vital areas - those which require occupancy for recovery or mitigation - in order to assure adequate access by means of design changes, shielding or procedural controls. The predicted integrated dose to an individual in those areas identified as vital was required to be within the 5 Rem limit of General Design Criterion 19 for the duration of the accident.

Inspection 50-219/83-13 assessed the General Public Utilities Nuclear (GPUN) corporation shielding design review for Oyster Creek originally outlined in a January 4, 1980 letter to the NRC. That inspection concluded that additional information was required, necessitating a re-analysis. A number of questions were identified in that report (Open Items 83-13-01 through 04) which involved:

- origin of core source term calculations;
- consideration of airborne concentration in the reactor building;
- specification of vital areas and associated doses;
- cancellation of Standby Gas Treatment System (SGTS) filter tie-in modification.

These questions were presented to GPU in a December 7, 1983 letter from NRR, and the licensee's response dated June 21, 1984, answered, in part, and committed to additional shielding studies. United Engineers was then retained to perform a re-analysis. This inspection reviewed those results.

The cancellation of the originally proposed SGTS tie-in was assessed during an inspection at UE&C offices on September 11, 1984, and documented in Detail 9 of Inspection Report No. 50-219/84-28. That inspection found the bases used by GPUN to cancel the modification to be justified. Those bases were summarized in a September 18, 1984 GPUN letter to NRR and approved by NRC in a safety evaluation issued to GPUN by NRR on October 2, 1984.

3. Calculations

UE&C utilized an in-house version of computer code QAD-CG, with a revised numerical integration option, to model post-accident sources. The principal sources were the isolation condenser and the reactor building upper space. The latter was the major contributor to vital area dose rates. UE&C code CCC-448/QAD-UE was benchmarked and accepted as a documented code as reported in the February 1984 Radiation Shielding Information Center (RSIC) newsletter.

The results of UE&C calculation set Nos. 7450-111-51 (December 1984) and 54 (January 1985) were reviewed with the cognizant engineer, R. Siu. The former calculation addressed doses due to airborne activity inside the reactor building, while the latter detailed the overall assessment of access evalua tions for vital areas, including dose maps and integrated exposures. The selected vital areas were found to have maximum dose rates and integrated 30-day exposures as follows:

Vital Area	Maximum Dose Rate (mR/hr)	Integrated Whole Body Exposure (Rem)	Occupancy
Control Room	58	0.7	Continuous
Security Bldg. (Main Gate)	960	.62	Continuous
Diesel Bldg.	3.1	negligible	Intermittent
PASS Room	30	within five	Intermittent
Hot Chemistry Lab	3,100	within five (Note 1)	Intermittent
TSC	13	negligible	Continuous
Stack RAGEMS (inside)	1,300	0.7 (Note 2)	One-Time
Turbine Bldg. RAGEMS (outside)	510	0.8 (Note 2)	One-Time
Alternate Hot Lab	60	within five	Intermittent

Notes:
1. Short duration access (less than ½ hour) for first 24 hrs.
2. Assuming 10 minute round trip transit and 20 minute service time to change nitrogen bottles for Radiation Analyzer and Gaseous Effluent Monitoring System (RAGEMS).

With the exception of the Main Security Building, all vital areas were appropriately identified, and all were predicted to meet the 5 Rem limit for occupancy for the duration of the accident or expected intermittent stay.

The Security Building, with current analytical assumptions, does not meet the exposure criterion. Subsequent phone conversations with GPUN licensing representatives on January 9 and March 11, 1985, concluded that more realistic assumptions will be employed to ascertain if predicted doses

could be lowered to within the 5 Rem limit. These would include: (1) pressure-dependent, primary to secondary leakage rates; and (2) use of occupancy factors in the building, similar to control room habitability studies. The resolution of the post-accident radiological habitability of the Main Security Building will be followed as an unresolved item (50-219/85-03-01).

4. Conclusions

All assumptions employed were found to be conservative, reasonable and accurately reflective of plant design. It is concluded that the results of GPUN's shielding study satisfactorily meet the requirements of NUREG-0737, Item II.B.2, contingent upon resolution of the habitability of the main security building. Therefore, unresolved Items 50-219/83-13-01 through 04 are considered closed.

5. Exit Interview

The results of this inspection were discussed with M. Laggart, GPUN Licensing, at the conclusion of this inspection and again (for the proposed approach to reducing the Main Security Building exposure prediction) in phone conversation on January 9 and March 11, 1985.