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Island
Power
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LSNRC-2173

U. S. Nuclear Regulatory Commission
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Shoreham Decommissioning Project
LIPA Response to NRC Concerns Related to
Survey Instruments Used for the Termination Survey
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-~~333~~ 322

Ref: (1) U.S. Nuclear Regulatory Commission letter dated April 24, 1994, James H. Joyner (NRC Region 1) to A. J. Bortz (LIPA); subject: NRC Inspection No. 50-322/94-01

(2) U.S. Nuclear Regulatory Commission letter dated July 15, 1994, James H. Joyner (NRC Region 1) to A. J. Bortz (LIPA); subject: NRC Inspection No. 50-322/94-02

(3) Long Island Power Authority letter LSNRC-2133 dated January 10, 1994; subject: Shoreham Decommissioning Project Termination Survey Plan - Revision 2

(4) U.S. Nuclear Regulatory Commission letter dated July 27, 1994, Clayton L. Pittiglio, Jr. (NRC) to A. J. Bortz (LIPA); subject: Request for Withholding Confidential Commercial Information in Accordance with 10CFR2.790 from Public Disclosure for Shoreham Nuclear Power Station, Unit 1, Termination Survey Report, Phase 2

Ladies and Gentlemen:

This letter provides the response of the Long Island Power Authority (LIPA) to recent questions raised by the NRC Resident Inspector for the Shoreham Decommissioning Project over the validity of certain survey measurements obtained as part of the final radiological status survey, the Termination Survey. Through this correspondence LIPA presents the issues along with the results of investigations performed by LIPA and provides justification to support LIPA's position that there is high confidence in the validity of all measurement data obtained during the termination survey of the Shoreham facility.

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Reference 1 provided the results of safety inspections conducted by Mr. R. L. Nimitz and others of the NRC Region 1 office during the period January 1, 1994 - April 8, 1994, at the Shoreham Nuclear Power Station. In this report the NRC described the review of LIPA's use and control of survey instrumentation used during termination surveys. They noted that LIPA was following the Termination Survey Plan in the accumulation of history files for each detector and probe being used for termination surveys, and further stated that no safety concerns were noted by the inspector as a result of review of the history files. During the review, the inspector observed that certain GM detectors exhibited responses to source checks which were outside established tolerances and that LIPA commonly assigned the cause to be either quench gas depletion in the GM tubes or radioactive decay of the check source. The inspector questioned LIPA on whether some of the observed behavior might be due to other possible causes and further suggested that LIPA consider the feasibility of conducting a more thorough periodic review of instrument histories. LIPA agreed to initiate an in-depth review of the causes for detector response outside of their established tolerances. The results of this review were to be evaluated in future inspections. The inspector also requested that LIPA evaluate a need to repeat selected previous surveys in light of these observations.

In response to these observations, LIPA initiated a review of performance histories of large area GM detectors, the results of which were presented to the NRC Resident Inspector in June, 1994. LIPA's review consisted of a random selection of eight (8) large area GM detectors, from the current inventory of 30 such detectors and a detailed review of the records of daily control chart limit checks covering the entire operating history of each selected detector. For the 8 selected detectors, a total of 609 separate source response control chart tests had been performed in the period January 1993 through March 1994, resulting in 22 recorded tests where detectors responded outside of the established control chart limits. Of the many conclusions reported in LIPA's evaluation, only two have direct bearing on the inspector's observations. First, LIPA found that the initial diagnosis of the cause for variation in a detector's response was subjective. The restrictive control limits required by the Termination Survey Program, however, ensure that the probability of unrecognized detector failures, which could bring into question the validity of survey measurements, is very low. LIPA found no evidence of unrecognized detector failure during the review. Secondly, the detector performance histories document only one event where a detector was used to obtain measurements prior to a questionable (unresolved) control chart response test. LIPA's review, attached as Enclosure 2, describes this singular event as well as the other 21 recorded tests, with attention to the potential impact on previous measurements. LIPA reviewed the questionable (unresolved) measurements, both at the time of the event and during the subsequent review, and concluded that repetition of the 40 measurements involved was not warranted. This decision was based on the fact that there was is good agreement with adjacent survey measurements obtained with different detectors and all measurements in that survey unit location, whether taken by the detector in question or by others. Furthermore, all measurements were indistinguishable from the established background for the survey area. Nonetheless, a repeat survey of the 40 measurement

locations was taken in order to confirm our assessment. This effort provided direct confirmation of the original measurements and confirmed the acceptability of the data.

Specific information relevant to the 40 measurements and justification of the validity of the data is provided in Enclosure 1 to this letter. The information in the enclosure describes the very small tolerances used to evaluate the performance of the detector and the magnitude of the deviation from these tolerances. These are compared to overall calibration accuracies for typical GM detectors. The mean (average) count rate for the 40 suspect measurements is provided and compared to the mean count rate of measurements taken with similar detectors in adjacent areas of the facility. The observed variation in measurements is also provided. Finally, the mean count rate of the repeat survey of the 40 measurement locations is given. The results of this repeat survey substantiate the validity of the original survey and serve as further justification for the acceptance of the original survey data. The complete report of LIPA's evaluation of the eight detector sample is provided as Enclosure 2.

The report identified three areas for improvement in the use and control of survey instrumentation, and LIPA has already implemented two of these suggestions. This was done through revision of the station procedure which provides guidance on how to establish and maintain instrumentation control charts, perform periodic control chart limit tests, and document tests results, including resolution of observed instrumentation response problems. The remaining improvement, that of better defining allowable tolerances for individual control chart mean values, remains an open issue. Although this may reduce the frequency of false indications of instrument performance degradation, the extent of effort required to properly implement the improvement is quite extensive given the duration of remaining survey activities. Any modifications to survey activities which might occur in order to implement such an improvement are viewed soley as a matter of efficiency with some possible economic benefit. Such changes would not provide any foreseeable benefit in terms of improved assurances of public health and safety. In the end, this type of improvement may be characterized as a learned lesson; that type of experience which can be of value to other licensees as they develop plans for the conduct of surveys similar to the final radiological status survey at Shoreham.

LIPA's report on detector performance histories (Enclosure 2) was reviewed with the NRC and additional observations are detailed in Reference 2. The concerns expressed in the NRC inspection reports seemingly point to one remaining issue; that LIPA provide a justification for accepting the validity of all survey measurements without need to review control chart histories of all detectors and/or probes for the potential of an undetected occurrence similar to that noted in LIPA's report (Enclosure 2) for the 40 measurements.

Confidence in measurement data has been a primary concern for LIPA's termination survey program. Even before data collection began in early 1993, the survey program and implementing procedures were established to provide a series of checks and

reviews of survey information throughout the entire survey process. As described in the Shoreham Decommissioning Project Termination Survey Plan (Reference 3), the final survey process involves a variety of activities which are considered necessary to prepare and survey the multitude of areas within the Shoreham facility. These activities include such tasks as preparation of a radiological history for a survey area, classification of the area as to residual contamination potential, survey design and preparation of individual area survey instructions, isolation and turnover of the survey area, performance of the survey, survey data management and evaluation, and reporting of measurement results. Each of these tasks have been accomplished through the use of written procedures which require independent review of the activities, oftentimes including review by members of the LIPA Quality Assurance Department staff. The entire termination survey has been subject to extensive surveillance by quality assurance inspectors, the results of which have been provided to the NRC in the various phased final survey status reports. Proper implementation of LIPA's survey procedures necessitates that no fewer than three individuals review the measurement data obtained within any given survey unit. Additional reviews are performed of the overall survey results and comparisons made to the release criteria. In addition, repeat or replicate surveys of at least 5% of termination survey measurements are performed with instruments and technicians not involved with the original survey. It is the sum total of these extensive reviews and verifications, which provides the basis for LIPA's high confidence in the validity of the survey measurements.

To summarize, LIPA does not suggest that there are no instances where detectors have failed control chart limit checks following use of that detector for purposes of obtaining survey data. However, evaluation of the potential impact of such events must be accompanied by an understanding of the extremely small tolerances which result from standard and accepted methods of developing instrumentation control charts. LIPA's experience in reviewing actual measurement values throughout the survey demonstrates that a detector response which falls outside established control chart tolerances does not automatically invalidate previous measurements taken with that detector. In fact, LIPA's review substantiates that variations in detector response to control limit tests are rarely due to instrument malfunctions, but rather are more often a product of the inherent variation in detector response to a low activity source. As described in LIPA's survey plan, the evaluation of survey results is based primarily upon the calculated mean values of acquired data and the determination of an upper confidence value representing an amount of residual contamination for which there is 95% confidence that the actual mean of the residual contamination does not exceed. In a survey population of approximately 95,000 direct surface beta-gamma measurements, such as is the current estimate for the Shoreham survey, statistical averages would hardly be impacted by changes in a few hundred points, either higher or lower; an effect which would be similar to measurements obtained with a malfunctioning detector.

In conclusion, LIPA finds extensive justification for a determination that the measurements obtained during the final radiological status survey are of high quality

and accurately reflect the radiological conditions of the Shoreham facility. A final indication of the acceptability of the measurements is found in the NRC-initiated confirmation survey performed in November, 1993. Although a formal report of results has yet to be issued, LIPA has been assured that the confirmation survey verified that the residual radioactivity levels for the facility surveyed thus far are as reported by LIPA in its initial (Phase 1) results submittal. This extensive discussion is provided in the interest of rapidly bringing outstanding concerns to a close.

The Affidavit of Richard P. Bonnifield in Support of Application for Withholding Data from Public Disclosure is included as Enclosure 3. This Affidavit identifies certain information that constitutes confidential commercial information in our response, and meets the criteria of 10 CFR 2.790(a)(4). A total of twenty-five pages from our response (all pages from Enclosures 1 and 2 of our response) are specified and substantiated in the attached Affidavit. LIPA respectfully requests that this information be withheld from public disclosure.

The pages proposed to be withheld from public disclosure in our response are identified and included in Enclosure 4. These pages have been substituted in our response with blank pages identifying the missing subject matter.

A request for withholding from public disclosure substantially the same confidential commercial information in the Shoreham Termination Survey Report Phase 2 was granted by the NRC recently (Reference 4).

Please do not hesitate to contact me if there are additional questions or if further information is required in order that the issue presented here may be resolved.

Very truly yours,

A. J. Boltz
Resident Manager

Enclosures: (1) Justification of Termination Survey Measurement Data
(2) A Review of Control Chart Histories for Termination Survey Large Area GM Detectors
(3) Affidavit of Richard P. Bonnifield in Support of Application for Withholding Information from Public Disclosure
(4) Pages Proposed to be Withheld from Public Disclosure

cc: R. Bernero, Director
Office of Nuclear Materials Safety and Safeguards
L. Bell
C. L. Pittiglio
T. T. Martin
R. Nimitz
D. Fauver

LSNRC-2178

ENCLOSURE 1

Information
Withheld Per
§2.790(a)(4)

Justification of Termination Survey Measurement Data

Information Withheld Per §2.790(a)(4)

Information
Withheld Per
§2.790(a)(4)

Information
Withheld Per
§2.790(a)(4)

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ENCLOSURE 2

Information
Withheld Per
§2.790(a)(4)

A Review of Control Chart Histories
for
Termination Survey
Large Area GM Detectors

A Review of
Control Chart Histories for
Termination Survey Large Area GM Detectors

Information
Withheld Per
§2.790(a)(4)

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Attachment 1

FT SERIES LARGE AREA G-M TUBES

Information
Withheld Per
§2.790(a)(4)

Attachment 1
FT SERIES LARGE AREA G-M TUBES
SPECIFICATIONS

Information
Withheld Per
§2.790(a)(4)

Attachment 2

CONTROL CHART PREPARATION FORM

Information Withheld Per §2.790(a)(4)

Attachment 3

ROUTINE PERFORMANCE AND BACKGROUND DATA FORM

Information Withheld Per §2.790(a)(4)

Attachment 4

INSTRUMENT CONTROL CHART

Information
Withheld Per
§2.790(a)(4)

Attachment 5

HP COUNTING EQUIPMENT INVESTIGATION FORM

Information
Withheld Per
§2.790(a)(4)

Attachment 6

LIPA TELEPHONE MEMORANDUM

Information Withheld Per §2.790(a)(4)

Attachment 7

DETECTOR COMPARISON ON SU025X01

Information
Withheld Per
§2.790(a)(4)

Attachment 8

CONTROL CHART SOURCE DECAY

Information
Withheld Per
§2.790(a)(4)

Attachment 9

CONTROL CHART SOURCE DECAY

Information
Withheld Per
§2.790(a)(4)

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ENCLOSURE 3

Affidavit of Richard P. Bonnifield
in Support of Application for Withholding
Information from Public Disclosure

AFFIDAVIT OF RICHARD P. BONNIFIELD IN SUPPORT OF
APPLICATION FOR WITHHOLDING DATA FROM
PUBLIC DISCLOSURE

Richard P. Bonnifield, General Counsel of the Long Island Power Authority, being duly sworn does state under oath in support of the Long Island Power Authority's Application for Withholding Data from Public Disclosure:

1. I am the General Counsel of the Long Island Power Authority ("LIPA") and have continuing legal responsibilities pertaining to LIPA's decommissioning of the Shoreham Nuclear Power Station ("Shoreham" or "Facility"). One of my responsibilities, as an upper-level management official of LIPA, is the function of reviewing data and information pertaining to the Facility to determine whether they should be withheld from public disclosure in accordance with 10 CFR 2.790. In that regard, I have been specifically delegated the function of reviewing the Shoreham Decommissioning Project LIPA Response to NRC Concerns Related to Survey Instruments Used for the Termination Survey ("LSNRC-2178") and am authorized to apply on behalf of its owner, LIPA, for withholding from public disclosure those portions of LSNRC-2178 containing confidential commercial information.

2. LSNRC-2178 contains certain information that constitutes confidential commercial information and meets the criteria of 10

CFR 2.790(a)(4).[1] Those portions ("Confidential Information") are as follows:

Item 1: Enclosure 1 -- Justification of Termination Survey Measurement Data

Item 2: Enclosure 2 -- A Review of Control Chart Histories for Termination Survey Large Area GM Detectors

3. The Confidential Information has intrinsic commercial and proprietary value. Therefore, the Confidential Information should be withheld from public disclosure as provided by 10 CFR 2.790.

4. The Shoreham Station is the first full size commercial nuclear power facility in the nation to be decommissioned. As such, and pursuant to federal regulations, the Facility has a rigid security control system which prevents unauthorized intrusions by the general public.

5. LIPA is a corporate municipal instrumentality of New York State, headquartered in Garden City, New York, created for the purpose, among others, of decommissioning the Facility.

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[1] Section 2.790(a)(4) specifies that the Commission will not disclose certain data:

> Trade secrets and commercial or financial information obtained from a person and privileged or confidential;
> . . . .

As set forth herein, the Items listed in paragraph 2 of this Affidavit constitute confidential commercial information and possibly trade secrets and thus should be protected from disclosure.

6. The Confidential Information has not been made available to the general public. This is demonstrated by the fact that the Confidential Information currently can only be found at the Facility, LIPA headquarters, and at the offices of certain of LIPA's contractors (such as the New York Power Authority) with whom LIPA has confidentiality agreements.

7. Items 1 and 2 are of commercial value in that an extensive amount of time and money was spent by LIPA in determining detector descriptions and detection sensitivities of various instruments contemplated for termination measurement use by LIPA. LIPA has invested more than $100,000 in the process of instrument measurement and calibration, data review and evaluation, summarizing and reporting. The results of this investment are represented in Items 1 and 2. Along with previous LIPA filings to the Commission -- each of which contain applications to withhold from public disclosure -- Items 1 and 2 are the only documented summaries which LIPA knows to exist which offer demonstrable evidence that the instruments used in radiation detection at Shoreham for termination purposes meet acceptable Commission criteria. Additionally, LIPA's substantial time and monetary investment has culminated in the only commercial evaluation conducted of various instruments and detectors produced for the purpose of termination survey work. Any entity engaged in nuclear termination surveys would commercially invest in the information provided by Items 1 and 2 because the instruments and data found therein have been demonstrated to be acceptable to the Commission and would thus significantly reduce the need to expend an

inordinate amount of time and money to undergo similar testing. Importantly, the information supplied in Items 1 and 2 is extremely difficult to duplicate without spending extensive time and expense.

8. The public interest in disclosing Items 1 and 2 is minimal. Items 1 and 2 do not purport to identify any actual residual radioactivity levels; rather, they merely reflect the fact that the instruments used in determining residual radioactivity levels at Shoreham are accurate.

9. The Confidential Information is of a type customarily intended to be held in confidence by LIPA. It is so held because LIPA wishes to protect the value of all confidential commercial information it owns, including the Confidential Information, for the financial benefit of the Long Island ratepayers it represents. LIPA is prepared to share this information and data with other entities engaged in decommissioning or similar projects, provided that an appropriate license and confidentiality agreement can be agreed to which would allow Long Island ratepayers to recoup some of the extensive costs they have incurred in connection with decommissioning of the Facility.

Richard P. Bonnifield

Richard P. Bonnifield

Sworn to this 8th day of August, 1994 in Garden City, New York.

Notary Public

M. TRABULSI
Notary Public, State of New York
NO. 4713511
Qualified in SUFFOLK COUNTY
My Commission Expires JUN 3, 1996

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ENCLOSURE 4

Pages Proposed to be
Withheld from
Public Disclosure