AUG 24 1988

In Reply Refer To:
Docket: 50-382

Louisiana Power & Light Company
ATTN: J. G. Dewease, Senior Vice President
Nuclear Operations
317 Baronne Street
New Orleans, Louisiana 70160

Gentlemen:

Attached is a copy of an addenda to the Federal Emergency Management Agency's (FEMA) evaluation report of your Prompt Alert and Notification Systems.

If you have any further questions, please contact Mr. Nemen Terc at (817) 860-8129.

Sincerely,

Original Signed By
A. B. Beach for

L. J. Callan, Director
Division of Reactor Projects

Attachment:
As stated

cc w/o attachment:
Chief, Technological Hazards Branch
FEMA Region VI
Federal Center
800 North Loop 288
Denton, Texas 76201-3698

cc w/attachment:
Louisiana Power & Light Company
ATTN: G. E. Wuller, Onsite
Licensing Coordinator
P.O. Box B
Killona, Louisiana 70066

RIV:SEPS	C:SEPS	C:RPB	C:DRP/A	D:DRP	AI 88-241
NTerc:cd	RJEverett	BMurray	DChamberlain	LJCallan	
8/10/88	8/10/88	8/10/88	8/22/88	8/23/88	

IE35

Louisiana Power & Light Company
ATTN: N. S. Carns, Plant Manager
P.O. Box B
Killona, Louisiana 70066

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ATTN: Mr. R. T. Lally
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New Orleans, Louisiana 70161

Louisiana Power & Light Company
ATTN: R. F. Burski, Acting Manager
Nuclear Safety and Regulatory
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Louisiana Radiation Control Program Director

bcc to DMB (A045)

bcc distrib. by RIV w/report:
Resident Inspector
Inspector
D. Wigginton, NRR Project Manager
SEPS:RPB File
RIV File

bcc w/o report:
R. D. Martin
R. L. Bangart
R. E. Hall
B. Murray
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S PS:RPB File
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DRP
MIS System
C. A. Hackney
W. D. Travers, NRR

TABLE OF CONTENTS

APPENDIX B

SAMPLE SIZE DETERMINATION

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The number of households that need to be surveyed is determined based upon the need to obtain a sample size sufficient to obtain a 95% confidence interval with precision (half-width) of 0.05 for the estimate of the proportion alerted. The exact number of households to be surveyed can be derived from the following statistical considerations. For relatively large sample sizes ($n \geq 30$), taken without replacement from a population (N), the sampling distribution for proportions (e.g., the proportion of the population alerted) is nearly a normal distribution, the mean of which is the proportion (p) of the population alerted and the variance of which is

$$p(1 - p)/n \left(\frac{N - n}{N - 1}\right)$$

If P is the observed sample proportion, then for a particular confidence level with confidence coefficient Z_c,

$$(P - p)^2 \leq Z_c^2 \; p(1 - p)/n \left(\frac{N - n}{N - 1}\right)$$

Thus, for this confidence level, the actual proportion of the population alerted satisfies the following inequalities:

$$\frac{P + \frac{Z_c^2}{2n}\left(\frac{N - n}{N - 1}\right) - Z_c\sqrt{\frac{P(1 - P)}{n}\left(\frac{N - n}{N - 1}\right) + \frac{Z_c^2}{4n^2}\left(\frac{N - n}{N - 1}\right)^2}}{1 + \frac{Z_c^2}{n}\left(\frac{N - n}{N - 1}\right)} \leq p \text{ and}$$

$$P \leq \frac{P + \frac{z_c^2}{2n}\left(\frac{N - n}{N - 1}\right) + z_c\sqrt{\frac{P(1 - P)}{n}\left(\frac{N - n}{N - 1}\right) + \frac{z_c^2}{4n^2}\left(\frac{N - n}{N - 1}\right)^2}}{1 + \frac{z_c^2}{n}\left(\frac{N - n}{N - 1}\right)}$$

Thus, the precision (W) is simply given by

$$W = \frac{z_c\sqrt{\frac{P(1 - P)}{n}\left(\frac{N - n}{N - 1}\right) + \frac{z_c^2}{4n^2}\left(\frac{N - n}{N - 1}\right)^2}}{1 + \frac{z_c^2}{n}\left(\frac{N - n}{N - 1}\right)}$$

This equation can be solved to determine the sample size (n) required to yield a given precision (W) with a given observed sample proportion (P) as follows:

$$n = \frac{\frac{z_c^2}{2W^2}\left[P(1 - P) - 2W^2 + \sqrt{W^2\left[1 - 4P(1 - P)\right] + P^2(1 - P)^2}\right]}{1 + \frac{z_c^2}{2W^2 N}\left[P(1 - P) - 2W^2\left(1 + \frac{1}{z_c^2}\right) + \sqrt{W^2\left[1 - 4P(1 - P)\right] + P^2(1 - P)^2}\right]}$$

Although this expression for n can be used directly, it is customary to make several approximations. First, since the term in N in the denominator (the finite population term) is positive definite for all reasonable values of W ($0 < W < 0.5$), omitting this term will result in an approximation to n that is slightly larger than its true value. This is an acceptable practice in sizing the sample since a larger sample gives greater precision.

A second approximation that can be made is to neglect the terms in W^2 within the bracket in the numerator. Analysis demonstrates that this underestimates n when $P < 1/2 - 1/4 \sqrt{2 + 8W^2}$ or $P > 1/2 + 1/4 \sqrt{2 + 8W^2}$ and overestimates n for P between those two values. For the case of interest (a 95% confidence interval with precision of 0.05), this approximation provides an overestimation of n when a sample size greater than 191 is required. Since the sampling plan calls for a minimum sample size of 250, regardless of the value of P, this approximation is acceptable because it also yields an estimate of n larger than the true value. Therefore, for the purposes of the pilot test and subsequent surveys, the following approximate equation can be used to determine whether a sample size larger than 250 is required:

$$n = \frac{Z_c^2}{W^2} P(1 - P)$$

or using 1.96 for Z_c and 0.05 for W,

$$n = 1536.64 \, P(1 - P)$$

Data from the pilot test can be used to illustrate the effects of these approximations. In the pilot test, the population of tone alert households from which the sample was to be drawn (N) was approximately 4500 and the observed proportion alerted (P) was 0.675. This yields 311 as the exact result for n. Neglecting the finite population term yields an estimate of 334 for n, and the simplified final approximation estimates n as 338. Thus, the final simplified approximation overestimates the required sample size by 27 in this case.

SOURCE: International Energy Associates Limited. "Analysis of Tone Alert Pilot Test." IEAL-321. September 27, 1983.

APPENDIX C

Evaluation of Helicopter Airborne Warning System

Federal Emergency Management Agency

Region VI, Federal Center, 800 North Loop 288
Denton, Texas 76201-3698

NTH November 18, 1987

MEMORANDUM FOR THE RECORD

FROM: Gary Jones, Chief
Technological Hazards Branch

SUBJECT: Waterford III Aerial Alerting Test Observation and Timing

On November 13, 1987, Waterford 3 representatives conducted a test of the Aerial Alert and Notification Warning System which was evaluated and timed by Region VI personnel to ensure that the 45 minute requirement could be met.

All participants met at the Holiday Inn in LaPlace, Louisiana, at 700 a.m. for a briefing on the test, routes, equipment and time elements. Mr. Reda Bassioni, consultant, Acoustic Technology, Inc., Boston, Mass., was also invited by the utility to perform an audio evaluation of a test message before we actually timed the four routes to ensure compliance with the 45 minute requirement. He discussed the test tape and equipment which was to be used to evaluate the audio portion of the message. He also, remarked on the positioning of the Parish-owned PA speakers that are attached to the underside of the helicopter.

Mr. Ron Perry, Emergency Planner, Louisiana Power and Light, provided maps outlining quadrants the helicopter would travel during the actual testing. He also briefly discussed the testing runs the helicopter would make initially to determine the audibility of the alert message.

The entire party then departed the motel in a motorcade enroute to departure point from which all the helicopter audibility test runs would originate. After participants were positioned on a deserted levy road, several flights were made back and forth at 75-80 mph and at an altitude of 500' while both auricular and electronic readings were taken to ensure the alerting message was audible to anyone on the ground. The FEMA evaluators could clearly understand the test message being given.

Following the completion of this phase of the test, a fisherman who had been inspecting his trot line approximately three miles away from the test site, appeared at the temporary helicopter pad and volunteered information that he had heard and fully understood the alerting message emitted from the helicopter.

Once the confirmation of the message audibility was complete, the helicopter was then timed as it travelled the four quadrants. The helicopter began each quadrant run at the local EOC's at which time the clock started in an attempt to complete the aerial alerting for each quadrant in the 45 minutes allowed. (It should be noted that for the purpose of this test and due to the expense involved, only one helicopter was used. Whereas in reality there would be four helicopters used - one for each quadrant.)

The flight times for the helicopter emergency alerting runs were as follows:

Quadrant A - 29 min

Quadrant B - 43 min/15 sec

Quadrant C - 45 min (Since this route utilizes the entire alotted time, the Quadrant A helicopter will be used to run a 15 minute portion of this quadrant.

Quadrant D - 35 min/21 sec

The aerial test clearly demonstrated that the four routes can be covered within the 45 minute time requirement. Also the message from the helicopter is clear and understandable from ground level.