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STANDARD GUIDE FOR THE EVALUATION OF ALERT AND NOTIFICATION SYSTEMS FOR NUCLEAR POWER PLANTS



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**STANDARD GUIDE FOR THE EVALUATION
OF ALERT AND NOTIFICATION SYSTEMS
FOR NUCLEAR POWER PLANTS**

Prepared for:
Federal Emergency Management Agency
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**FEDERAL EMERGENCY
MANAGEMENT AGENCY**

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STANDARD GUIDE
FOR THE EVALUATION OF ALERT AND NOTIFICATION
SYSTEMS FOR NUCLEAR POWER PLANTS

INTRODUCTION

The Federal Emergency Management Agency's (FEMA's) proposed 44 CFR Part 350 creates the regulatory framework by which FEMA will evaluate and approve state and local emergency plans and preparedness to deal with a radiological emergency which may occur at a licensed commercial nuclear power plant. This evaluation guide elaborates upon the requirements of 44 CFR 350 regarding alert and notification systems and provides guidance to (1) the Regional Assistance Committees (RACs) during their assistance to state and local government officials in the development of radiological emergency response plans (350.6), (2) the states during the preparation of a plan and subsequent application for formal review and approval by FEMA (350.7), (3) the FEMA Regional Directors during their detailed evaluation of a state's plan (350.11), (4) the FEMA Associate Director during his determination of adequacy of the state plan (350.12), and (5) the Nuclear Regulatory Commission (NRC) during its review of FEMA's findings and determinations on the adequacy of state plans. This evaluation guide may also be utilized when performing "interim" determinations of the acceptability of state plans and utility designs.

As stated earlier, this evaluation guide addresses only the alert and notification aspects of the total state emergency plan. At the appropriate time, this evaluation guide may be expanded to encompass the review of the total state plans. There are 16 planning standards identified in 44 CFR 350.5 which are to be used in evaluating, assessing, reviewing, and approving state emergency plans. These 16 planning standards emanate from and are augmented by evaluation

criteria in NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980. Of these 16 planning standards, three apply to alert and notification: E, Notification Methods and Procedures; F, Emergency Communications; and N, Exercises and Drills. This review guide addresses each of the three alert and notification system-related planning standards and seven of their fifteen evaluation criteria (from NUREG-0654/FEMA-REP-1) as follows:

1. Areas of Review. This section briefly scopes the review and defines what aspects of the appropriate emergency response plan should be addressed in consideration of the particular evaluation criterion. The applicability to licensee, state, and local plans is as specified in NUREG-0654/FEMA-REP-1, and only those portions of the evaluation criterion applicable to state/local plans will be reviewed per this review guide.
2. Acceptance Criteria. This section discusses the purpose of the review from the perspective of acceptability. Specific conditions and technical parameters to be satisfied are included, along with a rationale for inclusion. The objective of this section is to define as precisely as possible specifically what will be accepted by the reviewer as adequate. Whenever possible, acceptance criteria are specified in quantitative terms. Special attention is placed on identifying the information that should be provided to support the review. Both technical and institutional review items will result in an acceptability determination by the reviewer as follows:
 - Acceptable, exceeds standards
 - Acceptable, meets standards
 - Unacceptable/marginally acceptable, corrective actions recommended

An element is deficient when the reviewer(s) determines that that function or activity is not performed in a satisfactory manner as judged by the reviewer(s) based on their understanding of the intent of this guide. An item is deficient if, in the judgment of the reviewer(s) or the FEMA RAC Chairman or Regional Director, it is likely to be inadequate to provide reasonable assurance that

appropriate protective measures can and will be taken off site in the event of a radiological emergency to adequately protect the public health and safety.

Each identified deficiency will be accompanied by appropriate information regarding areas needing improvement, additional information needed, means of resolution or reasons why it is not resolvable, and appropriate references. If the reviewer discovers an area in which the plan presents a capability that significantly exceeds the requirements, the capability should be identified. Deficiencies may at times be offset by superior capabilities.

The reviewer(s) must evaluate and summarize the review findings from each criterion in relation to its planning standard. Replication, overlap, potential conflicts, and inconsistencies should be identified and explained if improvements are necessary. Sufficient information should be given regarding deficiencies so that timely corrections can be made to the state plan. Where necessary, references should be made to appropriate documentation to assist in instituting improvements. An overall acceptability determination will then be made by the reviewer(s) for each planning standard.

This approach will provide for a systematic and thorough review of state emergency plans submitted to FEMA in accordance with 44 CFR 350. State/local governments and the licensee using this evaluation guide should have an understanding of what FEMA reviewers will be expecting in the plans and how the reviewers will evaluate the plans. The quality and uniformity of state applications as well as FEMA reviews are expected to be enhanced.

Although efforts have been made to ensure completeness of this guidance, certain site-specific situations may occur that are not treated specifically by this document. Each of these cases should be handled on an individual basis by the reviewer(s).

The remainder of this guide is presented so that each planning standard comprises a separate section with page numbers prefixed by the planning standard letter (E, F, and N) as assigned in NUREG-0654/FEMA-REP-1. The planning standards and associated criteria are quoted from NUREG-0654/FEMA-REP-1. Only those criteria under the three planning standards (E, F, and N) that apply to alert and notification systems and that NUREG-0654/FEMA-REP-1 indicates should

be included in a state/local plan are addressed in this document.
The following criteria are therefore omitted:

E: 1, 2, 3, 4, 7

F: 2, 3

N: 4

Appendix 1, "Recommended Format For Submittals Describing Alert And Notification Systems," has been included as an aid to uniformity and completeness of the preparation and review of the alert and notification sections of state/local emergency plans.

E. Planning Standard: Notification Methods And Procedures

"Procedures have been established for notification, by the licensee of State and local response organizations and for notification of emergency personnel by all response organizations; the content of initial and followup messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established."

E.5 Evaluation Criterion

"State and local government organizations shall establish a system for disseminating to the public appropriate information contained in initial and followup messages received from the licensee including the appropriate notification to appropriate broadcast media, e.g., the Emergency Broadcast System (EBS)."

E.5.1 Areas Of Review

This evaluation criterion addresses the system(s) which is to be used to disseminate information to the public during an emergency. The review will ensure that: (1) the responsible state and local government organizations make provisions for a system of communicating appropriate information to the public during an emergency and (2) capabilities exist to implement the provisions.

The method by which the public may be informed will generally involve some form of broadcast media. Participation by all appropriate media is encouraged.

E.5.2 Acceptance Criteria

An emergency plan will typically be acceptable under this evaluation criterion provided that it clearly describes a system of disseminating information that meets the following criteria:

1. Presents a selection rationale for the stations and broadcasting systems which are to be used. The selection should ensure at a minimum:
 - . Radio signal(s) of adequate strength to be picked up within the coverage area under review; and
 - . Capability to broadcast official information 24 hours per day, seven days per week. If the station does not have a backup power supply, then an alternative radio station should be selected and included in the preparedness planning.
2. Depicts the procedures and responsibilities for each organization and a commitment that the agreeing parties will honor their obligations during an emergency. The procedures should address activation authorization and designate individuals, by title, who are responsible for system activation. Authentication codes themselves should not be identified.
3. References or includes some form of agreement, available for review, which states the station's or broadcast system's willingness to participate in the public notification process. The plan should identify, by title, points of contact who are accessible 24 hours per day, 7 days per week. Participation in a "Local EBS Operational Area Plan" should be considered as satisfactory.
4. Clearly defines specific intervals for broadcasting of official information statements for each class of emergency action level. It is recommended that the minimum broadcast interval be at least every 15 minutes (for official information during actual general emergencies) until the emergency is declared officially to be over.
5. Includes a commitment for the capability to monitor the broadcast of official information messages (radio/TV) in either the state or a local Emergency Operations Center (EOC). If incorrect information is being transmitted, this should be immediately identified to the station(s) by the EOC authorized point of contact.

E.6 Evaluation Criterion

"Each organization shall establish administrative and physical means, and the time required for notifying and providing prompt instructions to the public within the plume exposure pathway Emergency Planning Zone. (See Appendix 3.) It shall be the licensee's responsibility to demonstrate that such means exist, regardless of who implements this requirement. It shall be the responsibility of the State and local governments to activate such a system."

E.6.1 Areas Of Review

This evaluation criterion addresses the requirement that means be available for the prompt notification of the public within the plume exposure pathway Emergency Planning Zone (EPZ) in a situation that involves real or potential radiological hazards. The criterion calls for the establishment of both administrative and physical means for notification of the public. The plan must describe, for the administrative means, the interaction among the various organizations that are responsible for activating the system, as well as the responsibility of each of these organizations in the linkage.

Regarding the physical means, the reviewer must recognize that the licensee could employ a number of means to alert the public. The means of alert is at the option of the licensee. A fully effective alert and notification system may include a combination of means. These could include, but are not limited to, fixed sirens; mobile siren vehicles; tone alert radios; aircraft; automatic telephone dialers/switching equipment; modulated power lines; and police, fire, and rescue vehicles or personnel. Regardless of the combination of alert methods implemented, the licensee is expected to provide a design report of the selected system demonstrating its adequacy. The reviewer must, in turn, assess the acceptability of this design report prior to exercises or tests conducted to satisfy the alert and notification aspects of 44 CFR 350.9(a).

E.6.2 Acceptance Criteria

To be acceptable, the emergency plan must describe administrative and physical means that ensure that the initial notification of the affected population within the plume exposure pathway EPZ can and will be completed in a manner consistent with 44 CFR 350.12(b)(1).

Typically, a description of acceptable administrative means will include, at a minimum:

- . Specification of those organizations or individuals, by title, who are responsible for activating the system, including alternates as necessary to ensure that such organizations or individuals can be notified and mobilized in time to be in position to perform their responsibilities when required.
- . Discussion of the procedures to be employed to activate the notification system and an analysis of the amount of time required to implement these procedures, which demonstrates that, once the appropriate official has decided to activate the alert and notification system, the 15-minute design objective of NUREG-0654/FEMA-REP-1, p. 3-3, can be met.
- . Specification of the procedures and safeguards employed to ensure that a legitimate and clearly understood command to activate the alert system can be conveyed from the appropriate officials to the person(s) responsible for physically activating the system and that these persons will recognize, understand, and take appropriate actions in response to such a command.

In addition to meeting criteria regarding the administrative means of providing an alerting system, the physical system must have the ability to effectively alert the public as specified in Appendix 3 of NUREG-0654/FEMA-REP-1:

"The minimum acceptable design objectives for coverage by the system are:

- a) Capability for providing both an alert signal and an informational or instructional message to the population on an area wide basis throughout the 10 mile EPZ, within 15 minutes.

- b) The initial notification system will assure direct coverage of essentially 100% of the population within 5 miles of the site.
- c) Special arrangements will be made to assure 100% coverage within 45 minutes of the population who may not have received the initial notification within the entire plume exposure EPZ."

NUREG-0654/FEMA-REP-1 (page 11) also contains the following footnote regarding EPZ size determinations:

These radii are applicable to light water nuclear plants, rated at 250 MWt or greater. The FEMA/NRC Steering Committee has concluded that small water cooled power reactors (less than 250 MWt) and the Fort St. Vrain gas cooled reactor may use a plume exposure emergency planning zone of about 5 miles in radius and an ingestion pathway emergency planning zone of about 30 miles in radius. In addition, the requirements for the alerting and notification system (Appendix 3) will be scaled on a case-by-case basis. This conclusion is based on the lower potential hazard from these facilities (lower radionuclide inventory and longer times to release significant amounts of activity for many accident scenarios). The radionuclides considered in planning should be the same as recommended in NUREG-0396/EPA-520/1-78-016.

An effective system may include more than one of the alerting means discussed earlier. The design report must show that the integrated alerting system meets the above criteria. The design report should address each major system component as per the guidance given in the following sections. Alert and notification for institutions (such as recreation areas, schools, factories, hospitals, shopping centers, jails, and large office buildings) should be analyzed on a case-by-case basis and documented in the design report. The basis for any special requirements or exceptions should be included in the design report.

The intent of the design report is to demonstrate that the earlier quoted guidelines of NUREG-0654/FEMA-REP-1 are satisfied. The design report must include topographic maps of the EPZ. U.S. Geological Survey quadrangle topographic maps with latitude and

longitude indications (scales of 1:62,500 or larger, with the 1:24,000 preferred) are acceptable. These individual quadrangle maps covering the EPZ should be compiled into one overall composite (latitude and longitude grids should be indicated) with a final scale not smaller than 1:62,500, 1:24,000 preferred. Population centers and locations of parks, lakes, oceans, and major geographical areas controlled by institutions (i.e., military bases and universities) should be depicted on these maps. Additionally, the type of alerting system (e.g., tone alerts, sirens, mobile siren vehicles) designed to reach the population in geographical areas should also be indicated.

The following sections address the acceptance criteria for components that may comprise the total integrated alerting system.

E.6.2.1 Sirens

Wherever proposed as part of an alert system, a siren system design shall be documented in the design report. The maps mentioned above must additionally delineate: (1) areas where the population exceeds 2,000 persons per square mile (based on square-mile increments) and areas virtually unpopulated, (2) unique siren identifiers and siren locations, and (3) siren sound contours for C-weighted sound pressure levels (SPL) of 60 dBC and 70 dBC. In addition, should the design report choose to show that the siren sound level exceeds an average measured outdoor daytime (period between 7 a.m. and 10 p.m.) ambient sound level(s) by 10 dB, the maps mentioned above must include appropriate siren sound level contours for the SPL that is 10 dB above the average outdoor daytime ambient sound level(s). The ambient background noise level should be measured in that one-third octave band(s) containing the predominant tone(s) of the siren(s) used. The C-weighted SPL for these sound level contours must be indicated.

The design report should include a description of how the sound contours were calculated. The calculation should account for,

at a minimum, the effects of topographical features, temperature, relative humidity, wind direction, wind magnitude, measured siren sound output, and siren location/height. Average summer daytime weather conditions may be utilized. The sound contours may be based on Appendix 3 of NUREG-0654/FEMA-REP-1 including the use, in the absence of intervening topographical features, of the sound attenuation factor of 10 dB per doubling of distance used in FEMA CPG 1-17.* Where topographical features present sound barriers, they must be considered in attenuation computations. The design report should identify what assumptions from NUREG-0654/FEMA-REP-1 were used.

The validity of the calculation of siren SPL contours depends upon the validity of the siren sound output at 100 feet from the siren. The reasonableness of the method for determining the siren sound output and the resulting SPL contours should be documented in the design report. There are at least two ways to determine siren sound output:

- . Onsite field measurements around at least one of each type of siren used in the EPZ; and
- . Anechoic, semi-anechoic, or reverberation chamber tests in a qualified laboratory on sirens that are representative of each type of siren used in the EPZ.

Since consensus standards for field and chamber siren measurements are not available, the design report must detail the measurement procedures employed and their rationale.

The NUREG-0654/FEMA-REP-1 criteria, as quoted earlier, are satisfied when the design report shows that, for those geographical areas to be covered by fixed sirens, either (a) the expected siren sound level generally exceeds 70 dBC where the population density exceeds 2,000 persons per square mile and 60 dBC in other inhabited areas, or (b) the expected siren sound level generally exceeds

*"Outdoor Warning Systems Guide," CPG 1-17, Federal Emergency Management Agency, March 1, 1980.

the average measured daytime ambient sound levels by 10 dB. Should the design report show that the siren sound level exceeds a measured ambient by 10 dB, the following information should be provided: (1) a description of how the average daytime ambient sound levels were determined including survey locations and the rationale for their selection, (2) identification of actual measurements including frequency range measured and measurement time span and location, (3) assumptions used in the design report along with rationale, (4) population density relationships to measured ambient levels, (5) effects of major transportation routes, and (6) effects of commercial activities. Where the estimated siren sound level does not generally meet the specified level based either on population density or a 10 dB differential between the measured average ambient sound and estimated siren sound level, the siren system must be enhanced by other alerting methods which must be described in the design report.

Once the siren system is installed and operational, there should be a test and maintenance program for the system. The program should include regularly scheduled testing of the siren system including silent, growl, and full-scale tests. Silent tests should be conducted at least every two weeks. Growl tests should be conducted at least quarterly and when preventative maintenance is performed. Full-scale testing should be conducted at least annually and as required for formal exercises. The maintenance of the siren system should include prompt repair to any components which do not perform as expected during the tests. The program should include records of tests and repairs performed. The operability of the siren system will be considered acceptable when an average of 90% of the sirens can be shown to be functional over a 12-month period, as determined by a simple average of all tests conducted. Special considerations will be given for siren systems that have not been operational for 12 months. Available records of the maintenance program should be summarized, assessed, and included in the design report.

E.6.2.2 Mobile Siren Vehicles

Whenever mobile siren vehicles* are employed as part of the primary alerting system, the rationale for their use should be documented in the design report. A comprehensive description of the individual mobile siren configuration(s) should be included. This discussion should specify those aspects of the siren design that ensure that the mobile siren vehicle will be recognized by the public as a part of the alert and notification system rather than be mistaken for an emergency vehicle requiring clearance on the roadway. Sound attenuation computations should be made in order to predict distances, perpendicular to the vehicle's direction of travel, where 60 dBC and 70 dBC SPLs occur. The attenuation calculations for mobile siren vehicles and a description of how the SPL distances were calculated should be included in the design report. The design report should also show that the planned vehicle speed provides an effective duration of signal to alert the intended population.

The geographical areas to be covered by mobile siren vehicles should be clearly delineated on the topographic map(s) of the EPZ. The proposed route and elapsed time (measured from initial time of alert) of each vehicle along its route should be shown. Transit time of each vehicle to the initiation of its route must be accounted for. The geographical areas along the route(s) predicted to receive SPLs: (1) equal to and above 60 dBC for population densities below 2,000 persons per square mile, or (2) equal to and above 70 dBC for population densities above 2,000 persons per square mile should also be identified. Where the ambient background noise level has been determined, in accordance with the procedures of Section E.6.2.1, to be less than 50 dBC, the design report should so state, and the mobile siren coverage should be computed and depicted to show coverage that is at least 10 dB above the average measured outdoor daytime ambient.

*Mobile siren vehicles, as discussed in this section, are dedicated siren warning vehicles and do not include police, fire, or rescue vehicles. For acceptance criteria related to use of police, fire, or rescue vehicles, see Section E.6.2.4, "Special Alerting."

The NUREG-0654/FEMA-REP-1 criteria, as quoted earlier, are satisfied when the design report shows that, for those geographical areas to be covered by mobile siren vehicles, either (a) the expected siren sound level generally exceeds 70 dBC where the population density exceeds 2,000 persons per square mile and 60 dBC in other inhabited areas, or (b) the expected siren sound level generally exceeds the average measured outdoor daytime ambient sound levels by 10 dB. Total elapsed time for route coverage (including vehicle transit time to initiation of route) should not exceed 45 minutes when the design objective of the mobile siren usage is to ensure coverage of the population who may not have received the initial notification. Should the design report show that the siren sound level exceeds a measured ambient by 10 dB, the following information should be provided: (1) a description of how the average daytime ambient sound levels were determined including survey locations and the rationale for their selection, (2) identification of actual measurements including frequency range measurements and measurement time span and location, (3) assumptions used in the design report along with rationale, (4) population density relationships to measured ambient levels, (5) effects of major transportation routes, and (6) effects of commercial activities.

E.6.2.3 Tone Alert Radios

Wherever tone alert radios are proposed as part (or all) of an alert system, the rationale for their use should be included in the design report. In addition, the topographical maps in the design report must indicate the geographical areas in which tone alert radios are used. A tone alert radio is defined here as a radio receiver that contains circuitry which allows the radio to receive a signal which can activate an audible tone and provide a voice message. The design report should contain a description of the tone alert radio(s) utilized, including the manufacturer, model number, operating instructions, and photographs.

It is recognized that absolute control of tone alert radios is lost once they are given to the public for use in residences. However,

there are steps that can be taken to ensure that the public is offered the opportunity to benefit from the availability of tone alert radios in geographical areas where the radios are used as the alerting mechanism. At a minimum, an effective and continual program should be established that encompasses the following:

- . The program should offer the tone alert radios to the public in geographical areas where needed and must make a "best-effort" attempt to place the radios. This program should include a record system (register) that contains an accurate list of addresses (names are optional) in geographical areas where tone alert radios are needed. Addresses where radios are offered to residents and refused by the residents should be noted.
- . A maintenance program offering annual operating checks should be available at least annually to all residences in areas where tone alert radios are needed. The maintenance program and the register program mentioned above may be integrated.
- . Tests of the tone alerting feature are desired at least monthly. The final determination of testing frequency will rest with appropriate local government officials. The results of these tests do not have to be monitored. The purpose of these tests is to offer the public a means to self-test their receivers.
- . Written guidance should accompany the radio. It should address (1) its general use, (2) self-testing frequency and method, (3) suggested placement to facilitate efficient monitoring, (4) the maintenance program, and (5) telephone numbers for repair or replacements. This information should be provided as a reminder to each tone alert radio holder annually. This public information program may also be integrated with the register and maintenance programs mentioned above.
- . Determination should be made that the broadcast medium for initiating the tone alert signal has adequate availability (24 hours a day, 7 days a week), signal strength, and signal quality.

The NUREG-0654/FEMA-REP-1 criteria, as quoted earlier, are satisfied for the geographical areas of the EPZ requiring tone alert radios when a program as defined above has been implemented.

E.6.2.4 Special Alerting

As indicated in Appendix 3 of NUREG-0654/FEMA-REP-1, in certain circumstances it may be more cost effective to use alerting methods other than sirens, mobile siren vehicles, or tone alert radios.

Examples of such methods include but are not limited to:

- . Utilization of institutional alerting mechanisms already in place (for example, those in schools, factories, hospitals, shopping centers, jails, hotels and motels, and centralized offices);
- . Use of aircraft for alerting (either loudspeakers or leaflets);
- . Use of automatic telephone dialers/switching equipment;
- . Utilization of modulated power lines; or
- . Utilization of police, fire, and rescue (emergency) vehicles or personnel (for example, in an extremely sparsely populated area, it may be most cost effective to have law enforcement, fire protection, or rescue personnel alert households via their vehicle's public address, siren system, or personal contact).

FEMA encourages the development and use of such innovative cost-effective approaches for notifying and providing prompt instructions to the public within the plume exposure pathway EPZ.

Since special alerting methods encompass a broad variety of innovative alerting techniques, it is not possible to provide detailed acceptance criteria that will cover all cases. Instead, FEMA has taken the approach of providing general guidance as to the contents of an analysis to be included in the alert and notification system design report for special alerting methods, that would typically be acceptable under this criterion. These general acceptance criteria are supplemented by additional specific acceptance criteria for the five examples of special alerting methods discussed.

E.6.2.4.1 General Acceptance Criteria For Special Alerting Methods

Wherever special alerting methods are proposed as part (or all) of an alert system, a detailed description of each method and the

rationale for its use should be included in the design report. In addition, the topographical maps in the design report must indicate the areas in which each special alerting method is used. The design report should include a description, including any assumptions made, of any analyses or calculations necessary to verify that individuals in the areas in which the special alerting method is used can be provided an alert signal within 45 minutes when the design objective is to ensure coverage of the population who may not have received the initial notification. Such calculations should include conservative estimates of the time required to execute any necessary procedures and obtain or position any necessary equipment as well as conservative estimates of equipment capabilities. In those cases in which necessary equipment or personnel are not under the direct command and control of the individual responsible for activating the alert system, the design report should contain or reference written agreements ensuring that such equipment or personnel can and will be placed under that individual's effective control within the times estimated in the design report. The design report should also discuss the testing and maintenance provided for any equipment necessary to employ the special alerting method. In general, full-scale equipment testing should be conducted at least annually. FEMA recognizes that it may not be prudent or feasible to conduct full performance tests of certain portions of the special alerting methods employed in the alert and notification systems during exercises or annually. (Examples include those portions of methods that require movement of police, fire, and rescue vehicles at high speeds or in potential violation of traffic laws, that otherwise have the potential for jeopardizing public health and safety, or that are inordinately costly to test or exercise, e.g., helicopter airborne warning systems or leaflet drops.) In these cases, limited performance tests should be conducted, if prudent and feasible. Furthermore, routine uses of this equipment or these procedures, independent of their utilization as a part of the alert and notification system, that demonstrate those capabilities required for their performance as a part of the alert and notification system may be considered tests for the purposes of this section.

For those special alerting methods that involve distribution of equipment (other than tone alert radios) or special information to members of the public, the program should make a "best-effort" attempt to place the equipment or information. The program should include a record system (register) that contains an accurate list of addresses (names are optional), in the geographical area where the equipment or information is needed. Addresses where such equipment or information is offered to residents and refused by the residents should be noted. An ongoing maintenance program offering operating checks of the equipment should be available to all residences in areas where such equipment is needed. Necessary written guidance should accompany the equipment. It should address, if applicable, (1) its general use; (2) suggested placement to facilitate efficient use; (3) details of the maintenance program, including self tests, if appropriate; and (4) telephone numbers for repair or replacements. This information should be provided annually as a reminder to each equipment holder. Other necessary special information should also be redistributed annually as a reminder. The required audit (register update), maintenance, and public information programs can be integrated.

E.6.2.4.2 Utilization Of Institutional Alerting Systems

In addition to meeting the general acceptance criteria for special alerting systems, institutional alerting systems that are used as a part of the alert and notification system should have an effective and continual program that, at a minimum, encompasses the following:

- . Specification of those organizations and the individuals within those organizations, by title, who are responsible for activating each existing institutional alerting system.
- . Description of the procedures to be employed to notify those individuals (by title) that the alert and notification system is to be activated.
- . Distribution of special information to notify those individuals of their responsibility to activate the existing institutional alerting system, including, where appropriate (e.g., hotels, motels, shopping centers), guidance on the most effective method of alerting system activation or other supporting information (e.g., public information stickers, posters).

E.6.2.4.3 Use Of Aircraft For Alerting

Hiking trails and hunting areas are illustrative of areas where it may not be feasible to provide a prompt notification by any other means except by aircraft equipped with powerful sound systems or by dropping prepared leaflets.

In addition to meeting the general acceptance criteria for special alerting systems, aircraft programs used as a part of the alert and notification system should be described as follows in the design report:

- . The sound system, if any, to be employed in alerting the public via aircraft. The design report should include an analysis that demonstrates that the sound system can provide an intelligible alerting signal at ground level throughout the geographical area requiring coverage.
- . The system and procedures to be employed in dropping leaflets, if applicable. The design report should indicate the manner and location in which the leaflets are stored, the individual responsible for ensuring that they are loaded onto the aircraft, and the time required to load the leaflets onto the aircraft. It should also include an analysis or calculation demonstrating that the procedures employed are likely to provide adequate coverage of the geographical area to be alerted by this method.
- . The storage location and airfield for the aircraft should be described and its distance from the area to be covered should be specified. The design report analysis of the time required to alert individuals by this method should include, among other pertinent factors, the amount of time required to notify the pilot or alternate, who is available 24 hours a day, 7 days a week; the time required for him to reach the aircraft; the time required to prepare the aircraft for flight; the time required for take-off; and the time required to reach the area to be alerted.

E.6.2.4.4 Use Of Automatic Telephone Dialers/Switching Equipment

Systems are available whereby pre-selected telephone numbers could be dialed automatically and a recorded announcement played when a telephone is answered. After a fixed number of rings, the next number is dialed automatically, and the unanswered numbers

are redialed at the end of the queue. Other systems are available that connect directly to the telephone exchange equipment and can call 100, 1,000, or more stations simultaneously and may employ either a special ring condition (e.g., a half-second ring followed by a two-second pause) or a recorded voice or live voice message for alert and notification.

In addition to meeting the general acceptance criteria for special alerting systems, automatic telephone dialers/switching equipment that is used as a part of the alert and notification system should be described as follows in the design report:

- . The type, manufacturer, and general operating concepts of the automatic telephone dialers or switching equipment employed. If a sequential automatic dialer is used, the design report should include a calculation of total time required to cycle once through the queue under "worst-case" conditions (e.g., all respondents answer on the last ring before re-dial) and "expected" conditions. The analysis should also present the rationale for sequencing the numbers in the queue. Measures to ensure that the telephone system does not fail due to traffic (subscriber) overloading prior to at least one complete cycle through the queue should also be discussed in the design report. If simultaneous alert calling is used, the design report should discuss the provisions to ensure that lines that are "busy" at the time the system is activated are alerted. Measures to ensure that the telephone system does not fail due to traffic (subscriber) overloading during the alert call should also be discussed in the design report.

E.6.2.4.5 Utilization Of Modulated Power Lines

Electrical power lines can be used to transmit information by adding a modulated carrier frequency into the standard 60-cycle per second frequency used for power transmission. The information transmitted can perform a variety of functions such as turn on a water heater, activate a device that reads the electric meter and transmits the reading back to the utility, or ring a bell. Such a system could be modified to activate a variety of alerting devices, including an electrically driven horn, a warning light, or a buzzer.

In addition to meeting the general acceptance criteria for special alerting systems, modulated power line systems that are used as a part of the alert and notification system should be described as follows in the design report:

- . The type, manufacturer, and general operating concept of the modulated power line system employed. The design report should discuss the particular warning method implemented, including an analysis demonstrating that the system can serve as an effective alerting and notification system.
- . The centralized computer control system, if any, employed as a part of this system. The design report should specify whether the annunciator activation is simultaneous or sequential and, if sequential, the time required for all annunciators.

E.6.2.4.6 Utilization Of Police, Fire, Or Rescue Vehicles/Personnel

In very isolated areas, it may be determined that it is most cost effective to have police, fire, or rescue personnel alert individual households, either via their vehicle's public address/siren systems or by individually contacting members of the households. It may also be determined that this is the most cost-effective method for alerting individuals in small populated areas, such as parks, where seasonal and diurnal variations in the population make a fixed siren system less cost effective.

In addition to meeting the acceptance criteria for special alerting systems, the use of police, fire, or rescue vehicles or personnel as a part of the alert and notification system should be described in the design report and should include: (1) the geographical areas to be covered, (2) the routes to be used, and (3) the alerting procedures to be followed. The routes should be indicated by clear delineation on the topographic map(s) of the EPZ. The proposed route and elapsed time (measured from the initial time of alert) of each vehicle along its route should be shown. Transit time of each vehicle to the initiation of its route should be accounted for. This should also indicate the time required for the vehicle to slow or

pause to alert individual households along the route. Total elapsed time for route coverage should not exceed 45 minutes when the design objective of the route alerting is to ensure coverage of the population who may not have received the initial notification.

F. Planning Standard: Emergency Communications

"Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public."

F.1 Evaluation Criterion

"The communication plans for emergencies shall include organizational titles and alternates for both ends of the communication links. Each organization shall establish reliable primary and backup means of communication for licensees, local, and State response organizations. Such systems should be selected to be compatible with one another. Each plan shall include:

- a. provision for 24-hour per day notification to and activation of the State/local emergency response network; and at a minimum, a telephone link and alternate, including 24-hour per day manning of communications link that initiate emergency response actions.
- b. provision for communications with contiguous [sic] State/local governments within the Emergency Planning Zones;
- c. provision for communications as needed with Federal emergency response organizations;
- d. provision for communications between the nuclear facility and the licensee's near-site Emergency Operations Facility, State and local emergency operations centers, and radiological monitoring teams;
- e. provision for alerting or activating emergency personnel in each response organization; and
- f. provision for communication by the licensee with NRC headquarters and NRC Regional Office Emergency Operations Centers and the licensee's near-site Emergency Operations Facility and radiological monitoring team assembly area."

F.1.1 Areas Of Review

The review for alert and notification system effectiveness under the above criterion is limited to determining whether a primary and secondary means of communication exist from the Emergency Operations Facility through the alert and notification system's implementing chain to the officials responsible for initiating the alert system.

F.1.2 Acceptance Criteria

An emergency plan discussion of the alert and notification system will typically be acceptable under this evaluation criterion provided that it clearly describes a primary and secondary means of communication, from the licensee's near-site Emergency Operations Facility through the alert and notification system's implementing chain to the officials responsible for initiating the alert system, that meets the following minimum criteria:

- Coverage: The primary and secondary communications means must provide the capability for 24-hour per day notification from the licensee's Emergency Operations Facility to the officials responsible for making the decision to activate the alert and notification system. The primary and secondary communications means must also provide the capability for 24-hour per day notification from these officials to those individuals responsible for the actual activation of the alert and notification system. The systems employed should include identical communications capabilities at primary and alternate operating locations.
- Communications Net Control: To ensure effective use, communications net discipline, and communications availability, one location on each communications net should be assigned responsibility for net control and an alternate should be assigned. The primary and alternate location should be a state or local government activity. It should issue and update procedures on testing; communications net access; and discipline, maintenance, and repair.
- Communications System Availability And Reliability: All stations/points on the network and communication linkage must provide a capability for immediate dissemination, receipt, and acknowledgment of alert and warning messages on a 24-hour-per-day basis. It is desirable for oral message communications to be supported by written (e.g., telex or fax) verification. The primary or secondary means of communications should be able to function notwithstanding adverse environmental conditions, such as floods and power outages. At least one of those communications means should not be subject to pre-emption for lower priority purposes nor to failure due to traffic (subscriber) overloading. Primary and secondary communications means should be selected so that they do not have common failure modes under adverse environmental conditions.

Information Sensitivity: Design of communications systems and procedures should take into consideration that alert and warning information is highly sensitive and, if monitored or intercepted by unauthorized personnel, is subject to misinterpretation that can lead to undersirable and counterproductive reactions.

N. Planning Standard: Exercises And Drills

"Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected."

N.1.a Evaluation Criterion

"An exercise is an event that tests the integrated capability and a major portion of the basic elements existing within emergency preparedness plans and organizations. The emergency preparedness exercise shall simulate an emergency that results in offsite radiological releases which would require response by offsite authorities. Exercises shall be conducted as set forth in NRC and FEMA rules."

N.1.b Evaluation Criterion

"An exercise shall include mobilization of State and local personnel and resources adequate to verify the capability to respond to an accident scenario requiring response. The organization shall provide for a critique of the annual exercise by Federal and State observers/evaluators. The scenario should be varied from year to year such that all major elements of the plans and preparedness organizations are tested within a five-year period. Each organization should make provisions to start an exercise between 6:00 p.m. and midnight, and another between midnight and 6:00 a.m. once every six years. Exercises should be conducted under various weather conditions. Some exercises should be unannounced."

N.1.(a,b).1 Areas Of Review

The review under the above criteria is limited to an assessment of performance of the alert and notification system as it is exercised as part of the overall integrated capability for responding to nuclear power plant emergencies. Prior to recommending an exercise evaluation, the reviewer must have determined that the alert and notification system requirements of Planning

Standards E and F have been satisfied. The exercise evaluation is therefore only one part of the determination that the alert and notification system is adequate to protect the health and safety of the public by providing reasonable assurance that appropriate protective measures can and will be taken. The exercise evaluation should focus upon how the total alert and notification process functions as a whole.

N.1.(a,b).2 Acceptance Criteria

For the alert and notification system to demonstrate that it can function properly, the total chain of events to implement an alert decision should be exercised completely. The exercises should be structured so as to demonstrate the following:

- . Personnel responsible for activating the alert and notification system are notified and mobilized in time to be in position to perform their responsibilities when required;
- . A legitimate, informative, and clearly understood message summarizing the emergency is sent from the utility to the state/local officials who are responsible for making the decision to activate the alert and notification system;
- . A decision is made to activate the alert and notification system by an appropriate official;
- . A legitimate and clearly understood command to activate the alert system is sent from the state/local officials to the person(s) responsible for physically activating the alert system;
- . The alert system is appropriately activated or activation is simulated;
- . A legitimate and clearly understood command to disseminate specified instructions emanates from the state/local officials to the person(s) responsible for physically activating the notification system;
- . The notification system is appropriately activated or simulated; and
- . Specified public messages are relayed.

The above actions, to be meaningful, should result from undisclosed scenario situations and not from previously determined and specified times for certain events, such as alert system activation, to occur.

FEMA, however, recognizes that in many cases the state/local officials may decide to activate alert and notification systems only at predetermined times in order to avoid the problems associated with unannounced tests. FEMA supports this concept and encourages the licensee and state/local government organizations to give the public adequate advance notification of alert and notification system tests in order to avoid any public misunderstandings and to strengthen public education regarding the purpose of the alert and notification system. Therefore, it is satisfactory to exercise the alert decision implementing chain up to the point of actually activating the alert and notification system (although activation should be simulated as realistically as possible). Actual activation for the purpose of satisfying the criteria of this planning standard could occur at any time that the appropriate state/local officials mutually agree upon. The determination of the time of day that the alerting system is activated is the responsibility of the appropriate state/local officials. Activation for this test may or may not occur during the annual exercise.

FEMA also recognizes that it may not be prudent or feasible to activate certain of the special alerting methods employed in the alert and notification system for exercise purposes. (Examples include those methods that require movement of police, fire, and rescue vehicles at high speeds or in potential violation of traffic laws, that otherwise have the potential for jeopardizing public health and safety, or that are known to be reliable and are inordinately costly to exercise, e.g., helicopter airborne warning systems or leaflet drops.) Activation of those portions of the alert and notification systems should be simulated as realistically as possible. The design report required for those portions of the alert and notification system (see E.6.2.4) should be sufficiently detailed to provide reasonable assurances that, even

in the absence of actual activation during exercises, these special alerting methods will function as required during an actual emergency.

A final determination of the effectiveness of an alert and notification system must consider the system design, implementation, maintenance, and activation. However, an exercise does provide an excellent opportunity to measure the public's reception to the alert and notification system. For exercises or tests conducted to satisfy the alert and notification aspects of 44 CFR 350.9 (a), FEMA will conduct a telephone survey of randomly selected residents within the EPZ as soon as possible following the activation of the alert and notification system. The objective of the survey is to estimate the proportion of EPZ population alerted by the alert and notification system and to identify areas where enhancement of the alerting system may be needed. Therefore, the responsible organizations are encouraged to use all reasonable means (such as manual back-up activation) to ensure activation of all system components so that their effectiveness can be evaluated during the public survey. It is also important that specific components of the alert and notification system that are not operational during the test be identified so that the appropriate geographical areas impacted can be excluded from the public survey. This can be done by licensee or government observation.

A telephone survey will provide rapid results following the activation of the alerting system and permit monitoring of responses during the sampling process in order to obtain enough responses to achieve statistically valid survey results. In the case of unique situations in which large portions of the population within the EPZ may not have home telephones (e.g., where religious beliefs prevent telephones), special provisions will be considered. Other means of efficiently obtaining public survey information may be considered by FEMA on a case-by-case basis.

The statistical focus of the survey is public (residential households) alerting versus nonalerting, which is a binary event with some probability, p , for the EPZ population. The statistical

model to represent the number of successful events in such a process is the binomial distribution. Well-known statistical methods are available to estimate a confidence interval for p , based upon a random sample of the population. Assuming an acceptable level of confidence of 95%, a precision of 5%, and a reasonable proportion of affirmative-to-total answers, the representative sample for most sites will be approximately 250 residences within the EPZ but could approach 385 if the ratio of affirmative-to-total answers decreases. FEMA will ensure that the random samples are representative of the entire EPZ and that enough calls are made and responses received to achieve a statistically valid sample.

The FEMA telephone survey of EPZ residences will consist of approximately six questions and will be designed (subject to Office of Management and Budget approval) to determine:

- . The validity of the address and telephone number;
- . If the respondent was aware of any emergency alerting signal;
- . How the respondent was made aware of any emergency alerting signal;
- . The location (at home, away from home) of the respondent at the time of the test; and
- . If the residence had received an emergency instructional package regarding what to do in an actual emergency.

The results of the survey will be used to identify those areas in which enhancement of the alerting system may be needed. The non-operation of portions of the alerting system should not be a cause for a negative judgment of the entire alerting system if the reasons for the non-operation are understood and subject to correction by a routine maintenance program.

Utility personnel are encouraged to work closely with local government officials and demonstrated public opinion leaders, who represent

a broad cross section of the public, to identify enhancement measures for alerting the public when the survey indicates that additional alerting measures are needed. Periodic alerting system maintenance and continuous education of the public to the meaning of the alerting signal are encouraged.

N.2 Evaluation Criterion

"A drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular operation. A drill is often a component of an exercise. A drill shall be supervised and evaluated by a qualified drill instructor. Each organization shall conduct drills, in addition to the annual exercise at the frequencies indicated below:

a. Communication Drills

Communications with State and local governments within the plume exposure pathway Emergency Planning Zone shall be tested monthly. Communications with Federal emergency response organizations and States within the ingestion pathway shall be tested quarterly. Communications between the nuclear facility, State and local emergency operations centers, and field assessment teams shall be tested annually. Communication drills shall also include the aspect of understanding the content of messages."

N.2.1 Areas Of Review

The review for alert and notification system effectiveness under this criterion deals only with communication drills as specified in "a." above. The reviewer should ascertain that communication drills are held in accordance with the intent and schedule of the criterion.

N.2.2 Acceptance Criteria

For acceptance under this criterion, alert and notification system communication drills should be conducted monthly among the officials specifically responsible for activating the alert and notification system within the plume exposure pathway EPZ. This does not include coordination or support EOC staff. The drills should emphasize developing and maintaining the capabilities of the officials who are responsible for activating the alert and notification system.

N.3 Evaluation Criterion

"Each organization shall describe how exercises and drills are to be carried out to allow free play for decisionmaking and to meet the following objectives. Pending the development of exercise scenarios and exercise evaluation guidance by NRC and FEMA the scenarios for use in exercises and drills shall include but not be limited to, the following:

- a. The basic objective(s) of each drill and exercise and appropriate evaluation criteria;
- b. The date(s), time period, place(s) and participating organizations;
- c. The simulated events;
- d. A time schedule of real and simulated initiating events;
- e. A narrative summary describing the conduct of the exercises or drills to include such things as simulated casualties, offsite fire department assistance, rescue of personnel, use of protective clothing, deployment of radiological monitoring teams, and public information activities; and
- f. A description of the arrangements for and advance materials to be provided to official observers."

N.3.1 Areas Of Review

The reviewer should address during this review only the possibilities afforded by the exercise scenarios for the alert and notification system decision implementing chain to be practiced and tested. Drills are not to be addressed in this review.

N.3.2 Acceptance Criteria

The scenarios developed for exercises should lead to the decision to activate the alert and notification system and should allow the decision to be implemented in a free and unscheduled manner. Alert and notification system activation (or simulated activation) should result from the decision-implementing process through the communications chain and should not result from previously determined and specified times for certain events to occur.

N.5 Evaluation Criterion

"Each organization shall establish means for evaluating observer and participant comments on areas needing improvement, including emergency plan procedural changes, and for assigning responsibility for implementing corrective actions. Each organization shall establish management control used to ensure that corrective actions are implemented."

N.5.1 Areas Of Review

The review under the above criterion is limited to the means established for evaluating observer and participant comments concerning the performance of the alert and notification system during exercises and for assigning responsibility for implementing modifications to the alert and notification system.

N.5.2 Acceptance Criteria

An emergency plan will typically be acceptable under this evaluation criterion provided that it clearly describes a method for evaluating and responding to observer and participant comments concerning the performance of the alert and notification system during exercises that meets the following minimum criteria:

- . Observer and participant comments and recommendations and responses, if appropriate, by individuals responsible for planning, maintenance, or operation of the alert and notification system should be documented.
- . Evaluations of observer and participant comments and recommendations should be performed by qualified individuals, independent of those individuals with direct or supervisory responsibility for the planning or operation of the alert and notification system. These evaluations and the bases for any conclusions or recommendations should be documented.
- . The results of these evaluations, including disposition, should be maintained on file for review by appropriate federal, state, and local government officials and licensee personnel with the authority to take appropriate corrective actions.

- . The individual within each organization responsible for ensuring timely implementation of corrective actions should be identified by title.
- . Reports documenting observer and participant comments and recommendations and their evaluations should be retained for a period of at least five years.

APPENDIX 1

RECOMMENDED FORMAT FOR SUBMITTALS DESCRIBING ALERT AND NOTIFICATION SYSTEMS

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APPENDIX 1

RECOMMENDED FORMAT FOR SUBMITTALS DESCRIBING ALERT AND NOTIFICATION SYSTEMS

INTRODUCTION

FEMA's proposed 44 CFR Part 350 creates the regulatory framework by which FEMA will evaluate and approve state and local emergency plans and preparedness to deal with a radiological emergency that may occur at a licensed commercial nuclear power plant. This appendix supplements the "Standard Guide For The Evaluation Of Alert And Notification Systems For Nuclear Power Plants" by recommending a format and content for the alert and notification aspects of the total state emergency plan.

Purpose And Applicability

This recommended format and content appendix has been prepared as an aid to uniformity and completeness of the preparation and review of the alert and notification system sections of state/local emergency plans that are applicable to commercial (licensed) nuclear power plants. FEMA does not intend for this guidance to require states that have previously submitted plans (or even prepared plans for submission) to FEMA to restructure or resubmit those plans. In these cases, an attachment to the plan may be prepared, addressing only the alert and notification system aspects of Planning Standards E-5, E-6, F-1, N-1, N-2, N-3, and N-5, in accordance with this guidance.

This document describes the information to be presented for applicable sections of (or attachment to) the state and local emergency plan. Information submitted will be reviewed for completeness on

the basis of unique site considerations and the contents of the guide. If the submittal does not provide a reasonably complete presentation of the required information, FEMA's review will be delayed until the needed information is provided.

Use Of The Recommended Format

The format and content is described in succeeding sections. If the recommended format and content are adopted, the numbering system of this document should be followed at least down to the level of subsection (i.e., E.6.2.4). Certain subsections may be omitted from the submittal or identified as not applicable if they are clearly unnecessary to provide a complete submittal. Cross references among subsections should be employed to eliminate needless repetition. In such cases, appropriate adaptation of the format to accommodate the particular circumstances is permissible.

It may be desirable to submit information in support of the alert and notification system portion of the emergency plan that is not required under FEMA's regulatory framework in 44 CFR 350. Such information could include, for example, historical data submitted in demonstration of certain criteria; discussion of alternatives considered; or supplementary data regarding assumed models, data, or calculations. This type of information should be clearly labeled and provided as an attachment to the submittal so that it will not be considered to be a plan commitment and so that changes to it need not be reviewed under 44 CFR 350.14.

Style And Composition

The planner should strive for a clear, concise presentation of information that portrays the general perspective and concepts of the basic plan. Details about specific aspects (e.g., the alert and notification system design report) of the plan may be relegated to appendices to enhance the clarity of the presentation in the basic plan and to facilitate updating and maintenance of the information.

Confusing or ambiguous statements and general statements of intent should be avoided. Definitions and abbreviations should be defined in the document and should be consistent with generally accepted usage, if at all possible.

Drawings, diagrams, and tables should be used when information may be presented more adequately or conveniently by such means. In general, these illustrations should be numbered, have titles, and be located in the section in which they are first referenced. Care should be taken to ensure that all information presented in drawings is legible, that symbols are defined, and that drawings are not reduced to the extent that they cannot be read by unaided normal eyes.

A table of contents should be included in the submittal.

Physical Specifications Of Submittals

All materials submitted in an emergency plan that describe the alert and notification system should conform to the following physical dimensions of page size, quality of paper and inks, pagination, etc.:

1. Page Size

Text pages: 8-1/2 x 11 inches

Graphics: 8-1/2 x 11 inches preferred; however, a larger size is acceptable provided that the finished copy when folded does not exceed 8-1/2 x 11 inches.

Drawings: When folded, the finished copy should not exceed 8-1/2 x 11 inches.

Maps: Do not reduce below the scales suggested in the guide (Section E.6.2, p. E-6) and folded not to exceed 8-1/2 x 11 inches.

2. Paper Stock and Ink

Maintain suitable quality in substance, paper color, and ink density for handling and for microfilming.

3. Page Margins

A margin of no less than one inch should be maintained on the top, bottom, and binding side of all pages submitted.

4. Printing
Composition: Text pages should be single spaced.
Type face and style: Must be suitable for microfilming.
Reproduction: May be mechanically or photographically reproduced.
Pages of text may be printed on both sides with the images printed head to head.
5. Binding
Pages should be punched for loose-leaf standard 3-hole ring bindings.
6. Pagination
Pages should be numbered sequentially within sections.
7. Format References
In the submittal, references to this format should be by chapter and section numbers.

Procedures For Updating Or Revising Pages

The updating or revising of data should be on a replacement-page basis. The changed or revised portion of each page should be highlighted by a vertical line. The line should be on the margin opposite the binding margin for each line changed or added. All pages submitted to update, revise, or add pages to the submittal are to show the date of change. The transmittal letter should include an index page listing the pages to be inserted and the pages to be removed. When changes or additions that affect the table of contents are made, a revised table of contents should also be provided.

Number Of Copies

One copy of the alert and notification system portion of (or attachment to) the state plan should be submitted to the FEMA Regional Director of the Region in which the site is located. An NRC licensee submitting this attachment to a plan for approval as a supplement to the most recent interim finding should send it to the FEMA Regional Director through the appropriate state or local authorities. In either case, to facilitate review and approval, one additional copy of the alert and notification system portion of (or attachment

to) the plan should be submitted to the Chief, Field Operations Branch, Technological Hazards Division, Federal Emergency Management Agency, 500 C Street S.W., Washington, D.C. 20472.

Public Disclosures

FEMA has determined that the alert and notification system portions of emergency plans will be subject to public disclosure. Therefore, since alert and warning information is highly sensitive and, if monitored or intercepted by unauthorized personnel, is subject to misinterpretation that can lead to undesirable and counterproductive reactions, information that facilitates such monitoring or interception should not be included. In particular, specific radio frequencies and authentication codes employed should not be identified.

Compatibility

Efforts should be made to ensure that the alert and notification system portion of (or attachment to) the emergency plan is compatible with other portions of the emergency plan. However, other sections of the emergency plan should not be incorporated by reference to supply information requested by this guide.

Format And Content

The submittal should follow the numbering system established in this Standard Guide for the alert and notification system Planning Standards E, F, and N. This format, with the associated content requirements, is outlined in the remainder of this appendix.

E. NOTIFICATION METHODS AND PROCEDURES

E.5 Public Information Dissemination System

Provide a description, in sufficient detail to meet the acceptance criteria of Section E.5.2 (p. E-1) of the guide to which this is an appendix, of the system(s) which is to be used to disseminate information to the public during an emergency. This description should include the following:

- . Selection rationale for the stations and broadcasting systems to be used;
- . An agreement (may be included by reference), available for review, which states each station's or broadcast system's willingness to participate in the public notification process;
- . Clear definition of the specific intervals for the broadcasting of official information statements for each class of emergency action level;
- . A commitment for an EOC capable of monitoring the broadcast of official information messages (radio/TV) and a description of the procedures to be employed to identify and promptly correct any errors in such messages; and
- . Procedures and responsibilities for each participating organization and a commitment that the agreeing parties will honor their obligations during an emergency.

E.6 ADMINISTRATIVE AND PHYSICAL MEANS OF NOTIFICATION

E.6.1 Administrative Means Of Notification

Provide a description, in sufficient detail to meet the acceptance criteria of Section E.6.2 (p. E-4) of the guide to which this is an appendix, of the administrative means employed to make the initial notification of the affected population within the plume exposure pathway EPZ. This description should include the following:

- Specification of those organizations or individuals, by title, and their alternates, who are responsible for activating the system;
- Discussion of the procedures to be employed to activate the notification system; and
- An analysis of the time required to implement the system activation procedures, and specification of the procedures and safeguards employed to ensure that a legitimate and clearly understood command to activate the alert system can be communicated to the individuals responsible for physically activating the systems.

E.6.2 Physical Means Of Notification

Provide a general overview discussion of the physical means employed to make the initial notification of the affected population within the plume exposure pathway EPZ. Detailed descriptions of the physical means of notification should be presented in either the subsequent sections or an appended design report. This section of the plan must also include (or reference appended) topographic maps of the EPZ. U.S. Geological Survey quadrangle topographic maps with latitude and longitude indications and scales of 1:62,500 or larger (a scale of 1:24,000 is preferred) are acceptable. Individual maps should be compiled into a single overall composite covering the entire EPZ with a scale of 1:62,500 or larger (a scale of 1:24,000 is preferred). The maps should depict the following:

- . Population centers;
- . Parks, lakes, oceans, and other large recreational centers;
- . Major geographical areas controlled by institutions (e.g., military bases, universities); and
- . The type of alerting system (e.g., sirens, tone alerts, special alerting vehicles) designed to reach the population in each geographical area.

The maps should be legible with clear, understandable legends.

E.6.2.1 Sirens

If sirens are proposed as part of an alert system, then provide (either in this section or in a referenced section of an appended design report) a detailed description of the siren system to be employed. This description should be in sufficient detail to meet the acceptance criteria of Section E.6.2.1 (pp. E-6 through E-8) of the guide to which this is an appendix and should include the following:

- . Topographical maps that meet the criteria in section E.6.2 of this appendix of those sections of the EPZ where sirens are to be employed and that delineate: (1) areas where the population exceeds 2,000 persons per square mile (based on square-mile increments) and areas virtually unpopulated, (2) siren locations and individual siren identifiers, and (3) siren sound contours for C-weighted sound pressure levels (SPLs) of 60 dBC and 70 dBC. In addition, should the design report choose to show that the siren sound level exceeds an average measured outdoor daytime ambient sound level(s) by 10 dB, the maps mentioned above must include appropriate siren sound level contours for the SPL that is 10 dB above the average measured outdoor daytime ambient sound level(s). The SPL for these sound level contours must be indicated. (This information should be included on the same maps provided to meet the requirements of section E.6.2 of this appendix provided that map legibility can be maintained.)
- . A description of the manner in which sound calculation contours were calculated, including any assumptions made. This should be in sufficient detail to permit the reviewer to reproduce the calculation.
- . A description of the process employed to determine siren sound output.

- . If the basis for acceptance of the siren system is that the expected siren sound level generally exceeds average measured outdoor daytime ambient sound levels by 10 dB, the following additional information should be provided. (This information is not required if the ambient background sound levels are in accordance with NUREG-0654/FEMA-REP-1, Appendix 3, Section C.3.e, page 3-10.):
 - A description of how the average daytime ambient sound levels were determined, including survey locations and the rationale for their selection;
 - Identification of actual measurements performed, including frequency range measured and measurement time span and location;
 - Discussion of the relation of population density to ambient sound levels, including effects of seasonal, diurnal, and weekday population pattern variations upon background sound;
 - Effects of major transportation or commercial activities on ambient sound levels; and
 - Description of the analytical or calculation method, including all assumptions made, employed to estimate ambient sound levels. (This description should be sufficiently detailed to permit the reviewer to reproduce the estimated ambient sound levels.)
- . A description of the siren system test and maintenance program to be (or currently) employed, including test types and frequencies, a commitment to promptly repair any components that do not perform as expected during tests, and a commitment to maintain records of tests and repairs performed. A summary and assessment of available maintenance program records should also be included.

E.6.2.2 Mobile Siren Vehicles

If mobile siren vehicles* are to be employed as part of the primary alerting system, then provide either in this section or a referenced section of an appended design report, a description of the vehicles and their use. This description should be sufficiently detailed to

*Mobile siren vehicles, as discussed in this section, are dedicated siren warning vehicles and do not include police, fire, or rescue vehicles. For discussion of information to be submitted concerning the use of police, fire, or rescue vehicles, see Section E.6.2.4, "Special Alerting."

meet the acceptance criteria of Section E.6.2.2 (pp. E-9 and E-10) of the guide to which this is an appendix and should include the following:

- . The rationale for the use of mobile siren vehicles;
- . A relatively comprehensive description of the individual mobile siren design, including those aspects that ensure that the mobile siren vehicle will be recognized by the public as a part of the alert and notification system;
- . Topographic map(s) of the EPZ that delineate areas to be covered by mobile siren vehicles. These maps should also indicate the proposed route and elapsed time (measured from initial time of alert) for each mobile siren vehicle. The geographical areas, perpendicular to the vehicle's direction of travel, predicted to receive SPLs (1) equal to or above 60 dBC for population densities below 2,000 persons per square mile, (2) equal to and above 70 dBC for population densities above 2,000 persons per square mile, or (3) at least 10 dB above the average measured outdoor daytime ambient, where the ambient background noise level has been determined to be less than 50 dBC, should also be identified. This topographic map(s) of the EPZ should meet the criteria specified for topographic maps of the EPZ specified in section E.6.2 of this appendix. (This information should be displayed on the same map(s) provided to meet the section E.6.2 requirements if legibility can be maintained.)
- . A description of the calculations performed to determine the 60 dBC and 70 dBC SPL contours. This should be described in the same level of detail required by section E.6.2.1 of this appendix for fixed siren calculations. If similar calculation methods are employed for both sirens and mobile siren vehicles, then it is acceptable to limit this description to a clear delineation of the differences between the two methods.
- . A description, if applicable, of the method used and measurements made to determine average daytime ambient sound levels. This should be described in the same level of detail required by section E.6.2.1 of this appendix for such determinations made in concert with the use of fixed sirens. If methods similar to those employed in determining average daytime ambient sound levels for fixed siren analyses are used, then it is acceptable to limit this description to a clear delineation of the differences, if any, between the two methods. This information is not required if the ambient background sound levels utilized are in accordance with NUREG-0654/FEMA-REP-1, Appendix 3, Section C.3.e, page 3-10.

E.6.2.3 Tone Alert Radios

If tone alert radios are proposed as part of an alert system, then provide (either in this section or in a referenced section of an appended design report) a detailed description of the tone alert radio system to be employed. This description should be in sufficient detail to meet the acceptance criteria of Section E.6.2.3 (pp. E-10 and E-11) of the guide to which this is an appendix and should include the following:

- . Topographical maps of those sections of the EPZ where tone alert radios are to be employed that meet the criteria in section E.6.2 of this appendix. (This information should be included on the same maps provided to meet the requirements of section E.6.2 of this appendix provided that map legibility can be maintained.)
- . A discussion of the procedures employed to offer the tone alert radios to the public in geographical areas where needed, including a description of the record system (register) listing addresses in the geographical areas where tone alert radios are needed and the manner in which it is kept accurate and current.
- . A description of the testing and maintenance program provided for tone alert radios.
- . A copy of the written guidance that is provided with the radio (may be included as an appendix to the submittal) and a description of the program to periodically remind tone alert radio holders of this information.
- . A description of the tone alert radio(s) to be used, including the manufacturer, model number, operating instructions, and photograph(s) (may be satisfied by including an appropriately detailed vendor's brochure as an appendix to the submittal).
- . A description of the method used to ascertain the availability, signal strength, and signal quality of the broadcast medium for initiating the tone alert signal.

E.6.2.4 Special Alerting

If special alerting methods are proposed as a part of an alert system, then provide (either in this section or in a referenced section of an appended design report) a detailed description of those special alerting methods to be employed. This description should

be in sufficient detail to meet the acceptance criteria of Section E.6.2.4.1 and Sections E.6.2.4.2 through E.6.2.4.5 (pp. E-12 through E-17), as applicable, of the guide to which this is an appendix and should include the following:

- . Topographic maps of those sections of the EPZ where each special alerting method is to be employed. (Routes and elapsed times from the initiation of the alert should be indicated on these maps, if appropriate for the alerting technique.) These topographic maps of the EPZ should meet the criteria specified in section E.6.2 of this appendix. (This information should be displayed on the maps required by section E.6.2 of this appendix provided that legibility can be maintained.)
- . The rationale for employing each special alerting method.
- . A description, including any assumptions made, of any analyses or calculations necessary to verify that individuals in the areas in which each special alerting method is used can be provided an alert signal within 45 minutes when the design objective is to ensure coverage of the population who may not have received the initial notification.
- . Written agreements (or references to them), if appropriate, that ensure that necessary equipment or personnel, not normally under the direct command and control of the individual responsible for activating the alert system, can and will be placed under this individual's effective control within a specified time period.
- . A description of the testing and maintenance program for any equipment necessary to employ each special alerting method.
- . For those special alerting methods that involve distribution of equipment (other than tone alert radios) or special information to members of the public, a description of the means used to distribute such equipment or information and the record system used to maintain current knowledge of the individuals requiring such equipment and any individuals who have refused such equipment.

F. EMERGENCY COMMUNICATIONS

Provide a description, in sufficient detail to meet the acceptance criteria of Section F.1.2 (pp. F-2 and F-3) of the guide to which this is an appendix, of the primary and secondary means of communication from the emergency operations facility through the alert and notification system's implementing chain to the officials responsible for initiating the alert system. This discussion should include the following:

- . An analysis that demonstrates the 24-hour per day availability of equipment and personnel required for proper operation of the communications system;
- . An analysis of the effects of adverse environmental conditions, such as floods and power outages and traffic (subscriber) overloading on both the primary and secondary communications systems;
- . Any commitments or analyses necessary to demonstrate that at least one of those communications means is not subject to pre-emption for lower priority purposes; and
- . A description of procedures to ensure adequate communications net control and information security.

N. EXERCISES AND DRILLS

N.1 Alert And Notification System Exercises

Provide a description of the manner in which alert and notification system exercises will be structured and conducted. This description should be in sufficient detail to meet the acceptance criteria of Sections N.1.(a,b).2 (pp. N-2 through N-6) and N.3.2 (p. N-8) of the guide to which this is an appendix. This description should discuss the frequency of exercises and the approach taken to ensure that the total chain of events to implement an alert decision is completely exercised, that alert and notification system activation (or simulated activation) results from the decision-implementing process rather than from previously determined and specified times for certain events, and that there is reasonable assurance that possible deficiencies in the alert and notification system will be detected.

N.2 Alert And Notification System Drills

Provide a description of the manner in which alert and notification system drills will be structured and conducted. This description should be in sufficient detail to meet the acceptance criteria of Sections N.2.2 (p. N-7) and N.3.2 (p. N-8) of the guide to which this is an appendix. This description should address the frequency of drills, the individuals (by title) participating, and the approach taken to ensure that drills develop and maintain the capabilities of the officials responsible for activating the alert and notification system.

N.5 Review Of Comments On Exercises And Drills

Provide a description of the procedures for evaluating observer and participant comments concerning the performance of the alert and notification system during drills and exercises. This description should be in sufficient detail to meet the acceptance

criteria of Section N.5.2 (pp. N-9 and N-10) of the guide to which this is an appendix. This discussion should include the following:

- . Procedures to ensure that observer and participant comments and recommendations, and responses, if appropriate, by individuals responsible for planning, maintenance, or operation of the alert and notification system are documented;
- . Procedures for the evaluation of these comments and recommendations, including the documentation of the evaluator's conclusions and recommendations and their basis;
- . Procedures for reporting the results of those evaluations to individuals with the authority to take appropriate corrective actions;
- . Identification, by title, of the individual within each organization responsible for ensuring timely implementation of corrective actions; and
- . The manner in which the results of those evaluations will be retained and stored.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD 84 JAN -3 A10:53

In the Matter of)
LONG ISLAND LIGHTING COMPANY) Docket No. 50-322-OL-3
(Shoreham Nuclear Power Station, Unit 1) (Emergency Planning)
OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

CERTIFICATE OF SERVICE

I hereby certify that copies of The Standard Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants FEMA-43, September 1983 have been served on the following by deposit in the United States mail, first class, this 28 day of December 1983:

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