Message Plan
Evacuation Time Estimate Update

New Emergency Preparedness Regulations Require Licensees to Submit Updates on Evacuation Time Estimates

Background

The evacuation time estimate (ETE) calculates how long it would take to evacuate the emergency planning zone (EPZ) within about 10 miles of a nuclear power plant (NPP). The NRC requires power reactor licensees and certain applicants to prepare ETEs under 10 CFR 50.47(b)(10) and Section IV of Appendix E to 10 CFR Part 50, covering transient and permanent residents of the 10-mile EPZ using the most recent U.S. Census Bureau data. Licensees and offsite response organizations (OROs) use ETEs to inform protective action decision-making during an emergency. Licensees and OROs also use ETEs in advance of an emergency while developing traffic management plans to minimize evacuation delays. Since the ETE is used as an information tool, no minimum evacuation time is required.

Licensees must update ETEs when new U.S. Census Bureau data is published. In addition, Appendix E requires licensees to update ETEs whenever the permanent population within 10 miles of the plant increases enough to change ETE values by 25 percent or 30 minutes, whichever is less, from the current estimate. The NRC approves a licensee's ETE during the initial licensing process. The NRC reviews ETE updates to verify consistency with the guidance provided in NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies." NRC review of ETE updates does not constitute formal NRC approval of the ETEs, but rather ensures that the update was performed consistent with NRC guidance. ETE updates continually remain subject to future NRC inspection.

The NRC's resident inspectors at every NPP site use Inspection Procedure 71114.05, "Maintenance of Emergency Preparedness," to review the licensee's ETE and to ensure that: (1) the ETE is revised when new U.S. Census Bureau decennial census data is available; and (2) the licensee annually reviews and evaluates changes in the EPZ populations when updating the ETE. The NRC will notify the licensee of any perceived deficiencies in an ETE update submittal. Licensees can supplement their ETE update submittal in order to correct the deficiencies. If the licensee does not address the deficiencies or provide adequate justification for deviating from NRC guidance, the issues identified will be noted for follow-up as a potential inspection finding.

The NRC uses the Reactor Oversight Process (ROP) to inspect, evaluate, and assess NPP safety performance. ROP results are based on a combination of licensee performance indicators and a program of baseline and supplemental inspections. The licensee's performance, including ETE updates, is assessed by ROP to determine the need for further regulatory action. ETE deficiencies may reduce the effectiveness of a plant's emergency plan, and the NRC would consider increased oversight, more frequent inspections, and greater enforcement as warranted.

If an ETE update is considered incomplete, the NRC will institute enforcement actions to bring the licensee into compliance with 10 CFR Part 50 Appendix E.IV.4 for failure to submit an ETE by the required date.

How to Access

This message plan is available online in NRC's document system under the following accession number: ML13193A348.

Outreach Planning

Audience

Internal Stakeholders

- Office of Nuclear Security and Incident Response (NSIR)
- Office of General Counsel (OGC)
- Office of Congressional Affairs (OCA)
- Office of Public Affairs (OPA)
- Office of Federal and State Materials and Environmental Management Programs (FSME)
- Regional Division of Reactor Safety Directors
- Regional State Liaison Officers and EP Inspectors

External Stakeholders

- State and local Emergency Management Agencies
- Department of Homeland Security/Federal Emergency Management Agency
- Nuclear Power Reactor Licensees
- Nuclear Energy Institute
- Members of the public

Communication Tools

- Information will be electronically sent to NRC Internal stakeholders and external stakeholders as appropriate.

Frequently Asked Questions

Q: What is an evacuation time estimate (ETE)?

A: An ETE calculates the time it would take to evacuate the plume exposure pathway emergency planning zone (EPZ), which is the area surrounding a nuclear power plant out to a radius of approximately 10 miles (16 km).

Q: How are ETEs used?

A: Licensees and offsite response organizations use ETEs to make informed decisions about which protective actions they should recommend and implement, respectively, for the general public during a nuclear emergency. Officials can use the ETE to determine whether there is enough time to evacuate the public before a radioactive release from the plant reaches the public, or if the public would be exposed to less radiation by sheltering in place. State and local emergency management officials may also use the ETE as a tool while developing traffic management plans to support an evacuation.

Q: Do regulations establish a maximum evacuation time?

A: No, there is no regulatory threshold established for a maximum or minimum evacuation time. Licensees and offsite response organizations use the ETE as an informational tool when making decisions during an emergency.

Q: What regulations require the development of an ETE?

A: Section IV.2 of Appendix E to Title 10, Part 50 of the *Code of Federal Regulations* [10 CFR Part 50], requires that a nuclear power reactor applicant "Provide an analysis of the time required to evacuate various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations, using the most recent U.S. Census Bureau data."

Q: What regulations require nuclear power plants to update their ETEs?

A: Paragraphs 4–6 of Section IV in Appendix E to 10 CFR Part 50 contain the requirements for nuclear power reactor licensees to update their ETEs. Specifically, within 365 days of the availability of the most recent decennial U.S. Census Bureau data, nuclear power reactor licensees shall develop an ETE analysis using the decennial data.

During the years between decennial censuses, nuclear power reactor licensees shall estimate EPZ permanent resident population changes once a year using the most recent U.S. Census Bureau annual resident population estimate and State and local government population data, if available. If at any time during the decennial period, an increase in the EPZ permanent resident population causes the estimated evacuation time to increase beyond a designated threshold[1], a licensee shall update the ETE analysis to reflect the impact of that population increase.

[1] *Threshold: The EPZ permanent resident population increases such that it causes the longest ETE value for the 2-mile zone or 5-mile zone, including all affected Emergency Response Planning Areas, or the ETE for the entire 10-mile EPZ to increase by 25 percent or 30 minutes, whichever is less, from the licensee's currently NRC approved or updated ETE.*

Q: Who approves the ETE for a nuclear power plant site?

A: The NRC, in coordination with the Federal Emergency Management Agency (FEMA), reviews and approves an applicant's ETE as part of the initial plant licensing process.

The recently implemented EP Rule requires licensees to submit ETE updates to the NRC. The NRC does not perform a formal licensing review and approval of ETE updates. Instead, the NRC performs a "completeness" review to verify that all necessary components of the ETE as listed in the ETE guidance document NUREG/CR-7002 are included in the update.

Q: Are ETEs publicly available?

A: Yes. The submittal of ETE updates to the NRC ensures that ETEs are publicly available on the NRC's Agency-wide Documents Access and Management System (ADAMS).

Q: Will the NRC share ETE updates with FEMA?

A: Yes. NRC staff will periodically inform FEMA of ETE updates received and when completeness reviews have been finished.

Q: What guidance do the NRC and FEMA provide for developing an ETE?

A: The NRC published NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies," the latest guidance on developing ETEs, in November 2011.

NUREG/CR-7002 provides guidance on developing evacuation demand, preparation activities, ETE modeling, and reporting results. Additional criteria in the document include:

--Development of ETEs for a "staged evacuation" protective action. *A staged evacuation occurs when one area is ordered to evacuate while adjacent areas are ordered to shelter in place until directed to evacuate.*

-- Use of existing emergency preparedness programs when developing an ETE.

--Use of traffic simulation modeling.

-- Consideration of "shadow evacuation" in the ETE analysis. *A shadow evacuation is defined as an evacuation of people from outside an officially declared evacuation zone.*

-- Verification of commitment of resources, such as buses, ambulances, etc.

-- Consideration of the "evacuation tail." Research of existing evacuations shows that a small percentage of the public, about 10%, takes a longer time to evacuate. This 10% is defined as the evacuation tail.

--ETE updates.

Q: Are licensees required to follow the guidance outlined in NUREG/CR-7002 to develop ETEs?

A: No. Application of NRC guidance by licensees ensures consistent implementation of regulatory requirements by providing an acceptable method that licensees may use to meet the requirements. A licensee may choose not to use the NRC guidance but must justify how the ETE meets NRC regulatory requirements.

Q: Are State and local agencies involved in the development and updating of ETEs?

A: Yes. Section 5.3, "State and Local Review," of NUREG/CR-7002, states:

> "Interaction with State and local agencies is necessary to obtain local and regional data, understand the operations and resources of the emergency response capabilities, and understand the traffic management system. The ETE should list those agencies that have been contacted, and briefly, the extent of interaction with these agencies as related to the development of the ETE. Any issues that may affect the ETE should be discussed and resolved. This will help assure that appropriate agencies, such as those providing traffic control or resources to support the evacuation, are aware of the ETE strategies, issues, and assumptions."

Q: Does the NRC provide guidance on incorporating ETEs into protective action strategies?

A: Section 1.3.1 to NUREG/CR-7002 provides guidance on developing ETEs for a staged evacuation. Staged evacuation ETEs are used to determine whether a staged evacuation could be implemented as a protective action strategy during a rapidly progressing severe accident. Supplement 3 to NUREG-0654/FEMA-REP-1, "Guidance for Protective Action Strategies," provides additional guidance on using ETEs to make protective action decisions.

Q: Why is "shadow evacuation" considered, and what percentage of the population is considered?

A: NUREG/CR-7002 recommends including a 20% shadow evacuation in the ETE analysis to account for any effect this population group (outside an officially declared evacuation zone) may have on impeding an evacuation for those under a formal evacuation order.

Q: Why should an ETE be developed to provide the time to evacuate both 90% and 100% of the total EPZ population?

A: The 90% value is developed to account for a small percentage of the public, about 10%, that may take a longer time to evacuate. This 10% is referred to as the "evacuation tail." While planning is established to evacuate all of the public, decision makers should use the 90% ETE values when developing procedures for the implementation of protective action decisions. The 90% value informs decision makers of the estimated time to evacuate the vast majority of the public, and the 100% ETE informs decision makers on the likely time for the EPZ to be fully evacuated. Therefore, the time to evacuate 90% and 100% of the population should be provided in the ETE study.