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## Emergency Preparedness: Beyond power reactors

The Nuclear Regulatory Commission has always emphasized protecting public health and safety in the event of a nuclear power plant accident. But did you know that the NRC also oversees the emergency plans for other types of nuclear facilities and materials, including research and test reactors, fuel fabrication facilities, and nuclear medicine? NRC also oversees the emergency plans of decommissioned nuclear power plants and spent fuel storage facilities. Over the next few issues of Emergency Preparedness and Response News, we will offer information about the nuclear regulations related to these licensees. In this article, emergency preparedness related to research and test reactors is discussed.

Research and test reactors (RTRs), also called “non-power” reactors, are nuclear reactors mainly used for research, training and development. RTRs contribute to almost every field of science including physics, chemistry, biology, medicine, geology, archeology, and environmental sciences.

NRC regulations contained in

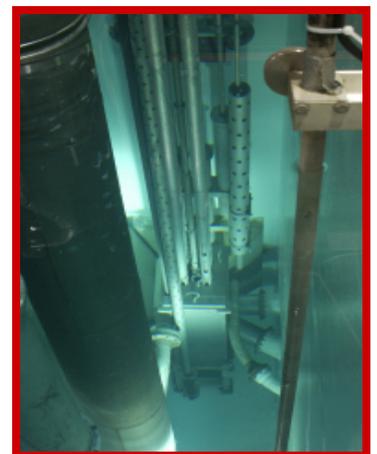
Title 10, Part 50.54(q)(2) of the Code of Federal Regulations (CFR), state that RTRs follow and maintain in effect emergency plans that meet the requirements of Appendix E to 10 CFR Part 50. Guidance for the content of these emergency plans is described in Regulatory Guide 2.6, “Emergency Planning for Research and Test Reactors.”

There are 10 planning standards for RTRs, similar to the 16 planning standards in Appendix E to 10 CFR Part 50 for commercial nuclear power reactors. These planning standards include: Organization and Responsibilities, Emergency Classification System, Emergency Action Levels, Emergency Planning Zones, Emergency Response, Emergency Facilities and Equipment, Recovery, and Maintaining Emergency Preparedness.

ANSI-15.16-1982 and NUREG-0849, “NRC’s Standard Review Plan for the Review and Evaluation of Emergency Plans for Research and Test Reactors”, identify the elements of an emergency plan that describes the approach to coping with emergencies and minimizing the

consequences of accidents at research and test reactor facilities. NUREG-0849 specifies emergency planning zones (EPZs) designed to prevent radiological doses to the general public exceeding EPA protective action guides. As such, RTR EPZs range in size from the reactor site’s operations boundary to 800 meters based on the steady-state thermal power output of the reactor.

The four emergency classification levels identified in Appendix E to 10 CFR Part 50 (Unusual Event, Alert, Site Area Emergency, and General Emergency) are applicable to RTRs. However, since the potential radiological release is small, RTRs do not have events that could result in general emergency classification.



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## Enhancing the Emergency Classification Process

The NRC is in the process of reviewing and assessing the endorsement of Revision 6 to Nuclear Energy Institute (NEI) 99-01, "Development of Emergency Action Levels for Non-Passive Reactors." This document, which provides guidance to licensees and applicants on acceptable methods for complying with NRC's regulations contained in Section 50.47(b)(4) to Title 10, Part 50 of the *Code of Federal Regulations* (10 CFR 50), requiring the development of a "standard emergency classification and action level scheme ..." NEI 99-01 provides specific thresholds and criteria, referred to as Emergency Action Levels (EALs), for the classification of events based on system malfunctions, hazardous events, fission product barriers, and abnormal radiological conditions.

Revision 6 to NEI 99-01 incorporates lessons learned from recent industry events, as well as enhancements and clarifications identified from developing and implementing site-specific EAL schemes, and will facilitate consistent implementation of the EAL guidance. Implementation includes a detailed review of the guidance to re-validate the appropriateness of an EAL. In addition, the revision incorporates specific lessons learned from

the Fukushima Dai-ichi event and recommendations from the recently published NRC study, entitled NUREG/CR-7154, "Risk-Informed Emergency Preparedness Oversight: Evaluation of Emergency Action Levels."

While the entire document has undergone changes related to format and structure, the following high-level changes to NEI 99-01, Revision 6, are highlighted below.

- Revised EALs to remove ambiguity and add guidance as necessary to facilitate consistent event classification;
- Added EALs to capture spent fuel pool level events consistent with NRC order EA-12-051;
- Added a General Emergency EAL to capture simultaneous losses of power (alternating current (AC) and batteries (DC));
- Provided additional guidance for the development of EALs for non-passive reactor designs.

This document is available online in NRC's document system, under ADAMS Accession Number: MLI2257A236.

## Changes to Evacuation Time Estimate Study Requirements and Guidance

The evacuation time estimate (ETE) is a calculation of the time needed to evacuate certain sectors of the plume exposure pathway emergency planning zone (EPZ), which is the area with a radius of about 10 miles around a nuclear power plant. The ETE is used primarily to inform protective action decision-making and may also be used to develop traffic management plans to support an evacuation. With the recent revision to its emergency preparedness regulations, the NRC has updated and clarified requirements for the periodic review and updating of ETEs. Under the new regulations, nuclear power reactor licensees shall use their ETEs in the formation of protective action recommendations and

provide the ETE to State and local governmental authorities for use in developing offsite protective action strategies.

Concurrent with the new EP Rule, NRC published NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies." Some of the key criteria developed in this document include:

- Development of ETEs for a staged evacuation protective action;
- Emphasis on the use of existing emergency preparedness programs when developing the ETE; and
- Consideration of shadow evacuation in the analysis.

### Upcoming Events of Interest to the EP Community



23rd Annual National Radiological Emergency Planning Conference (NREP)

April 8-11, 2013 in Austin, TX [www.nationalrep.org](http://www.nationalrep.org)

Annual NEI Emergency Preparedness Forum and Training

June 9-14, 2013 in Baltimore, MD [www.nei.org](http://www.nei.org)

