



The Importance of Effective and Efficient Communication during Real and Exercise Situations of the Emergency Plan of Nuclear Power Plants

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Abstract

Equipment and system failures are common operational events in nuclear power plants. Experience has shown the sequence of events from a combination of initiating events associated with human and design deficiencies culminating in critical external consequences. The nuclear accidents that have already occurred at the TMI, Chernobyl and Fukushima plants can be used as example and they have been exhaustively and extensively evaluated and several lessons learned and recommendations have been generated, with the aim of increasing the operational safety of the nuclear plants. Additionally, exercises related to the Emergency Plan for nuclear power plants are carried out periodically, at various levels. There are several levels of exercises carried out throughout the year, the most important being the General External Emergency Plan exercise, which is carried out every odd year, involving real response actions, such as the assembly of hospitals in campaign, evacuation of volunteers from the affected areas and real mobilizations by other organizations. In even years, this exercise is performed partially as a tabletop exercise. The National Nuclear Energy Commission, in its standard CNEN NN 1.04, establishes regulatory requirements associated with the Local Emergency Plan (PEL). It also has emergency plans for regulatory action during these emergency situations. When an emergency situation exceeds the limits of the nuclear installation, in addition to CNEN, other organizations also initiate procedures for handling the nuclear emergency. Although each of these organizations has its own emergency plan, guiding the actions to be taken, there is a general plan, called the External Emergency Plan (PEE) of Rio de Janeiro, which generally describes the harmonious and combined performance of these plans. There is also a government organization called the Brazilian Nuclear Program Protection System – SIPRON, which provides general guidelines for planning and carrying out actions inherent to a nuclear emergency, in the area outside the limits of the nuclear installation. This organization establishes the structure of emergency centers at local (municipal), state and federal levels. There is also an Emergency Center responsible for disseminating information related to the Nuclear Emergency – Nuclear Emergency Information Center – CIEN, formed by the main organizations that respond to a nuclear emergency. In addition to CIEN, on an individual basis, the Regulatory Body and the operating organization the plant are expected to be asked for information. There must be a perfect harmony in the dissemination of this information in order to avoid conflicts and confusion for the population and for the external respondents themselves. Within this context, communication plays an important role, informing the population about the occurrence of events associated with the operation of the nuclear power plant, trends, guidelines and recommendations regarding the necessary protective actions. This paper presents the current communication structure that exists to act during a nuclear emergency or exercise, experiences from previous exercises and recommendations, based on the IAEA references to improve and strengthen aspects related to these communications.

Keywords: Nuclear emergency, Exercises on nuclear emergencies, Emergency plans, Response to Nuclear Emergencies

References

- [1] CNEN, “Norma NN 1.04”, *Licenciamento de Instalações Nucleares*, Rio de Janeiro, 2002.
A. Author, “Article,” *Journal Name*, vol. 1, pp. 1–199 (2013).
- [2] Eletronuclear, *Plano de Emergência Local – PEL*, Angra dos Reis, 2021
- [3] IAEA, “General Safety Guide GSG-2”, *Criteria for use and Response for a Nuclear or Radiological Emergency*, IAEA, Viena, 2011.
- [4] IAEA, “General Safety Guide GSG-14”, *Arrangements for Public Communication in Preparedness and Response of Radiological and Nuclear Emergency*, IAEA, Viena, 2020.
- [5] IAEA, “Emergency Preparedness Response – EPR”, *Actions to Protect the Public in an Emergency due to Severe Conditions at a Light Water Reactor*, IAEA, Viena, 2017.
- [6] IAEA, “Emergency Preparedness Response – EPR”, *Communication with the Public in Nuclear or Radiological Emergency*, IAEA, Viena, 2012.
- [7] IAEA, “Emergency Preparedness Response – EPR”, *Preparation, Conduct and Evaluation of Exercises to a Nuclear or Radiological Emergency*, IAEA, Viena, 2005.
- [8] IAEA, *Safety Glossary - 2018 edition*, IAEA, Viena, 2018.