

Application of the modified APELL methodology coupled to the use of Bayesian network for external emergency plans

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Introduction

The issue of the risk of the activities on the facilities belonging to the nuclear fuel cycle has occupied a prominent position in discussions about the facilities' security, not only of their employees, but also to the population living in their surroundings. This work presents a case study based on the perception of the local population to verify the existence of a risk communication between a nuclear facility and the local population (structured questionnaire) in order to analyze their social perceptions with regard to the nuclear facility itself [1]. The questionnaire was developed with a view to be included in communication programs for local emergencies, should they surpass the limits of their respective facilities, using a modified APELL (Awareness and Preparedness for Emergencies at Local Level) methodology, as the facility in question does not currently use questionnaires in its mobilization plans. The questionnaire with their answers was modeled using Bayesian Networks in order to identify the district improvements regarding the credibility of the facility installation before the population. The calculations were performed using the NeticaTM [2] program and their results have shown that this is an appropriate approach as it improves the reliability of the questionnaire automatically generating predictions or decisions.

Considerations and Conclusions

After processing the data with SPSS [3], it was possible to draw some conclusions about how to apply the modified APELL methodology to the residents living near the Engenheiro Passos plant, in the district of Resende (RJ, Brazil). The first is that, regardless of age and/or educational level, the vast majority believe that the plant in question impairs their quality of life and would like to be warned about possible emergency programs. Also, they consider it of paramount importance that the representatives of the factory keep them always

informed through meetings about what happens both inside and outside the plant. As they trust the representatives and believe that the installation of sirens in the town would be an excellent method for warning the inhabitants about eventual accidents.

The second conclusion is that one should promote cooperation between public, private and community institutions, to encourage awareness in the local community, and finally, to perform joint actions between the community and factory representatives, because it is this community that will be affected if an accident occurs.

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