

Approaches to Estimating the Radiation and Socio-Economic Consequences of the Fukushima Daiichi Nuclear Power Plant Accident Using the Data Available in the Public Domain

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Abstract : Major radiation accidents carry not only the potential risks of negative consequences for public health due to exposure but also because of large-scale emergency measures were taken by authorities to protect the population, which can lead to unreasonable social and economic damage. It is technically difficult, as a rule, to assess the possible costs and damages from decisions on evacuation or resettlement of residents in the shortest possible time, since it requires specially prepared information systems containing relevant information on demographic, economic parameters and incoming data on radiation conditions. Foreign observers also face the difficulties in assessing the consequences of an accident in a foreign territory, since they usually do not have official and detailed statistical data on the territory of foreign state beforehand. Also, they can suppose the application of unofficial data from open Internet sources is an unreliable and overly labor-consuming procedure. This paper describes an approach to prompt creation of relational database that contains detailed actual data on economics, demographics and radiation situation at the Fukushima Prefecture during the Fukushima Daiichi NPP accident, received by the author from open Internet sources. This database was developed and used to assess the number of evacuated population, radiation doses, expected financial losses and other parameters of the affected areas. The costs for the areas with temporarily evacuated and long-term resettled population were investigated, and the radiological and economic effectiveness of the measures taken to protect the population was estimated. Some of the results are presented in the article. The study showed that such a tool for analyzing the consequences of radiation accidents can be prepared in a short space of time for the entire territory of Japan, and it can serve for the modeling of social and economic consequences for hypothetical accidents for any nuclear power plant in its territory.

Keywords : Fukushima, radiation accident, emergency measures, database

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