

The TGT Estimation of the Social Behavior Characteristics for Permanent Resident around NPPs in KOREA

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1. Introduction

The most strong protection method of radiation emergency preparedness is the evacuation when a great deal of radionuclide materials is released to environment.

NRC(Nuclear Regulation Committee) made the evacuation time estimation to be necessary condition of emergency plan as the basis technology through the NUREG-0654 and has performed the research of the evacuation using traffic analysis continuously. In KOREA, The Notice 2004-11 of Ministry of Science & Technology nuclear enterprise must estimate evacuation time through the consultation with local autonomous entities and the result of the consultation must be appended in emergency plan. But evacuation estimation method in KOREA was based on simple assumption which did not consider evacuation characteristics and traffic analysis; therefore it could not reflect actual accident adequately [1]. Besides technical aspect, the characteristics of personal and social behavior must be considered in evaluation of the evacuation time. These characteristics of behavior emerged in the research of natural and human disaster rather than nuclear accident which has little experience [2]. So, the characteristics of personal and social behavior must be considered in evacuation time estimation.

2. Methods and Results

2.1 Trip Generation Time (TGT)

Evacuation Time consists of preparation time or trip generation time and trip time. Federal Government Guidelines specify that the planner estimate the event distributions of elapsed times associated with activities undertaken by the public in preparation for evacuation. The Trip Generation Time (TGT) means the sum of event distributions of elapsed times for evacuation (see Table 1). Associated with each sequence of events are one or more activities as Table II [3].

Event Number	Event description
1	Warning initiation
2	Warning receipt
3	Departure from work
4	Arrival home
5	Departure from home

TABLE II. Evacuation Activity.

Event Sequence)	Activity
1→2	Public receives notification information
2→3	Prepare to leave work
2,3→4	Travel home
2,4→5	Prepare to leave for evacuation trip

2.2 Design the questionnaire for Social Behavior Characteristics

We conducted a questionnaire survey of resident around NPP in KOREA to estimate the TGT. The questionnaire content includes the general variables related social behavior characteristics. The target of this survey is 1500 residents around three NPPs in KOREA

TABLE III. Survey Contents

Target	Permanent resident of EPZ around Kori, Wolsong, Ulchin NPP
Sampling	Random sample by aerial allocation
Frequency	Total 1,500 persons
Standard deviation	Total ± 2.49 , Kori ± 4.32 , Wolsong ± 4.29 , Ulchin ± 4.32 (95% confidence level)
Method	Telephone survey
Survey mean	Structured questionnaire
Period of time	23.Jan.2006 ~ 25.Jan.(3days)

3. RESULTS

The TGT of permanent resident around three NPPs in Korea in this research was 50 to 130 min at the 95% cumulative distribution [Fig. 1]. In case of all NPPs, the TGT was 130 min using method of probable sum. This results agree well with the NUREG data in USA.

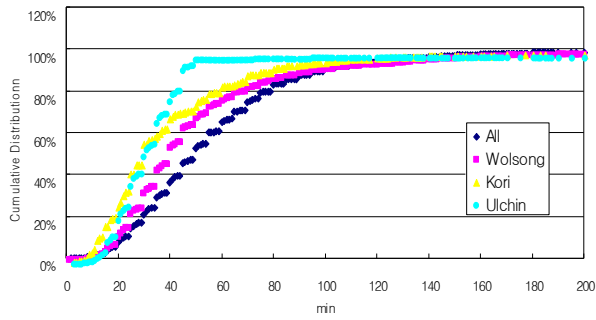


Figure.1. Cumulative distribution of the TGT on three NPPs in Korea

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