

## The Preparation of an Enhancing Model for Nuclear Risk Communication

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### 1. Introduction

When government or regulatory agencies must decide whether to license nuclear power plants despite extremely low probability of pipe rupture in a future accident, democratic societies are faced with difficult choices. The usual decision-making processes of consensus or social acceptability are insufficient to resolve such issues of modern technology, as denoted by CRPC [1].

In the past, only a few experts possessed the best information available to accurately estimate the extent of the possible harm or the likelihood of its occurrence. However, while great weight needs to be given to these experts' decisions, democratic principles require that the decisions be controlled by non-specialists, including NGO, who are answerable to the public. It is also necessary to identify various promoting and/or limiting factors in the communication process which primarily occurs among the receivers related with the process.

Many communities have defined the underlying problem in terms of "public understanding of risk," "risk perception," and "risk communication. [1]" We believe that what is needed is for people to better understand or more substantially perceive the potential costs and benefits of specific technological options. In order to deal with these matters, since early 2007, KINS started a new project to achieve the research objective of its plan to establish a "nuclear risk communication (Nu-RiCom) model" based on public nuclear issues.

### 2. Environmental Analysis for the Nu-RiCom

In general, the term, "risk communication" can be defined as an interactive process among individuals, groups, and institutions, used in exchanging information about topics concern with health, safety, security, or the environment [2].

The ultimate goal of this study is to establish a practical implementation system for Nu-RiCom. First of all, fundamental processes for this system, including sender, message, channel, and receiver, were diagnosed through in-depth searches on domestic example cases. The search results are summarized as follows;

- a) There is an insufficient manpower and organization available for preparing Nu-RiCom in many companies.
- b) It seems that the strategies for Nu-RiCom in a company are somewhat diverse and non-unified.

- c) Short-term strategy to meet stakeholder needs exists, without long-term planning for Nu-RiCom.
- d) There are few category differences in the target (receiver) groups.

Next, vulnerabilities and advanced features of previous Nu-RiCom systems were identified through the environmental impact analysis given by PEST technique.

- (1) **Political environment.** In actually, the government takes care of regulatory policies considering mindset on the public movement and feedback; there is a changing trend from the DAD (decide-announcement-defence) policy to the public opinion-focused policy; also there is a newly-emerging trend about mutual networking and cooperation-based policy.
- (2) **Economical environment.** It seems that the public thinks the value for the current nuclear power generation is steadily increasing; however, if the nuclear safety cannot be totally assured, the other regenerative energies may be superior to the nuclear power. Also, if an adequate communication system for the public is achieved, it can help to solve the problems or conflict of opinions related with the nuclear power generation.
- (3) **Society-cultural environment.** In terms of social perception for the safety, the concerns of the public for preparing a compound solution such as risk communication have been increased; public consciousness on the involvement to the nuclear policies and related systems has been gradually increased; new movements on the science-culture regarding a special public culture are emerged.
- (4) **Technological environment.** Since the commitment to high quality, excellence and professionalism in nuclear power operation can be found throughout the diverse PR tools of media and experts' statement, acting as a positive mechanism for the reduction of public distrust; The IT for two way information transfer such as high speed communication network has been highly developed; with the ground demand of techniques for achieving safe and pleasant environment, the transparency for such management on nuclear power and waste treatment is also required.

After the summary on the results of PEST analysis, we can conclude that the global environmental factors

surrounding Nu-RiCom have become more affirmative, and that might allow more active and positive strategies on domestic Nu-RiCom.

### 3. Preliminary Model of the Nu-RiCom

For preparing a Nu-RiCom model, benchmarking on the current other similar models are as follows [3];

- the model for general risk perception pattern process,
- the model for social amplification of risk,
- the model based on lay public communication,
- general hazard risk communication model,
- the model for crisis and emergency risk communication model,
- the mental model approach,
- the enhanced cooperative model (ENCOM).

After benchmarking of the above models, a preliminary model on Nu-RiCom is suggested. The model is based on the traditional S-M-C-R-E (sender-message-channel-receiver-effect) scheme (“Who says what in which channel to whom with what effect?”) and tentative primary factors as shown in Figure 1.

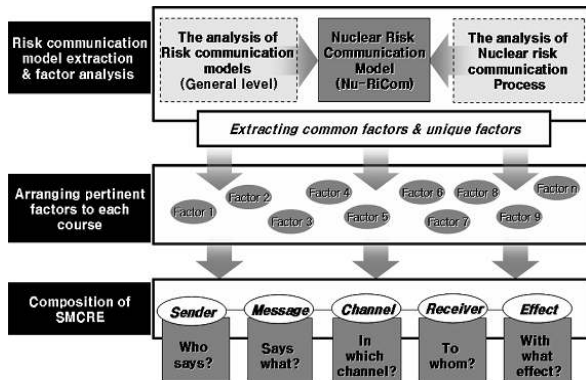


Figure 1. The View of preliminary Nu-RiCom Model

### 4. The Survey for Optimizing the Model

Typical primary factors of each S-M-C-R-E process have been surveyed by way of preliminary and small-scale (200 samples) public questioning, and then screened out for optimizing the model configuration. The major objective of the survey is to extract a lot of primary factors for the determining perception of the public on Nu-RiCom. The numbers of items of the survey for each process, as well as explanation of the process, are denoted in Table 1. The survey is evaluated by the 7-points “Likert scale.” In the scale, point 1 means “I absolutely disagree,” point 4 means “Normal or I don’t know,” and point 7 denotes “I absolutely agree.” Finally we can extract the primary factors (P.F.) for each process, as shown in Table 1.

In the near future, a wide-scale public questioning will be done for further intrinsic delicacy of primary factors of S-M-C-R-E processes, followed by the study on the causal influence between primary factors (i.e., causal loop diagram). Then, diverse actual cases including major issues related with Nu-RiCom will be analyzed.

Table 1. The numbers of items of the survey

Process	Description	Survey Items	# of P. F.
S	Sources for providing nuclear-related information	75	8
M	Messages for nuclear-related information	66	7
C	Channels for transferring nuclear-related information	60	6
R	Receivers on nuclear-related information	60	6
E	Effects resulting from the communication	61	6

### 5. Conclusions and Further Study

We expect that our Nu-RiCom model can play an important role in obtaining public consensus and enhancing public acceptability on nuclear power. This expectation is primarily based on the following conclusions:

- 1) The model can give practical two way process for communication in case of occurrences of nuclear safety issue
- 2) It can assist to make an effective national framework regarding policy communication.

The final objective is an enhancing model for this kind of risk communication; thus, further research results such as the use of wide-scale public questioning, a model of the casual loop diagram, and the implementation of system dynamics will be given and utilized.

### REFERENCES

[1] Committee on Risk Perception and Communication, *Improving Risk Communication*, National Academy Press, Washington D.C., 1989.  
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 [3] W. J. Kim, et al., A Study of Nuclear Risk Communication Environment & Process, KINS/HR-866, Feb. 2008.