

## An Analysis of the Public Survey for Nuclear Risk Communication

Chang-Ju Lee <sup>a\*</sup>, Yeon-Hee Hah <sup>a</sup>, Kju-Myeng Oh <sup>a</sup>, Won-Je Kim <sup>b</sup>

<sup>a</sup>Korea Institute of Nuclear Safety, 34, Gwahak-ro, Yuseong-gu, Daejeon, Korea, 305-338

<sup>b</sup>U-plus Institute, 379-1, Mangwon, Mapo, Seoul, Korea, 121-820

\*Corresponding author: cjlee@kins.re.kr

### 1. Introduction

Communication is a broad social-science and an imperfect art. This is why the nuclear society is getting more involved in identifying the public's nuclear perception and in coping with the communication challenges in a well-planned, effective and integrated manner. Undoubtedly, the starting point of risk communication should identify what the public wants.

Since 2001, the Korea Institute of Nuclear Safety (KINS) has conducted public opinion polls on a yearly basis in order to gain knowledge about the public's awareness toward nuclear safety and to identify their needs. The main purpose of these past surveys is to provide the regulatory authority with basic information concerning the public's opinion on nuclear safety and regulations. Acting on objective assessment of the public's opinion findings, KINS can formulate long-term nuclear safety policies and public relations strategies to enhance the public in understanding nuclear safety better.

In order to mutually support these objectives, since early 2007, KINS has a project to establish a "nuclear risk communication (henceforth Nu-RiCom) model" based on public nuclear issues [1], where a public survey is included.

Table 1. Respondent Characteristics

Demographics		Cases
Total		1,000
Gender	Male	494
	Female	506
Age	10-29	343
	30-39	207
	40-49	209
	Over 50	238
Occupation		37
	Agriculture/Fisheries	182
	Self-Employed	91
	Service	46
	Blue Collar	188
	White Collar	202
	Housewives	199
	Student	55
Region ①	Yeonggwang	125
	Ulsan	126
	Gori	125
	Wolsung	124
Region ②	Seoul	306
	Gyeong-Gi	194

### 2. Overview of the Survey

In this section, key features of the public survey are described. Typical primary factors of each S-M-C-R-E process have already been surveyed by way of preliminary and small-scale (200 samples) public questioning in 2007, and then screened out for optimizing the model configuration. For further intrinsic delicacy of primary factors of S-M-C-R-E [1] processes, specific recommendations by experts were gathered.

The main objective of the wide-scale survey (1,000 samples) performed in 2008 is to get practical factors for determining perception of the public on the Nu-RiCom, and to evaluate relationships between affecting factors, followed by the study on the causal influence between primary factors (i.e., causal loop diagram). Other objectives of the survey are to identify the level of public awareness concerning nuclear risk, and to check the nuclear policy where more risk communication is necessary, depending on survey regions.

Table 2. Overall Structure of Survey

Class	Description	Survey Items	Primary Factors
Factors for SMCRE Process	(S) Sources for providing nuclear-related information	28	5
	(M) Messages for nuclear-related information	28	5
	(C) Channels for transferring nuclear-related information	31	5
	(R) Receivers on nuclear-related information	30	5
	(E) Effects resulting from communication	27	6
Other Concerns	Nuclear risk perception	16	n/a
	Nuclear policy preference	11	n/a

The respondent characteristics are presented in Table 1. As shown in Table 1, 500 citizens from the capital city and 500 site residents from each plant site participated in the survey. The questioning items are items for each Nu-RiCom process, for risk perception and for policy preference, respectively, as shown in Table 2. For the objective survey, we outsourced the work to an external consultant, i.e. Focus Research, Inc. The company has carried out the respondent sampling, interviewee selection and training, face-to-face

interview, data collection, and processing. The survey was evaluated by a 7-point "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." To identify the internal consistency of the survey items, we used Cronbach's alpha ( $\alpha$ ) as a reliability measure, and it should be noted that the analyzed values of all items by this measure were acceptable.

### 3. Analysis of the Survey Results

#### 3.1 Relationship of Process Factors

The survey results indicate that there is a difference between urban region and local site inhabitants' region in terms of the factor structure. To get a better deeper understanding, we performed multi-variable stepwise regression analysis, providing a former factor as an independent variable and a latter factor as a dependent variable. In terms of anticipation level of receivers, we can find highly affecting independent factors to the dependent factor for whole regions, site region, and non-site region, respectively, as shown in Table 3.

Table 3. Highly Affecting Factors in terms of Expect. Level

Process	Whole regions	Site region	Non-site region
S	Moral recognition, Social duty	Speciality	Moral recognition
M	Diversity info.	In-depth info.	Trust info.
C	Consideration on attribute/distinction	Media diversity	Media diversity
R	Demands and concerns	Objective judgment	Request for info. improvement
E	Enhancement of Policy support	Consensus of public opinion	Enhancement of magnanimity

#### 3.2 Comparison Assessment on Nuclear Perception

There exists a so-called "region gap" in nuclear perception, including risk perception, because each region has a different perception in terms of subjective safety. For example, in case of the question on "Nuclear is an important source of energy" or "Nuclear energy is risky," subjective perception of site region is higher than those of non-site (i.e. urban) region.

The previous study [2] identifies that the local residents near nuclear power plants had their own perception toward nuclear safety mostly based on the following four sub-factors: communication, trust, emergency response capability, and personal emergency coping skills. It seems that the survey results confirm that identification.

#### 3.3 Comparison Assessment on Nuclear Policy

Also, there exists a "region gap" in terms of nuclear policy. Table 4 presents some cases of assessment items. In case of the question on "Site inhabitants' should be provided by any compensation due to the residual risk of nuclear energy" and "Nuclear facility gives bad image to the people of site region," subjective perception of urban region is higher than those of site region. However, we cannot identify exact reasons why these unexpected results come out.

Table 4. Some Comparison Results (4 out of 11) on the Survey of Nuclear Policies

Assessment Items by Questionnaire	Non-site region (*)	Site region	t
I agree on the government policy for nuclear energy.	4.53	4.69	-1.77
I believe the press (media) regarding nuclear news.	4.57	4.44	1.50
Site inhabitants' should be provided by any fund or compensation.	5.70	5.48	2.98
Nuclear facility can give bad image to the people of site region.	5.0	4.06	10.0

(Note) It is given by mean values from 7-points Likert scale assessment.

### 4. Conclusions

This study presents some valuable insights on policy preference and diverse affecting Nu-RiCom factors in terms of expectation levels, as follows:

- 1) The highly affecting independent factors to the dependent factor are sometimes different for each region;
- 2) There is a "region gap" in nuclear perception, because each region has a different perception in terms of subjective safety;
- 3) Unexpectedly, for some questions, subjective perception of urban region is higher than those of site region.

Based on these survey insights, it seems that improved strategies for more effective communication, which feature the planning, methods, details and new approaches of such communication, will be necessary.

### REFERENCES

- [1] C. J. Lee, et al., *Preparation of an Enhancing Model for Nuclear Risk Communication*, Korean Nuclear Society Autumn Meeting, Pyeong-Chang, Korea, October 30-31, 2008.
- [2] Y. H. Hah, et al., *Study on the Enhancement of Public Acceptance in Nuclear Safety*, KINS/GR-365, 2007.