Development and Pilot Operation of Nuclear Safety Information Training Programs for Local Residents of NPP

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1. Introduction

With the enforcement of Act on Nuclear Safety Information Disclosure and Communication, information disclosure and communication have been significantly strengthened. In particular, in terms of accessibility of information, a paradigm change in communication is expected by expanding from online to offline. Accordingly, as a duty of the Nuclear Safety Information Sharing Center, it is necessary to provide education and contents suitable for the public eye level[1]. Most of domestic nuclear safety education is being conducted for legally required education, for each institution's own business or publicity, and for professional knowledge and technology. In particular, local residents of nuclear power plants are a group of high interest in nuclear energy, but there is no specialized education for local residents. Therefore, in this study, among the educational programs to be provided through the Nuclear Safety Information Sharing Center in the future, a training course targeting local residents was designed and the results of the design were analyzed through pilot operation.

2. Methods and Results

2.1 Overview of Program Development

For curriculum development, it was used based on the ADDIE model, a systematic educational content and course development model. This is one of the main methodologies used by the IAEA to assess the effectiveness of training in nuclear facilities[2]. The basic ADDIE process consists of analysis, design, development, implementation, and evaluation.

Table I: Development Methodology

Step	Contents
Analysis	- Analysis of requirements - Analysis of existing curriculum
Design	- Set educational objectives and - Selection of content experts
Development	- Basic manuscript development - Inspection by HRD expert
Implementation	- Establishment of training plan - Pilot course operation
Evaluation	- Pilot course operation - Evaluation of satisfaction

2.2 Analysis of Requirements

The requirements for educational programs were investigated through telephone interviews with residents in the area around the nuclear power plant. Through questions about opinions on the development of nuclear safety information education programs, education topics, contents, methods and priorities were investigated. As a result, the most important educational topic was reactor safety, especially how to deal with safety accidents. In addition, there were many opinions on the regular operation of two-way communication, experience, practice, and collective education.

2.3 Curriculum Design and Development

On the educational topic derived through the analysis of educational consumer requirements, the purpose, process of education, main contents, and methods were designed through content experts. Based on this, textbooks and lecture materials were developed. The developed basic curriculum is shown in Table 2 below. The developed curriculum is organized in the form of a module for each subject and is designed so that it can be selectively trained as necessary.

Table II: Suggested Basic Courses for Local Residents

Educational Objectives			
- You can know the current status of nuclear power plants, management and inspection, and waste management in our region. - You can learn the national radioactive disaster prevention system and action tips in case of emergency. - Major protective equipment and equipment can be utilized.			
Module I	Current Status of Nuclear Power Plant Management in Korea		
Contents		Method	Time
- Understanding nuclear energy and power generation - Trends in nuclear power plants at home and abroad - Safety management of nuclear power plants in our region - Safety management of radioactive waste - Disposal of spent nuclear fuel		Lecture Case Study Q&A	2.0H

Module II	Nuclear Safety and Crisis Management and Countermeasures in Emergency	
Contents	Method	Time
- Understanding nuclear facility disaster - Radiation emergency recognition - Understanding radiation emergency planning zone(EPZ) - Radiation emergency action tips	Lecture Case Study	2.0H

2.4 Pilot Implementation and Evaluation

Among the developed curriculum, Module II, which was highly necessary for the demand survey, was selected and piloted. Collective education was conducted for local residents and operated in a two-hour course. After education, process evaluation was conducted through a survey on educational satisfaction and major opinions.

Table III: Pilot Curriculum Satisfaction Survey

Category		Measurement Method
Personal Information		-
Level of Difficulty		5 Point Scale
Curriculum	Formation	5 Point Scale
	Content	5 Point Scale
	Material	5 Point Scale
Educational Method	Effective Method	Suggestion
	Inducing Interest	5 Point Scale
Others	Positive Part	Suggestion
	Improvements	Suggestion

The results of the educational satisfaction survey are shown in Table 4 below. As a result of the satisfaction survey, it was found that the educational difficulty was appropriate, but the educational method needed to be improved. As an effective educational method, the necessity of diversifying programs, such as actual cases and experience programs, communication and discussion between participants, was suggested.

When classified by region, it can be seen that the difference in satisfaction by region is large. In particular, the large variation in satisfaction with educational content seems to be due to the fact that the expected level and main interest content due to participation in education differ by region.

Therefore, it is considered that there should be a difference in the composition of educational content depending on the region and target.

Table IV: Results of the Satisfaction Survey of the Pilot Curriculum (N=44)

Region	Level	Curriculum			Interest	Total
		Formation	Content	Material		
Kori	4.14	3.86	3.71	4.00	3.29	3.80
Daejeon	4.17	4.17	4.17	4.17	4.00	4.13
Saeul	4.36	4.27	4.55	4.36	3.64	4.24
Wolsong	4.11	3.67	3.78	3.67	3.56	3.76
Hanul	4.00	3.60	3.20	3.80	3.60	3.61
Total	4.16	3.98	4.00	4.05	3.66	3.95

3. Conclusions

Through this study, the curriculum was designed for residents in areas around nuclear power plants based on the ADDIE model, and the curriculum was evaluated through pilot operation. The purpose of this study was to find examples and improvements for educational programs that can be provided to local residents through the Nuclear Safety Information Sharing Center in the future. Through a preemptive demand survey and component analysis of education targets, the necessity of providing customized education that consumers want was confirmed. We look forward to more active information disclosure and communication through the full-fledged operation of the Nuclear Safety Information Sharing Center.

REFERENCES

[1] Nuclear Safety and Security Commission, “Act on Nuclear Safety Information Disclosure and Communication”, Act No.18239, 2021

[2] IAEA, “A Methodology to Evaluate the Effectiveness of Training in Nuclear Facilities”, IAEA-TECDOC-1893, 2019