

Nuclear Safety Education for Public Communication

Eunkyung Kim, Miwha LEE, Doohyun Cho
Korea Institute of Nuclear Safety(KINS)
ekkim@kins.re.kr, k720lmw@kins.re.kr, s162cdh@kins.re.kr

1. Introduction

1.1 The need for education

The nuclear power plant of South Korea is nearly 30% of total electrical consumption. The nuclear Power Plants have been responsible for stable power supply in South Korea since 1956. Despite of those contributions of nuclear power plant to electrical power production, there had been a negative perception for the radiation risk at the same time. After Fukushima accidents, general public's fears and concern for nuclear power plant have increasing dramatically. Those negative prejudices of nuclear power have been stronger due to the misreport, misinformation or incorrect knowledge. Therefore, it is important to provide right information and knowledge on nuclear power plant use radiation for public to release their vague fear and concern. This program has played a important role as a communication channel by promoting understanding regulation of nuclear safety system.

1.2. The purpose of education and overview

The nuclear safety education program has provided tailored curriculum for students, teachers and general public to solve the vague fear and anxiety from negative aspects of nuclear and radiation. This goal of this program is to promote understanding on nuclear safety and to build trust on assurance of nuclear safety by experiencing and learning nuclear regulatory works and systems. The participants in this program have widespread their knowledge and experience in their community. Those activities have made a consensus on public trust by sharing of information and communicating openly.

1-3 The history of education development

- 2005 : Launched a special 'safety experience' program to help students, parents and opinion-leaders understand nuclear safety and regulatory works through experience such as visits to nuclear facilities and virtual hands-on activities
- 2009 : Extended the target audience of the 'safety experience' program to teachers and the general public in light of public communication on nuclear
- 2011 : Expanded 'Safety experience' program extensively to meet public interests and concern After Fukushima accident and Re-highlighted programs' contribution as a public communication channel for nuclear safety
- 2011: selected one of good practices as a result of the IAEA IRRS, (Good practice-66, 2011.07)

"The "safety experience" training course of KINS dedicated to students/parents, teachers, opinion leaders has been shown to positively influence public understanding and acceptance of the regulatory body's activities"

- 2012 : Introduced throughout the world by President's keynote speech at UN General Assembly

2. The contents of education

2.1. Introduction of Education Course

2.1.1 Targeted participants and structure

This education program is designed for students/parents, teacher/professor, government institution/ organization, social group/institution and others.

It is operated in a customized contents considering the participant's characteristics, age, knowledge level, needs and etc.. The education is scheduled for 1 day or 1 night and 2 days basically but schedules can be adjusted according to education contents and participants' characteristics. The education contents consist of introduction of basic concepts of nuclear safety as a theoretical education, facility tours and field trip to nuclear power plants and scientific experiences related to nuclear power and research. Additionally, this program launched new type course for middle school students in conjunction with "Youth free-learning semester" of the Ministry of Education in 2017.

The new course covers the roles and function of nuclear regulation, so that youth can gain knowledge and experience to make their dream and career. It was implemented lectures or exhibition in educational donation fair.

2.1.2 The specific contents

This education program's curriculum consists of theoretical and experiential parts.

First, the contents of the theoretical education include explanation of the role and status of Korea Institute of Nuclear Safety(KINS), principles and safety regulation of nuclear power generation, regulation of radiation and radioactive waste safety, and radiation emergency responses. Specially, video clips are used to enhance those background knowledge effectively for introduction of KINS, lessons learned from Fukushima accident, and joint training for disaster prevention.

Secondly, the contents of experiential education include field trips to nuclear power plant site, tour of simulator and nuclear reactor, observation of mist box to experience radiation. Technical visit is designed according to each course's needs and purpose. For instance, participa

nts visit the Korea Hydro and Nuclear Power(KHNP)'s public information center to confirm the actual thickness of the 5th barrier wall or tour to the Korea Radioactive waste agency to understand the process of radioactive waste management.

2.2. The Status of implementation in 2017

2.2.1 'Nuclear Safety experience' program

- Programs to general public in various groups.
- Target: general public (students /parents, teacher /professor, government institution/ organization, social group/institution and others)
- Schedule: 1 day or 1 night and 2 days
- Annual Performance: Total 40 times
- Total Participants: 1,845 persons
(General public: 420, Students: 1,425)
- Main contents: ①Education for the general public and social organizations, ②Experience of customized nuclear safety course for youth free learning semester, ③Training for teachers such as career teachers, science teachers, etc. ④Operation of youth camp for nuclear safety, ⑤ Participation to education donation fair for Youth free-learning semester, ⑥Radioactive Disaster Prevention Education by MOU with Yeonggwang Local Government

2.2.2 Program for youth

- Program for youth to provide an opportunity to find out the dreams and career paths by providing customized contents about nuclear / radiation safety regulations based on institutional characteristics
- Program for youth to promote their understanding for radiological disaster prevention so that students can actively cope with nuclear accident
- Type: ① KINS program (5h) consist of theoretical education, facility visit and practical training (7 times, 286 participants) ② School visiting program (3h) consist of theoretical education, practical training (13 times, 634 participants)

2.2.3 Participation in educational experience exhibition

- Provide of nuclear safety education program by installing exhibition booth at Educational Contribution Fair held in Gwangju city from December 14 to December 17, 2017
- Book Cafe using eco-friendly paper shelf
- Title of exhibition: Nuclear radiation safety, which everyone can see and talk easily



- Contents of exhibition: demonstration and explanation of nuclear / radiation protection, explanation nuclear power and radiation regulation using AR (Augmented Reality) video demonstration



2.3. Development of various contents

2.3.1 Design of Edu-Map

The target of education were classified into 10 categories through analysis of last education performance. The Edu-map was designed considering participants' characteristics, education needs and purposes. The optimized education contents, method can be identified on the Edu-map.

2.3.2 '100 Common sense about nuclear and radiation safety'

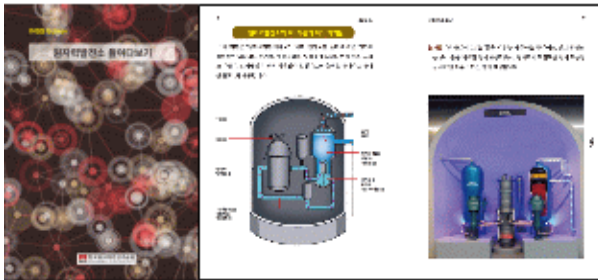
'100 Common sense about nuclear power and radiation safety' was developed as modular contents according to educational needs and characteristics.

Categories	Contents
General	basic concepts for regulation of nuclear and radiation
For me and my family	Environmental radiation
For neighborhood and local	Regulation Issues related to my area
About nuclear facilities	Accidents of Nuclear Power Plant
For protection of environment	Global Environmental Protection
For safe future	Anti-movement for NPP, Radioactive waste, Decommissioning

2.3.3 Development of booklets for lectures/field trip

The 13 types of booklets were developed. Those booklets were distributed as a material.

No.	Title
1	Look into nuclear power plants
2	Nuclear fission and nuclear power
3	Uranium-235 instead of uranium
4	Children and radioactivity
5	Radiation Emergency
6	Fukushima Accident Follow-Up
7	Nuclear power plant safety regulation for earthquake
8	Thinking about accident _ Sri Miled
9	Thinking about accident _ Chernobyl
10	Thinking about accident _ Fukushima
11	Reconstruction of Accident - Ulsan Nondestructive Investigation System
12	Controversy surrounding nuclear power
13	Being a Nuclear Safety Expert



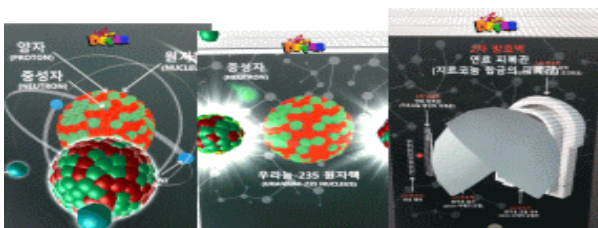
2.3.4 Development of worksheet for students/teachers

The worksheets for students and teachers were developed to use at school. It is specially designed to use "Youth free learning semester" program.



2.3.5 Development of video clip using AR

Video clips using AR (augmented reality) were developed to improve education outcome.



3. Conclusion

Nuclear Safety Education program was designed to alleviate the vague fear and correct misunderstanding of nuclear and radiation. It has provided opportunities to learn theoretical education and experience field trips for general public. Participants have been noted to have correct knowledge and awareness of nuclear and radiation safety after this program.

In addition, this nuclear safety education program expanded to youths in 2017. Youths are able to have opportunities to be aware of their dream and career path about nuclear and radiation safety regulation under the youth free learning semester.

KINS will discharge social responsibility of communication with the public to support transparency on nuclear safety through nuclear safety education continually.