

Development of an Integrated Education/Training based Nuclear Outreach Model

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1. Introduction

The introduction of a nuclear program for the peaceful use in a country requires a nationwide sound infrastructure [1] developed in accordance with its progress. A key element of the infrastructure is stakeholder involvement, which essentially necessitates nuclear outreach including risk communication [2]. Actually, the outreach effort involves human resource development (HRD) activities to a large extent in order to be effective and sustainable [3]. Such efforts are more motivated by the recent nuclear power accident in Fukushima.

The Korean nuclear community also recognizes the importance of outreach from its experience with radwaste and nuclear power programs. Accordingly, nationwide programs dealing with public information, support for local community development, and HRD are implemented continuously involving a number of organizations concerned [4, 5]. The Nuclear Training & Education Center (NTC) of the Korea Atomic Energy Research Institute (KAERI), with its unique function and capability as a national research organization, has needs for the enhancement of public acceptance for KAERI programs, a better contribution to the national effort, and addressing the emerging needs for international education/training on nuclear outreach.

This paper presents an integrated education/training based nuclear outreach model with a set of reference program, which is developed for NTC.

2. Development of a Nuclear Outreach Model for NTC

A general national level nuclear outreach framework including HRD is conceived as a basis for the development of NTC program. The framework consists of 1) analysis of stakeholder involvement, 2) program design, development and implementation, and 3) evaluation and feedback. Considerations given in the framework include:

- Integrity: stakeholder needs based, systematic [6], and national leadership with harmonization of programs of individual organizations involved
- Sustainability: focusing on future generations and seeking for mutual benefits, e.g. job opportunities in nuclear vs. interests in nuclear
- Innovativeness: introducing diverse and attractive program delivery methods.

Then, an integrated education/training based nuclear outreach model for NTC is designed by defining

program objectives, identifying target audiences from the stakeholders, integrating existing and new individual sub-programs in the form of reference program, and establishing an evaluation system, as shown in Fig. 1. Also included in the model are infrastructure and a network system which support the program development and implementation.

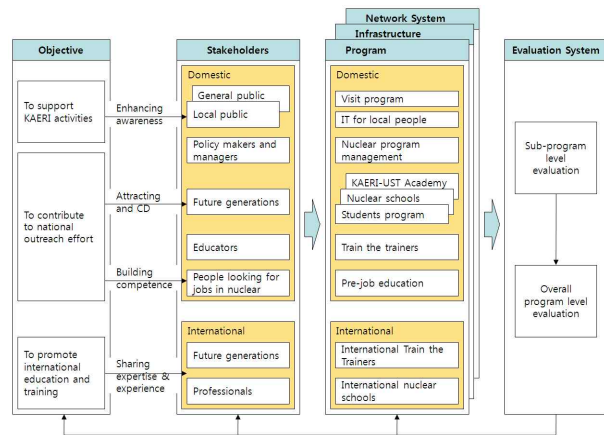


Fig 1. An E/T based nuclear outreach model

The objectives of the outreach program are defined to 1) support KAERI activities through enhancing the awareness of nuclear from the public and policy makers, 2) contribute to the national nuclear outreach efforts by attracting future generations through their career development in nuclear, and by building competence of people looking for jobs in nuclear, and 3) promote international education/training through sharing Korean expertise and experience regarding nuclear outreach.

Major target audiences are identified from the conceivable stakeholders of KAERI activities. They are domestic audiences (i.e. the public, policy makers and project managers, future generations, educators, and people looking for jobs in nuclear) and international audiences (i.e. future generations and professionals).

The program itself is established in the form of reference program addressing the identified target audiences. To support the program, a set of infrastructure requirements, such as facilities and operation system, are identified. Also, a network system is designed to utilize resources within KAERI, and those of domestic and international organizations.

The evaluation system consists of sub-program and overall program level evaluations, which are performed with respect to the program objectives, through opinion survey on the program participants and other stakeholders.

3. Development of a Reference Program

The reference program outlined in the model is further developed by specifying target audiences especially for future generations, identifying sub-programs, and creating design sheets on respective sub-programs, as shown in Fig. 2.

| Target Audience | | Reference program | |
|-----------------|------------------------------------|---|---|
| Domestic | Public | • Visit program for the public | |
| | | • IT course for the local public | |
| | Policy makers and project managers | • Nuclear program management | |
| | Future generations | Primary/middle school students | • Nuclear camp |
| | | High school students | • Nuclear class for the next generation |
| | | University students | • Experiencing research reactor technology for non-nuclear scientists and engineers • Internship programs • On the job training |
| | Educators | Post-graduates & youngsters | • KAERI-UST MS/Ph D. course • Nuclear schools |
| | | Teachers | • Course for primary and middle school science teachers • Course for Meister high school teachers |
| | | Lecturers | • Training to train instructors for nuclear outreach |
| | People looking for jobs in nuclear | • Pre-job education for small and medium sized nuclear related industries | |
| Inter-national | Future generations | • International training to train teachers and instructors for nuclear outreach | |
| | Professionals | • International nuclear schools | |

| Program Design Sheet | |
|-----------------------------|--|
| Title | |
| Objective | |
| Target audience | |
| Contents | |
| Delivery method | |
| Duration | |
| Lecturer requirements | |
| Text, references | |
| Infrastructure requirements | |
| Expected effects | |
| Evaluation method | |
| Remarks for application | |

Fig 2. An E/T based nuclear outreach reference program

The identified sub-programs are:

- Visit program for the public; IT course for the local public
- Nuclear program management (in 3 levels) for policy makers and project managers
- Nuclear camp for primary/middle school students
- Nuclear class for the next generation for high school students
- Experiencing research reactor technology for non-nuclear scientists and engineers (customized to university students' measures); Internship programs; On the job training
- KAERI-UST MS/Ph D. course; Nuclear schools (in nuclear power and RI applications)
- Course for primary and middle school science Teachers; Course for Meister high school teachers
- Training to train instructors for nuclear outreach
- Pre-job education for small and medium sized nuclear related industries
- International training to train teachers and instructors for nuclear outreach
- International nuclear schools (in nuclear power and RI applications).

Design sheets are prepared on the sub-programs, in terms of title, objectives, target audience, contents, delivery methods, duration, lecturer requirements, texts/references, infrastructure requirements, expected effects, evaluation methods, and remarks for applications. Here, the contents are selected from topics of energy policy, nuclear principles, nuclear applications, nuclear safety, lecturing skills, and risk communication, before their levels of depth are adjusted to the audience needs. Delivery methods are arranged along with the specific nature of individual sub-program by introducing conventional and innovative methods,

e.g. class room lectures, e-learning, multimedia display, experiments/experiencing and visits.

4. Application Aspects

The developed model with a set of reference program is to be adjusted and upgraded to the needs of the stakeholders, following the advancement of program delivery methodology, and applied to specific audience with necessary customizations.

Such customization to international programs may consider current stage of the concerned nuclear program, national infrastructure, socio-economic environment, etc. in a recipient country(ies) or a region.

5. Conclusion

An integrated education/training based nuclear outreach model for NTC is developed addressing the increasing needs for public acceptance on the peaceful use of nuclear energy, in terms of supporting KAERI activities, contributing to the national nuclear outreach efforts, and promoting international education and training on nuclear outreach.

The model, harmonized with the national nuclear outreach system, consists of objectives, target audiences, a set of reference program supported by infrastructure and networking, and an evaluation system. The program is further specified into sub-programs with detailed design for the respective audiences.

The developed model with a reference program is characterized by its integrity in terms of encompassing the whole outreach process cycle, and setting up of a target audience based total program structure with existing and new sub-programs. Also, it intends to be sustainable by addressing future generations' needs as well as innovative in the program delivery. The model will be continuously upgraded and applied addressing respective needs of the audiences.

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