

Agenda Analysis of IAEA Meetings in the Area of Nuclear Safety: Measures to Enhance Effectiveness in Participation

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1. Introduction

The Department of Nuclear Safety and Security of International Atomic Energy Agency (IAEA) hosts nearly a thousand meetings per year as a part of endeavor to promote a strong and sustainable global nuclear safety and security framework in its Member States, working to protect people, society and the environment from the harmful effects of ionizing radiation.

The meetings are being held with various goals including information and/or experience exchange, training, consultation, etc. to further enhance global nuclear safety. Experts of IAEA Member States, nevertheless of their national status on nuclear power, advanced or in the process of embarking on it, are actively participating in the meetings as technical experts, lecturers and trainers, trainees, etc.

The experts from Korea Institute of Nuclear Safety (KINS) are also actively participating in nuclear safety related IAEA meetings in average of 60 persons per year which is about 10% of its annual overseas business trips. Since the annual participation accounts for a considerable portion of the overall annual business trips, there lies necessity to enhance effectiveness in participation.

In the course of seeking measures to enhance participating effectiveness, trend analysis of IAEA meetings in 2009-2016, KINS participated meetings in 2015-2016, as well as comparative analysis between IAEA meetings and KINS participated meetings in 2015-2016 have been performed. In this paper, the results of analysis and the measures for its potential application to the participation will be presented.

2. Trend analysis of IAEA meetings

To seek for the trend in nuclear safety related IAEA meetings, the meetings being hosted in 2009-2016 has been analyzed. The purpose of setting the timeframe to 2009-2016 was based on the hypothesis that the major possible-trend-affecting event, the tragic accident took place in Fukushima Daiichi Nuclear Power Plant in March, 2011 affected the trend of IAEA meetings. [1]

For the analysis, the trends in the number of meetings, and the major topic through text-mining technique has been analyzed.

2.1. Trend in the number of meetings

Preliminarily, the annual number of meetings has been looked into, and as expected, the annual number of meetings between 2009-2016 has been gradually increased from mid-500s to almost 1000s by 2016.

Year	Total Number of Meetings
2009	543
2010	743
2011	637
2012	750
2013	943
2014	928
2015	1019
2016	974

Table I: Numerical analysis result of the IAEA Meetings 2009-2016

With such trend in the gradual increase, it has been expected that there would be also changes in specific expertise areas affected. In this vein, the meetings has been segmentalized into 11 specific expertise areas and analyzed for respective trend in the areas of emergency preparedness and response, nuclear security, operational safety, radiation safety, research reactor safety, regulatory and transport safety, safety assessment, safety and security coordination, site and seismic safety, waste safety, policy and programme support.

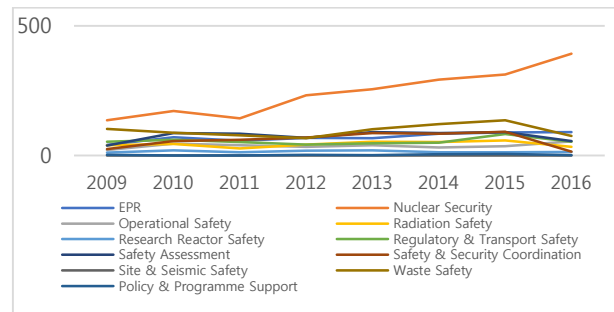


Fig. 1. Segmentalized analysis result of the IAEA meetings 2009-2016

Through the numerical analysis, it has been shown that about 1/3 of overall annual meeting was held in the area of nuclear security, followed by emergency preparedness and response and waste safety in descending order. Additionally, an interesting fact was that there was no site and seismic safety related meeting held during the targeted period.

However, the segmentalized analysis showed that there is no evident changes in the number of meetings per specified expertise areas or significantly affected by Fukushima Daiichi accident except for the nuclear security.

2.2. Trend in the topics

Since the result of the numerical analysis indicated the difficulty in finding significant meaning from the number of the meetings, keyword analysis through text-mining technique has been performed, especially to seek for the trend in the topics of the meetings after the Fukushima Daiichi accident.

For the keyword analysis, word frequency from the topics of the meetings of specific expertise area related to nuclear safety namely emergency preparedness and response, operational safety, radiation safety, safety assessment and waste safety held between 2011-2016 has been analyzed and compared to that of 2009-2010.

Through the text-mining keyword analysis, certain topics for respective specific expertise areas with extremely low or no frequency in the years before the Fukushima Daiichi accident has been identified as shown in the table below.

Expertise Area	Emerg Topics
EPR	Public communication, consequence management, medical response, notification, reporting and assistance, monitoring, public protection, assessment and prognosis, revision of safety standards, requirements and guides
Operational Safety	Safety culture, management system, Root cause analysis, operating experience feedback, leadership and management, ageing management, human and organizational factor, revision of safety standards, requirements and guides
Radiation Safety	Radiation protection, medical exposure, control of contaminated food and drinking water, NORM
Safety Assessment	PSR, severe accident management programme, accident consequence analysis, external event, severe accident analysis management, DBA, DEC, radiological consequence of emergency
Waste Safety	Decommissioning, safe management of radioactive waste and spent fuel, disposal of radioactive waste

Table II: The identified topics emerged after Fukushima accident

3. Result and Comparative Analysis with KINS' Participation Trend

3.1. Result

By performing numerical analysis and keyword analysis of IAEA meetings held between 2009-2016, it has been identified that even the total number of annual meeting has been gradually increased over the years, the average number of meetings for specified expertise areas has not been much affected by the Fukushima Daiichi accident.

However, despite the number of meetings does not carry meaningful significance, it is viewed that the topics of the meetings has been much influenced by the accident, addressing the issues that have arisen in global nuclear safety society after the accident.

With such result, yet it is difficult to present the degree of importance for respective expertise areas and topics in quantitative numerical value based on the frequency, the followings can be identified from the result of the topical

analysis as the issues that IAEA values with the greater importance:

- Human and organizational factors
- Governmental, legal and regulatory framework
- Leadership and management
- Radiation protection
- Radioactive waste and spent fuel management
- Emergency preparedness and response
- Severe accident management

3.2. Comparative Analysis with KINS' Participation Trend

With the IAEA focused areas identified, the IAEA meetings KINS experts participated during 2015-2017 was analyzed to compare whether the participation has been in-line with the IAEA focused area.

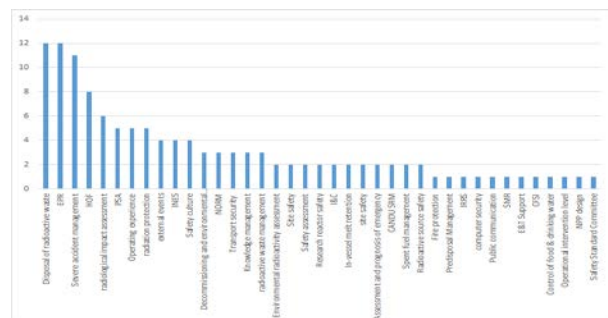


Fig. 2. KINS' participation trend analysis by topic

Through the comparative analysis of KINS participated IAEA meetings with IAEA focused area, it has been identified that topics of the frequently participated meetings are aligned with IAEA focused areas which are counted to 73% of overall participation within the analyzed period. The rest of the meetings from the IAEA focused areas are participated in relation to domestic needs and global, or technical specific issues.

However, there exists a limitation to the interpretation of analysis result. The result only indicates that a considerable portion of KINS participation to the IAEA meetings is in line with the topical trend in numerical value without consideration to the qualitative and effectiveness point of view.

4. Measures to enhance participation effectiveness

Effectiveness in participation to the IAEA meetings can be variously defined by the point of views as follows:

- Enhancing contribution to the global society
- Fostering global experts
- Improving response to the domestic needs or issue

4.1. Enhancing contribution to the global society

The IAEA meetings can be broadly categorized into three types; technical meetings, consultancy meetings, trainings.

- Technical meetings are the meetings, conferences where experts share and exchange information, experience, expert views on certain issues. Participation to the majority of technical meetings are in voluntary basis.
- Consultancy meetings are usually being held with a small number of experts to produce practical and professional results such as technical documents, guidance documents, etc. Most of the consultancy meetings are closed meetings, and the participation is in invitational basis.
- Training meetings are being held in various forms such as lecture, workshop, etc., and in levels of global, regional and national levels. The depth and participation of training vary by the targeted audience and the topic of each trainings.

By considering the IAEA meeting characteristics, especially, increase participation to the consultancy meetings and to the training meetings as lecturers can enhance contribution to the global society, as one of the leading nuclear advanced states.

It has been identified that topics of the considerable portion of KINS participated meetings are in line with IAEA focused areas. Yet, the participated meeting types are rather concentrated in the technical meetings for the past three years.

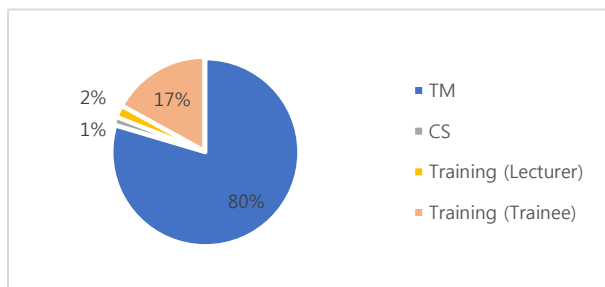


Fig. 3. Composition of KINS' participated meetings by meeting type

Such trend does not imply that the current participation pattern is not effective, nonetheless, it can also be viewed that there are further opportunities to contribute to and possibly reflect the voice of our country to the practical work of IAEA by participating to consultancy meetings.

To increase participation to consultancy meetings which participation is mostly under invitational basis as mentioned above, experts' active and continual participation to technical meetings should be premised upon, thus, achieving recognition to be one of global experts in certain area of expertise.

4.2. Fostering global experts

It has been analyzed that the current participation trend of KINS experts to the IAEA meeting are much in line with the areas IAEA values. It is highly recommended

that such participation trend to be kept up, but could be further improved with a continuous participation of experts in respective expertise areas. In other words, global experts in various areas needs to be fostered.

The areas of KINS experts' participation to the IAEA meetings are usually based on the expertise field of the departments the participants belong. This leads to changes in the participants if organizational restructuring or department transfer take place. There would be no problem arising from such changes, however, there remains lacking of knowledge transfer and management and possibility of building up a perception towards frequently changing KINS participants as a random participant rather than as an expert in the field globally credited for.

In order to foster global experts, participation continuity needs to come first, and knowledge and information transfer to the succeeding participant should take place if changes should occur, as well as the management of the accumulated knowledge. There are certain areas where such so called global experts are participating in IAEA meetings with continuity, nevertheless, such global experts are need to be fostered possibly in all areas of expertise KINS deals with.

4.3 Improving response to the domestic needs or issues

The participation to IAEA meetings is with purposes not only to contribute to the global nuclear safety society, but also to actively respond to domestic needs or issues.

Participation to technical meetings and trainings are in relation with such initiative. Such participation provides the participant with an opportunity to collect global information and trend, as well as to be trained or educated on certain areas.

To improve response to the domestic needs or issue by participating in IAEA meetings, the participation should go beyond the opportunity of participation itself. The discussed content and result of the meeting and training are required to be further disseminated upon their return. The disseminated information can be utilized or referred to when dealing with domestic technical or political needs or issues.

5. Conclusion and Challenges

The ideas to enhance effectiveness in participation to the IAEA meetings presented in this paper, talk mostly about improving effectiveness through enhancing personal expertise. However, enhancement in personal expertise and active dissemination of the accumulated expertise, knowledge also leads and contributes to the potential strengthening of organizational capability in all areas related to nuclear safety. Such initiative also aligns with the implementation purpose and direction of organizational international cooperative activities.

Through the analyses carried out in the course of writing this paper, it has been indicated that there are key areas where IAEA values with priority and importance, and KINS' participation trend is in line with the IAEA's trend in decent portion.

However, the limitation of this paper is that the analyses were carried out only based on quantitative, numerical inputs. The frequency of meetings being held does not necessarily imply the weight or the degree of importance on the respective topics. It is viewed that, in the following research, considering qualitative side of the meetings, and possibly domestic issue trend of the analysis period would further provide significant insights from the meeting and participation trend.

Also, ideas to further improve participation effectiveness to the IAEA meetings have been pointed out. It is believed that further study needs to be carried out to consider many aspects such as organizational manpower operation point of view, etc., in the course of realizing ideas into practical measures.

REFERENCE

[1] IAEA, Nuclear Safety and Security Meeting Calendar, 2009-2016 (www-ns.iaea.org/meetings)