

**ASEM SEMINAR ON NUCLEAR SAFETY:
NATIONAL, REGIONAL AND INTERNATIONAL NUCLEAR EMERGENCY
PREPAREDNESS AND RESPONSE**

SINGAPORE, 13-15 JUNE 2012

CO-CHAIRS' SUMMARY REPORT

1 The first ASEM Seminar on Nuclear Safety was held in Singapore, from 13-15 June 2012. The Seminar was co-chaired by Mr Vanu Gopala Menon, Deputy Secretary (Asia-Pacific) of the Ministry of Foreign Affairs of Singapore, Mr Peter Faross, Acting Deputy Director-General and Director, Nuclear Energy, European Commission, Dr Tarja Ikäheimonen, Director, Research and Surveillance Department, Radiation and Nuclear Safety Authority, Finland, Mr Jean-Luc Lachaume, Deputy Director-General, Nuclear Safety Authority, France, Mr Ichiro Ogasawara, Deputy Director-General for Disarmament, Non-Proliferation and Science, Ministry of Foreign Affairs, Japan, and Dr Kim Sang-Yun, Director, Research and Policy Division, Korea Institute of Nuclear Safety (KINS).

2 The theme for the Seminar was “National, Regional and International Nuclear Emergency Preparedness and Response”. Participants included representatives from nuclear regulators and operators from 24 ASEM partners, the International Atomic Energy Agency (IAEA), and the World Association of Nuclear Operators (WANO).

OPENING SESSION

3 Singapore’s Minister of State for Home Affairs and Foreign Affairs Mr Masagos Zulkifli was the special guest at the opening session of the Seminar. IAEA Deputy Director-General Denis Flory delivered the keynote address while the Seminar Co-Chairs also made opening remarks.

4 In his remarks, Minister of State Masagos Zulkifli noted that nuclear incidents could have far-reaching effects. He added that while nuclear safety remained a national responsibility, because of the transboundary nature of incidents, he asked the Seminar to discuss how to enhance capacities and strengthen coordination and cooperation at regional and international levels.

5 In his keynote address, Mr Flory called for strengthening the international response framework. The IAEA and the international community shared a common goal of reducing the likelihood of accidents and improving nuclear safety worldwide. Hence IAEA Director-General Yukiya Amano had proposed a 12-point Action Plan, which IAEA member states had adopted unanimously in September 2011. The success of the plan depended on implementation by member states. There was also a need to harmonise standards. Mr Flory added that while nuclear power remained a viable energy option for some countries, public confidence had been damaged by the Fukushima nuclear accident. It was important that governments engage communities on nuclear safety. To this end, the IAEA would be organising an International Experts’ Meeting to discuss transparency and

effective communication. The IAEA also helped states assess their emergency readiness and compiled best practises through platforms such as the Response and Assistance Network (RANET).

6 Mr Vanu Gopala Menon (Singapore) listed the objectives of the Seminar, which were to initiate discussions on nuclear safety within ASEM, encourage cooperation within and between the respective regions on nuclear safety, and learn from each others' experience.

7 Mr Peter Faross (EC) said nuclear safety would remain an overriding priority among European policy makers. Nuclear accidents did not stop at borders. As an example of regional cooperation, the EC and all European regulators had, for the first time, organised comprehensive stress tests for all EU and neighbouring countries.

8 Dr Tarja Ikäheimonen (Finland) called for sharing experiences and lessons learned in the field of international cooperation in nuclear safety, which was a way to ensure continuous improvement.

9 Mr Jean-Luc Lachaume (France) said there was much at stake when considering nuclear power, and issues such as health and environmental impact had to be considered. He also said that there was a need to strengthen nuclear safety.

10 Mr Ichiro Ogasawara (Japan) spoke on recovery efforts post-Fukushima. Following the incident, Japan had submitted two reports to the IAEA and contributed funds and personnel to help the IAEA implement its Action Plan. Japan was also working with the IAEA to extend RANET capabilities.

11 Dr Kim Sang-Yun (ROK) stressed the importance of effective communication between the regulatory body and the public. Post-Fukushima, Korea learned the importance of providing accurate information and having a consistent public message.

SESSION 1: INTRODUCTION TO POTENTIAL ACCIDENT SCENARIOS (CHAIR: MR VANU GOPALA MENON)

Presentations

12 Dr Olivier Isnard, Deputy Head, Emergency Response Organisation Department of the French Institute for Radiological Protection and Nuclear Safety (IRSN), spoke on "Expertise in Consequence Management, Means for the Forecast of Radiological Consequences and Role as Support to Local Decision Makers". He spoke on the overarching role of the IRSN as a technical support organisation with industrial and commercial activities, which provided technical assistance to public authorities and public communications during emergencies. It was under the supervision of five ministries (Environment, Industry, Research, Defence, Health and the Home Office), and interfaced between nuclear power plant (NPP) operators and safety authorities. It possessed considerable technical expertise, with 400 experts in 20 fields. It had 4-dimensional modelling capabilities, and could do Europe-wide modelling, measure radiation dosages and forecast post-incident scenarios.

13 Mr Steen Hoe, Chief Advisor of the Danish Emergency Management Agency (DEMA), presented on “The Role of Radiation Detection Networks in Emergency Response”. He noted that Denmark was a non-nuclear country with NPPs located near its borders. DEMA therefore had 24/7 monitoring and response capabilities and tapped on the European network EURDEP which had over 4000 stations. This optimised DEMA’s capabilities and compensated for its limited manpower (it had only a small team of 12 persons). Hence, DEMA was able to quickly forecast scenarios and estimate effects such as food contamination. Mr Hoe highlighted the importance of having a common data format (the IAEA’s IRIX format) in order to exchange data.

14 Mr Toshihiro Bannai, Director, International Affairs Office, of the Japanese Nuclear and Industrial Safety Agency, Ministry of Trade and Industry, presented on “Japan’s Response to TEPCO’s Fukushima Dai-ichi Nuclear Power Station Accident”. He outlined the lessons learned and decommissioning operations which would be carried out in three phases over 30 to 40 years. He also outlined the criteria for the PM and key Ministers to decide on restarting NPPs. He added that new regulatory structures were being set up post-Fukushima. The new Nuclear Regulatory Authority, an external organ of the Ministry of Environment, aimed to unify functions currently spread across ministries and separate regulatory from operational functions.

Discussions

15 It was noted that scenario planning on multiple meltdowns was ongoing. Participants were informed that EURATOM members were obliged to share data. There was a call to have a similar network for sharing data among Asian countries. A view was expressed that as a start, it was useful for neighbouring states to pursue “gentleman’s agreements” before making legally binding arrangements. To a query on backup plans, it was noted that NPP operators had manual backups for software projection and IRSN had a backup centre. In addition, assessments were carried out at three levels (national, local and NPP) and there was some redundancy. It was noted that radiation plume modelling was not done for aircraft flying to and from Japan during the Fukushima crisis as it was generally not harmful to fly through radionuclides, unlike volcanic ash.

SESSION 2: DEFINING OPERATOR AND REGULATORY ROLES AND RESPONSIBILITIES

(CHAIR: MR VANU GOPALA MENON)

Presentations

16 Mr Takashi Shoji, Programme Director, London Office of the World Association of Nuclear Operators (WANO) presented on “Operators’ Role and Responsibility – Maximising the Safety and Reliability of Nuclear Power Plants”. He spoke on lessons learned from Fukushima, namely shortfalls in response, training and communication. He noted the importance of regulatory oversight of construction, during which safety and quality should be prioritised before cost and scheduling. WANO could support nuclear newcomers at three key stages: early construction, commissioning and pre-startup, through technical support missions and experience programmes. WANO also held

biennial General Meetings and Plant Managers' Conferences for information exchange.

17 Mr N Davidenko, Deputy Director for Production and Maintenance of Russia's Rosenergoatom, presented on "Operator and Regulator's Roles and Responsibilities". He covered lessons learnt from Chernobyl and Fukushima, the use of peer review, and the legislative framework for regulators and operators. Post-Fukushima, there was a need to mitigate "Beyond Design Basis Accidents" (BDBAs) and new Russian designs were made to withstand such events. He remarked that complacency was unacceptable; that risk assessments had to identify bottlenecks, and that openness and transparency were required to improve safety systems.

18 Prof Dr Erich Wirth, Head, Department for Emergency Preparedness of the German Federal Office for Radiation Protection, presented on "Nuclear Emergency Preparedness and Response – the role and responsibilities of the operator and of the regulatory bodies". Prof Wirth laid out the decision-making process, resources required, and planned responses in the event of a nuclear incident. He added that German NPP operators were required to have technical expert advisors, as was the responsible authority (the Ministry of Environment).

19 Mr S Duraisamy, Director, Operating Plants Safety Division, of the Indian Atomic Energy Regulatory Board, presented on "Defining Roles and Responsibilities of Operator and Regulator". Mr Duraisamy outlined India's legislative framework and response process workflow. He emphasised that adequate and well-established legislation needed to be in force to formulate nuclear and radiological emergency plans, and these were tested periodically by operator and reviewed by regulator taking into account various experiences.

Discussions

20 Participants shared their views on how best to avoid "cosy" relationships between regulator and operator and ensure that the former remained objective. It was noted that the task of the regulator was to define requirements, which the operator had to fulfil. Operators also had to exercise ownership and responsibility to avoid accidents. A view was expressed that there were sometimes too many demands placed on operators and that requirements had to be practical. It was necessary to build confidence between regulators and operators. Another view was expressed that it was difficult to have a total separation of roles. The regulator's function was to check, correct and give recommendations to help operators implement norms and standards. There were also financial and physical considerations.

21 There was some discussion on how to avoid delays in decision-making in crisis situations. Participants shared their national decision-making frameworks which could include empowering local government to act without national-level clearance in some circumstances. It was also noted that the first level of decision-making usually rested with plant operators who would then escalate the issue depending on the situation. The question of responsibility for offsite consequences of NPP accidents was raised. Participants noted that it was often the task of public authorities to deal with offsite consequences. In some cases, the operator had to plan for offsite consequences within a certain radius. In an [wider] emergency, there could also be a committee comprising regulators, national authorities and other operators that would evaluate the situation.

SESSION 3: DEVELOPING NATIONAL EMERGENCY RESPONSE FRAMEWORKS INCLUDING THE CREATION OF FIRST RESPONDER TEAMS

(CHAIR: MR ICHIRO OGASAWARA)

Presentations

22 Mr Yao Bin, Director-General of the Department of Nuclear Emergency and Safety Regulation of the China Atomic Agency Authority briefed the meeting on China's national nuclear emergency system and the response to the Fukushima nuclear accident. Based on this experience, he shared the importance of having well-coordinated nuclear emergency systems integrating relevant agencies at the national, provincial, and operational units levels, as well as conducting regular emergency exercises. In addition, effective response to nuclear incidents required international cooperation. He informed that China would be conducting a national nuclear emergency exercise in 2013 and would invite its neighbouring countries to observe this exercise.

23 Ms Sophie Chevalier, Director, Environment and Emergency Situations Department of the Nuclear Safety Authority (ASN) of France presented on "Radiological Emergency Preparedness and Response in France". She provided an overview of ASN's role as an independent regulator and how it works with relevant ministries, the nuclear operator, other French institutions, the public, and the media, as part of the national response organisation. She also outlined on-going actions towards an integrated emergency response in cooperation with neighbouring countries. In this regard, better mutual understanding of the practices and the interlocutors at the planning phase was the "key" to success in the event of a radiological emergency situation.

24 Mr Dedik Eko Sumargo, Director, Inspection of Nuclear Installation and Nuclear Material, Nuclear Energy Regulatory Agency (BAPETEN), Indonesia, described Indonesia's nuclear regulatory framework and the role of BAPETEN. He outlined the National Nuclear Emergency Response Organization and the areas of improvement needed from the Self Assessment Program to strengthen Indonesia's emergency preparedness and response capabilities. He also highlighted the importance of international and regional cooperation in areas such as managing public information and regional emergency-response mechanisms.

25 Mr Peter Faross, Acting Deputy Director-General and Director, Nuclear Energy, of the European Commission, presented on the various EU-level competencies and requirements on emergency response, sharing of information and data, and cooperation in civil protection. He also outlined further EU initiatives such as the need for "stress test" of emergency preparedness and response, enhanced support for processing and interpreting information in case of an emergency, and the need for emergency response plans for circulation of goods at the local and international levels. Emergency response plans needed to be established at the national level; however, this had to be done in close cooperation with neighbouring countries.

Discussions

26 Participants discussed the value of early information exchange, including the

question of having a radiological threshold before sharing of information should be undertaken. While early notification of a nuclear and radiological incident was legally binding for EU countries, it was noted that regular sharing of information even on non-serious incidents could increase confidence in the system. Participants also shared the view that emergency exercises at the various levels were important to help identify weaknesses and gaps where more education, training, and capacity building might be required. There were also questions about the testing of countermeasures during exercises. It was noted that this would be possible on a minor scale, but impossible on a large scale (such as evacuating large areas or large number of people).

SESSION 4: MANAGING PUBLIC INFORMATION IN A CRISIS

(CHAIR: MR ICHIRO OGASAWARA)

Presentations

27 Ms Anneli Hällgren, Director of Communications of the Swedish Radiation Safety Authority presented on Swedish strategies and experiences from the Fukushima Dai-ichi accident. She emphasised the core values of reliability, integrity, openness and transparency in crisis communication strategies as well as the need for consistency in messaging. She emphasised that it was important for the whole of the organisation to believe in the fact that communicating with openness is part of handling crises successfully.

28 Dr Sang-Yun Kim, Director, Research and Policy Division, Korea Institute of Nuclear Safety (KINS), briefed on the activities undertaken by KINS to engage both the public and the media in response to the Fukushima nuclear accident. His presentation highlighted the Korean public's reaction as a neighbouring population to a country affected by an NPP disaster, and stressed the need for "one voice" and information dissemination backed by expert knowledge. He also highlighted the value of continuing public education on radiation and nuclear energy matters so as to upgrade the knowledge level of the public.

29 Dr Tarja Ikäheimonen, Director, Research and Environmental Surveillance Department, Radiation and Nuclear Safety Authority (STUK), Finland, outlined STUK's responsibilities in the national response to emergency situations. It was important to have clear and regular communications. This keeps up public trust which in turn is crucial in order to make people act according to given instructions. It was also important to listen to the public's views and respond accordingly. In addition, Dr Ikäheimonen shared some lessons identified from STUK's experience during the Fukushima nuclear accident. These included the need for more trained spokesperson able to simplify difficult terminology and technical/scientific issues, the value of better understanding of public behaviour and needs, the importance of having information sheets for the public and media prepared in advance and requiring only routine updating, and a clear policy and practical guideless for the use of social media, which would help public communication in a crisis.

Discussions

30 A point was made that it would also be useful to address the psychological

need of the general public in order to enable them to be able to do something in a crisis situation instead of remaining passive. Another point was made that countries that did not operate nuclear facilities might lack experts who could effectively undertake the necessary public communications in a nuclear emergency. An example was shared on the far-reaching (and unintended) effects of social media such as Twitter in spreading messages. A question was raised as to the best way to convey messages to a “mixed” society in which only a small segment may have access to the internet. It was noted that the main channel for public communications even in developed countries was still traditional media such as the radio, television, and newspapers.

31 A view was expressed that transparency could be enhanced, inter alia, through developing and implementing internationally applicable standards and mechanisms to disseminate information. It was also noted that transparency depended not only on the quantity and quality of data, but that the public must also be empowered to make sense of the data being released.

SESSION 5: NUCLEAR NEWCOMERS’ EMERGENCY AND RESPONSE PLANS

(CHAIR: MR ICHIRO OGASAWARA)

Presentations

32 Dr Nguyen Hao Quang, Director, Technical Support Centre for Radiation Safety and Emergency Response, Agency for Radiation and Nuclear Safety, Vietnam, presented on Vietnam’s national capabilities for response to radiological and nuclear emergencies. He briefed the meeting on the current status of the use of radioactive sources and nuclear techniques in Vietnam, the national legal framework on preparedness and response to radiological and nuclear emergencies, and development of its national capabilities in this regard. Dr Nguyen noted that the types of accidents Vietnam was likely to face were categories III and IV. However, in view that the planned NPPs would be located close to the Vietnamese border, the emergency preparedness and response system needed to be upgraded to cope with category I emergencies.

33 Dr Vidas Paulikas, Head Radiation Protection Department, of the Lithuanian State Nuclear Power Safety Inspectorate (VATESI) presented on Lithuania’s emergency preparedness and response infrastructure. He outlined Lithuania’s national legislative framework dealing with civil protection, nuclear energy, nuclear safety, and radiation protection. He also briefed the meeting on Lithuania’s emergency management system which covered the state, municipality, and onsite levels, and its arrangements to exchange information with its neighbouring countries, the EC and the IAEA. Dr Paulikas concluded that regardless of the size of the country or extent of its nuclear activities, each country should have an emergency preparedness and response plan and capacity.

Discussions

34 Participants discussed the challenge of having enough trained personnel to undertake public communications when a country was considering multiple technologies for its NPPs. Assistance from developed countries and the vendor was important in this

regard. There was also interest in the extent to which the nuclear newcomers' national emergency preparedness and response plans included cooperation with neighbouring countries as well as whether they took into account different types of natural disasters

35 It was highlighted that decommissioning of NPPs posed another type of challenge for safety and emergency preparedness compared to the operation of NPPs. It was noted that the decommissioning process required regular adjustments to the corresponding emergency response plans such that it was more a "living" plan.

SESSION 6: REGIONAL AND INTERNATIONAL COOPERATION (CHAIR: MR JEAN-LUC LACHAUME)

Presentations

36 Ms Elena Buglova, Head, IAEA Incident and Emergency Centre, presented on "The Role of the IAEA in Enhancing Regional and International Cooperation". She emphasised that legal instruments were the basis for all of the IAEA's work and provided an overview of the legal instruments, safety standards, protocols and operational arrangements applicable to the international emergency preparedness and response framework. The IAEA worked to enhance capacities of member states and facilitated training and exercises. It also served as the global focal point for interagency efforts and worked with 16 other international organisations co-sponsoring joint plans. Ms Buglova outlined the work of the IAEA's Incident and Emergency Centre and operational tools such as First Responder Toolkits, RANET, Unified System for Information Exchange in Incidents and Emergencies (USIE), and Emergency Preparedness Review (EPREV). She noted that there was still some way to go on member states' participation in the various IAEA initiatives. However, it was encouraging that some of the presenters had made reference to IAEA standards.

37 Mr Jose Mota, Programme Manager, EU Policies, of the European Commission, presented on "Current EU Cooperation on Nuclear Safety and Future Perspectives". He noted that the Chernobyl nuclear accident was the "wake-up call" which led to several multilateral agreements on nuclear safety. The EU operated on the basis of "3S" – Safety, Safeguards and Security. Mota outlined the EU's Instrument for Nuclear Safety, which sought to build nuclear regulators' capacity. Assistance was extended to countries based on their geographical proximity to the EU. There were no political strings attached but recipient countries had to be parties to, or show firm intent to accede to, the relevant IAEA conventions.

38 Dr Didier Louvat, Managing Director, European Nuclear Safety Training and Tutoring Institute (ENSTTI), presented on "Training and Tutoring of Professionals in Nuclear Safety, Nuclear Security and Radiation Protection". He emphasised the importance of acquiring practical knowledge through hands-on experience. His presentation covered the ENSTTI's programme to develop expertise and a mindset of nuclear safety through technical courses for member states and third countries in cooperation with the IAEA, EC and regional safety networks. ASEAN member states whose officials had been trained included Indonesia, Malaysia, and the Philippines.

39 Mr Peter Faross, Acting Deputy Director-General and Director for Nuclear Energy, European Commission, presented on “EURATOM and the Development of Nuclear Safety at EU Level”. He outlined the legislative framework underpinning the EU’s nuclear safety regime, and EURATOM’s aim to promote responsible nuclear energy use worldwide by promoting common standards. This would make country reports directly comparable because the same criteria would apply to different states. He also noted that two issues key to public acceptance of nuclear power were (a) safety and security (b) nuclear waste management. The outcome of the post-Fukushima stress tests carried out across EU and neighbouring countries was being evaluated and served as a basis for future decisions on whether to amend legislative and non-legislative nuclear safety frameworks. He also noted that stress tests were very resource-intensive.

Discussions

40 It was highlighted that the IAEA had been promoting the application of international standards at the national level and on a regional basis. The Fukushima incident reinforced the need for this. It was also highlighted that it was a challenge to report in plain language as one could not easily translate the information meant for technical experts for presenting to the general public. This required joint efforts in advance with the involvement of technical experts. It was noted that the IAEA had developed some templates for reporting which member states might find useful.

41 It was further noted that a component of the European stress tests was managing public information. Participants were informed that the results of the stress tests were published online and available to the general public. It was noted that the EU decided to have the maximum transparency possible as public acceptance was very much influenced by nuclear safety considerations. The utility of meetings with the public, including all stakeholders and non-governmental organisations (NGOs) to discuss the outcomes of the stress tests was underlined. Participants also discussed the different economic and financial implications arising from stress tests for different countries. It was noted that the objective of the stress tests was not to interfere but to strengthen nuclear safety.

42 It was observed that the International Nuclear Event Scale (INES) was a tool for communication and not emergency action. For emergency action, the classification scheme should be used. Concerning the Fukushima accident, which involved more than one reactor, it was generally recognised that INES was not working effectively as a public communication tool, as each reactor was accorded a different scale. As such, the IAEA had developed additional guidance on the application of INES in a severe nuclear emergency involving multiple reactors, which would be finalised in mid-July and published at the end of this year.

43 A question was raised on whether Beyond Design Basis Accidents (BDBAs) were included in the European stress tests. Participants were informed that the stress tests were divided into three parts: (i) trigger event (ii) loss of safety functions and (iii) actual accident management. The “unthinkable” was not completely included as the tests were focused on disasters that European countries were more likely to be confronted with. It was also stressed that there would be follow-up on the recommendations arising from the stress tests.

44 It was highlighted that the public health community was also a very important segment in emergency response. Participants noted that the IAEA had been working jointly with the World Health Organisation (WHO) and other relevant international organisations in developing public health guidelines in an emergency.

45 It was noted that optimising economic considerations was usually a key factor when deciding on the power capacity of a NPP. A question was raised as to whether optimising nuclear safety should also be a consideration. It was observed that safety should be part of the considerations. As the economic burden was on the operators, they would have to balance safety considerations against the cost of operating a small or large NPP. There were differing views on whether smaller or larger reactors were preferable in this regard. It was also noted that reactors with passive safety systems could cope better with loss of external power.

46 Participants were also informed that a new EU legislation, the Nuclear Waste and Spent Fuel Management Directive, established national responsibility to install waste repositories to store spent fuel. Nevertheless, although the principle was one of national responsibility, the door was open for regional cooperation on common repositories given that the burden of establishing repositories differed depending on the size of a country and its geographical features .

WORKING GROUP SESSIONS

47 Working Group 1 discussed Enhancing National Emergency Preparedness including Managing Public Information. It was co-moderated by Ms Anneli Hällgren, Director of Communications, Swedish Radiation Safety Authority and Y.M. Raja Dato' Abdul Aziz Raja Adnan, Director-General, Atomic Energy Licensing Board (AELB), Malaysia. The summary conclusion of Working Group 1 is attached at Annex B.

48 Working Group 2 discussed Establishing and Strengthening Regional Emergency Response Mechanisms. It was co-moderated by Mr Peter Faross, Acting Deputy Director-General and Director for Nuclear Energy, European Commission and Mr Ichiro Ogasawara, Deputy Director-General for Disarmament, Non-Proliferation and Science, Ministry of Foreign Affairs, Japan. The summary conclusion of Working Group 2 is attached at Annex C.

CLOSING SESSION

49 Participants agreed that there had been substantive presentations and discussions at the Seminar and that it provided a good platform for the exchange of views and experiences on nuclear safety. It was agreed that while it was States' responsibility to put in place strong legal and regulatory frameworks, international cooperation was necessary given the transboundary nature of nuclear incidents. Participants also acknowledged the role played by international organisations such as the IAEA and WANO.

50 Participants expressed their appreciation to the Singapore Government for the

excellent hosting of the Seminar. Participants expressed interest in having further ASEM seminars on nuclear safety. The results of the seminar will be submitted to the attention of the ASEM governments.

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SINGAPORE
15 June 2012

Annexes

- A:** List of Participants
- B:** Report of Working Group 1
- C:** Report of Working Group 2