Conference "50 Years of Nuclear Power – the next fifty years"

Meeting Summary

Presented by
Chairman of the Final Round Table Session,
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1. At the Conference "Fifty years of nuclear power – the next fifty years", over 400 participants from 39 Member States noted that Obninsk NPP is recognised as a major milestone in world technological development. Speakers from all continents praised the Russian nuclear achievements and congratulated the Russian industry on its continuing research and development programmes.
2. The participants noted that nuclear power, applied in many countries since 1954 has reached a mature stage, and in several countries such as the USA and France, licence renewal and efficient operation continues. Korean and French representatives described evolutionary designs that are ready to build that will achieve improved economic performance and safety. These designs will be built in Europe and Korea in the next few years. India, Japan, China and Russia each presented plans for significant expansion of nuclear programmes based upon existing designs. It is clear that after 50 years, plants for large scale production of electricity from nuclear power can be built and are considered necessary in many countries.
3. Several countries, among them Ukraine, Argentina, Brazil and Armenia, with existing nuclear power programmes, indicated the vital importance of nuclear power to their energy sector.
4. Patterns of nuclear power growth can be recognised in different regions driven by the energy needs, availability of energy resources, technological confidence and the availability of appropriate infrastructure. Several speakers suggested that a range of different designs and power production capabilities were required to ensure the greatest contribution to worldwide energy needs as different nations and regions had different requirements. It was suggested that different strategies for growth may be appropriate in different regions
5. Many speakers presented national plans for major development of nuclear plants. These included representatives of countries with no nuclear plant who wished to develop nuclear, and countries with existing nuclear programmes that need to replace older plants or expand the role of nuclear generation. Speakers from Turkey, Indonesia, and Thailand described the potential for the use of nuclear energy for other uses. The desalination of water and the production of hydrogen were suggested as the most likely uses. India described a nuclear joint desalination and electricity production plant that is already operating. Nuclear desalination is already feasible and the technology for hydrogen production is under active development.
6. Many examples of improvements in the design of reactors were also described. These generally were aimed at achieving improved economic performance while maintaining and improving safety standards. It was recognised that for several of these designs to reach maturity they would need research support and international cooperation. The evolution of design from 1954 to the present and future generations of plant was discussed in depth.
7. A general issue that came through many of the sessions was how to improve communication with the public and decision makers. Several journalists participated in a media panel and indicated that the historical perception of secrecy, misrepresentation and industrial attitude of superiority was difficult for the nuclear industry to overcome. The journalists advised a greater

openness and provision of objective and higher quality data about the issues that are of concern to the public. An issue raised in discussion was the degree to which the IAEA should provide greater support to the public debate on nuclear energy. It was agreed that the Agency could not promote nuclear energy in any specific country, unless requested by the Government, although several speakers supported the concept that the Agency should provide greater visible and public support for nuclear energy in order to ensure that the option of adopting nuclear energy remains an option for any country that wishes it.

8. There was significant support for the continuation of innovation in terms of technology and infrastructure issues. The use of the INPRO guidelines which are being developed is seen as a means of assessing the merits of many of the developing technologies described during the Conference. Collaboration between INPRO and GEN IV is seen as a valuable contribution to development in this area.
9. The need was mentioned for the nuclear industry to be able to attract new scientists and engineers and to ensure that the experience of the retiring generations was passed to them. This was noted as an issue that will need attention for many years to come. It was noted that new projects and international collaboration will be of benefit in this area.
10. It was noted that while there is a need to maintain safety standards there is a need for the ability to assess the cost effectiveness of operation of the nuclear plants. It was noted that the most efficient and best managed plants also tend to be the safest plants
11. A theme running through the Conference was the need for nuclear power in order to avoid the emission of greenhouse gases, and help with the reduction of fossil fuel use. The future environmental benefits of nuclear power were stressed by many speakers. Several speakers provided comparisons between scenarios with and without nuclear power in their countries. For the United Kingdom and Armenia the expectations are that without further nuclear plants there would be a dependency of from 60-80% on imported energy. It was frequently commented that the stability of nuclear electricity costs is a major benefit. For example doubling the cost of nuclear fuel would increase the price of nuclear generated electricity by 2-4% compared with, for example, the effect of doubling the cost of natural gas which could lead electricity price rises of 60-70%.
12. It was generally noted that the drivers for the future development of nuclear power for the next fifty years were the need to increase energy use globally in order to improve living standards for less developed regions, and environmental protection by the avoidance of increased greenhouse gas emissions. To achieve this development it is necessary for the nuclear industry to provide economic plants and for the political issues of management of waste and spent fuel to be resolved.
13. It was noted that nuclear plants need to be attractive to investors. Issues such as nuclear liabilities and insurance remain issues that need to be addressed in the development of improved infrastructure.
14. Developments in spent fuel recycling, the use of fast reactors and the technology of waste management were presented as areas that would need to receive further technical development over the next fifty years in order to maximise potential fuel use and to minimise storage requirements. Some speakers argued that the closure of the fuel cycle would be necessary to achieve sustainability from nuclear power. The need for quantitative assessment of proliferation resistance of fuel cycle technologies and international cooperation between smaller countries were discussed as issues that should receive international attention.

15. Several discussions addressed nuclear safety, security and non-proliferation. It was stated several times that to maintain acceptable standards, continuous efforts to improve standards of design and management are necessary.
16. An issue repeatedly stressed by participants in the Conference was the need to strengthen the nuclear energy related activities of the Agency to ensure the maintenance of the nuclear energy option for those countries that wish to use or adopt it in future.
17. It was suggested that the IAEA should consider developing a comparative risk assessment looking at several aspects of energy use and production. Issues for this study should include energy options, the health and safety risks of alternative energy systems, local, regional and global environmental issues, sustainability and economics. This study could provide definitive information on world needs for energy, the pressures that arise due to dependency upon specific fuels, and the economic risks that the various scenarios may introduce