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BOARD OF GOVERNORS
GENERAL CONFERENCE

Item 15(a) of the Conference's provisional agenda
(GC(45)/1)

MEASURES TO STRENGTHEN INTERNATIONAL CO-OPERATION IN NUCLEAR, RADIATION, TRANSPORT AND WASTE SAFETY

THE SAFETY OF NUCLEAR RESEARCH REACTORS (Secretariat responses to nuclear installation safety issues of Member States)

BACKGROUND

1. In GC(44)/RES/14 the General Conference, inter alia, invited the Board of Governors and the Director General of the Agency to continue to maintain its emphasis on the safety of research reactors, particularly assisting Member States to implement relevant Safety Standards, and requested the Secretariat to monitor closely research reactors subject to IAEA Project and Supply Agreements and to assist relevant Member States in fulfilling all relevant safety obligations; and to continue work on exploring options to strengthen the international nuclear safety arrangements for civil research reactors, taking due account of input from INSAG and the views of other relevant bodies.

DEVELOPMENTS SINCE THE 44TH SESSION OF THE GENERAL CONFERENCE

Working Group on International Nuclear Safety Arrangements

2. A Working Group (WG) was convened by the Secretariat from 21 to 24 May 2001 to explore options for strengthening the international nuclear safety arrangements for civil research reactors. Fifteen participants from seven Member States attended the meeting. The report of the WG has been circulated to Member States under Note by the Secretariat 2001/Note 17.

3. The WG identified, inter alia, the following factors underlining the need to strengthen safety arrangements for research reactors:

- Statistics show that of the 651 research reactors included in the research reactor database of the Agency, 284 are in operation and 109 have been decommissioned. The remaining 258 are shutdown but not decommissioned. More than half of the operating reactors are over thirty years old. Some of the 284 facilities declared operational are in an extended shutdown condition and are not being adequately maintained.

- Outcomes from recent missions and ongoing Agency programmes have identified significant safety problems, including the effects of ageing, absence of effective regulation, the need for upgrading to meet seismic parameters, and lack of management resources and political will.

- Apart from data obtained by the Secretariat regarding approximately 50 research reactors, there is an absence of information about the condition of majority of the research reactors in the world.

- Problems associated with ageing, the loss of expertise and control, and the lack of operating and regulatory infrastructure will get worse with time unless action is taken.

- There is a need to raise the awareness of countries about the issues, to establish clearly the fundamental, internationally accepted safety regime for research reactors, and for countries to provide information on the state of their facilities to guide further development of international activity in this area.

4. It was noted that the Agency currently has a number of mechanisms to address the safety of research reactors: Integrated Safety of Research Reactors (INSARR) missions (primarily for facilities with Project and Supply Agreements); standards and safety guides; technical co-operation programme projects to support research reactors; and an incident reporting system.

5. After considering a variety of forms of binding agreements, the WG concluded that while not foreclosing this option in the long term, they could not see the benefit of having a legally binding agreement at present; such agreements would put an excessive burden on countries, without necessarily improving the safety of research reactors. Two other types of instruments were considered:

  - An adaptation of the modalities to strengthen the monitoring system drawing upon experience in other fields, e.g. the “oversight service” used in the International Civil Aviation Organization (ICAO) to review performance of national airline safety regulation.

  - The development of a Code of Conduct for research reactors. Although it would not be legally binding, such a document would establish clearly international best practices and raise awareness about issues affecting research reactor safety.

6. Given the need for more comprehensive information on the status of safety at research reactors, the WG proposed an assessment survey that would in the process of gathering the information, heighten Member State awareness and attention to the safety issue and identify opportunities to apply Agency programmes to meet concerns about research reactor safety.

7. The WG also recommended that the Agency consider establishing an international action plan for research reactors for consideration by the Member States that includes: developing an assessment survey; preparation of a Code of Conduct; exploration of modalities to strengthen the monitoring system drawing on experience in other fields, such as ICAO; and review of Agency programmes addressing research reactor safety, including technical co-operation projects, to ensure that priorities correspond to safety relevance. The Secretariat endorses the recommendations of the WG and is proposing action (paragraph 18) for implementing its recommendations.

8. In its report, the WG recognized that "for this international plan of action to succeed there needs to be additional resources devoted to these matters within the Agency and political will in the Member States".

Agency Activities for Strengthening Regulatory Supervision of Research Reactors

9. Under a European regional technical co-operation project, a Regional Workshop for Regulators of Research Reactors was held in September 2000 in Vienna. Following this workshop, a work plan was established for the region in order to enhance the capabilities of regulators and operators. In January 2001 a one-month training course for new staff of regulatory bodies and operators was held in Austria and Slovakia. Two more training activities will be conducted in late 2001, on Decommissioning and Extended Shutdown (in Latvia) and on Emergency Preparedness (in Romania). The Netherlands has agreed to host a two-week training course on the establishment of quality assurance programmes in research reactors of countries participating in the regional project. Under the same regional project, a workshop on management of ageing in research reactors and a training course for regulators of research reactors are scheduled for 2002.

10. For the Latin American region, training activities will be conducted for research reactors in the areas of safety culture, quality assurance, decontamination and decommissioning. A training course on the safety assessment of research reactors will be offered at Santiago de Chile in November 2001 to staff of regulatory bodies, research reactors and other nuclear facilities.

11. In the East Asian region, a regional technical co-operation project is supporting activities for the management of ageing; and a seminar was held at Mumbai, India, in December 2000. The Extrabudgetary Programme on the Safety of Nuclear Installations in South East Asia, Pacific and Far East Countries is providing support to some of the countries in the region to enhance nuclear safety, with a focus on strengthening the technical capabilities of regulatory bodies. A programme to start the safety review of research reactors in the region has been prepared.

12. The West Asia and Africa regions do not currently have specific regional programmes on the safety of research reactors. However, under national projects the Agency has provided assistance missions to Egypt, the Islamic Republic of Iran, the Libyan Arab Jamahiriya and Uzbekistan.

Safety Standards for Research Reactors

13. Several safety standards are in preparation, including revised Safety Requirements for Research Reactors, covering both design and operation, which is scheduled to be sent to

Member States for review in 2001. Three Safety Guides are about to be published (subject to any revisions for consistency after the Safety Requirements are approved) namely, *Commissioning of Research Reactors, Maintenance and Periodic Testing for Research Reactors,* and *Operational Limits and Conditions*. Other guidance and information documents are in various stages of preparation and available in draft form, covering extended shutdown conditions, results of INSARR Missions, non-destructive testing, source term calculations, core management, and training and qualification for regulators and operating personnel.

Incident Reporting System for Research Reactors

14. The Incident Reporting System for Research Reactors is a service provided by the Agency in order to collect and distribute among the participating countries timely information on unusual events at research reactors. Thirty Member States are currently participating in the system. It is important that other Member States join the programme to allow for a more effective exchange of information. A meeting of participants was held in Vienna in November 2000, and another is planned for November 2001 in Portugal.

Research reactors subject to IAEA Project and Supply Agreements

15. Letters were sent in late 2000 to all 23 Member States having research reactors subject to Agency Project and Supply Agreements, requesting them to report to the Agency, pursuant to their obligations under the relevant agreement, on the present condition of the facilities. To date, ten Member States — Colombia, Islamic Republic of Iran, Finland, Pakistan, Peru, Slovenia, Spain, Syrian Arab Republic, Turkey and Venezuela — have responded to the letters. The reports received did not indicate any special concerns about the safety of the facilities.

16. Since the last session of the General Conference, twelve missions pursuant to Project and Supply Agreements have been carried out to monitor the safety of the facilities and to provide assistance to the regulatory authorities and operating organizations. The Member States involved include Chile, Democratic Republic of the Congo, Greece, Indonesia, the Islamic Republic of Iran, Malaysia, Morocco, Nigeria, Philippines, Romania, the Syrian Arab Republic and Viet Nam. In addition to conventional INSARR activities, workshops and direct assistance addressed Safety Analysis Report improvements, regulatory body enhancement, new facility safety design review, commissioning programme review, emergency planning and seismic issues. Encouraging findings include the establishment of a Safety Committee in the Democratic Republic of the Congo and new regulatory bodies in the Libyan Arab Jamahiriya and Nigeria. Other findings underline the need for emergency planning, point to inadequate regulatory supervision in a number of countries and, in one case, identified a reactor in extended shutdown with fuel in temporary storage and insufficient resources for reconstruction.

Other Research Reactor Activities

17. Assistance was provided to Bangladesh during a pre-INSARR mission under a technical co-operation project to evaluate the present condition of the reactor, the commissioning programme for the restart and the Safety Analysis Report. An INSARR mission is scheduled for late this year. A review of the Preliminary Safety Analysis Report was performed for the Replacement Research Reactor to be constructed in Australia, and an INSARR follow-up mission to the Netherlands is scheduled to be conducted late this year.

SUGGESTED ACTION BY THE BOARD

18. It is suggested that the Board take note of the Secretariat's report contained in this document and request the Secretariat to develop and implement, in conjunction with Member States, an international Research Reactor Safety Enhancement plan which includes the following elements:

- conduct of a survey of research reactor safety in Member States;

- preparation of a Code of Conduct on the safety of research reactors with a view to establishing the desirable attributes for management of research reactor safety; and

- exploration of possible means to strengthen the system for monitoring the safety of research reactors, taking account of the experience of organizations working in other fields.