

# **Where to with the Code of Conduct on the Safety of Research Reactors?**

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**Abstract. The Code of Conduct on the Safety of Research Reactors was adopted by the Board of Governors of the IAEA and endorsed by the General Conference in 2004. The development of the Code took place over several years and followed letters to the Director General on research reactor safety from the International Nuclear Safety Advisory Group. The Code is a non-binding international legal instrument designed to ‘serve as guidance to States for, inter alia, the development and harmonization of policies, laws and regulations on the safety of research reactors.’ It contains guidance on best practice directed to the State, to the regulatory body and to the operating organization. As it is non-binding in nature, the Code does not itself include a mechanism for implementation based upon the process of ratification and the participation in formal review meetings that implements the Convention on Nuclear Safety and the Joint Convention. Nonetheless, processes for information exchange and a form of peer review are being considered by interested Member States. In 2006, the General Conference supported a proposal that periodic meetings be organised to discuss application of the Code in Member States. It looked forward to discussion of implementation of the Code including at this International Conference. The non-binding status of the Code and the consequently more informal nature of mechanisms for implementation may be an advantage in allowing for a graded approach to the different types of research reactors, their status and the safety issues they face.**

## **A Short History**

The development of the Code of Conduct on the Safety of Research Reactors began with letters to the Director General from the International Nuclear Safety Advisory Group (INSAG) in November 1998 and April 2000.

In these letters, the INSAG particularly drew attention to the issues of: the increasing age of research reactors; the numbers of research reactors that are not operating, but have not been decommissioned; and the number of research reactors in countries that do not have appropriate regulatory authorities. The INSAG pointed out that research reactors generally were not covered by the international safety conventions. They suggested that a protocol to the Convention on Nuclear Safety be developed to cover research reactors.

In September 2000, the General Conference of the IAEA passed a resolution that requested ‘the Secretariat ... to continue work on exploring options to strengthen the international nuclear safety arrangements for civil research reactors, taking due account of input from INSAG’. In turn, a working group convened by the secretariat in May 2001 recommended as one element of an international action plan on research reactor safety the ‘preparation of a Code of Conduct that would clearly establish the desirable attributes for management of Research Reactor safety.’ This recommendation was taken up by the Board of Governors and endorsed by the General Conference in September 2001.

Subsequently, open ended meetings to draft a Code of Conduct took place in 2002 and 2003. The Code was adopted by the Board in March 2004 and endorsed by the General Conference in that year.

### **What is a Code of Conduct?**

A Code of Conduct is a non-binding international legal instrument. The non-binding nature of the Code of Conduct on the Safety of Research Reactors is made clear in its text. The preamble to the Code states that the IAEA's Member States 'decide that the following Code of Conduct should serve as guidance to States for, inter alia, the development and harmonization of policies, laws and regulations on the safety of research reactors.' The Code itself continually refers to the application of the guidance of the Code and it is made up of 'should' statements.

Member States have strongly emphasised the non-binding nature of the Code. A General Conference resolution in 2004 went no further than encouraging Member States to apply the guidance in the Code to the management of research reactors; and requested the Secretariat to continue to assist Member States in the implementation of the Code and associated safety guidance within available resources. Similar General Conference resolutions passed in 2005, 2006 and 2007.

### **Structure of the Code**

After the preamble, scope and definitions, the body of the Code sets out guidance for the role of the State, the regulatory body and the operating organization, as well as for the IAEA.

The Code encourages the use of IAEA safety standards, the use of a graded approach related to hazard, and that, if in difficulty, the State may communicate difficulties and required assistance to the Agency.

Major roles for the State are setting up the legislative and regulatory framework; establishing and supporting the regulatory body; ensuring a system for financing safe operation, safe extended shutdown and decommissioning; reviewing the safety of existing research reactors; and ensuring safe management of any research reactors in extended shutdown.

The regulatory body and the operating organization have mirroring provisions dealing with : assessment and verification of safety; financial and human resources; QA; human factors; radiation protection; emergency preparedness; siting; design, construction and commissioning; operating, maintenance, modification and utilization; extended shutdown; and decommissioning.

The role of the IAEA is disseminate the Code and related information widely; to assist States in application of the Code; and to continue to collect and disseminate information relating to the safety of research reactors, provide safety review services, develop and establish relevant technical standards and provide for the application of these standards at the request of any State.

### **Where to Next?**

So, the first regulatory challenge is 'how can a non-binding Code of Conduct help improve the safety of research reactors world-wide?' It can certainly serve as a shining example of a statement of international best practice in nuclear safety. It can shape the further development of research reactor safety standards. And the Agency can use it as high level guidance for missions and can reflect the Code in project and supply agreements that it concludes with Member States. These steps are all very good things and to be mightily encouraged.

However, I do not believe that the Code will have the extensive impact on research reactor safety that should be hoped for until Member States commit to follow the guidance in the Code and there is a mechanism whereby they can share experience and learn from each other.

The international nuclear safety and radiation protection community is becoming used to the notion of 'review meetings' at which there are relatively formal processes that require the submission of country reports, questions being asked by other countries on the basis of those reports and peer review exchanges within country groups. These are the processes that have been adopted through the Convention on Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management.

Another model has been a meeting of technical and legal experts for 'sharing information' as to States' implementation of the Code of Conduct on the Safety and Security of Radioactive Sources that took place in June 2007. That Code of Conduct has the same non-binding legal status as the research reactor Code.

At the third review meeting of the Convention on Nuclear Safety (at which some 27 countries had voluntarily reported on research reactors in their national reports), the Contracting Parties passed a resolution reading as follows:

*'Having taken into consideration the positive impact of the incentive nature and the benefits of the Review Process of the Convention on Nuclear Safety on improving nuclear safety, the Contracting Parties to the Convention on Nuclear Safety request the Director General of the IAEA to convene meetings to which all Member States would be invited. The objective of the meetings should be to discuss how best to assure the effective application of the 'Code of Conduct on the Safety of Research Reactors'.*

An open-ended meeting responding to this resolution was convened in December 2005. At this meeting, representatives from 31 countries discussed ways to assure effective application of the Code.

The meeting recognized the importance of information exchange as part of international cooperation on improving and harmonizing the safety of research reactors world-wide. It was also accepted that there needed to be flexibility in the mechanisms for information exchange in this area – the full 'bells and whistles' of a formal country report, formal questions and answers and a peer-review examination may deter many countries, particularly countries with limited resources, from participating in the information exchange from which they would otherwise derive much benefit.

The open-ended meeting agreed that there should be periodic meetings to discuss topics related to the application of the Code of Conduct in Member States. The meetings would exchange experience and lessons learned, identify good practices in applying the Code and discuss future plans for using the Code to improve research reactor safety. The meetings should also discuss difficulties that may be being encountered and the international or Agency assistance that might help overcome these difficulties and allow the country to achieve full conformance with the Code.

The suggestion is that the discussions at these periodic meetings should be taken from documents submitted by Member States. It was emphasised that the documents submitted by countries should be informal, submitted for the purposes of discussion, and not be considered as formal national reports.

As suggested by the open-ended meeting, regional meetings to share information on the application of the guidance in the Code have now taken place for Africa, eastern Europe and Asia. The next speaker will address the outcomes of those meetings.

An international meeting on the Code is, I believe, still scheduled for 2008 in some proximity to the fourth review meeting under the Convention on Nuclear Safety.

The most recent General Conference continued to give encouragement to member States to adopt the guidance in the Code, it looked forward to the outcome of the proposed international meeting on the Code – and looked forward to the outcomes of this Conference.

I offer some thoughts for the international meeting to be held in 2008.

First, in addition to hearing from countries, I believe it would be helpful for the meeting to have before an assessment by the Agency of major issues and trends in nuclear safety for research reactors. This assessment would draw attention to generic issues and would be derived from the outcomes of relevant peer review missions, reports to the incident register and the general experience of Agency staff in assisting Member States. It is now established that such an assessment is prepared prior to review meetings under the Convention on Nuclear Safety.

I think it would be valuable for this Conference to call upon the agency to prepare such a document in time for the international meeting.

I would also like to see some discussions arranged directed at cross cutting policy issues. Some that I suggest are:

- The relationship between the State, the regulatory body and the operating organization. All three will need to be involved in discussion of implementation of the Code. This distinction in roles may in itself represent a regulatory challenge for the regulator of a research reactor. In many countries, some or all of the research reactors may be operated by a Government organization, an instrumentality of the State. Often, indeed, that organization – an Atomic Energy Commission or similar name - has been the origin of the regulatory body itself. Further, the Government will have only a small pool of nuclear safety expertise to draw upon and the regulator may also be the de facto adviser to the State in some of its roles.
- The application of the ‘graded approach’. What does this mean in practice? The concept is simple enough – but there is the potential for much heated discussion about its application. One regulator’s ‘graded approach’ may be ‘over-regulation’ to the operating organization and ‘regulatory capture by the operator’ to the national or local environment groups. It is not just the reactor power that needs to be borne in mind, but the utilization programme. The caveat about maintaining a strong nuclear safety culture within a graded approach needs careful consideration as to its practical meaning.
- Nuclear safety culture in research reactor organizations that may also have one or both of a ‘research culture’ and a ‘production culture’
- The management of extended shutdown. The issue of extended shutdown was a controversial area of discussion in the drafting of the Code. The preferred position is, of course, that there should be no such state. A reactor should be operating with a utilization programme, or it should be under decommissioning. But, as was pointed out by INSAG in its original advice, there is a legacy of research reactors in this limbo-like state. It appeared to the drafters of the Code that the most effective and pragmatic course was to recognise this and allow for the safety of extended shutdown to be addressed directly. The resolve of the State and availability of resources to regulators and operators to address extended shutdown needs to be encouraged.

In addition, of course, Member states need to be given the opportunity to share experience and information about the reality of applying the guidance in the Code.

## **Conclusion**

The adoption of the Code of Conduct on the Safety of Research Reactors offers an important opportunity to tackle the issues about the safety of research reactors that have been nagging at the international nuclear safety community for quite a few years. There are regulatory challenges, but the non-binding nature of the Code and the more informal mechanisms of the periodic meetings offer an opportunity for a very broad-based and effective response to these issues.