

Chapter 2

IAEA's Nuclear Safety and Nuclear Security Worldwide



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The International Atomic Energy Agency is the world's central intergovernmental forum for scientific and technical co-operation in the nuclear field. It works for the safe, secure and peaceful uses of nuclear science and technology, contributing to international peace and security and the United Nations' Sustainable Development Goals.

Strong nuclear and radiation safety and security underpin all Agency activities. The IAEA's Department for Safety and Security fosters cooperation to enhance nuclear and radiation safety and security worldwide. The Agency promotes the widely accepted principle of 'safety first' in nuclear and radiation matters.

This paper highlights the key role of global cooperation in nuclear and radiation safety and security. It does so by first explaining the context into which the IAEA's safety and security work fits, with a special focus on conventions and codes. It then discusses the lasting impact of nuclear accidents on the Agency's safety work and concludes by highlighting some of the ways the IAEA fosters cooperation to enhance nuclear and radiation safety and security.

Nuclear safety and security are the responsibility of each individual country. The IAEA, and particularly its Department for Safety and Security, support Member States fulfil that responsibility. All support is provided only at States' request in line with the Agency's mandate.

The IAEA promotes adherence to and implementation of international legal instruments on nuclear safety adopted under its auspices.

Legally-binding Conventions include:

- Convention on Nuclear Safety

The Convention on Nuclear Safety was adopted in Vienna on 17 June 1994. Its aim is to commit participating States operating land-based civil nuclear power

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plants to maintain a high level of safety by setting international benchmarks to which States would subscribe.

The Convention is based on the Parties' common interest to achieve higher levels of safety that will be developed and promoted through regular meetings. It obliges Parties to submit reports on the implementation of their obligations for "peer review" at meetings that are normally held at IAEA Headquarters. This mechanism is the main innovative and dynamic element of the Convention.

The Convention entered into force on 24 October 1996. As of October 2017, it had 83 parties.

- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was adopted in Vienna on 5 September 1997. It is the first legal instrument to address the issue of spent fuel and radioactive waste management safety on a global scale. It does so by setting international benchmarks and creating a similar "peer review" process to the Convention on Nuclear Safety.

The Convention applies to spent fuel resulting from the operation of civilian nuclear reactors and to radioactive waste resulting from civilian applications. It also applies to spent fuel and radioactive waste from military or defence programmes if such materials are transferred permanently to and managed within exclusively civilian programmes, or when declared as spent fuel or radioactive waste for the purpose of the Convention by the Contracting Party concerned. In addition, it covers planned and controlled releases into the environment of liquid or gaseous radioactive materials from regulated nuclear facilities.

The Joint Convention entered into force on 18 June 2001. As of October 2017, it had 76 parties.

- Convention on the Physical Protection of Nuclear Material and its Amendment

The Convention on the Physical Protection of Nuclear Material was signed at Vienna and at New York on 3 March 1980. The Convention is the only international legally binding undertaking in the area of physical protection of nuclear material. It establishes measures related to the prevention, detection and punishment of offenses relating to nuclear material.

The Convention went into force on 8 February 1987. As of October 2017, it had 155 Parties.

A Diplomatic Conference in July 2005 was convened to amend the Convention and strengthen its provisions. The amended Convention makes it legally binding for States Parties to protect nuclear facilities and material in peaceful domestic use, storage as well as transport. It also provides for expanded cooperation between and among States regarding rapid measures to locate and recover stolen or smuggled nuclear material, mitigate any radiological consequences of sabotage, and prevent and combat related offences.

On 8 July 2005, the Parties to the Convention adopted by consensus an Amendment to the CPPNM.

The Amendment aims to improve the physical protection of nuclear material and facilities. Whereas the obligations for physical protection under the CPPNM covered nuclear material during international transport, the Amendment to the CPPNM makes it legally binding for States Parties to protect nuclear facilities and material in peaceful domestic use, storage and transport. It also provides for expanded cooperation between and among States regarding rapid measures to locate and recover stolen or smuggled nuclear material, mitigate any radiological consequences of sabotage, and prevent and combat related offences.

The Amendment entered into force on 8 May 2016. As of October 2017, it had 115 parties.

- Convention on Early Notification of a Nuclear Accident

The Convention on Early Notification of a Nuclear Accident aims to strengthen international cooperation in providing relevant information about nuclear accidents so that transboundary radiological consequences can be minimized. States Parties commit that, in the event of a nuclear accident that may have transboundary radiological consequences, they will notify the IAEA along with countries that may be affected and provide relevant information on the development of the accident. The IAEA will in turn inform States Parties, Member States, other States that may be physically affected and relevant international organizations of the notification received and will, upon request, promptly provide other information.

The Convention went into force on 27 October 1986. As of October 2017, it had 121 parties.

- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

The Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency sets out an international framework for co-operation among States Parties and the IAEA to facilitate prompt assistance and support in the event of nuclear accidents or radiological emergencies. The IAEA serves as the focal point for such cooperation. It helps channel information and supports the efforts of States Parties and other partners involved.

The Convention went into force on 26 February 1987. As of October 2017, it had 115 parties.

In addition, the IAEA encourages Member States to express political commitment to and implement non-legally binding Codes of Conduct.

These include:

- Code of Conduct on the Safety and Security of Radioactive Sources

This Code aims to help national authorities ensure that radioactive sources are used within an appropriate framework of radiation safety and security. The Code is

a well-accepted, non-legally binding international instrument and has received political support from more than 130 Member States.

Two documents supplement the Code. The Guidance on the Import and Export of Radioactive Sources supplements the Code and aims to provide for an adequate transfer of responsibility when a source is being transferred from one State to another. The Guidance on the Management of Disused Radioactive Sources provides further guidance regarding the establishment of a national policy and strategy for the management of disused sources, and on the implementation of management options such as recycling and reuse, long term storage pending disposal and return to a supplier.

- Code of Conduct on the Safety of Research Reactors

This Code strengthens the international nuclear safety arrangements for civil research reactors. It sets out parameters for the management of research reactor safety and provides guidance to governments, regulatory bodies and operating organizations for the development and harmonization of the relevant policies, laws and regulations.

Its objective is to achieve and maintain a high level of safety in research reactors worldwide, which is achieved by proper operating conditions, the prevention of accidents and, should accidents occur, the mitigation of their radiological consequences.

The IAEA is a resource and partner to all Member States as they work to fulfil their responsibility for nuclear and radiation safety and security, including by adhering to these Conventions and Codes.

The Chernobyl and Fukushima Daiichi accidents profoundly impacted the IAEA's nuclear safety work.

The 1986 Chernobyl accident sparked discussions that eventually led to the 1994 adoption of The Convention on Nuclear Safety, described above. This key instrument fosters cooperation among its parties, and it promotes transparency: CNS country reports are available on the IAEA website.

The Convention on the Early Notification of a Nuclear Accident, and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency were adopted in the immediate aftermath of the Chernobyl accident. Both are based on cooperation. The Notification Convention strengthens international cooperation in order to provide relevant information about nuclear accidents as early as necessary to minimize transboundary radiological consequences. The Assistance Convention sets out an international framework for co-operation among States Parties and with the IAEA to facilitate prompt assistance and support in the event of nuclear accidents or radiological emergencies.

The IAEA Response and Assistance Network helps countries fulfil their obligations under the Assistance Convention. Countries that participate in this Network have informed the IAEA about the assistance they could offer upon request in an emergency. A country that contacts the IAEA seeking support then can be swiftly

assisted. This Network is just one example of concrete cooperation fostered by the IAEA to enhance nuclear and radiological safety and security.

In the aftermath of the 2011 Fukushima Daiichi accident, IAEA Member States endorsed the IAEA Action Plan to Make Nuclear Power Safer. The Action Plan was a programme of work to strengthen the global nuclear safety framework in light of the accident. As part of this programme, Member States and the IAEA took action in 12 areas, including safety assessments, capacity building and radiation protection.

In 2015, the IAEA Director General's Report on the Fukushima Daiichi Accident and its five technical volumes was published. This comprehensive report considers human, organizational and technical factors to provide an understanding of what happened, and why, so that the global nuclear community can apply its lessons. The report notes that the accident underlined the vital importance of effective cooperation. The IAEA is where most of that cooperation takes place.

The Action Plan elements and observations and lessons from the Fukushima Report have now been incorporated into the Agency's regular work. Following a systematic analysis and prioritization, we identified methods to further strengthen nuclear safety. These are highlighted in the IAEA's Nuclear Safety Review 2017.

Years have passed since the Fukushima Daiichi accident, but its legacy—a sharper focus on nuclear safety everywhere—remains. There can be no grounds for complacency about nuclear safety anywhere—safety comes first. The IAEA is working to ensure that this principle will continue to guide work.

The Chernobyl accident led to the development the safety culture concept, and the Fukushima Daiichi accident further underlined the need for a robust safety culture. Continuous questioning and openness to learning from experience are key to safety culture and essential for everyone involved in nuclear power. This somewhat intangible concept can be a challenge to implement in practice, but we offer resources to help Member States: assessments, reviews and courses. For example, in October 2017, the IAEA holds a Pilot International School of Nuclear and Radiological Leadership for Safety in Nice, France, to show junior and mid-career professionals an opportunity to learn how they can lead for safety throughout their careers.

The IAEA fosters cooperation in many ways. The Agency's meetings, workshops, courses, peer review missions and other events bring together participants and experts from many countries, enabling both formal and informal cooperation that strengthens nuclear safety and security globally.

In addition, the IAEA supports networks to promote intensified cooperation. The IAEA Global Nuclear Safety and Security Network comprises almost 20 networks that help Member States connect, collaborate and communicate to strengthen nuclear safety and security. These networks are specialized on a particular topic or function, or they bring stakeholders from a region together. A regional example is the European and Central Asian Safety Network brings together countries that face common regional issues so that they can exchange information and experience, coordinate work and cooperate.

A topical example is the Small and Modular Reactor Regulators' Forum, which enables cooperation, learning and experience exchange among regulators who are facing similar challenges as they regulate this type of reactor.

The statute tasks the Agency with creating standards of safety and to provide for the application of these standards. The IAEA safety standards are a set of more than 100 documents that reflect a consensus on what is considered a high level of nuclear and radiation safety.

The standards outline the basics of how to establish, maintain and continuously improve governmental, legal and regulatory frameworks for nuclear and radiation safety. They are not binding, but we encourage Member States to apply them. The document titled 'Fundamental Safety Principles' lay the groundwork for all standards. Documents called Safety Requirements support these principles by highlighting requirements that must be met to ensure the protection of people and the environment, both now and in the future. Safety Guides explain how to comply with the safety requirements.

We draw upon the expertise of Member States to create and update the standards. Member States take part in Committees that provide feedback on the standards, and in a Commission that endorse the standards. Finally, the Board of Governors establishes the safety requirements and authorizes the Director General to issue them as part of the IAEA safety standard series. It is a cooperative and consultative process that takes time and results in well-founded documents that reflect international consensus.

Security is accepted as a fundamental requisite for the safe and peaceful use of nuclear energy. There is a risk that nuclear or other radioactive material could be used in criminal or intentional unauthorized acts, creating a threat to international security.

Member States have asked the Agency to assume the central and leading role in nuclear security globally in IAEA General Conference resolutions and in statements delivered at our Board of Governments meetings. This wish was also expressed at the 2016 IAEA International Conference on Nuclear Security.

To support Member States in nuclear security, the Agency has developed the Nuclear Security Series, which provides international consensus guidance on all aspects of nuclear security. The series comprises Nuclear Security Fundamentals, Recommendations, Implementing Guides and Technical Guidance.

The Agency also fosters cooperation and carries out activities as states' request to strengthen global nuclear security. In addition, it offers training, equipment and tools as well as technical advice and advisory services in the field of nuclear security.

For example, in June 2017, the IAEA launched a mobile application that helps customs officers determine whether radiation alarms going off at border crossings are sparked by naturally occurring radioactive material in goods such as ceramics, fertilizer and soy beans, or whether the alarm could indicate smuggled material, warranting further inspection.

To help Member States assess how their practices and frameworks compare to those recommended in the IAEA Safety Standards and Security Guidance, the

Agency offers peer reviews and advisory services. These are built on and foster cooperation: a peer review team typically includes experts from several Member States who work together to review another country's practices. A mission is a beneficial experience for hosts and reviewers alike. Everyone learns from each other to the benefit of nuclear safety and security.

Nuclear safety comes first is a principle that is widely adhered to in the nuclear community.

Maintaining a high level of nuclear safety and security are challenging responsibilities for all countries, and the IAEA offers wide-ranging support.

The IAEA fosters international cooperation to strengthen nuclear safety and security.

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