

Convention on Nuclear Safety 1994

1 Snapshot of Convention on Nuclear Safety 1994

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| Title | Convention on Nuclear Safety |
| Parties | 83 |
| Location | Vienna |
| Adopted | 17th June 1994 |
| Came into force | 24th October 1996 |
| Subject | Safety of land based civil nuclear power plants and related facilities |

2 Background

- 2.1 The Convention on Nuclear Safety was adopted on 17 June 1994 by a diplomatic conference convened by the International Atomic Energy Agency (“IAEA”), and entered into force on 24 October 1996. Its aim is “*to legally commit participating States operating land-based nuclear power plants to maintain a high level of safety by setting international benchmarks to which States would subscribe.*”¹
- 2.2 The Convention results from co-operation between governments, national nuclear safety regulators and the International Atomic Energy Agency (“IAEA”) in the aftermath of the Three Mile Island and Chernobyl accidents. It forms part of the international legal framework governing nuclear safety and security, including the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, the Convention on the Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, the Convention on the Physical Protection of Nuclear Material, and the IAEA Action Plan on Nuclear Safety.
- 2.3 An overview of international co-operation in nuclear safety must also encompass:
- (a) the wider work of the IAEA and the Nuclear Energy Agency of the OECD, including development of safety fundamentals and standards, and services such as the IAEA’s Operational Safety Review Team (OSART) programme established in 1982 to assist member states with the enhancement of safety of nuclear power plants;

¹ <http://www-ns.iaea.org/conventions/nuclear-safety.asp>

- (b) the role of Euratom, including directives on nuclear safety and management of spent fuel and radioactive waste;
- (c) the work of the European Nuclear Safety Regulators Group (ENSREG) in maintaining continuous improvement and promoting common understanding and transparency in nuclear safety and radioactive waste management between EU member states; and
- (d) the work of the World Association of Nuclear Operators (WANO), formed following the Chernobyl disaster to bring together operators of commercial nuclear power plants worldwide with the overriding priority of assurance in nuclear safety and excellence in operational performance.

3 Status

- 3.1 As of September 2017, the Convention on Nuclear Safety has 83 members, comprising 82 countries (including Syria, whose recent ratification takes effect on 17 December 2017) and the European Atomic Energy Community (Euratom). All 35 countries that currently have operational or permanently shut-down power reactors or reactors under construction are members. All European Union (EU) countries are members.

4 Obligations and operation

- 4.1 The Convention on Nuclear Safety provides a high level international framework for enhancement and review of nuclear safety, supplementing and further strengthening the role of the IAEA in establishing and monitoring nuclear safety standards and disseminating best practice.
- 4.2 The Convention is primarily an agreement to facilitate co-operation in the enhancement of nuclear safety, rather than a mechanism to impose prescriptive standards. Its stated objectives are:
- (a) *“to achieve and maintain a high level of nuclear safety worldwide through the enhancement of national measures and international co-operation ...”*
 - (b) *“to establish and maintain effective defences in nuclear installations against potential radiological hazards in order to protect individuals, society and the environment from harmful effects of ionizing radiation from such installations ...”*
 - (c) *“to prevent accidents with radiological consequences and to mitigate such consequences should they occur.”²*
- 4.3 To a great extent the provisions of the Convention are based on IAEA Fundamental Safety Principles³. Development and implementation of a regulatory regime consistent with those principles is a central requirement for any state seeking to establish an internationally acceptable nuclear power programme.
- 4.4 The obligations set out in the Convention encompass the creation of an acceptable legislative and regulatory framework, general safety considerations, emergency preparedness and provisions relating to regulation of siting, design, construction, and operation of nuclear installations.

² Convention on Nuclear Safety, Article 1

³ http://www-pub.iaea.org/MTCD/publications/PDF/Pub1273_web.pdf

- 4.5 The greatest practical innovation of the Convention lies in the establishment of mechanisms for regular reporting on nuclear safety by each member, and creation of a structured process for peer review of those reports and the sharing of best practice at a national level – all based on a common commitment to achievement of the highest safety standards.
- 4.6 The Convention applies to regulation and safety of “*any land-based civil nuclear power plant ... including such storage, handling and treatment facilities for radioactive materials as are on the same site and are directly related to the operation of the nuclear power plant ...*” A plant will continue to fall within the definition of “*nuclear installation*” until “*all nuclear fuel elements have been removed permanently from the reactor core and have been stored safely in accordance with approved procedures, and a decommissioning programme has been agreed to by the regulatory body.*”⁴
- 4.7 Primary obligations are set out in Chapter 2, which is divided into sections comprising:
- (a) general provisions;
 - (b) legislation and regulation;
 - (c) general safety considerations; and
 - (d) safety of installations.

Chapter 3 then sets out requirements for review meetings of members.

5 Chapter 2: Obligations

General provisions

- 5.1 Consistent with the central concept of enhancing nuclear safety through peer review, Article 5 requires each member to report on measures taken to implement each of its obligations under the convention (this requirement is considered further below in context of Chapter 3 and peer review meetings).
- 5.2 Article 6 contains a general requirement for each member to “*take the appropriate steps to ensure that the safety of nuclear installations existing at the time the Convention enters into force for that Contracting Party is reviewed as soon as possible.*” For each of its nuclear installations a member must then either:
- (a) “*ensure that all reasonably practicable improvements are made as a matter of urgency to upgrade the safety of the nuclear installation*”; or
 - (b) if upgrading cannot be achieved, implement plans “*to shut down the nuclear installation as soon as practically possible.*”

This requirement to upgrade or shutdown sets a context for the remainder of the Convention.

⁴ Convention on Nuclear Safety, Article 2(i), definition of “nuclear installation”

Legislation and regulatory framework

- 5.3 Articles 7 to 9 establish high level requirements for the regulatory framework that each member must maintain to govern the safety of nuclear installations.
- 5.4 Those articles set out two key principles.
- (a) Implementation of the regulatory framework must be entrusted to a regulatory body. That regulatory body must have “*adequate authority, competence and resources to fulfil its responsibilities*”⁵ and must be independent, with “*effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy.*”⁶
 - (b) The regulatory framework must ensure that “*prime responsibility for the safety of a nuclear installation rests with the holder of the relevant licence ...*”⁷ (being the licensed site operator).

General safety considerations

- 5.5 Articles 10 to 16 set out general principles relating to the prioritisation of safety, adequacy of resources and consideration of specific safety related factors.
- 5.6 Each member must ensure that:
- (a) “*all organizations engaged in activities directly related to nuclear installations shall establish policies that give due priority to nuclear safety*”⁸;
 - (b) “*adequate financial resources are available to support the safety of each nuclear installation*”⁹; and
 - (c) “*sufficient numbers of qualified staff with appropriate education, training and retraining are available for all safety-related activities ...*”¹⁰
- 5.7 Specific safety related considerations encompass:
- (a) “*the capabilities and limitations of human performance*”¹¹, requiring an understanding of and allowance for capacity for human error in safety regulation, systems and designs;
 - (b) establishment and implementation of quality assurance programmes;¹²
 - (c) requirements to ensure that
 - (i) “*comprehensive and systematic safety assessments are carried out before the construction and commissioning of a nuclear installation and*

⁵ Convention on Nuclear Safety, Article 8(a)

⁶ Convention on Nuclear Safety, Article 8(b)

⁷ Convention on Nuclear Safety, Article 9

⁸ Convention on Nuclear Safety, Article 10

⁹ Convention on Nuclear Safety, Article 11.1

¹⁰ Convention on Nuclear Safety, Article 11.2

¹¹ Convention on Nuclear Safety, Article 12

¹² Convention on Nuclear Safety, Article 13

*throughout its life.*¹³ Assessments must be documented and kept up to date, and reviewed under the authority of the regulatory body,

- (ii) *“verification ... is carried out to ensure that that the physical state and the operation of a nuclear installation continue to be in accordance with its design, applicable national safety requirements, operational limits and conditions”,¹⁴ and*
- (iii) *“radiation exposure to the works and the public ... shall be kept as low as reasonably achievable and that no individual shall be exposed to radiation doses which exceed prescribed national does limits”,¹⁵*

and

- (d) *emergency preparedness, ensuring that “there are on-site and off-side emergency plans that are routinely tested for nuclear installations”, and “insofar as they are likely to be affected by a radiological emergency, [each member’s] own population and competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response.”¹⁶*

Safety of installations

- 5.8 Articles 17 to 19 govern safety requirements relating to the siting, design, construction and operation of nuclear installations.
- 5.9 Each member must establish and implement a regulatory regime:
 - (a) *“for evaluating ... site related factors likely to affect the safety of a nuclear installation [and] the likely safety impact of a proposed nuclear installation on individuals, society and the environment”,¹⁷*
 - (b) *“for re-evaluating ... all relevant factors to ensure the continued safety acceptability of the nuclear installation ...”,¹⁸ and*
 - (c) *“for consulting [other member countries] in the vicinity of a proposed nuclear installation, insofar as they are likely to be affected by that installation ...”¹⁹*
- 5.10 Each member must also ensure that *“the design and construction of a nuclear installation provides for several reliable levels and methods of protection (defense in depth) against the release of radioactive materials ...”,* incorporating technologies which *“are proven by experience or qualified by testing or analysis”,* and allowing *“reliable, stable and easily manageable operation, with specific consideration of human factors and the man-machine interface.”²⁰*

¹³ Convention on Nuclear Safety, Article 14(i)

¹⁴ Convention on Nuclear Safety, Article 14(ii)

¹⁵ Convention on Nuclear Safety, Article 15

¹⁶ Convention on Nuclear Safety, Article 16

¹⁷ Convention on Nuclear Safety, Article 17(i) & (ii)

¹⁸ Convention on Nuclear Safety, Article 17(iii)

¹⁹ Convention on Nuclear Safety, Article 17(iv)

²⁰ Convention on Nuclear Safety, Article 18

- 5.11 Article 19 sets out requirements relating to authorisations to operate a nuclear installation, operating procedures, technical resources, reporting, sharing of experience and waste minimisation. Each member must ensure that
- (a) *“the initial authorisation to operate a nuclear installation is based upon an appropriate safety analysis and a commissioning programme demonstrating [consistency] with design and safety requirements”*;²¹
 - (b) *“operational limits and conditions ... are defined and revised as necessary ...”*;²²
 - (c) *“operation, maintenance, inspection and testing ... are conducted in accordance with approved procedures”*;²³
 - (d) *“procedures are established for responding to anticipated operational occurrences and to accidents”*;²⁴
 - (e) *“necessary engineering and technical support in all safety-related fields is available ...”*;²⁵
 - (f) *“incidents significant to safety are reported in a timely manner ...”*;²⁶
 - (g) *“programmes to collect and analyse operating experience are established, the results ... acted upon and that existing mechanisms are used to share important experience with international bodies and with other operating organizations and regulatory bodies”*;²⁷ and
 - (h) *“the generation of radioactive waste resulting from the operation of a nuclear installation is kept to the minimum practicable ...”*²⁸

6 Chapter 3: Meetings of the Contracting Parties

Review meetings

- 6.1 Chapter 3 builds on the comprehensive reporting obligation contained in Article 5, establishing a regime of review meetings. Member are required to hold meetings *“for the purpose of reviewing the reports submitted pursuant to Article 5”*²⁹, with provision for sub-groups of representatives *“for the purpose of reviewing specific subjects contained in the reports.”*³⁰ Meetings must be held at intervals not exceeding three years.³¹
- 6.2 Each member must be given *“a reasonable opportunity to discuss the reports submitted by other Contracting Parties and to seek clarification of such reports.”*³²
- 6.3 The annex to the “Final Act” of the IAEA conference convened for the purpose of adoption of the Convention on Nuclear Safety includes a series of clarifications on the

²¹ Convention on Nuclear Safety, Article 19(i)

²² Convention on Nuclear Safety, Article 19(ii)

²³ Convention on Nuclear Safety, Article 19(iii)

²⁴ Convention on Nuclear Safety, Article 19(iv)

²⁵ Convention on Nuclear Safety, Article 19(v)

²⁶ Convention on Nuclear Safety, Article 19(vi)

²⁷ Convention on Nuclear Safety, Article 19(vii)

²⁸ Convention on Nuclear Safety, Article 19(viii)

²⁹ Convention on Nuclear Safety, Article 20.1

³⁰ Convention on Nuclear Safety, Article 20.2

³¹ Convention on Nuclear Safety, Article 21.3

³² Convention on Nuclear Safety, Article 20.3

conduct of review meetings. In accordance with those clarifications “*the review process should*

- *include in-depth study of all national reports, to be conducted by each party before the meeting, as it deems appropriate;*
- *be carried out through discussion among experts at the meeting;*
- *take into consideration the technical characteristics of different types of nuclear installation and the likely radiological impact of potential accidents;*
- *identify problems, concerns, uncertainties, or omissions in national reports, focusing on the most significant problems or concerns in order to ensure efficient and fruitful debate at the meetings; and*
- *identify technical information and opportunities for technical cooperation in the interest of resolving safety problems identified.”³³*

6.4 Debates during review of reports are confidential.³⁴ The members must however adopt and publish a document addressing issues discussed and conclusions reached during a meeting.³⁵

6.5 The seventh review meeting took place in March / April 2017, with the highest level of participation to date. The meeting followed submission of national reports by all member countries other than Libya.

Extraordinary meetings

6.6 Extraordinary meetings must also be held if agreed by a majority of members.³⁶

6.7 An extraordinary meeting took place in August 2012 to review initial analysis of the Fukushima accident and the effectiveness of the Convention. Following that meeting, national reports under the Convention are to include specific design, operational and organisational issues derived from lessons learnt from Fukushima, and measures to ensure the independent of the regulatory body.

6.8 At a further extraordinary meeting in February 2015 members adopted the Vienna Declaration on Nuclear Safety.³⁷ The declaration contains principles intended to guide members in implementation of the Convention objective to prevent accidents with radiological consequences and to mitigate radiological consequences should they occur, again drawing on learning from Fukushima.

Rules of Procedure and Financial Rules

6.9 Article 22 requires the members to adopt Rules of Procedure and Financial Rules, and establish (in accordance with those Rules of Procedure) guidelines regarding the form and structure of reports under Article 5, dates for submission and the process for

³³ Annex to the Final Act of the IAEA Diplomatic Conference, INFCIRC/449/Add.1, <https://www.iaea.org/sites/default/files/infirc449a1.pdf>

³⁴ Convention on Nuclear Safety, Article 27.3

³⁵ Convention on Nuclear Safety, Article 25

³⁶ Convention on Nuclear Safety, Article 23

³⁷ https://www.iaea.org/sites/default/files/cns_viennadeclaration090215.pdf

review.³⁸ Rules and guidelines may then be reviewed and revised at subsequent review meetings.³⁹ The current version was issued in January 2015.⁴⁰

7 Implementation in the UK

- 7.1 The UK has in place an extensive regulatory regime governing nuclear safety, covering all aspects of the Convention on Nuclear Safety.
- 7.2 Obligations under the Convention and wider regulation of nuclear safety in the UK are implemented by the following three pieces of primary legislation and various regulations made under that legislation:
- (a) the Nuclear Installations Act 1965, which established the UK's nuclear site licensing regime and permits Office for Nuclear Regulation (ONR) to impose licence conditions in relation to nuclear safety and radioactive waste management;
 - (b) the Health and Safety at Work Act 1974; and
 - (c) the Energy Act 2013, which established the Office for Nuclear Regulation as the UK's independent regulatory body charged with regulating and enforcing nuclear safety standards.
- 7.3 Relevant secondary legislation includes:
- (a) the Ionising Radiation Regulations 1999;
 - (b) the Nuclear Reactors (Environmental Impact Assessment for Decommissioning Regulations) 1999;
 - (c) the Radiation (Emergency Preparedness and Public Information) Regulations 2001;
 - (d) the Management of Health and Safety at Work Regulations 1999; and
 - (e) the Health and Safety and Nuclear (Fees) Regulations 2016.
- 7.4 UK implementation of the Euratom Nuclear Safety Directives⁴¹ and Basic Safety Standards Directive⁴² is achieved via the licensing regime under the Nuclear Installations Act 1965. Pending withdrawal, the UK also has obligations under relevant provisions of the Euratom treaty, including Article 37 (requiring submission of data relating to disposal of radioactive waste before any relevant licence or permit is issued) and Articles 35 and 36, requiring monitoring of radioactivity and submission of data to the European Commission.
- 7.5 In addition, the Radioactive Substances Act 1993 and the Environmental Permitting (England and Wales) Regulations 2010 govern disposal of radioactive waste in Scotland and England & Wales respectively.

³⁸ Convention on Nuclear Safety, Article 22.1

³⁹ Convention on Nuclear Safety, Article 22.2

⁴⁰ <https://www.iaea.org/sites/default/files/infcirc573r6.pdf>

⁴¹ Council Directive 2009/71/Euratom, amended by Council Directive 2014/87/Euratom

⁴² Council Directive 96/29 Euratom, consolidated and repealed by Council Directive 2013/59 (to be implemented by 6 February 2018)

8 Euratom and Brexit

- 8.1 On 23 June 2016, the UK held a referendum on its membership of the EU, with a majority voting in favour of the UK leaving the EU.
- 8.2 The European Union (Notification of Withdrawal) Act 2017 was given Royal Assent on 16 March 2017. The UK's notice triggering exit under Article 50 of the Treaty on European Union expressly extends to exit from Euratom.
- 8.3 Until exit negotiations are concluded, the UK remains a full member of the EU and Euratom, and all rights and obligations arising from EU and Euratom membership remain in force in relation to the UK. During this period, EU and Euratom related legislation and relevant treaty obligations will continue to be implemented and applied.
- 8.4 For more information on the potential implications of the UK's exit from the EU and Euratom, see News Analysis: Brexit and Euratom and LNB News 24/02/2017 107.