Nuclear Legislation in OECD and NEA Countries

Regulatory and Institutional Framework for Nuclear Activities

Turkey

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Turkey

I. General regulatory regime

1. Introduction

There are no nuclear power plants in Turkey. The Turkish Atomic Energy Authority (TAEK) operates a 5 MW pool type research reactor with MTR type fuel (TR-2) in Çekmece Nuclear Research and Training Center (ÇNAEM) in Istanbul. It is used for radioisotope production, material tests and educational purposes. Another research reactor (TR-1) in ÇNAEM was dismantled in 1977. There is a Nuclear Fuel Pilot Plant being operated in ÇNAEM since 1986. It is a facility using natural uranium, covering uranium refining and conversion to sinterable UO2, and manufacturing UO2 pellets. Radioactive waste is managed in centralised waste processing facility in ÇNAEM. Low and intermediate level radioactive waste is either processed or conditioned, or both, in this facility.

There is a 250 kW TRIGA Mark II pulse reactor at the Energy Institute of Istanbul Technical University which is used for educational purposes.

National radioactive mineral deposits are mined and milled by ETI Mine Works General Management (See Part II "Institutional Framework" *infra* for further details).

Turkey has no general Nuclear Energy Act apart from legislation relating to the Turkish Atomic Energy Authority (*Türkiye Atom Enerjisi Kurumu* – TAEK) [Act. No. 2690 of July 1982, published in Official Gazette (OG) No. 17753 of 13 July 1982], the applicable law mainly covers protection against ionizing radiation and the licensing of nuclear installations.

2. Mining regime

Legislation concerning the prospecting and mining of nuclear materials comprises:

- Law on radioactive ores No. 3971 (Official Gazette (OG) No. 21854 of 19 February 1994);
- Mining Law No. 3213 (Official Gazette: 15 June 1985, no. 18785, amended by Law No. 5177 OG No. 25483 of 5 June 2004).

According to Article 2 of Law No. 3971, "uranium and thorium exploration and exploitation can only be conducted by the state". General Directorate of Mineral Research and Exploration (MTA) carries out exploration of uranium and thorium according to the establishment laws.

The state enterprise, ETI Mine Works General Management, holds the exclusive right of exploitation of uranium and thorium minerals according to the Cabinet Decree No. 7/16681 (OG No. 16462 of 31 October 1978).

The Mining Law No. 3213 of 2004 establishes principles, requirements and procedures regarding exploration, operation, ownership and closure of mines. The General Directorate of Mining Affairs of the Ministry of Energy and Natural Resources regulates mining activities in Turkey and is responsible for licensing and inspection of mining activities.

Article 2 of the Mining Law classifies minerals into five groups:

- Sand and gravel
- Marbles and aggregates
- Dissolved salts and CO2
- Metallic, industrial and energy minerals (including uranium and thorium)

- Precious stones

Article 50 of the Mining Law states that "produced uranium and thorium ores shall be sold to the state or to entities determined by the Council of Ministers".

According to Articles 4 and 8 of Turkish Atomic Energy Authority (TAEK) Law No. 2690 (OG No. 17753 of 13 July 1982), TAEK deals with issues related to safeguards, physical protection, security and safety, grants permits or licences to operate, import, export, hold, store, transfer or transport nuclear materials, according to the amount of special fissionable material, its form, usage purpose, etc.

The Regulation on Issue of Licenses for Nuclear Installations (OG No.18256 of 19 December 1983) defines procedures and requirements for licensing of nuclear fuel cycle facilities, including mines.

3. Radioactive substances, nuclear fuel and equipment

Regulations governing the use of radioactive substances and radiation sources are laid down in the Radiation Safety Decree of 1985 (OG No. 18861 of 7 September 1985) which superseded Decree No.7/9038 of 1974 on that subject. In accordance with the 1985 Decree, the regulation, issued in 2000 (OG No. 23999 of 24 March 2000) in accordance with the 1985 Decree and revised in 2004 (OG No. 25598, 29 September 2004) contains a number of provisions on the system for registering and licensing such materials.

4. Nuclear installations

Turkish regulations for the licensing of nuclear installations are laid down in Decree No. 83/7405 of 11 November 1983 (OG No. 18256 of 19 December 1983). Various other technical regulations on siting, design, construction and operation adapted from the IAEA safety standards have been issued.

In accordance with Decree No. 83/7405, the licensing procedure is divided into three main stages:

- site licence;
- construction licence;
- operating licence

Any application for a licence must be submitted to the Turkish Atomic Energy Authority (TAEK). Nuclear reactor facilities and nuclear fuel cycle facilities are required to obtain a licence. Nuclear reactor facilities are defined to include training reactors, research reactors, material testing reactors, test reactors, prototype reactors, reactors for the production of heat and reactors for the production of electrical power. Nuclear fuel cycle facilities are defined to include mining, milling and refining facilities, conversion facilities, enrichments facilities, nuclear fuel fabrication facilities, spent fuel reprocessing facilities and radioactive waste management facilities (including those for final disposal).

The licensing process, including the review, assessment and issuance of licences for nuclear installations, is co-ordinate by the TAEK Vice President responsible for Nuclear Power and Safety and it involves the AEC, the Advisory Committee on Nuclear Safety and the Department of Nuclear Safety.

Any application for a licence should be sent in written form to the authority together with all necessary supporting documents such as the site report, the safety analysis report or other reports containing results of the inspections and/or tests performed at the proposed site or installation. TAEK reviews and assesses those submissions based on the established safety principles, criteria, regulations and guides. The decision is issued by TAEK.

The TAEK is authorised to inspect nuclear installations to ascertain whether the conditions laid down in the relevant regulations and in the licence are being implemented. Institutions responsible for nuclear installations subject to such inspections are obliged to supply all necessary information and provide the authority's officials with free access to their premises.

Turkey ratified the 1994 Convention on Nuclear Safety on 8 March 1995. It is also a party to the 1986 Convention on Early Notification of a Nuclear Accident and the 1986 Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, both ratified on 3 January 1991.

5. Trade in nuclear materials and equipment

Turkey became a party to the Zangger Committee (ZC) in October 1999 and to the Nuclear Suppliers Group (NSG) in June 2000.

TAEK is the responsible authority for the export controls of nuclear and nuclear related dual use items covered in the lists, which are revised and updated from time to time by the members of the NSG and the ZC.

National Regulations on Permission for the Export of Material and Equipment used in the Nuclear Field and Related Technology were adopted in 2000 (OG No. 23965 of 15/02/2000) and updated in 2007 (OG No. 26642 of 19/09/2007).

6. Radiation protection

The Turkish Atomic Energy Authority, as a regulatory body, has legal and governmental responsibilities in respect to the safe use of sources of ionizing radiation, radiation protection, safe management of radioactive waste and safe transport of radioactive material. TAEK is entitled to liaise with many other government departments and customs and regional officials in order to undertake its functions effectively.

The Radiation Safety Decree of 7 September 1985 covers many fundamental aspects related to the regulation for radiation safety – particularly authorisation and inspection of practices. The Radiation Safety Regulations of 24 March 2000 have been amended on September 2004. Apart from the Radiation Safety Regulations, other practical specific regulations are:

- Regulation on the Licensing and Safety of Gamma and Electron Beam Irradiation Facilities, 18 June 1994, OG No. 21964;
- Regulation on the Licensing of the Facilities Including Ionizing Radiation Sources for Therapy Purposes in Medicine, 21 July 1994, OG No. 21997;
- Regulation for the Safe Transport of Radioactive Materials, 10 September 1997, OG No. 23106, amended in 2005, OG No. 25869 and based on the IAEA 1996 Regulations for the Safe Transport of Radioactive Material;
- Regulation on Nuclear and Radiological National Emergency Preparedness, 15 January 2000, OG No. 23934;
- Licensing Regulation for Industrial Radiography, 8 July 2005, OG No. 25869;
- Regulation for the Management of Waste arising from the Use of Radioactive Material, 2 September 2004, OG No. 24571.

7. Radioactive waste management

Radioactive waste processing installations are classified as nuclear installations and, as such, are covered by Decree No. 83/7405, which governs the licensing of nuclear installations.

Measures for protecting workers and the public against hazards arising from radioactive waste are laid down in the Radiation Safety Decree (OG No. 18861 of 7 September 1985) and the Radiation Safety Regulations (OG No. 23999 of 24 March 2000). Further provisions are set out in the Regulations governing Radioactive Discharges into the Environment from Non-Fuel-Cycle facilities which were issued in 2004 (OG No. 24571 of 2 September 2004).

8. Nuclear security

Turkey ratified the 1968 Treaty on the Non-Proliferation of Nuclear Weapons on 17 April 1980 and the relevant Safeguards Agreement with the IAEA was signed and entered into force on 20 October 1981. An Additional Protocol to this Agreement was signed and entered into force on 12 July 2001.

Turkey is also a Party to the 1979 Convention on the Physical Protection of Nuclear Material (CPPNM), ratified on 27 February 1985, and signed the new amendment in 2005. It had already issued a Regulation on Physical Protection Requirements for Special Nuclear Materials in 1979 (OG No. 16702 of 20/07/1979).

National Regulations on Nuclear Material Accounting and Control were adopted in 1997 (OG No. 23106 of 10 September 1997).

9. Transport

The Regulation on the Safe Transport of Radioactive Materials amended in 2005 (OG No. 25869 of 8 July 2005) repealed the regulation issued in 1997.

The Turkish Atomic Energy Authority is generally responsible for licensing and supervising the transport of radioactive substances.

As regards international agreements relating to the safe transport of dangerous goods, including radioactive substances, Act No. 3938, issued on 14 December 1993 (Official Gazette No. 21788), incorporates all the annexes of RID based on the COTIF Protocol of 20 December 1990. The protocol of 3 June 1999 has been in force since 1 July 2006. The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) will come into force starting from 1 January 2010 and the relevant international regulations issued by the International Civil Aviation Organization (ICAO), International Air Transport Association (IATA) and the International Maritime Organisation (IMO) are also applied by the relevant governmental bodies.

10. Nuclear third party liability

Turkey is a contracting party to the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy. Turkey has also signed and ratified the amending Protocols of 28 January 1964 and 16 November 1982. In 2004 the Amending Protocol was signed on 12 February 2004 and will be ratified in the near future. A special national legislation in this field is being drafted. In addition, Decree No. 83/74045 of 19 December 1983, approved by the Turkish Atomic Energy Authority, requires the operator of a nuclear installation to have insurance or other forms of financial security, approved by the Turkish Atomic Energy Authority (Act No. 299 of 8 May 1961 – OG No. 10806 of 13 May 1961; Act No. 878 of 1 June 1967 – OG No. 12620 of 13 June 1967; – Cabinet Decree No. 86/10513 – OG No. 19115 of 23 May1986).

II. Institutional Framework

1. Regulatory and supervisory authorities

a) Prime Minister

At the outset, nuclear activities in Turkey were placed under the authority of the Prime Minister. More specifically, the Atomic Energy Commission (now the Turkish Atomic Energy Authority) was established under his authority and it is still administratively attached to the Prime Minister's Office (Act No. 6821 of 27 August 1956 setting up the Commission, now superseded by Act No. 2690 of 13 July 1982).

b) Ministry of Energy and Natural Resources

This Ministry is the major competent authority in the national energy sector. It is responsible for the preparation and implementation of energy policies, plans and programmes in co-ordination with its subsidiary and related institutions and other public and private entities.

The Law on Construction and Operation of Nuclear Power Plants and Energy Sale (Law No. 5710, unofficial translation reproduced in *Nuclear Law Bulletin* No. 80) entered into force on 21 November 2007. The purpose of this law is to stipulate the procedures and principles regarding the construction and operation of nuclear power plants for electricity production and energy sale in accordance with the energy plan and policies.

The procedures and principles regarding the requirements which the bidding companies have to meet in order to construct the nuclear power plants under this law and the selection of the company are defined in a regulation published in the Official Gazette on 19 March 2008. A competition for selling electricity generated by nuclear power plants will be held by the Turkish Electricity Trading and Contracting Company (TETAŞ). The deadline of the tender process for the construction of NPP units at the Akkuyu Site expires on 24 September 2008. The bids will include an installed capacity of 3000 to 5000 MWe. The company who gives the most favourable bid with respect to energy sale unit price will sign a contract with the TETAŞ for the period of 15 years.

Priority shall be given to private companies to construct and operate nuclear power plants in the framework of this law. However, the establishment of a public-private partnership and the construction of nuclear power plants by public companies may also be possible.

Based on this law, the Turkish Atomic Energy Authority (TAEK) established a set of criteria. The criteria setting the general principles were prepared and published by TAEK. All investors/bidders should meet the TAEK Criteria in order to ensure that their bids are accepted for competition.

c) Ministry of Health

This Ministry is responsible for public health. It is also the supervisory authority over the General Directorate for Drugs and Pharmacy which was established in 1946 and reorganised in 1984 to become the Drug Regulatory Authority under the Ministry. Medical exposures and operational radiation protection of health practitioners will be enforced by the Ministry of Health based on TAEK regulations.

d) Ministry of the Environment and Forestry

This Ministry establishes principles of national policy and related plans and programmes for protection and improvement of the environment, and the prevention of environmental pollution. In concrete terms, the Ministry's responsibilities include ensuring the most proper and effective use and protection of land, the protection and improvement of the natural plant and animal habitat and the prevention of environmental pollution. In order to carry out these responsibilities, the Ministry issued a Decree on assessment of installations in terms of their environmental impact on 23 June 1997 [OG No. 23028]. According to this Decree on Environmental Impact Assessment, the operator of a facility has to prepare an Environmental Impact Assessment Report at the planning stage which should be submitted to the Ministry. The Ministry evaluates the report for the feasibility and environmental aspects of the proposed installation, and grants permission to the operator to carry out his project if the report is found satisfactory. Nuclear installations fall within the definition of facilities which require this authorisation from the Ministry.

2. Public and semi-public agencies

a) Turkish Atomic Energy Authority (TAEK)

The Turkish Atomic Energy Authority (TAEK), established by the Turkish Atomic Energy Authority Act No. 2690 in 1982 replaced the former General Secretariat of Turkish Atomic Energy Commission that was created in 1956.

i) Legal status

In its constitutive act, TAEK is defined as a legal body under the direct supervision of the Prime Minister and authorised to draw up regulations concerning radiation protection, licensing and safety of nuclear installations and radiation sources. In November 2002, the Government of Turkey re-organised the relation between several public agencies to ministries. According to this re-organisation, TAEK is affiliated to the Ministry of Energy and Natural Resources.

ii) Responsibilities

TAEK undertakes all the regulatory activities concerning nuclear safety, radiation protection, radioactive waste, transport and security. TAEK is authorised to inspect nuclear installations to ascertain whether the conditions laid down in the relevant regulations and in the licence are being implemented. Institutions responsible for nuclear installations subject to such inspections are obliged to supply all necessary information and provide the authority's officials with free access to its premises.

More specifically, TAEK is responsible for the following issues;

- issuing licences to private and state enterprises conducting various activities involving radiation sources;
- supervising such enterprises from the radiological safety standpoint and ensuring that licensing conditions are complied with;
- issuing approval, permit and licence related to siting, construction, operation and environmental safety of nuclear power and research reactors and nuclear fuel cycle facilities;
- performing necessary review, assessment and inspection in these installations;
- limiting the operating authorisation in case of non-compliance with the permit and the licence;

- revoking the licence and/or permit issued previously either temporarily or permanently and submitting its recommendations to the Prime Minister for shutting down such installations;
- preparing the necessary rules and regulations for above purposes;
- taking the necessary steps to arrange for transportation, processing, storage and disposal of radioactive waste produced by nuclear installations and radioisotope laboratories;
- arranging training of staff required in the nuclear and radiological sector;
- supplying the all necessary information in this field;
- formulating the general policy and relevant programmes on peaceful uses of nuclear energy and submitting them to the Prime Minister for approval;
- carrying out and/or coordinating research on nuclear energy applications in the context of Turkey's scientific, technical and economic development;
- conducting research to provide industrial access to nuclear technology and know-how;
- constructing and operating research centers, laboratories and pilot plants; and
- building and operating installations for the production and distribution of radioisotopes.

iii) Structure

TAEK is headed by a president appointed by the Prime Minister. The president is the authority's official representative and is responsible for implementing its programme. He is assisted by three vice-presidents.

The bodies of TAEK are:

- The Atomic Energy Commission;
- The Advisory Committee;
- The Specialised Departments:
  - Nuclear Safety Department
  - Radiation Health and Safety Department
  - Technology Department
  - Research, Development and Co-ordination Department
  - Department of Administrative and Financial Affairs
- The Affiliated Centers:
  - Çekmece Nuclear Research and Training Centre (ÇNAEM)
  - Sarayköy Nuclear Research and Training Centre (SANAEM)
  - Nuclear Research and Training Center for Turkish Speaking Countries (TÜDNAEM)

TAEK undertakes its duty to do research by performing experimental and theoretical studies at TAEK's research centres and by making projects with the universities and other related organisations. The research infrastructure at the Çekmece Nuclear Research and Training Centre of

TAEK is especially devoted to the research and development programmes addressing the issues of nuclear reactor and fuel technology.

Çekmece Nuclear Research and Training Centre (ÇNAEM)

The Çekmece Centre (*Çekmece Nükleer Araştirma ve Eğitim Merkezi* – ÇNAEM) was founded in 1962 near Istanbul and is affiliated to the Turkish Atomic Energy Authority. It is a government research centre and, as such, may co-operate with universities and other scientific and research institutes in the development and application of nuclear science and technology for peaceful uses.

The work programme of the ÇNAEM is co-ordinated with TAEK's nuclear programme in support of the national economy and it focuses on nuclear technology, applications and training.

The ÇNAEM commissioned a 1 megawatt thermal power reactor (TR-1) in 1962 for both research and production of isotopes for industrial and medical purposes. It was operational from 1962 to 1977 and has now been dismantled. A 5-megawatt TR-2 reactor was later built in the same building and has been operating since 1982 for irradiation purposes.

The Centre is directed by the Director of Centre, who reports to the president of the Turkish Atomic Energy Authority, and is assisted by three deputy directors for nuclear technology and safety, radiation applications and measurements and administrative matters respectively. Five divisions are responsible of development and applications of nuclear technology and techniques for peaceful uses. The divisions are managed by a head of division, who reports to the Director of the centre. There is a Quality Manager and other managers for administrative and finance affairs reporting to Deputy Directors. Main installations and systems at ÇNAEM are as follows:

- Research reactor (TR-2).
- Ion accelerator with low energy (neutron generator).
- Nuclear fuel pilot plant, low level radioactive waste processing plant.
- Radioisotope and radiopharmaceuticals laboratory.
- Calibration laboratory for radiation measurement instrument (SSDL).
- Development and production laboratory for radiation measurement instrument.
- Chromosome aberration analysis laboratory.
- Well-equipped radioactivity analysis laboratory.
- Well-equipped chemical analysis laboratory.
- Non-destructive testing laboratory;
- Ceramic material laboratory.
- Instrument for radiation measurement.
- Well-equipped computers and network systems.
- Workshops, buildings and infrastructure.

Sarayköy Nuclear Research and Training Centre (SANAEM)

Sarayköy Nuclear Research and Training Centre (SANAEM) is one of the affiliated institutions of Turkish Atomic Energy Authority. It was established on 5 July 2005 in place of former research centres namely Ankara Nuclear Research and Training Centre and Ankara Nuclear Research Center for Agriculture and Animal Science.

Today SANAEM has considerable expertise in application of nuclear techniques in medicine, industry, environment, food, agriculture and animal sciences including environmental radioactivity monitoring, industrial applications such as using industrial irradiation facility for sterilization of food and single used medical products, e-beam applications, detection of irradiated foods and gene based biotechnology. Additionally the Centre is responsible for occupational personnel radiation monitoring countrywide. Apart from the functions mentioned above SANAEM has the duty to utilize accelerator technologies for medical purposes such as production of radiopharmaceuticals for diagnostics and therapy.

The activities at SANAEM are carried out in Measurement and Instrumentation Division, Research and Development Division, Technology Division and Applications Division. The Centre operates the first industrial irradiation facility of Turkey (serving for irradiation of single used medical products and food stuff) and an experimental gamma cell. There is also a registered Fusion Laboratory where a "Spherical Tokomak System" and a new plasma focus system are used for fusion research.

A 30 MeV cyclotron will be constructed at the Centre and be in operation by 2010 for the production of PET and SPECT radioisotopes and for research activities. It has a total of 1.2 mA current and consists of 4 beam lines (one to be used for research activities). There is also a 500 keV, 20 mA electron accelerator (e-beam) at the Center which is the only e-beam facility of Turkey and it is used for flue gas and waste water treatment in addition to other research activities.

Nuclear Research and Training Centre for Turkish Speaking Countries (TÜDNAEM)

Nuclear Research and Training Centre (TÜDNAEM) was founded in Ankara in 1999 for co-operation in peaceful uses of nuclear energy among countries of the Eurasian and to initiate regional projects involving three or more countries to derive distinct benefits for co-ordinated and co-operative activities.

b) General Directorate for Mineral Research and Exploration (MTA)

The General Directorate for Mineral Research and Exploration (*Maden Tetkik Arama Enstitüsü* – MTA) was established on 22 June 1935 to explore ore deposits in Turkey. MTA is a government organisation under the supervision of the Prime Minister (Act No. 2804 of 14 June 1935 – OG No. 3035 of 22 June 1935) and is headed by a Director-General appointed by the government. MTA undertakes explorations of mineral and raw material deposits and carries out scientific and geologic investigations as well as chemical analyses and technological tests (Act No. 2804 and Act No. 3213 of 4 June 1985).

c) ETI Mine Works General Management

ETI Mine Works General Management (formerly ETIBANK) was established by Act No. 2805 of 14 June 1935 (OG No. 303 of 25 June 1935) to carry out activities in the field of mining, metallurgy and chemicals. In 1997 ETIBANK was divided into two companies, ETIBANK and the ETI Mine Works General Management (Mining, Chemistry, Metallurgy). The latter does not carry out any bank-related functions. Both ETIBANK and the ETI Mine Works General Management are state economic enterprises under the supervision of the Ministry of Energy and Natural Resources. ETI Mine Works General Management is involved in the exploitation of boron, uranium and thorium minerals and also produces aluminium.

d) Turkish Electric Generation and Transmission Corporation (TEAS)

TEAS is in charge of the planning, construction (of thermal power plants only), operation and maintenance of electricity generation and transmission installations in Turkey. TEAS has been divided into three entities on 4 April 2000. The Turkish Electricity Transmission Company (TEIAS) is responsible for electricity transmission and load dispatch activities. The Electricity Generation Company (EUAS) is responsible for the operation of existing public power plants. The Turkish Electricity Trading and Contracting Company (TETAS) is responsible for electricity wholesale and purchases

e) Turkish Electricity Distribution Corporation (TEDAS)

TEDAS is responsible for carrying out electricity distribution activities and related to these activities are tasks such as the necessary construction, operation and maintenance of installations, buying electricity for generating utilities and selling to purchasers. Privatisation is at an advanced stage.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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NUCLEAR ENERGY AGENCY

The OECD Nuclear Energy Agency (NEA) was established on 1st February 1958 under the name of the OEEC European Nuclear Energy Agency. It received its present designation on 20th April 1972, when Japan became its first non-European full member. NEA membership today consists of 28 OECD member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Portugal, Republic of Korea, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Communities also takes part in the work of the Agency.

The mission of the NEA is:

- to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes, as well as
- to provide authoritative assessments and to forge common understandings on key issues, as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

Specific areas of competence of the NEA include safety and regulation of nuclear activities, radioactive waste management, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information.

The NEA Data Bank provides nuclear data and computer program services for participating countries. In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

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