

Legislative update: Turkey

Turkish law on construction and operation of nuclear power plants and energy sale

A law on construction and operation of nuclear power plants and energy sale¹ was adopted in Turkey on 9 November 2007. The law paves the way for the construction of the country's first nuclear power plant, which has been the aim for more than 30 years.

The law has a rather procedural nature, listing steps to be taken by a number of institutions involved in its implementation. The Turkish Atomic Energy Authority (TAEK) must define criteria for companies that plan to build and operate a nuclear power plant. These criteria concern nuclear safety, licensing, reactor type, plant lifespan, proven technology, fuel technology, localisation, operational record and electrical power, and have already been published by TAEK.²

The Ministry of Energy and Natural Resources has published a regulation on requirements to be met by the bidding companies, the selection process, land allocation, the licence fee, infrastructure incentives, fuel supply, production capacity, the volume of electricity to be purchased by the Turkish Electricity Trading and Contracting Company (TETAŞ) and the energy unit price.³ Following the adoption of this regulation, TETAŞ launched the tender process on 24 March 2008, inviting local and foreign companies to bid until 24 September 2008.

The law stipulates that TETAŞ will buy the electricity produced at the nuclear power plant pursuant to a contract to be signed between the selected company and TETAŞ for a period not exceeding 15 years after the power plant has started its operation.⁴

With respect to third party liability, the law states that in case of an accident at a nuclear power plant or during transport of nuclear fuel, radioactive materials or radioactive waste, the 1960 Paris

Convention on Nuclear Third Party Liability, its amendments and other national and international liability provisions shall apply.⁵ Turkey is a contracting party to the 1960 Paris Convention on Nuclear Third Party Liability and its Amending Protocols of 1964 and 1982, and has signed the 2004 Amending Protocol.

A remarkable provision of the new law is that the company constructing the nuclear power plant shall be obliged to allocate 1% of its annual revenue to research and development activities.⁶

As an *ultima ratio*, the new law foresees that public companies may be established by the Council of Ministers and assigned to build and operate the plant and sell the electricity produced. This might be interpreted as Turkey's determination to turn this new attempt at nuclear energy into a success.

Background

Turkey has a long history of abandoned attempts at nuclear energy. Studies to build a nuclear power plant in Turkey started in 1965. Between 1967 and 1970, a feasibility study was undertaken to build a nuclear power plant and have it operational by 1977, but due to difficulties relating to site selection and other issues, the project was not realised. In a second attempt in 1974-1975, site selection studies were carried out and the Akkuyu location was found suitable for the construction of the first nuclear power plant for which the Atomic Energy Commission granted a site license in 1976. The next year, a bid was prepared and the ASEA-ATOM and STAL-LAVAL companies were awarded the contract. However, in September 1980, due to the Swedish government's decision to withdraw a loan guarantee, the project was cancelled. A third attempt was made in 1980 and three companies were awarded the contract to build four nuclear power plants, yet the project once again fell through as a consequence of financial difficulties. In 1993, the High Council of Science and Technology identified nuclear electricity generation as the third highest priority project for the country. In view of this decision, the Turkish

Electricity Generation and Transmission Company (TEAŞ) included a nuclear power plant project in its 1993 investment programme. After starting the bidding process in 1997, a series of delays lead to the government's decision to postpone the project in July 2000.⁷

Turkey lacks significant domestic energy resources and highly depends on foreign gas imports.⁸ In 2004, Turkey had a total installed electricity generating capacity of 35.6 GWe which constitutes a 36% increase since 2000. Conventional thermal sources (coal, gas, oil and geothermal) composed 68% of Turkey's electricity supply in 2004; hydroelectricity generation makes up almost all of the remainder. Taking into

consideration diversity and energy supply security, nuclear energy is seen as an important alternative to fossil resources. ■

Notes:

1. Law No. 5710 – an unofficial translation of the text has been reproduced in the *Nuclear Law Bulletin*, No. 80, page 105.
2. Available in English at www.taek.gov.tr/olcutler/taekcriteria_final_211207.pdf.
3. Published in the Turkish Official Gazette No. 26821 on 19 March 2008.
4. Articles 4(1)(a) and 3(5) of the law.
5. Article (5)(5) of the law.
6. Article (5)(6) of the law.
7. www.nea.fr/html/general/profiles/turkey.html.
8. Two-thirds of gas is imported from the Russian Federation and the rest mainly from Iran.

Phase IV of the TDB project

The NEA Thermochemical Database (TDB) project is a long-standing co-operative effort to assemble a comprehensive, internally consistent and quality-assured chemical thermodynamic database of selected chemical elements to meet the predictive modelling requirements for the performance assessments of radioactive waste disposal systems. The data are used, for example, to calculate the migration of radioelements across engineered barriers and the geosphere.

The TDB project combines a scientifically sound review methodology and a stable organisational framework in line with its long-term objectives. The main products of the review exercises are the books published in the Chemical Thermodynamics Series, providing in the open literature:

- access to critical judgement of existing literature and data, reviewed by world experts in the field;
- knowledge transfer between TDB review teams and the performance assessment community;
- identification of areas needing further research.

The project was established in the 1980s following the realisation that existing databases at that time lacked internal consistency or were not sufficiently documented to allow the tracing of the original data sources. The chemical thermodynamics of uranium, americium, technetium, neptunium and plutonium were the first elements to be reviewed and published. The data for these elements were updated during the

second phase of the project (1998-2003), and new reviews were undertaken for inorganic species and compounds of fission and activation products, such as selenium, nickel and zirconium. In addition, reviews of organic compounds and complexes (oxalate, citrate, EDTA and iso-saccharinic acid) of all of the previously cited elements (U, Np, Pu, Am, Tc, Se, Ni and Zr) were completed and published in 2005.

In the third phase of the TDB project (2003-2008), it was decided to review:

- thorium (Th), chosen for reasons of chemical consistency within the database for actinides;
- tin (Sn), present as a fission product in nuclear waste and whose thermochemical properties present substantial gaps and inconsistencies for solubility limiting species;
- iron (Fe), a key element in determining the redox (oxidation-reduction) conditions in repositories for which a consistent chemical thermodynamic database is lacking.

Participants also agreed to prepare guidelines for the evaluation of thermodynamic data for solid solutions. These solids have not been systematically examined for database work so far, but they may provide more accurate information in relation to waste migration as well as the performance of engineered and natural barriers. The book on solid solutions was published in 2007 as volume 10 in the series of TDB books. The review of thorium data is expected to be issued in 2008, followed by the reviews of tin (Sn) and iron (Fe) in early 2009.