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Turkey's Nuclear Regulatory Regime: Questions About Independence

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Introduction: Atoms for Peace

On Tuesday 8 December 1953, American President Dwight D. Eisenhower stood before the United Nations and warned of the threat of nuclear proliferation and the horror of nuclear war. Eisenhower soon pivoted away from his emphasis on nuclear threats and began to herald the peaceful uses of the atom. Eisenhower proposed the development of an international atomic energy agency tasked with overseeing the peaceful development of nuclear energy. Eisenhower, in 1955, directed the U.S. Atomic Energy Commission (AEC) to provide technical and financial assistance, as well as fissile material to "free world" countries interested in taking advantage of atomic energy. The Turkish Republic was the first country to take advantage of the new policy and signed a nuclear agreement with the United States on 10 June 1955.

U.S. – Turkish Nuclear Negotiations: The 1955 Nuclear Cooperation Agreement

Turkish Prime Minister Adnan Menderes hailed the agreement as "historic" and described it as a "demonstration of the close cooperation that exists between these two close friends and trustworthy Allies."[1] At the time of the signing, the U.S. government had concluded that Turkey had no atomic energy board or executive authority to oversee the development of nuclear energy.[2] The United States was offering to supply Turkey with a partially funded small research reactor. Turkey, while eager to use the small research reactor for radioisotope production, envisioned generating power from a larger reactor.[3]

The Parties agreed to the exchange of information pertaining to: the design, construction and operation of research reactors and their use as research, development, and engineering tools and in medical therapy; health and safety problems related to the operation of small research reactors; the use of radioactive isotopes in physical and biological research, medical therapy, agriculture, and industry.[4] The agreement also allowed for Turkey to lease the fuel needed to operate the reactor and obligated the United States to provide fresh fuel rods when the reactor needed to be refueled. The two sides agreed that the fuel rods transferred "shall not at any time be in excess of six kilograms of contained U-235 in uranium enriched up to a maximum of twenty percent U-235."[5] When the fuel rods needed replacement, Turkey was required to return them to the United States, unless the two sides agreed to a different arrangement. The spent fuel

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[1] Incoming Telegram, No. 1382, Department of State, 5 May 1955, National Security Archives.
[2] Incoming Telegram, No. 639, Department of State, 15 October 1955, National Security Archives.
[3] Ibid.
[4] Agreement for the Cooperation Concerning Civil Uses of Atomic Energy Between the Government of the United States of America and the Government of the Turkish Republic, Agreement signed at Washington on 10 June 1955, National Security Archive.
[5] Ibid.

was not to be altered, presumably to prevent Turkish officials from conducting reprocessing experiments. Turkey was responsible for maintaining control over the U-235 assemblies and tasked with ensuring that the fissile material was well protected. Moreover, the Turkish atomic establishment was required to keep detailed operating records and submit them to the AEC for review. If the AEC found any discrepancies in the rate of fuel burn-up, they had the authority to conduct inspections. Moreover, Turkey agreed to only use U.S. supplied technology and fuel for peaceful purposes (i.e. – non-weapons related research) and not to re-transfer any of the equipment to third parties.

Turkey's Nuclear Regulatory Agency

Turkey's first nuclear reactor was built with a $350,000 grant from the American AEC. The Turkish government contributed $270,000 for laboratory equipment and other incidental items. Following the signing of the U.S. – Turkey nuclear cooperation agreement, Ankara established the Turkish Atomic Energy Commission (TAEC) in 1956. It was formed under the auspices Prime Ministry and tasked with overseeing the country's nuclear research centers and to issue licenses for future power plants.[6] TAEC signed a contract on 5 May 1959 with American Machine and Foundry for the construction of a 1 MWth pool type reactor. TAEC was replaced in 1982 with the Turkish Atomic Energy Authority (Turkiye Atom Enejisi Kurumu - TAEK). TAEK is authorized to draft and oversee regulations related to nuclear safety and site licensing. Turkey, however, does not have a general nuclear energy act. The closest equivalent is the legislation that created TAEK, which has provisions related to protection against radiation and the licensing of nuclear power plants.[7]

The licensing regulations were enshrined on 11 November 1983 in Decree no. 83/7405. The licensing procedures were adapted from International Atomic Energy Agency recommendations. The licensing procedure is divided in to three parts: 1) site license, 2) construction license, 3) operator license. The legislations allow for TAEK to partner with foreign firms to oversee the licensing procedures and to review bids for nuclear tenders. Once TAEK issues a license, it is also the entity responsible for inspecting the facility to ensure that it is operating according to the law.

In 2002, the Turkish government re-organized the TAEK and expanded its mandate. TAEK is now affiliated with the Ministry of Energy and Natural Resources. The Ministry is responsible for formulating and implementing Turkey's energy policies. TAEK's president is appointed by the Prime Minister and tasked with overseeing the implementation of Turkey's nuclear energy program. Three vice presidents are chosen to

[6] Ibid.
[7] "Regulatory and Institutional Framework for Nuclear Activities: Turkey," Nuclear Legislation in OECD Countries, Nuclear Energy Agency, 2008, http://www.oecd-nea.org/law/legislation/turkey.pdf.

assist the president. Together, they oversee the Atomic Energy Commission (AEC), an advisory council, and the advisory committee on nuclear safety.[8]

The Atomic Energy Commission is made up of representatives from the Ministries of National Defense, Foreign Affairs, Energy and Natural Resources, and four faculty members from Turkish universities. The representatives are selected by the Prime Minister to serve four-year terms.[9] The AEC is responsible for drafting budgets, laws, and an annual report for the Prime Minister. Members of the advisory council are appointed by the AEC, and then submitted to the Prime Minster for approval. The advisory council conducts studies assigned to it by the AEC and reports its findings to the AEC during regularly held meetings.

Questions about TAEK's Independence

Despite having modeled much of its regulatory infrastructure on European Union Law, there continue to be serious questions about TAEK's regulatory independence.[10] TAEK is responsible for procuring nuclear reactors from foreign suppliers, overseeing the operation of the reactor, and regulating and inspecting the reactor's construction and operation. These responsibilities are in contradiction to one another. On the one hand, TAEK has an incentive to ensure that the firm constructing the reactor meets the construction deadlines. However, TAEK is also tasked with regulating and inspecting the reactor while under construction. Thus, TAEK could be forced to choose between cutting corners to ensure the timely construction of its reactor project, or slowing a project down if it encounters small safety issues that require redesigning the reactor site.

Moreover, TAEK's leadership remains under the authority of the Prime Ministry. The law that established TAEK does not include a provision that prevents the chairperson from being removed from his/her post for decisions made during his/her term. The AEC, which is also critical for the licensing and regulation of nuclear power plants, is also appointed by the Prime Ministry and its members, like the chairperson, are not protected from being dismissed for decision's made during their term. TAEK's budget is also under direct control of the office of the Prime Ministry, which in turn raises more questions about the Agency's independence. Other agencies in Turkey receive their budget from non-affiliated ministries so as to preserve financial independence and lessen the likelihood of political interference.[11] In addition, the law mandates that TAEK be

[8] "TAEK Organizational Chart," Turkish Atomic Energy Authority, 10 February 2012, http://www.taek.gov.tr/eng/about-us/taek-organization-chart.html.
[9] "Atomic Energy Commission," Turkish Atomic Energy Authority, 10 February 2012, http://www.taek.gov.tr/eng/about-us/aek.html.
[10] Izak Atiyas and Deniz Sanin, "A Regulatory Authority for Nuclear Energy: Country Experiences and Proposals for Turkey," in "The Turkish Model for Transition to Nuclear Energy – II," The Center for Economics and Foreign Policy Studies, December 2012, http://edam.org.tr/eng/EDAMNuclear/Nuclear%20Report%202012/edamreport2012big.pdf.
[11] Ibid., pg. 149.

regulated by the High Inspection Board, which is an entity under the control Prime Ministry.

Lastly, TAEK has not yet dealt with the issue of spent reactor fuel and reactor decommissioning. Currently, Russia's Rosatom is contracted to take back all spent fuel and to decommission the reactors at the Akkuyu nuclear site. However, the lack of an overarching Atomic Energy Act has raised legitimate concerns about spent fuel storage should Turkey opt to partner with a foreign supplier that is unwilling to take back the reactor's spent fuel at the Sinop site. Moreover, the issues of liability and insurance, should there be an accident at the Akkuyu reactors, remain murky at best.

Regulating the Energy Market: Privatization and Turkey's Nuclear Tenders

In 1963, the recently created Ministry of Energy and Natural Resources (MENR) was tasked with regulating Turkey's electricity sector. Shortly thereafter, the Turkish government created the Turkish Electricity Administration (TEK) – a state monopoly that was put in charge of "incorporating all electricity activities other than distribution."[12] Thus, when Turkish nuclear authorities undertook studies between 1972 and 1974 for the construction of a nuclear power reactor, TEK was involved in regulating and overseeing the licensing procedures. TEK concluded in 1974 that the Akkuyu bay near the Turkish coastal town of Mersin was an ideal location for the country's first power plant, which in turn prompted the TAEC to issue a site license in 1976. Shortly thereafter, Turkey began negotiations with a Swedish consortium for the supply of a nuclear power reactor. The negotiations, however, were halted after the Swedish government refused to finance the $800 million loan. Stockholm was put-off by the 1980 military coup and the prospect of funding the construction of a nuclear reactor in a country controlled by the military.

After the 1980 coup, the military regime sought to change Turkey's economic system from import-substitute-industrialization (ISI) to an export oriented free market economy. The task was entrusted to Turgut Ozal, who later would go on to be the Prime Minister once the military administration stepped aside and allowed for democratic elections in 1983. The market reforms led to the passage of Law No. 3096, which allowed for institutions other than TEK to produce, distribute, and trade electricity.[13] The passage of this law led to the Turkish parliament putting in place the legal infrastructure to support the government's preference for build-operate-transfer (BOT), build-operate-own (BOO), and transfer of operating rights (TOOR) financing models for the electricity sector.

The new law allowed for private companies to invest in Turkey's underdeveloped electricity sector and for the government to decrease the subsidies that it had been paying to keep electricity prices low. It also allowed for the new government to attract foreign investment without a large outlay of state capital. However, the policy has prevented Turkey from making progress on its decades old quest to generate a significant

[12] Necmiddin Bagdadioglu and, Necmi Odyakmaz, "Turkish Electricity Reform," *Utilities Policy*, Vol. 17, (2009), pg. 145.
[13] Ibid.

percentage of its electricity from nuclear power reactors. General Electric (GE), Kraftwerk Union (KWU), and Atomic Energy of Canada Limited (AECL) cited BOT as the primary reason for the failure to conclude a deal for the export of power reactors during the 1980s.

In 1994, the BOT financing model was further expanded upon in Law No. 3996. The law sought to make BOT more attractive by offering treasury guarantees, take or pay clauses, and tax exemptions.[14] In 1997, the Turkish government passed Law No. 4283. The updated regulations are designed to encourage private sector investment through a licensing scheme, rather than the previous emphasis on government concessions.[15] Law 4283 codified BOO as the preferred platform for electricity investment. Hence, Turkey has recently sought to pursue a BOO style financing scheme with foreign nuclear firms, rather than the previous policy that had emphasized BOT. However, the government's continued refusal to grant government treasury guarantees for the reactor's construction has prevented progress with the major Western/Asian (non-Chinese) nuclear firms.

In 2001, the combination of a financial crisis and World Bank recommendations resulted in further changes to Turkish energy law. Law No. 4628 was passed in 2001 and is intended to fully privatize Turkey's electricity sector. The new provision established an independent regulatory agency dubbed the Energy Market Regulatory Authority (EMRA). EMRA is nominally tied to the Ministry of Energy and Natural Resources. The Prime Ministry controls EMRA's budget, as opposed to other state regulatory agencies, which raises questions about the regulatory agency's independence.[16] The new law maintains its commitment to BOO and BOT but did away with the take or pay provisions that were included in the previous law.

The new law, however, has done little to spur investment in Turkey's nuclear industry. While Ankara was willing to partner with Russia's Rosatom for the construction for four power reactors at the Akkuyu site, the insistence on BOO has prevented Turkey from partnering with other Western/Asian (non-Chinese) nuclear firms. The issue continues to be that the Turkish side is unwilling to grant financial guarantees, which prevents the constructing firm from being able to secure funding from their government's export-development bank for the reactor's construction. Despite its previous difficulties with Western/Asian (non-Chinese) suppliers, Turkey continues to forge ahead with its BOO financing model for its nuclear power industry. Currently, China and Russia are the only two countries that have expressed a willingness to finance the construction without receiving guarantees from the Turkish government. Thus, it appears that from the financial perspective Chinese nuclear firms are the current frontrunners for Turkey's latest nuclear tender. However, it is believed that it would still be difficult for the Turkish government to award the tender to Chinese companies in view of the prevailing safety

[14] Tamer Cetin and Fuat Oguz, "The politics of regulation in the Turkish electricity market," *Energy Politics*, Vol. 25 (2007), pg. 1763
[15] Ibid.
[16] Ibid., pg. 1767.

and security concerns about Chinese designed reactors. Also it is not clear at this stage whether China will be able to export to Turkey reactors under U.S. or French license.

Turkey's Uranium and Thorium Mining Regulations

Despite Turkey's conclusion of an agreement with Russia's Rosatom for the supply of nuclear fuel for the reactors at Akkuyu, Turkish officials have refused to rule-out purchasing or developing enrichment facilities to enrich its own nuclear fuel in the future. According to Turkish law, uranium and thorium exploration and exploitation can only be conducted by the state. According to Decree no. 7/16681, the state-owned ETI Mine Works General Management holds the exclusive right to mine uranium and thorium.[17] The General Directorate for Mining Affairs and MENR are responsible for overseeing and regulating all of Turkey's mining operations.[18] Once the ore is mined, Turkish law mandates that the mining company sell it to the "state, or entities determined by the council of ministers."[19] TAEK is responsible for regulating the transfer, safeguarding, and holding of special fissionable materials. Thus, the mined uranium or thorium would fall under TAEK's regulatory purview once it is transferred or stored.

International Agreements

Turkey is an original member of the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy. Ankara has also signed the follow on protocols to the Paris Convention in 1964 (ratified in 1967) and 1982 (ratified in 1986).[20] Moreover, Ankara has approved similar local legislation requiring that nuclear installations have insurance or other forms of financial liability. Turkey also signed the Convention on the Physical Protection of Nuclear Material in 1983 and the Parliament ratified it in 1986.[21] Thus, TAEK is bound to follow international protocol for its practices and policies related to the protection of radiological material. In addition, Turkey is a member of the Convention on the Early Notification of Nuclear Accidents, as well as the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.[22] Ankara signed both in 1986 and the Parliament ratified both agreements in 1990. Turkey also decided to sign the Convention on Nuclear Safety in 1994. The parliament ratified the agreement one year later.

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[17] "Regulatory and Institutional Framework for Nuclear Activities: Turkey," Nuclear Legislation in OECD Countries, Nuclear Energy Agency, 2008, http://www.oecd-nea.org/law/legislation/turkey.pdf.
[18] Ibid.
[19] Ibid.
[20] Agreements: International Multilateral Agreements Conventions, the Turkish Atomic Energy Authority, last updated 20 December 2012, http://www.taek.gov.tr/eng/international/agreements.html.
[21] Ibid.
[22] Ibid.

Ankara has also sought to sign bilateral nuclear agreements with its neighbors regarding early notification of a nuclear accident. Turkey has signed early notification agreements with Bulgaria, Ukraine, Romania, Europe's Euratom, and the Russian Federation.

Conclusion: Regulatory Problems and the Need for More Independence

Despite having taken numerous steps to reform its regulatory agencies, Turkish law continues to prevent the further development of Turkey's nuclear industry. The BOO/BOT format, despite having some advantages for investment and infrastructure development, continues to hinder Turkey's negotiations with foreign nuclear suppliers. American, Canadian, German, French, Japanese, and South Korean nuclear firms have all cancelled nuclear negotiations with Turkey for reasons related to BOO/BOT. Moreover, while Turkey has taken steps to break-up the state energy monopoly, state-owned industries continue to enjoy some advantages over private firms. Thus, nuclear companies are still forced to sell electricity to a state-owned transmission monopoly, which in turn leads to a demand for artificially low electricity prices. Thus, the nuclear firms competing for Turkey's nuclear tender have to contend with the prospect of receiving no financial guarantees for the cost of construction, as well as an artificially low rate of return on the initial investment in the form of guaranteed electricity sale spaced over thirty years.

With regards to regulating Turkey's nuclear industry, TAEK continues to have some structural problems that raise issues about its independence. Despite having been reorganized in 2002, TAEK continues to rely on the Prime Ministry for its budget and the appointment of its senior leadership. Thus, it falls outside the purview of parliamentary oversight, which raises a number of questions about the level of political influence the Prime Ministry has within the organization. Moving forward, Turkey should seek to wall off TAEK from the Prime Ministry, allow for parliament, or a non-affiliated ministry, to allocate the organization's budget, and encourage more transparency from the organization. This should move in parallel to a re-evaluation of Turkey's preference for BOO financing for nuclear reactors.