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The Akkuyu Nuclear Power Plant in Turkey: Some Causes for Concern

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Abstract

This article focuses on the Akkuyu Nuclear Power Plant in Turkey. Its thesis is that its construction marks a turning point in the history, character, dynamics and risk profile of both Turkey and the Greater Middle East. The construction of the Plant reflects a number of emerging phenomena with unmistakable geopolitical implications. These encompass the nuclearization of Turkey, the nuclearization of the Greater Middle East and what appears to be an increasingly intimate Russo-Turkish bilateral relationship at odds with Turkey's membership of NATO. Against this background, the article pinpoints several causes for concern. Among these is the detachment of Turkey from a string of international conventions that seek to promote nuclear safety or to protect the sea, the wider environment, workers or other people. Other causes for concern include the absence in Turkey of a deep-rooted culture steeped in transparency, press freedom, whistleblowing and other potential facilitators of nuclear safety. The article ends with five sets of recommendations directed towards the Government of Turkey plus the Governments and inhabitants of other states in the Greater Middle East and the EU, two of whose member states, the Republic of Cyprus and Greece, are situated in relatively close proximity to the Plant.

Disclosure statement

No potential conflict of interest was reported by the author. However, in the interests of transparency, the author has made declarations of interests at www.uclancyprus.ac.cy/academic/dr-klearchos-kyriakides/ and www.uclancyprus.ac.cy/the-new-roles-of-dr-klearchos-a-kyriakides-of-the-school-of-law-of-uclan-cyprus/

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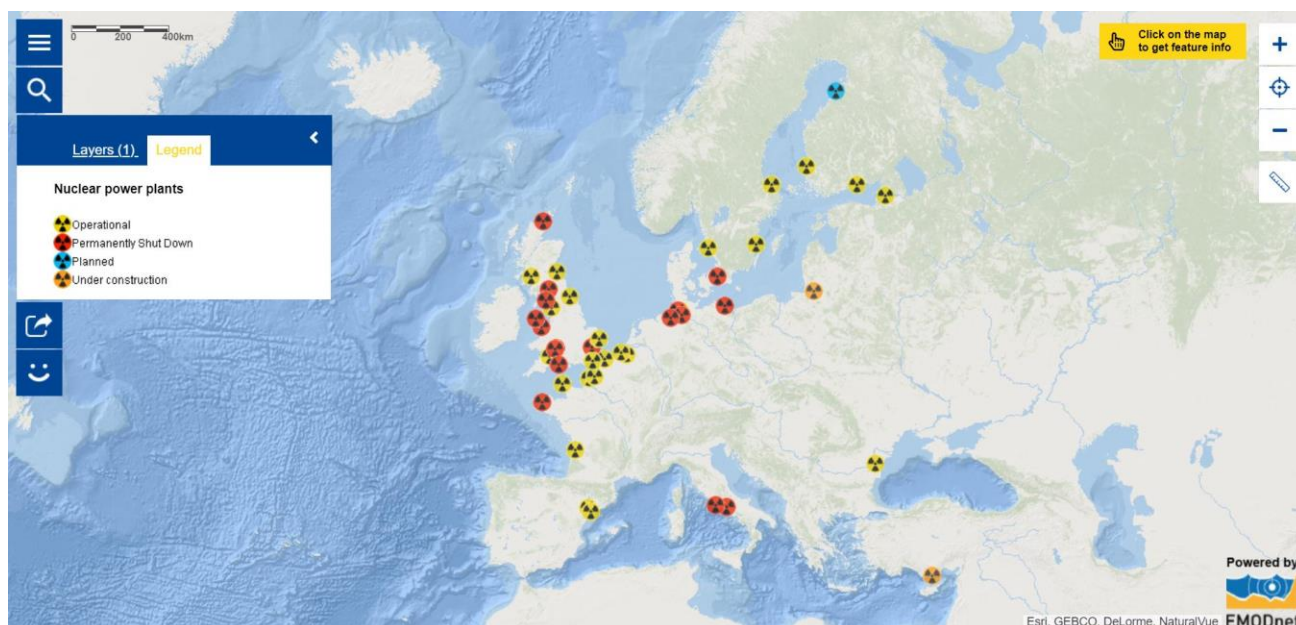


Image 1: A map portraying the nuclear reactors that are ‘operational’, ‘permanently shut down’, ‘planned’ or ‘under construction’ in the European Union, the UK and Turkey. The map excludes the nuclear power plants in Russia, Ukraine and elsewhere. Source: ‘Map of the week - Nuclear Power Plants.JPG’, website of the European Marine Observation and Data Network (EMODnet) managed by the Directorate-General for Maritime Affairs and Fisheries, <https://emodnet.ec.europa.eu/en/file/map-week-nuclear-power-plantsjpg> (accessed 5 September 2021).

Introduction

This article constitutes a wake-up call. The article begins by pointing to an emerging phenomenon – the nuclearization of the Eastern Mediterranean and the wider region (hereafter ‘the Greater Middle East’) by means of nuclear power plants that are already under construction or operational. The article moves on to focus on the vast Russian-backed Turkish nuclear power plant at Akkuyu (‘the Akkuyu Nuclear Power Plant’), its geopolitical significance and its status as a manifestation of a long-standing yet seemingly deepening Russo-Turkish bilateral relationship.

Against this background, the article raises a number of concerns about the Akkuyu Nuclear Power Plant, where as many as four nuclear reactors are springing up in unprecedented, unsatisfactory and potentially unsafe circumstances. Chief among these concerns is the conspicuous detachment of Turkey from a host of international treaties which relate to nuclear safety or other cognate subject areas such as the protection of the sea, the protection of the wider environment, the protection of workers and the protection of other people. Other concerns flow from a number of other sources, not least the systemic deficiencies in Turkey in realms such as transparency, press freedom and whistleblowing, that are capable of facilitating nuclear safety.

Across the academic spectrum, there already exists an expanding literature on the Turkish civil nuclear programme.¹ Both the contribution of this article to that literature and its originality stem from its pre-occupation with certain geopolitical, legal and ethico-legal issues that have not hitherto attracted as much attention as they deserve.

In turn, the originality of the article overlaps with its overarching thesis, which boils down to a single proposition: the construction of the Akkuyu Nuclear Power Plant marks a turning point in the history, character, dynamics and risk profile of the Greater Middle East. Why is that so? The answer is that, for the first time, the Eastern Mediterranean part of that region finds itself subject to a relatively new civil programme of nuclearization with theoretically beneficial but possibly adverse and, indeed, potentially catastrophic consequences for the inhabitants of that volatile part of the world. These include the inhabitants of southern Turkey, the nearby Republic of Cyprus in whose northern area Turkey remains the occupying power,² the Dodecanese islands of Greece and Syria, all of which are in relatively close proximity to Akkuyu.

For these reasons, this article dovetails with a previous academic article of mine which was written in the form of an open letter and published in the *Journal of Balkan and Near Eastern Studies* in May 2020. I composed that previous article after a joint United States ('US'), United Kingdom ('UK') and French military operation in Syria on 14 April 2018. I did so primarily in order to shine a spotlight onto another emerging phenomenon in the Greater Middle East – toxic dust clouds and other sources of poor air quality.³ At the same time, I used that article to flag up the looming environmental risks arising from the Akkuyu Nuclear Power Plant.⁴ This new article focuses on some of those risks which form part of a much bigger environmental picture that is a source of intense unease, particularly for those who live or work in reasonably close proximity to that Plant.⁵

A brief history of the Akkuyu Nuclear Power Plant

The Turkish civil nuclear programme owes its origins to the Prime Ministership of Adnan Menderes from 1950 until 1960. Under the aegis of the then Prime Minister's Office, Turkey established the Turkish Atomic Energy Commission ('TAEC') by means of Act No. 6821 of 27 August 1956. That was enacted a few months before the formation of the International Atomic Energy Agency ('IAEA') under its Statute dated 26 October 1956⁶ and the subsequent admission of Turkey to the IAEA on 19 July 1957.⁷ Act No. 6821 was then supplanted by Act No. 2690 of 13 July 1982. The latter resulted in the Turkish Atomic Energy Authority ('TAEK') taking the place of the TAEC.⁸

The Akkuyu Nuclear Power Plant has emerged from these origins,⁹ but on the back of previous aborted civil nuclear projects at Akkuyu. These include one aborted project involving Canada. That was initiated in 1980 and reinforced in 1985 by a bilateral Canadian-Turkish Agreement for Cooperation in the Peaceful Uses of Nuclear Energy.¹⁰ However, this Canadian-backed initiative at Akkuyu was eventually 'cancelled'.¹¹ Then, in 2010, as part of a much bigger Russian-Turkish bilateral relationship, the Russian Federation ('Russia') stepped into the breach.

What amounts to the official 'Project History' of the Akkuyu Nuclear Power Plant may be traced on its official website, as maintained by Rosatom, the State Atomic Energy Corporation of Russia, which, at the time of writing in November 2021, holds a massive 'stake' in the project at Akkuyu that is calculated to be '99.2%'.¹² The 'Project History' pinpoints a number of milestones including those listed below, which outline how and when Russia and Rosatom became involved in the project:

'Turkey's intention to build a nuclear power plant on its land dates back to the 1960s. ...

'In 1974, the Akkuyu site in the Gulnar district of Mersin province was considered suitable for the creation of the first nuclear power plant. ...

'After a long break due to financial and political reasons, Turkey decided to turn to Russia's many years of experience in the field of nuclear technology.

'The countries made a joint decision that Akkuyu nuclear power plant (translated from Turkish as "white well" / "clean spring") would be built in the Republic of Turkey on the Mediterranean coast in the Gulnar district of Mersin. The relevant agreement was signed between the Government of the Russian Federation and the Government of the Republic of Turkey in Ankara on May 12, 2010. ...

'On April 2, 2018, the Turkish Atomic Energy Authority (TAEK) granted AKKUYU NUCLEAR JSC the main construction license to build Power Unit No. 1.¹³

Name of Reactor	Construction Start Date	Reactor Type	Owner	Operator	Thermal capacity
AKKUYU 1 (under construction)	3 April 2018	PWR (Pressurized Water Reactor)	Akkuyu Nuclear Joint Stock Company	Akkuyu Nuclear Joint Stock Company	3200 MW _t
AKKUYU 2 (under construction)	8 April 2020	PWR	Akkuyu Nuclear Joint Stock Company	Akkuyu Nuclear Joint Stock Company	3200 MW _t
AKKUYU 3 (under construction)	10 March 2021	PWR	Akkuyu Nuclear Joint Stock Company	Akkuyu Nuclear Joint Stock Company	3200 MW _t

Table 1: Details regarding three of the nuclear reactors under construction at Akkuyu Nuclear Power Plant; the construction of the fourth one is scheduled to begin in 2022. Source: Information from the IAEA website at <https://pris.iaea.org/PRIS/CountryStatistics/ReactorDetails.aspx?current=553>, <https://pris.iaea.org/PRIS/CountryStatistics/ReactorDetails.aspx?current=1080> and <https://pris.iaea.org/PRIS/CountryStatistics/ReactorDetails.aspx?current=1081> respectively (accessed 14 November 2021).

In total, four nuclear reactors are scheduled to become operational at Akkuyu. According to the Presidency of Turkey, the first of the four nuclear reactors at Akkuyu, named AKKUYU 1, 'will be operational in 2023 ...'.¹⁴ As to when the other reactors will follow suit, the IAEA calculates that they 'will be put into commercial operation at one[-]year intervals until the end of 2026'.¹⁵ In the meantime, at the time of writing in November 2021, construction has already started on three of the four reactors – AKKUYU 1, AKKUYU 2 and AKKUYU 3. (See Table 1.) Meanwhile, although progress at AKKUYU 4 is lagging behind the other three nuclear reactors, an official press release, dated 29 October 2021, has confirmed that AKKUYU 4 has received a construction licence¹⁶ and construction work is expected to begin in 2022.¹⁷

The Akkuyu Nuclear Power Plant in wider context

The Akkuyu Nuclear Power Plant is a tangible outcome of the long-standing regime of Recep Tayyip Erdogan, the Prime Minister of Turkey from 2003 until 2014 and (after abolishing the office of Prime Minister) its President, Head of State and Head of Government since 2014. Indeed, the Plant is very much a product of his abrasive style of leadership, his regime's concerted efforts to recast Turkey as a major power on the world stage and, as explained in more detail below, his country's burgeoning if somewhat capricious relationship with Russia.¹⁸

No less importantly, the Akkuyu Nuclear Power Plant reflects both a global trend in favour of civil nuclear power¹⁹ and the energy security strategy pursued by the Erdogan regime.²⁰ As President Erdogan himself affirmed before the Grand Assembly of Turkey on 1 October 2021:

'In energy, we will further increase the share of renewable energy resources in our total power by focusing on solar, wind and nuclear generation opportunities. ... We will commission the first phase of our nuclear power plant, which is being built in Akkuyu, in 2023, and we will take necessary steps for the construction of new power plants.'²¹

If the civil nuclear aspirations of President Erdogan are clear enough, what is shrouded in murkiness is the related question of whether the publicly declared Turkish civil nuclear programme is being – or may in future be – accompanied by a covert military nuclear programme designed to transform Turkey into the holder of nuclear weapons.²² For years, that question has been the subject of seemingly informed speculation.²³ To take one example, in 2011, when the civil nuclear project at Akkuyu was still finding its feet, Colonel William G. Eldridge of the United States Air Force ('USAF') observed:

'... Turkey has a history of contacts with other nations for assistance in nuclear issues. ... Although Turkey's nuclear capabilities are low, the government continues to pursue a nuclear energy program which could provide the experience and knowledge necessary for a future weapons program. Additionally, Turkey's traditional ally Pakistan could be a potential source of nuclear weapons expertise if [the] Turkish leadership seriously decided to pursue a nuclear weapons program.'²⁴

For his part, President Erdogan has already issued a number of Delphic statements that point to a possible Turkish governmental interest in supplementing civil nuclear power with military nuclear power. On 24 September 2019, following the address given in Turkish by President Erdogan before the General Assembly of the UN, his Presidency issued a written statement in English that echoed what he had said verbally in his native language:

'The inequality between nuclear states and non-nuclear weapon states is alone enough to undermine global balances. It bothers us like anyone else that the weapons of mass destruction are used as leverage in every crisis instead of their total elimination. The possession of nuclear power should either be forbidden for all or permissible for everyone. For the sake of a peaceful future for all humanity, let us solve this problem as soon as possible on the basis of justice.'²⁵

Without wishing to endorse either the proliferation of nuclear weapons or the Presidency of Turkey, one can acknowledge that President Erdogan may have had a point when he referred to 'inequality'. That concept is inherent in a world in which certain states, including the five permanent members of the UN Security Council, possess nuclear weapons while striving to deny that right to others. Be that as it may, if one is against the proliferation of nuclear weapons or against any expansion in the number of states that hold such weapons, it is surely a cause for concern that Turkey is among the states to have hitherto failed to sign let alone ratify the 2017 Treaty on the Prohibition of Nuclear Weapons.²⁶ The other non-signatories include the five permanent members of the UN Security Council plus several of Turkey's neighbours namely (in alphabetical order) Egypt, Greece, Israel, Lebanon, the Republic of Cyprus and Syria.²⁷ Yet, only one of these, Israel, is widely acknowledged to be a military nuclear power,²⁸ a fact which may be a driver of any covert Turkish military nuclear programme.

All that being said, what is not in any doubt is that Turkey is no stranger to the actual or potential threats emanating from military as well as civil nuclear power. In common with certain parts of Europe,²⁹ Turkey has played host to US nuclear weapons,³⁰ a fact that came to the fore during the Cuban Missile Crisis of 1962.³¹ Even so, as illustrated by Images 1, 2 and 10, whereas nuclear power plants have been scattered across Europe for decades, they constitute a relatively new phenomenon in the Greater Middle East.³²

Middle East nuclear power plants



Image 2: The nuclear power plants dotted around the Middle East which, in 2018, were 'operational', 'under construction' or 'planned'. Source: 'Middle East countries plan to add nuclear to their generation mix', 5 March 2018, US Energy Information Administration website, www.eia.gov/todayinenergy/detail.php?id=35192# (accessed 31 August 2021).

The nuclearization of the Greater Middle East by means of civil nuclear power

The nuclearization of the Greater Middle East by means of civil nuclear power is a geopolitical phenomenon that first saw the light of day as recently as the second decade of

the twenty first century. In 2011, the Bushehr Nuclear Power Plant in Iran became the first operational nuclear power plant in the Greater Middle East.³³ More recently, in 2018, after Image 2 was published by the US Energy Information Administration ('EIA'), a second nuclear power plant became operational in the Greater Middle East at Barakah in the United Arab Emirates ('UAE').³⁴ If, as scheduled, Turkey's first nuclear reactor becomes operational at Akkuyu in 2023 or shortly thereafter, a third new chapter will open in the nuclearization of the Greater Middle East.

In due course, other chapters are expected to open, not least in Egypt.³⁵ In 2019, likewise after Image 2 was published, the Nuclear Regulation and Radiological Authority of Egypt issued a Site Approval Permit for the site earmarked to become the El Dabaa Nuclear Power Plant – along the Mediterranean coastline of Egypt to the west of Alexandria.³⁶ This Permit was consistent with the declaration made in October 2007 by the then President of Egypt, Hosni Mubarak, that nuclear power plants would mushroom across his country to generate electricity.³⁷

As in the case of Akkuyu, Russia has been closely involved in the Egyptian nuclear project at El-Dabaa,³⁸ which has been described by Amged El-Wakeel, Chairman of the Nuclear Power Plants Authority of Egypt, as 'the first' nuclear power plant in Egypt.³⁹ The involvement of Russia has raised eyebrows, particularly in Israel,⁴⁰ but the fact remains that in terms of its progress towards operationalisation, the civil nuclear project at Akkuyu is streets ahead of the one at El-Dabaa. Accordingly, if the Akkuyu Nuclear Power Plant becomes operational in 2023, it will be the third such plant in the Greater Middle East and the first such plant in either Turkey or the Eastern Mediterranean.

As the future unfolds, at least two more nuclear power plants may become operational in Turkey. According to the IAEA in its 'Country Nuclear Power Profile' dedicated to Turkey, as updated in 2020:

'Other NPPs will be in operation [in Turkey] by 2035. The second nuclear plant (Sinop NPP) will be constructed and operated in Sinop Province [on the coast of the Black Sea]. The site selection process for the third nuclear plant is still ongoing.'⁴¹

At Sinop on the northern coast of Turkey, the Government of Turkey entered into an agreement with the Government of Japan, dated 3 May 2013.⁴² However, in its 'Country Profile' for Turkey updated in 2021, the IAEA disclosed the following:

'In the context of the Sinop project, feasibility studies and development of a feasibility report for site suitability evaluation and financial model development were completed in June 2018. According to review of the feasibility report by MENR [i.e. the Ministry of Energy and Natural Resources of Turkey], it was decided to cease cooperation with Japan due to outcomes of the feasibility report. Turkey is seeking other possibilities to continue the project.'⁴³

In the context of the nuclearization of the Greater Middle East, it would be remiss of me not to add a word or two about Jordan. On 24 July 2021, the Jordanian state news agency disclosed fresh details about the budding civil nuclear programme of Jordan⁴⁴ and this led to eye-catching headlines such as one entitled 'Jordan declares uranium plant 'fully operational'.⁴⁵ In due course, as part of a 'Three-Point Plan',⁴⁶ Jordan is planning to

construct and operationalise a fully-fledged nuclear power plant, whereupon Jordan will join the expanding civil nuclear club in the Greater Middle East.⁴⁷

Other geopolitical implications



Image 3: An image published on 9 May 2019 by the US House of Representatives Foreign Affairs Committee. Source: <https://twitter.com/houseforeign/status/1126536055581216769> (accessed 23 September 2021).

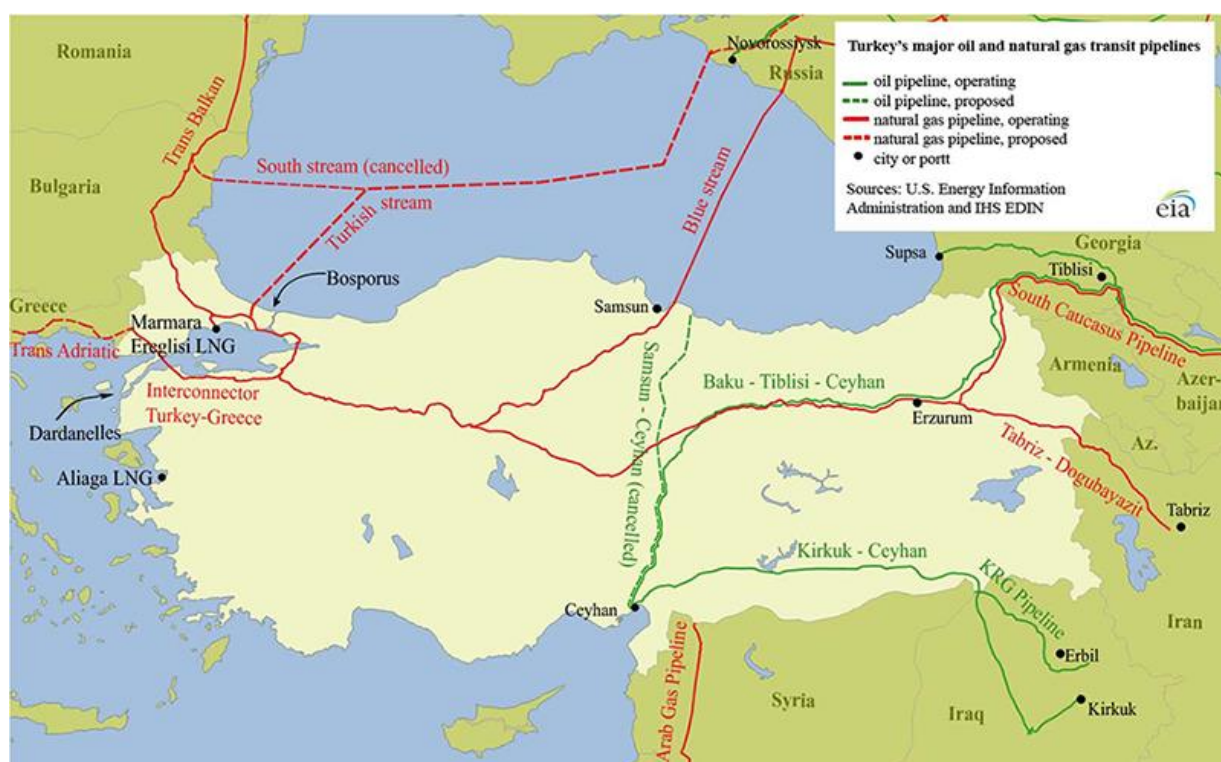


Image 4: 'Turkey's major oil and natural gas transit pipelines'. (The map is misleading. Firstly, it presents the cease-fire lines across the sovereign territory of the Republic of Cyprus as undotted and, thus, as if they are *de jure* borders; they are *de facto* cease-fire lines. Secondly, the map does not depict the boundaries shared by the two UK-administered Sovereign Base Areas with the Republic of Cyprus.) Source: 'Turkey: Overview', 2 February 2017, US Energy Information Administration website, www.eia.gov/international/analysis/country/TUR www.eia.gov/todayinenergy/detail.php?id=35192# (accessed 25 September 2021).

The Russo-Turkish civil nuclear project at Akkuyu not only constitutes a new element in the wider history of civil nuclear power.⁴⁸ It also forms the civil nuclear dimension of two broader but inter-linked geopolitical developments. One is the penetration of Russia – and China – into the Greater Middle East, a process that has aroused the indignation of other international actors, not least the US. (See Image 3.) The second is what appears to be an increasing intimacy in the Russo-Turkish bilateral relationship, something that is at odds with Turkey's membership of NATO.⁴⁹ Each of these two developments owes its roots to earlier epochs of history, including that of the Cold War⁵⁰ but, since then, each one has borne fruit in spheres other than nuclear energy. An example is the Blue Stream pipeline project.⁵¹ (See Image 4.).

In recent years, Russo-Turkish bilateral relations have been spearheaded by two veteran politicians. One is Vladimir Putin, who has exercised power in Moscow since 1999. The other is Recep Tayyip Erdogan who has exercised power in Ankara since 2003.

During his meeting with President Vladimir Putin in Sochi, Russia, on 29 September 2021, President Erdogan underlined the criticality of Russia to the Akkuyu Nuclear Power Plant:

'Intense efforts are underway. There are 13 thousand people working there. 10 thousand of them are Turks and 3 thousand are Russian. However, almost all of them have been trained in Russia, which further reinforces our bilateral relations.'⁵²

It goes without saying that the close Russo-Turkish relationship and Putin-Erdogan partnership are difficult to reconcile with the status of Turkey as a member of the North Atlantic Treaty Organization ('NATO') and as an ally of the US.⁵³ For its part, the Government of Turkey has no qualms about openly admitting that 'Russia is building Turkey's first nuclear power plant on the Mediterranean coast'⁵⁴ and that the increasingly intimate Russo-Turkish partnership is strong in more than one field of energy. As President Erdogan declared in Moscow on 8 April 2019:

'Our cooperation with Russia in the area of energy is one of the pillars of our economic relations. All our partnerships in this area, the Blue Stream [see Image 4], the Turk[ish] Stream [see Image 4] and the Akkuyu Nuclear Power Plant in particular, are long-term and strategic choices.'⁵⁵

These sentiments have been echoed by the aforementioned 'Project History' of the Akkuyu Nuclear Power Plant, as published by Rosatom:

'The project of the first nuclear power plant in Turkey includes four power units equipped with the state-of-the art Russian-designed VVER-1200 reactors with a total capacity of 4800 megawatts. It is planned that after the construction is completed, Akkuyu NPP will produce about 35 billion kWh per year, providing approximately 10% of Turkey's electricity needs.'⁵⁶

The 'Project History' adds: 'The nuclear power plant construction project is the largest joint venture between Russia and Turkey.'⁵⁷ Against this backdrop, a cause for concern is the self-evident Russo-Turkish co-ordination over the timing of construction. The Kremlin has hinted that the decision to operationalise the Akkuyu Nuclear Power Plant in 2023 has been

driven by political considerations. This is implicit in a statement published by the Kremlin on 10 March 2021 in which President Putin is quoted as disclosing the following:

‘Turkey’s first Akkuyu NPP should start operating in 2023 when the 100th anniversary of the establishment of the Republic of Turkey will be celebrated. The Turkish leadership and Mr Erdogan set this task when this project was launched. We also attach great significance to this; the President of Turkey and we have agreed to continue providing the necessary assistance and support to the Akkuyu project.’⁵⁸

In other words, the decision to open the Akkuyu Nuclear Power Plant in 2023 does not appear to have been taken because the Plant will not be safe or otherwise ready to operationalise until that specific year. The year 2023 seems to have been chosen in order to serve a crude political agenda linked to a centenary. If that is so, this may explain why the COVID-19 pandemic has not been allowed to delay construction work at the Plant.⁵⁹

In the statement published by the Kremlin on 10 March 2021, Alexei Likhachev, the CEO of Rosatom, described the ‘project’ at Akkuyu as ‘truly unique’, as ‘the largest nuclear construction site in the world’ and as ‘the world’s only nuclear power project built under the Build-Own-Operate (BOO) concept.’⁶⁰ As the ‘Project History’ explains, the BOO concept ‘means that the operating company is responsible not only for the design and construction, but also for the maintenance, operation and decommissioning of the station.’ The same source adds: ‘Such a model, among other things, is an additional guarantee of construction quality, since the company of the industry will also operate it in the future.’⁶¹

The Turkish civil nuclear programme in the light of the Chernobyl and Fukushima Disasters

Whereas the civil nuclear project at Akkuyu in southern Turkey hinges upon the co-operation of the Kremlin in Moscow, the civil nuclear project at Sinop in northern Turkey was originally earmarked to hinge upon the co-operation of the Kantei, the equivalent of the Kremlin in Tokyo. Put another way, before the cancellation of Japan’s involvement, the Turkish Government chose to build its civil nuclear strategy upon co-operation with the Kremlin and the Kantei. This reality raises questions as to the judgment of the Turkish Government. This, too, is a cause for concern, especially if one recalls that the catastrophe that began at the nuclear power plant at Chernobyl in Ukraine in the then Soviet Union on 26 April 1986 (‘the Chernobyl Disaster’) and the catastrophe that started at the nuclear power plant at Fukushima Daiichi on 11 March 2011 (‘the Fukushima Disaster’).

On the one hand, the then Soviet-cloaked Kremlin bears ultimate political responsibility for the Chernobyl Disaster,⁶² for the cover-up which immediately followed⁶³ and for its enormous impact. Indeed, as illustrated by Image 5, the impact of the Chernobyl Disaster was sprawling in terms of its geographical coverage. At the same time, it had acute legal ramifications⁶⁴ together with grave implications for human health,⁶⁵ wildlife and the wider environment,⁶⁶ particularly in Ukraine as well as in Russia and Belarus.⁶⁷

On the other hand, the Kantei under the then leadership of Prime Minister Naoto Kan bears political responsibility for the Fukushima Disaster.⁶⁸ At the time, the Japanese Government allegedly engaged in a cover-up⁶⁹ that formed part of a much broader cover-up.⁷⁰ To his

credit, after leaving Prime Ministerial office, Naoto Kan held his hands up and conceded that the Japanese state shoulders most of the culpability for the Fukushima Disaster.⁷¹

Chernobyl 29 April 1986 15:00h UTC

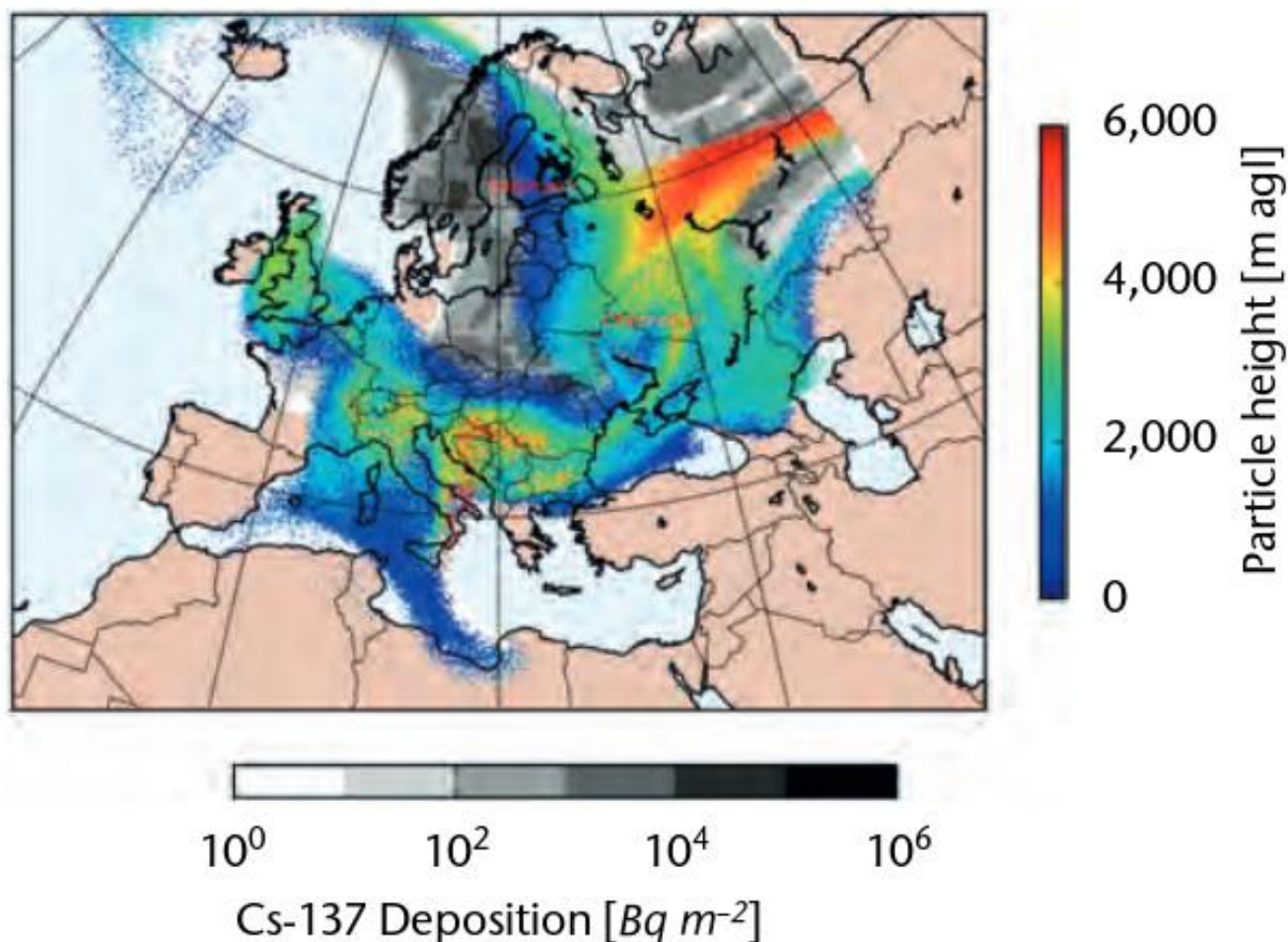


Image 5: 'A dispersion forecast of the radioactive plume following the Chernobyl accident in 1986, using a modern version of NAME [a dispersion modelling system]', Met Office website page devoted to the 'History of numerical weather prediction', www.metoffice.gov.uk/weather/learn-about/how-forecasts-are-made/computer-models/history-of-numerical-weather-prediction (accessed 4 September 2021).

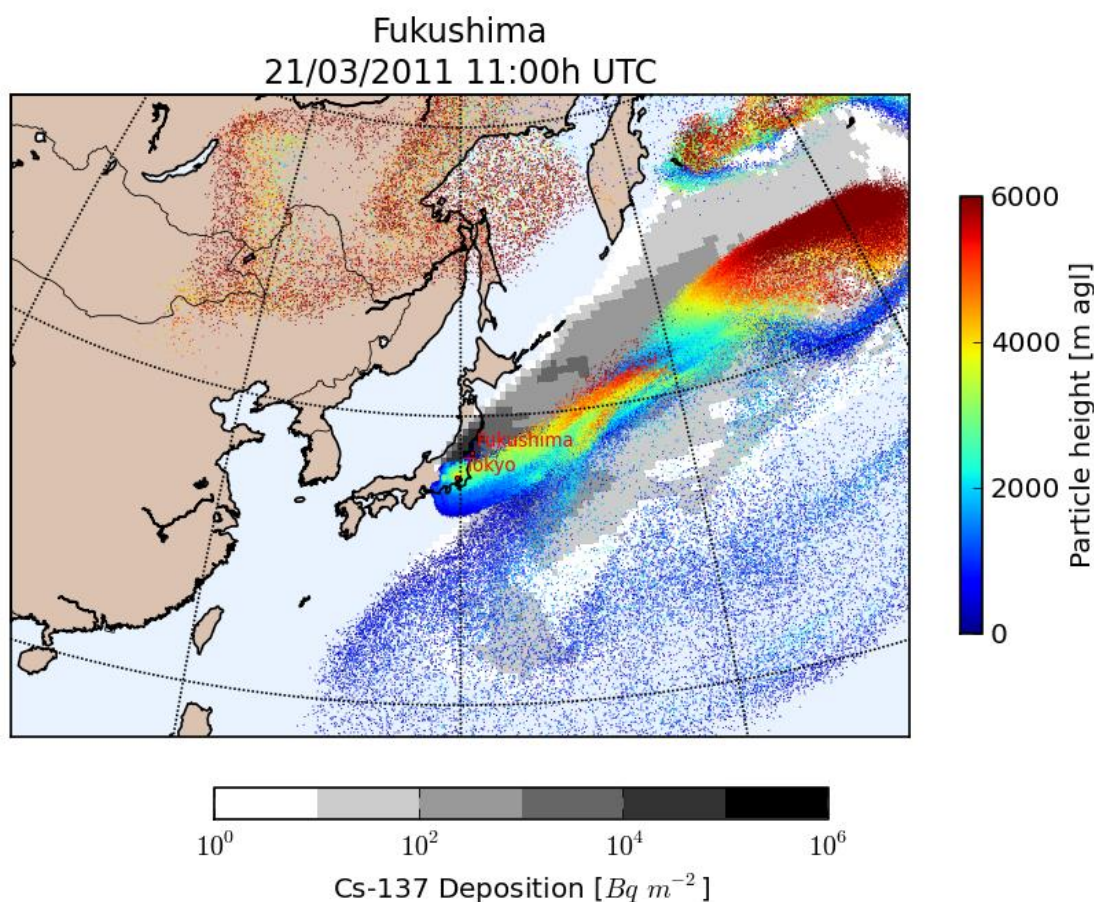


Image 6: ‘Image showing the airborne spread of radioactive material from Fukushima Daiichii [Nuclear Power Plant]. The colours show the height of the material and the grey shading shows regions where radioactive material is deposited. No ocean modelling is included.’ Source: ‘10-years of radiological incident response developments since the Fukushima Daiichi accident’, undated but published in 2021, UK Met Office website, www.metoffice.gov.uk/research/news/2021/fukushima-daiichi-accident (accessed 16 September 2021).

The lessons of the Chernobyl Disaster⁷² and the Fukushima Disaster⁷³ are manifold but, of these, at least three stand out as being particularly relevant to the civil nuclearization of Turkey and other parts of the Greater Middle East. The first and perhaps the most obvious lesson is that ‘prevention is better than cure’. It is far better to stop a nuclear accident from arising in the first place than to respond to one and thereafter recover from its aftermath. A second lesson is that complacency is not an option for any sovereign state or individual that lies in relatively close proximity to a nuclear power plant. A third lesson is that in the event of any catastrophe at a nuclear power plant, those likely to be adversely affected are not limited to the members of staff and any other people who are physically within the plant. (See Images 5 and 6.) A fourth lesson is that for the purposes of preventing as well as responding to any nuclear catastrophe, those responsible for nuclear safety must be transparent and truthful.

The critical issue of nuclear safety

On the critical subject of nuclear safety, the Government of Turkey has been propagating a rather simplistic narrative. In the words of its Ministry of Energy and Natural Resources of

Turkey, 'nuclear power plants ensure that nuclear energy is obtained in a safe, controlled and sustainable way'.⁷⁴ A similar message has been disseminated by the authorities at the Akkuyu Nuclear Power Plant whose official website claims that 'measures are being taken to ensure safety' at the Akkuyu Nuclear Power Plant.⁷⁵ As a result of these and similar assurances,⁷⁶ the impression is left that there is nothing much to worry about with respect to the Plant.

The same general narrative is encapsulated by two governmental assurances. One is Russian; the other is Turkish. The Russian assurance was issued on 4 May 2018 by the Foreign Ministry of Russia in a text dated 4 May 2018 and entitled 'Press release on ensuring the safety of the Akkuyu Nuclear Power Plant in Turkey'. According to this:

'Russia will build a nuclear power plant [at Akkuyu] that will meet the most advanced safety standards accepted throughout the world. The safety systems will remain operational in any adverse scenario that might unfold, including earthquakes, flooding, tsunami, tornado, hurricane, dust storm, air-shock wave or even a large plane crash.'⁷⁷

As for the Turkish assurance, this appears in the statement issued by the Presidency of Turkey on 10 March 2021:

'Pointing out that nuclear energy holds a special place in Turkey's energy policies, President Erdogan stated that Turkey aims to include in its energy basket the nuclear energy, which has zero emission and causes no harm to the environment.'⁷⁸

These unqualified Turkish Presidential claims are demonstrably misleading or apt to mislead. The reality is much more nuanced than the optimistic picture painted by the Presidency of Turkey. As the US Energy Information Administration ('EIA') readily admits in general guidance entitled 'Nuclear explained: Nuclear power and the environment':

'Unlike fossil fuel-fired power plants, nuclear reactors do not produce air pollution or carbon dioxide while operating. However, the processes for mining and refining uranium ore and making reactor fuel all require large amounts of energy. Nuclear power plants also have large amounts of metal and concrete, which require large amounts of energy to manufacture. ...

'Nuclear energy produces radioactive waste

'A major environmental concern related to nuclear power is the creation of radioactive wastes such as uranium mill tailings, spent (used) reactor fuel, and other radioactive wastes. These materials can remain radioactive and dangerous to human health for thousands of years. Radioactive wastes are subject to special regulations that govern their handling, transportation, storage, and disposal to protect human health and the environment. ...

'Spent reactor fuel assemblies are highly radioactive and, initially, must be stored in specially designed pools of water. ...'.⁷⁹

None of the details provided by the US EIA were mentioned by President Erdogan when, during the ceremony held at Akkuyu on 10 March 2021, he misleadingly claimed that ‘nuclear energy ... has zero emission and causes no harm to the environment’.⁸⁰

The same omissions were glaring in the official press release after President Erdogan had spoken about Akkuyu before a crowd at nearby Mersin on 17 September 2021. Not only did this press release reiterate that the Akkuyu Nuclear Power Plant ‘would be made operational in 2023’ whereupon it will take its place among the ‘currently 443 active nuclear power plants in 32 countries and 51 NPPs [Nuclear Power Plants] under construction in 19 countries across the world.’⁸¹ The same press release painted a rosy picture without any qualification and, in the process, quoted the following claims of President Erdogan:

‘The facility in Akkuyu will significantly contribute to our development through electricity generation, to the nature through lower carbon emissions, and to our efforts in this area through its technology. At a time when climate change is debated more and more widely, nuclear plants are still the most important alternative energy sources for countries like ours.’⁸²

Given the detachment of Turkey from so many relevant instruments of international law (as explained below) as well as the appalling human rights record of Turkey (as also explained below), these assurances bring to mind another key lesson of nuclear history, as learned in painful circumstances following the Chernobyl Disaster in 1986 and the Fukushima Disaster in 2011. The key lesson is this: one must be wary of any assurance given as to the safety or harmlessness of any nuclear power plant; any such assurance ought to be greeted with caution, scepticism and eternal vigilance matched by an ongoing dialogue between the authorities responsible for any nuclear power plant and the people affected by it.

The need for eternal vigilance is all the more vital if one buys into the thesis advanced by Greenpeace in a report published in 2012, in the aftermath of Fukushima Disaster of the previous year. According to Greenpeace, the Fukushima Disaster brought about ‘The end of the nuclear safety paradigm’ because it confirmed that ‘nuclear safety does not exist in reality.’ Somewhat unnervingly, Greenpeace moved on to assert that ‘a significant nuclear accident has occurred approximately once every decade.’⁸³

This latter assertion of Greenpeace is broadly – but not fully – in line with the brief history of nuclear accidents published by the IAEA in 2016. Back then, the IAEA referred to ‘about 30 incidents and accidents since the first accident was recorded at Chalk River, Canada, in 1952.’ However, the IAEA only classified three of these as ‘major nuclear accidents’ – ‘the Three Mile Island accident’ in Pennsylvania in the US in 1979, ‘the Chernobyl accident’ in the then Soviet Union in 1986 and ‘the Fukushima Daiichi accident’ in Japan in 2011.⁸⁴ Not surprisingly in the light of these accidents, international law has developed in ways that place much greater emphasis on health and safety generally and on nuclear safety in particular. Even so, as explained below, Turkey has detached itself from one relevant instrument of international law after another.

The detachment of Turkey from key instruments of international law

Nuclear energy engages various areas of domestic and international law. In the international sphere, these include issues arising under public international law,⁸⁵

international human rights law⁸⁶ and, in the EU, the law of the EU.⁸⁷ In this overall context, Turkey has ratified a number of pertinent instruments of international law that directly or indirectly relate to nuclear energy and its principal sub-set – nuclear safety. These include the 1956 Statute of the International Atomic Energy Agency,⁸⁸ the 1986 Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency⁸⁹ and the 1994 Convention on Nuclear Safety.⁹⁰ Equally significantly, the civil nuclear project at Akkuyu is being monitored by the Turkish Atomic Energy Authority⁹¹ and by the IAEA, the latter of which Turkey joined in 19 July 1957.⁹² In that same year, Russia likewise joined the IAEA, albeit while wearing its then Soviet cloak.⁹³ More importantly in the context of Russia, that state has unquestionably learned and applied lessons since the Chernobyl Disaster of 1986.⁹⁴ That is all to the good and, on the face of it, conducive to the promotion of nuclear safety at Akkuyu. Be that as it may, there remain a number of causes for concern, particularly in the field of international law.

To begin with, Turkey has largely remained outside the framework of the Euratom Treaty and the nuclear energy law of the EU with which Turkey maintains a somewhat semi-detached relationship as a result of its dual status as a non-EU member and as a candidate country to join the EU.⁹⁵ That, of course, is an unavoidable consequence of Turkey remaining outside the EU. However, a practical ramification is that, unlike the nuclear power plants already in operation or under construction within the EU, the Akkuyu Nuclear Power Plant is not governed by the full range of legal safeguards, nuclear safety standards and mechanisms of regulation imposed by EU law,⁹⁶ as overseen by the European Atomic Energy Community ('EURATOM')⁹⁷ and by other bodies of the EU such as the European Commission, European Parliament and Court of Justice of the EU.⁹⁸

To be sure, Turkey is a candidate country to join the EU and, as such, has been required to align its laws and practices with those of the EU.⁹⁹ Nevertheless, when it comes to alignment, Turkey has acquired a mixed record. More worryingly, in recent years, Turkey's uneasy relationship with the EU has deteriorated to such an extent that, according to a Report of the European Parliament published in 2021, that relationship has reached 'a historic low point'.¹⁰⁰ It follows that neither the institutions of the EU nor the laws of the EU can be relied upon to act as mechanisms which guarantee nuclear safety at Akkuyu.

None of this would matter so much if Turkey had aligned itself with the full gamut of international conventions that exist outside the framework of the EU. However, Turkey has not done so. Turkey has failed to sign let alone become a full state party to a string of other significant instruments of international law which directly or indirectly affects nuclear safety or other cognate subject areas such as the sea, the environment or labour protection.

More specifically, Turkey has failed to sign – and, thus, failed to go one step further and become a state party to – each of the instruments of international law in the representative but non-exhaustive list below:¹⁰¹

- The 1963 Vienna Convention on Civil Liability for Nuclear Damage (which, as its name suggests, establishes a regime relating to nuclear liability and compensation);¹⁰²

- the 1982 UN Convention on the Law of the Sea, otherwise known as UNCLOS (Articles 22 and 23 of which deal with certain nuclear issues in a maritime context);¹⁰³
- the 1991 Espoo Convention on Environmental Impact Assessment in a Transboundary Context (some of whose provisions, such as Article 2.2, dovetail with Appendix 1 of the Convention, the latter of which refers to ‘nuclear power stations and other nuclear reactors’);¹⁰⁴
- the 1997 Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (whose first ‘Objective’, under Article 1 (i), is ‘to achieve and maintain a high level of safety worldwide in spent fuel and radioactive waste management, through the enhancement of national measures and international co-operation, including where appropriate, safety-related technical co-operation’);¹⁰⁵
- the 1998 Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (transparency being an issue discussed elsewhere in this article);
- the 1998 Rome Statute of the International Criminal Court (Article 8 (2) (b) (iv) of which recognises that ‘the natural environment’ must be protected from ‘severe damage’ during any international armed conflict);¹⁰⁶
- the 2003 Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context (whose ‘Objective’, under Article 1, is ‘to provide for a high level of protection of the environment, including health’ by various specified means);¹⁰⁷
- the 2015 Convention on Supplementary Compensation for Nuclear Damage (which, as its name suggests, provides for a supplementary regime vis-à-vis and nuclear damage);¹⁰⁸
- the 2017 Treaty on the Prohibition of Nuclear Weapons (which is touched on elsewhere in this article).

In addition, Turkey has failed to sign let alone become a state party to a substantial collection of instruments of international law promoted by the International Labour Organisation and designed to protect workers;¹⁰⁹ these include the 1977 Working Environment (Air Pollution, Noise and Vibration) Convention,¹¹⁰ the 1990 Chemicals Convention¹¹¹ and the 1993 Prevention of Major Industrial Accidents Convention.¹¹² Other relevant instruments which Turkey has not signed let alone ratified include the 1992 Convention on the Transboundary Effects of Industrial Accidents.¹¹³

With Akkuyu Nuclear Power Plant becoming a critical element of the national infrastructure of Turkey but with repercussions beyond its borders, Turkey remains disconnected from mainstream instruments of international law and from some of the mechanisms of justice that form integral parts of the international system. In practice, this means that Turkey remains cut off from the Court of Justice of the EU in Luxembourg, the International

Tribunal for the Law of the Sea in Hamburg and the International Criminal Court in The Hague. To make matters worse, unlike Greece, the Republic of Cyprus, the UK and 70 other states, Turkey has not made any declaration expressly recognising the compulsory jurisdiction of the International Court of Justice in The Hague.¹¹⁴

Somewhat surprisingly, whereas the IAEA's 'Country Nuclear Power Profile' of Turkey embodies a list of 'International treaties, conventions and agreements signed/ratified by Turkey',¹¹⁵ the same 'Profile' does not embody any equivalent list of such texts that have *not* been signed or ratified by Turkey. Even though the IAEA's 'Profile' of Turkey is thereby deficient – and perhaps worryingly so – it does not equate to a whitewash. Emblematic of this are two sentences found in the 'Profile':

'The Turkish regulatory structure is composed of laws, decree laws, presidential decrees, regulations, guides, and codes and standards. ... Within this structure, the legislative and regulatory framework of Turkey is consistent with international conventions, treaties and IAEA Safety Standards in most aspects of nuclear safety and security.'¹¹⁶

By expressly incorporating the rather imprecise word 'most' in the final sentence quoted above, the IAEA has implicitly acknowledged that the legislative and regulatory framework in Turkey is far from ideal. Given the ground-breaking character, scale and ramifications of the first nuclear power plant under construction at Akkuyu in Turkey, one wonders why that is so. More broadly, one wonders why Turkey has detached itself from so many treaties of direct or indirect relevance to nuclear safety or to the protection of the sea, the environment, workers or other people.

Even if Turkey did become a state party to all of the instruments of international law which it has hitherto distanced itself from, this does not necessarily mean that Turkey would comply with the letter or the spirit of each one. This is the unavoidable inherence one may draw from the history of Turkey's uncomfortable relationship with the 1950 European Convention for the Protection of Human Rights and Fundamental Freedoms, which Turkey signed in 1950 before ratified it – and bringing into force – in 1954,¹¹⁷ and with the European Court of Human Rights, the judicial guardian of the European Convention.

Some of the risks perceived to be inherent in the Akkuyu Nuclear Power Plant

A nuclear catastrophe at Akkuyu Nuclear Power Plant cannot be ruled out, especially in view of the matters raised in this article and the precarious geographical location of Akkuyu in one of the most earthquake-prone, militarised, conflict-ridden and otherwise volatile parts of the world.¹¹⁸ (See Images 7 and 8.) In practice, a nuclear catastrophe may be sparked by a design failure, mechanical failure, management failure, act of negligence, earthquake, act of terrorism, act of war or other man-made or natural cause.¹¹⁹

According to a scientific study published in September 2021, the areas to be affected by any 'accident' at Akkuyu may include parts of the southern coast of Turkey, as well as the Republic of Cyprus, the Dodecanese Islands (of which Rhodes is the largest), the Cyclades Islands (of which Naxos is the largest) and even the easterly part of Crete (the largest of the islands forming part of Greece).¹²⁰ In this context, it suffices to point out that Akkuyu is situated 85 or so kilometres away from the point on the northern coast of the Turkish-

occupied north of the Republic of Cyprus that is in closest proximity to Akkuyu, 110 or so kilometres from Nicosia, the capital city of the Republic and 355 or so kilometres from the north-east coast of the Greek island of Kastellorizo in the Dodecanese; Akkuyu is also 200 or so kilometres from Latakia on the western coast of Syria.¹²¹ (See Image 9.)

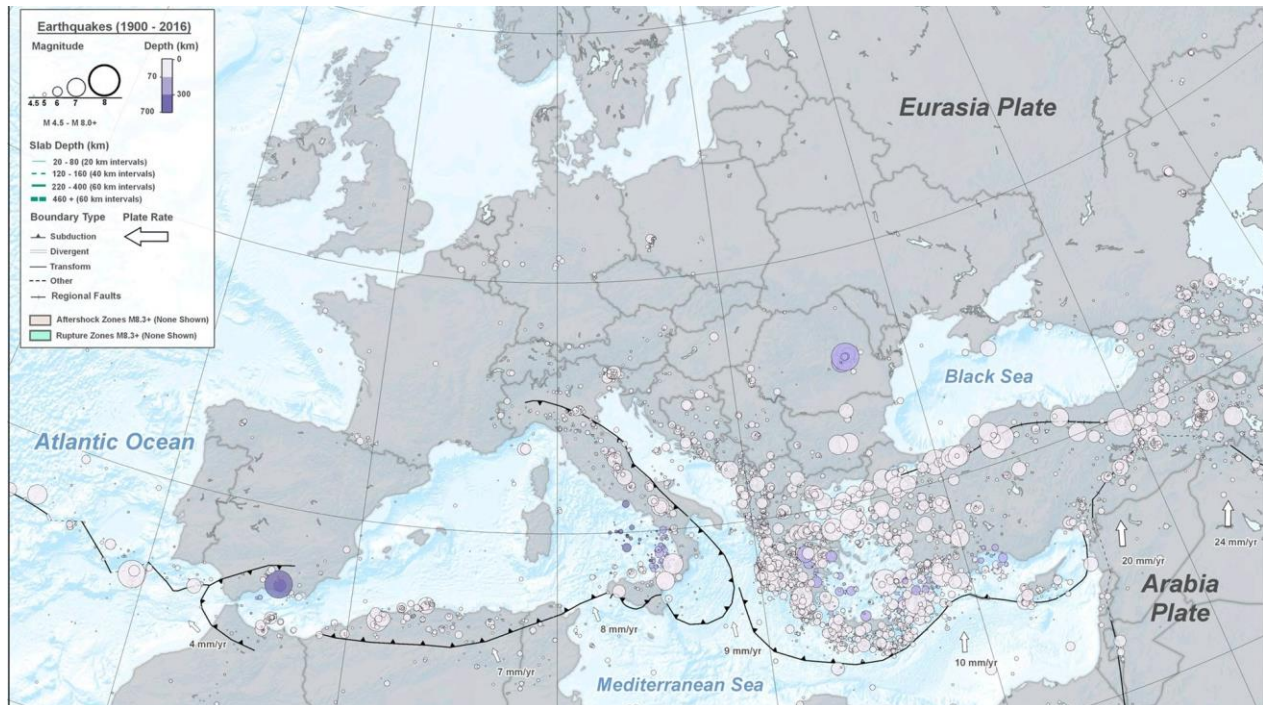


Image 7: 'Earthquakes 1960-2016'. Source: 'Map of Tectonic Summary Region', website of the US Geological Survey, US Department of the Interior, <https://earthquake.usgs.gov/earthquakes/eventpage/us7000c7y0/region-info> & https://earthquake.usgs.gov/earthquakes/tectonic/images/mediterranean_tsum.pdf (accessed 21 September 2021).

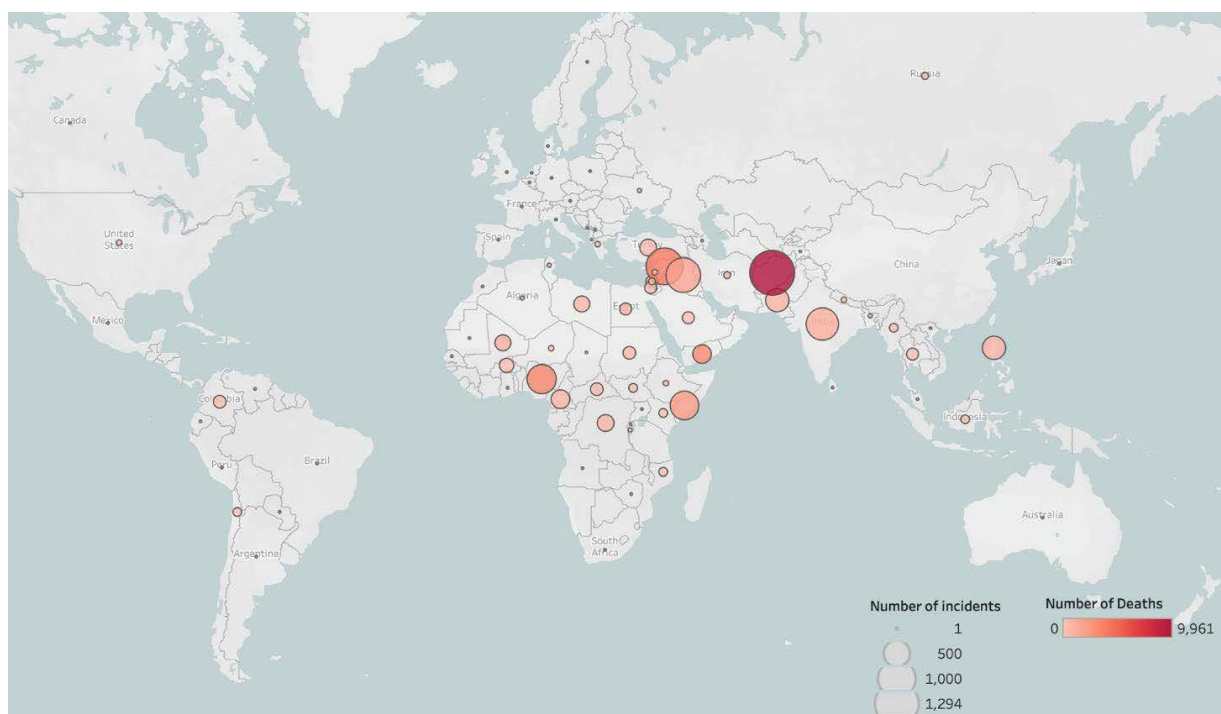


Image 8: 'Global Terrorist Incidents and Deaths, 2018'. Source: *Annex of Statistical Information Country Reports on Terrorism 2018* (Bethesda, Maryland: Prepared for the US State Department by Development Services Group, Inc., under Department of State Contract No. 19AQMM18F2564, October 2019), 6 (Figure 2.1), US State Department website, www.state.gov/wp-content/uploads/2019/10/DSG-Statistical-Annex-2018.pdf (accessed 21 September 2021).



Image 9: A map portraying the location of Turkey vis-à-vis the Island of Cyprus wherein the Republic of Cyprus is situated. Akkuyu Nuclear Power Plant is perched on the southern coast of Turkey, approximately 85 kilometres to the north of the Republic of Cyprus. Source: 'Turkey', European Commission website, https://ec.europa.eu/echo/where/europe/turkey_en (accessed 14 September 2021).

Given the history, location and size of the Akkuyu Nuclear Power Plant, it is hardly surprising that grave expressions of concern have been voiced by the Green movement in Europe,¹²² protesters on the ground,¹²³ professional bodies¹²⁴ and others. These opponents could be brushed aside if a reliable guarantee existed to ensure that the Akkuyu Nuclear Power Plant is or will be safe. However, no such guarantee appears to exist.

Irrespective of whether or not there is a catastrophe at the Akkuyu Nuclear Power Plant, its very existence may inevitably present risks to public health, wildlife, the sea and the wider environment of various places, including Turkey and the Republic of Cyprus. This was certainly the view of Ioanna Panayiotou during her tenure as Environmental Commissioner of the Republic. To quote from a statement of Environment Commissioner Panayiotou, as published in Greek on 5 April 2018, as freely translated by me below:

'This serious problem [at Akkuyu] must be dealt with great responsibility on the part of Cyprus, because it poses a threat to the environment, health and safety for all the inhabitants of our island and the wider region. All we have to do is remember the cases of Chernobyl and Fukushima.

'Radioactivity will exist during the normal operation of a nuclear power plant but in the event of an accidental leak it will destroy the quality of life of all living creatures in the area, including humans. The Eastern Mediterranean basin is a gigantic and interdependent ecosystem. In the event of a radioactive leak, areas within a radius of several hundred kilometers around the nuclear power plant will be directly affected.

'Nuclear waste is in itself an environmental disaster that will last for centuries. No one can say for sure that there is a safe way to dispose of it, since the risk of leaks will always exist. The cost of nuclear waste management is very high and this refutes the theories that nuclear energy is a cheap source of energy. This is because they [presumably the advocates of nuclear energy] do not calculate this cost, nor the cost of environmental impact. We wonder which region will want to host for tens of thousands of years the nuclear waste that is to be buried in its soil?' ...¹²⁵

At least two major European bodies have expressed similar concerns. One is the elected European Parliament of the EU (of which the Republic of Cyprus but not Turkey is a member). The other is the Parliamentary Assembly of the Council of Europe (of which the Republic of Cyprus and Turkey are both member states).

In a Resolution adopted on 6 July 2017, the European Parliament:

'... Calls on the Turkish Government to halt its plans for the construction of the Akkuyu nuclear power plant; points out that the envisaged site is located in a region prone to severe earthquakes, hence posing a major threat not only to Turkey, but also to the Mediterranean region; requests, accordingly, that the Turkish Government join the Espoo Convention, which commits its parties to notifying and consulting each other on major projects under consideration that are likely to have a significant adverse environmental impact across boundaries; asks, to this end, the Turkish Government to involve, or at least consult, the governments of its neighbouring countries, such as Greece and Cyprus, in relation to any further developments in the Akkuyu venture; ...'.¹²⁶

On 10 October 2018, the Parliamentary Assembly of the Council of Europe adopted a Resolution, Paragraph 8 of which expressed the following sentiments:

'Regarding the proposed plans by Turkey and the Russian Federation for the construction of the nuclear power plant of Akkuyu in the province of Mersin (Turkey), situated just 85 kilometres from the border with Cyprus and in very close proximity to other neighbouring countries, the Assembly expresses its deep concern regarding the construction of this nuclear power plant in an earthquake-prone region of Turkey, in accordance with European Parliament Resolution (2016/2308(INI)) of 6 July 2017. It therefore asks the Turkish Government to join the Espoo Convention and to take into account all concerns expressed also by its own citizens asking it to consult with neighbouring countries according to the International Convention on Nuclear Safety.'¹²⁷

In practice, the Resolutions adopted by the European Parliament and the Parliamentary Assembly have cut little or no ice in either Ankara or Moscow; as shown elsewhere in this article, the Governments in these capitals have instead fostered a narrative of 'safety' with the aim or effect of negating any concerns. However, this narrative has not allayed the concerns still harboured by many who remain unconvinced. These include the Members of the European Parliament – from both the right and the left of the political spectrum – who have asked the European Commission to answer questions about Akkuyu.¹²⁸

An example is Giorgos Georgiou MEP of the Left Group in the European Parliament (and an elected MEP from the Republic of Cyprus). In the Spring of 2021, he engaged in a

revealing exchange of correspondence with the European Commission. For his part, on 3 March 2021, Mr Georgiou submitted the following to the Commission as a 'Question for written answer':

'On 27 February 2021, Turkish Energy Minister Fatih Donmez announced that Turkey would launch the third reactor at the Akkuyu nuclear power plant on 10 March 2021.

'In his reply of 18 September 2019 to question P-002485/2019, Commissioner Johannes Hahn [the then European Commissioner for European Neighbourhood Policy and Enlargement Negotiations] notes that Turkey should align its legislation with the EU acquis on nuclear safety, which requires nuclear installations to be designed, located, constructed, commissioned and operated in such a way as to prevent accidents. The reply also stated that Turkey has committed to conduct nuclear stress tests. In view of the above:

'1. Given the lack of progress so far, what action does the Commission intend to take?

'2. What action will the Commission take to prevent the construction of a nuclear power plant that is not in line with the EU acquis and endangers the safety and quality of life of Cypriots and threatens the environment in the Mediterranean region?'¹²⁹

On 12 May 2021, the European Parliament published the following response from Kadri Simson, European Commissioner for Energy:

'Third countries have a sovereign right to decide whether and where to construct nuclear power plants (NPP) on their territory. As a candidate country, Turkey is expected to align its legislation, among others, with the EU acquis on nuclear safety.

'While the ultimate responsibility for the safety of the Akkuyu NPP remains fully with the relevant entities and authorities of Turkey, the safety of the construction of the NPP is regularly raised in the relevant meetings in the framework of the EU-Turkey Association Agreement. Furthermore, technical experts from Turkey and the European Commission are exchanging views on the organisation of the peer review of Turkey's Stress Tests National Report by the European Nuclear Safety Regulators Group (ENSREG). The ENSREG peer review of Akkuyu NPP is expected to start in the course of 2021 with a view to being completed in 2022.

'The Commission 2020 Report on Turkey recognised that some progress was made on nuclear energy, nuclear safety and radiation protection as Turkey updated its regulatory framework. However, Turkey has not yet acceded to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, and is not yet a member of the European Community Urgent Radiological Information Exchange system.'¹³⁰

By referring to no more than 'some progress' in Turkey, the European Commission indicated that Turkey has been dragging its feet while paying little more than lip service to

the gentle prods being exerted by the EU. At the same time, this answer signalled that the European Commission has adopted a conciliatory if not casual approach to the Akkuyu Nuclear Power Plant and the seemingly systemic deficiencies which characterise it. Put another way, the European Commission has taken next to no effective action, such as the imposition – or the threat of the imposition – of restrictive measures or sanctions with the twin aims of pressing Turkey to ratify as well as adhere to all of the international conventions to do with nuclear safety and to take all other appropriate steps necessary to protect the Republic of Cyprus and the Dodecanese islands of Greece, i.e. those parts of the EU which are at the front line of any potential civil nuclear threat emanating from Akkuyu.

If one reads the European Commission's 2020 Report on Turkey¹³¹ and its 2021 Report on Turkey,¹³² one comes across the same conciliatory approach. For the reasons sketched out in this article, not only is this approach unwise. It is arguably unfair, especially if one bears in mind that whereas the civil nuclear programme of Turkey presents an actual or potential threat to both Greece and the Republic of Cyprus, these two member states of the EU present no equivalent threat to Turkey. This is because neither Greece nor the Republic of Cyprus has any civil nuclear programme. (See Image 10.)

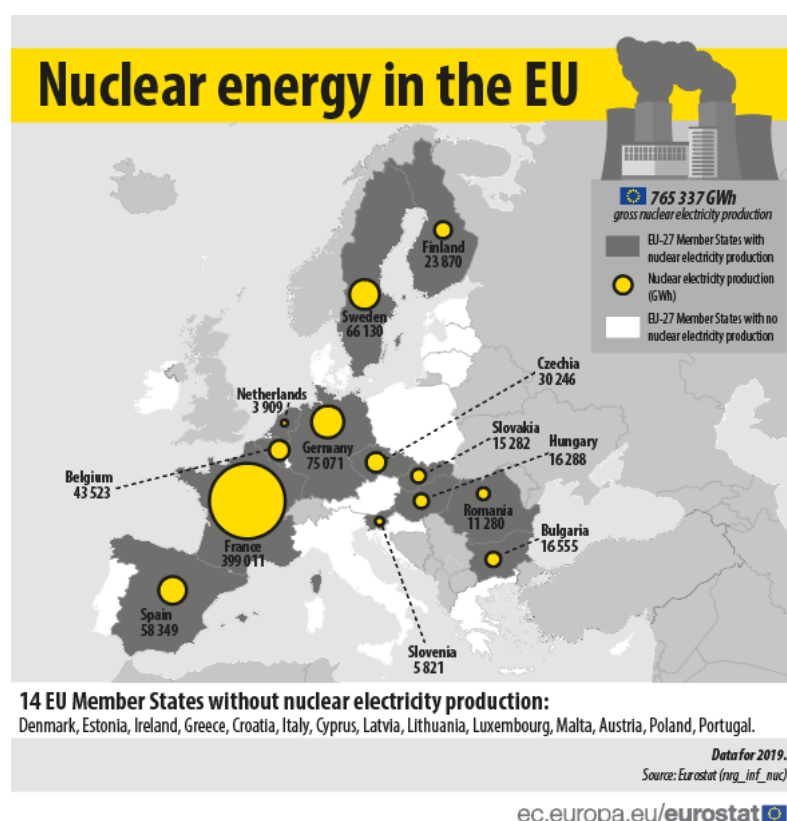


Image 10: The 14 Member States of the EU 'without nuclear electricity production' and the 13 with such production. Source: 'Nuclear power plants provide about a quarter of EU's electricity', 19 February 2021, European Statistical Office (Eurostat) website, <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210219-1> (accessed 13 September 2021).

Akkuyu in the context of human rights, transparency, whistleblowing and press freedom

As corroborated by the course of human history since the US dropped an atomic bomb on the Japanese city of Hiroshima on 6 August 1945,¹³³ nuclear energy, be it civil or nuclear, has the intrinsic potential to threaten or undermine human health¹³⁴ and what are now known as human rights, including the most fundamental right of all – the right to life.¹³⁵ With this history in mind, the Akkuyu Nuclear Power Plant is a possible source of human rights violations. That possibility is underlined by several judgments in which the European Court of Human Rights has already established that Turkey or Russia has been responsible for one or more breaches of human rights within an environmental context.¹³⁶ If one studies some of these judgments,¹³⁷ one notices that, in common with Russia, Turkey lacks a deep-rooted as well as effective health and safety regulatory framework that forms part of an ethical culture that is steeped transparency, whistleblowing and press freedom.

To begin with, systemic secrecy is alleged to bedevil Turkey,¹³⁸ its Turkish civil nuclear programme¹³⁹ and the Akkuyu Nuclear Power Plant in particular.¹⁴⁰ Yet, that secrecy is inconsistent with the priority accorded to transparency by the IAEA which considers the principle to be one of tools in the 'Nuclear Communicator's Toolbox'.¹⁴¹ That secrecy also runs counter to one of the calls to action issued on 27 March 2012 by Ban Ki-moon, the then Secretary-General of the UN, in the aftermath of the Fukushima Disaster of 2011:

'Determining the appropriate energy mix is a decision of sovereign states. But nuclear safety and security is a global public good.

'The general public has a right to know. Governments and the nuclear industry must heed the growing demands for greater transparency, accountability and access to impartial information.'¹⁴²

The seemingly systemic lack of transparency in Turkey is accompanied by a long-standing failure to adopt any stand-alone Turkish legislation that is devoted to whistleblowing.¹⁴³ Thus, again in common with Russia,¹⁴⁴ Turkey lacks a modern, effective and user-friendly whistleblower protection framework.¹⁴⁵ Hence, it would appear, the conviction and imprisonment in Turkey of so many people who equate to whistleblowers.¹⁴⁶ This is an acute cause of concern as the practice of whistleblowing and the protection of whistleblowers are both recognised as among the facilitators of ethics, transparency, openness and accountability within the civil nuclear industry.¹⁴⁷

All of which is aggravated by the precarious condition of press freedom in Turkey.¹⁴⁸ This is not conducive to the prompt exposure of any alleged acts of wrongdoing, alleged acts of negligence, alleged systemic failures or other alleged sources of looming danger in the Turkish civil nuclear programme. I make this point mindful of the fact that, throughout the history of the media across the world, investigative journalism has helped to expose multiple acts of wrongdoing, acts of negligence, systemic failings or cover-ups in the private and the public sectors of various states.¹⁴⁹ For example, it was partly thanks to the media that the Kremlin-induced cover-up at Chernobyl was exposed following the accident there in 1986.¹⁵⁰ Conversely, the media has been accused of failing to unearth what was wrong in the Japanese nuclear industry before the Fukushima Disaster of 2011.¹⁵¹ In other words, history teaches us that the media ought to be keeping a constant and watchful eye on what is happening in any civil nuclear programme, where-ever it may exist. Yet, in Turkey, journalists face an uphill struggle to fulfil this vital task by virtue of the dangers inherent in

being an independent-minded investigative journalist in that country;¹⁵² such journalists who are female face an even more uphill struggle.¹⁵³

In practice, press freedom in Turkey has deteriorated markedly since the ill-fated coup in Turkey on 15 July 2016. So much so that the media in Turkey has faced what Human Rights Watch has branded as a 'deepening' government-led 'assault on critical journalism'.¹⁵⁴ Turkey has thereby become a byword for the imprisonment of journalists¹⁵⁵ and it has even acquired a related epithet, which has been woven into the title of a press release published by Amnesty International: 'The world's largest prison for journalists'.¹⁵⁶

All that being said, the restrictions on press freedom in Turkey have not prevented the proliferation of alarming allegations and resultant headlines in sections of the Turkish as well as the international media. In the Autumn of 2021 alone, such headlines included the following: 'Poor conditions and no trade union at Turkey's first nuclear power station';¹⁵⁷ 'Fire Breaks Out at Turkey's Unfinished Nuclear Power Plant in Mersin (+Video)';¹⁵⁸ 'VIDEO: Terrible blast at Turkey Akkuyu Nuclear Power Plant';¹⁵⁹ 'The cafeteria of the \$20 billion project [at Akkuyu] is under water';¹⁶⁰ 'Horrible incident at Mersin Akkuyu Nuclear Power Plant';¹⁶¹ 'Three workers die in construction site for Turkey's first nuclear power plant, says worker';¹⁶² and 'Worker allegedly beaten to death by security at Akkuyu Nuclear Power Plant'.¹⁶³ Not surprisingly, some of these matters have prompted the authorities at the Plant to challenge, rebut or otherwise respond to what has been alleged.¹⁶⁴

Even though I cannot verify the accuracy of either the allegations or the official statements issued in response to them, at least two things are clear. The first is that the allegations which circulated in the Autumn of 2021 form part of a wider pattern of allegations as well as reports and video postings.¹⁶⁵ The second is that, for the reasons set out in this article, it is difficult to have any great confidence in the ability or willingness of Turkey and Russia to develop the Turkish nuclear programme in line with the international conventions, principles and practices that are designed to facilitate nuclear safety and to foster a culture resting on that critical concept.¹⁶⁶

Conclusions and recommendations

This article has delivered a wake-up call. In parallel, the article has advanced the thesis identified in the Introduction to the article, i.e., that the civil nuclear project at Akkuyu 'marks a turning point in the history, character, dynamics and risk profile of the Greater Middle East.' In keeping with this thesis, the article has explained how Akkuyu reflects a much wider phenomenon – the nuclearization of the Greater Middle East by virtue of the nuclear power plants that have already sprung up in the region and the new ones that are planned to do so in the years ahead. This phenomenon has altered the energy mix of the region, but at the cost of presenting a range of actual or potential new risks to people, wildlife and the environment. The article has pointed to some of these risks.

As the Greater Middle East enters an inherently unstable new nuclear epoch, I end with five somewhat inter-twined sets of recommendations which are directed towards the Government of Turkey, the Governments of other states in the Greater Middle East, the EU and all of the inhabitants of both the EU and the Greater Middle East.

Firstly, while appreciating that it is much easier said than done, Turkey must undertake – and must be pressed to undertake – a radical change in culture. With the aim of ensuring that the Turkish civil nuclear programme is truly safe as well as effective, all of the organs of the Turkish state must become truly wedded to nuclear safety and, in that context, public consultation exercises, mechanisms of public participation in decision-making, whistleblowing procedures, press freedom and the other characteristics of democracy that help to facilitate or reinforce nuclear safety.

Secondly, the UN, the Council of Europe, the EU, the 27 member states of the EU and other international actors should openly demand that Turkey signs, ratifies, brings into force and complies with all of the mainstream instruments of international law which it has hitherto shied away from. In the meantime, it is unwise – to put it mildly – for Turkey to construct or operate any civil nuclear reactor while remaining detached from so many such instruments. It is equally unacceptable for Turkey to be subject to the other systemic deficiencies identified in this article.

Thirdly, all persons living or working in Turkey and the Greater Middle East must exercise their inherent democratic right to demand enhanced levels of nuclear safety coupled with much greater nuclear-related transparency, openness and accountability. So, too, must journalists searching for the truth, trade unionists representing workers and, of course, politicians elected by the people, be they politicians serving in local councils, national parliaments or other mechanisms of democracy.

Fourthly, nuclear safety, nuclear emergency preparedness and related issues must rise to the top of the diplomatic agenda and the public dialogue across the Greater Middle East. To both ends, the co-operation of Turkey is essential as part of a co-ordinated national, multinational and multi-organisational approach to these issues. In this regard, I can do little better than to echo the remarks of UN Secretary-General Ban Ki-moon on 22 September 2011:

‘The effects of nuclear accidents respect no borders. To adequately safeguard our people, we must have strong international consensus and action. We must have strong international safety standards. ... The message has been clear and unified: we cannot accept business as usual – and we all have a stake in getting it right.’¹⁶⁷

Fifthly, every inhabitant in the Greater Middle East must become fully informed of the risks and responsibilities that are associated with living or working in reasonably close proximity to the Akkuyu Nuclear Power Plant and the other nuclear power plants in the region. At the same time, every *de jure* and *de facto* public and private body across the region must update its risk management, emergency preparedness and emergency response policies. In practice, this requires certain steps to be taken in the interests of the health and safety of every employee and of every other person that comes into contact with such a body. To take one example, in addition to staging regular earthquake responsiveness and fire evacuation drills, every such body should conduct regular nuclear emergency drills and other related forms of training.¹⁶⁸ So, too, should the emergency services in co-ordination with other related public services.

By the same token, every inhabitant of the Greater Middle East should be exposed to a public education campaign with the aim of providing nuclear emergency training coupled

with tailor-made guidance akin to the guidance published by the US Nuclear Regulatory Commission and entitled 'What Do I Do in a Nuclear Emergency?'¹⁶⁹ On the subject of public education, Ban Ki-moon is again instructive. On 10 May 2011, in the aftermath of the Fukushima Disaster, the then UN Secretary-General commented:

'We cannot eliminate disasters, but we can mitigate risk. We can reduce damage. We can save more lives. ... We know what works. Good building design. Proper land-use planning. Public education. Community preparedness. Effective early warning systems. Focusing on the needs and potential of women – the largest untapped resource for change.'¹⁷⁰

In closing, I sincerely hope that, upon publication, this article will stimulate others to engage in ethical academic research, investigative journalism and other appropriate activities in pursuit of nuclear safety. I also hope that the recommendations pinpointed in the preceding paragraphs will be acted upon. However, for these aspirations to be realised, all governments in the Greater Middle East must adjust their mindset and modes of behaviour accordingly. As must the EU, two of whose member states, Greece and the Republic of Cyprus, have territory in perilously close proximity to the Akkuyu Nuclear Power Plant. At stake is the safety of every inhabitant of the Greater Middle East, the security of every sovereign state situated in that region and the welfare of the environment.

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¹⁶⁵ See, for instance, Julia Harte, 'Building of Turkey's First Nuclear Plant, Sited on a Fault Line, Facing Fresh Questions', 25 March 2011, www.reuters.com/article/idUS122778134920110325, Andrew Wilks, 'Akkuyu: Turkey's nuclear dream overshadowed by safety fears', 13 August 2019, www.thenationalnews.com/world/europe/akkuyu-turkey-s-nuclear-dream-overshadowed-by-safety-fears-1.897761 and 'Akkuyu Nuclear vows to adopt measures after blast at power plant site that injured two', 20 January 2021, www.duvarenglish.com/akkuyu-nuclear-vows-to-adopt-measures-after-blast-at-power-plant-site-that-injured-two-news-55939 (all accessed 20 November 2021).

¹⁶⁶ See *Basic Safety Principles for Nuclear Power Plants 75-INSAG-3 Rev. 1* INSAG-12: A Report by the International Safety Advisory Group: INSAG -12 (Vienna: IAEA, October 1999), IAEA website, www-pub.iaea.org/MTCD/Publications/PDF/P082_scr.pdf and www.iaea.org/publications/5811/basic-safety-principles-for-nuclear-power-plants-75-insag-3-rev-1, *Safety Reports Series No. 1: Examples of Safety Culture Practices* (Vienna: IAEA, 1997), IAEA website, www-pub.iaea.org/MTCD/Publications/PDF/STIPUB1039-70388427.pdf and *Principles for a Strong Nuclear Safety Culture* (Atlanta, GA: Institute of Nuclear Power Operations, 2004), US Nuclear Regulatory Commission website, www.nrc.gov/docs/ML0534/ML053410342.pdf (all accessed 9 October 2021).

¹⁶⁷ 'Fukushima accident a 'wake-up call' to boost nuclear safety, UN forum told', 22 September 2011, UN website, <https://news.un.org/en/story/2011/09/387942-fukushima-accident-wake-call-boost-nuclear-safety-un-forum-told> (accessed 20 November 2021).

¹⁶⁸ For details, see 'EPR [Emergency Preparedness & Response] Exercises and Training', IAEA website, www.iaea.org/topics/epr-exercises-and-training and 'Hostile Action Based Emergency Preparedness (EP) Drills', US Nuclear Regulatory Commission website, www.nrc.gov/about-nrc/emerg-preparedness/respond-to-emerg/hostile-action.html (both accessed 24 November 2021).

¹⁶⁹ 'What Do I Do in a Nuclear Emergency? Nuclear Power Plant Emergency', US Nuclear Regulatory Commission website, www.nrc.gov/about-nrc/emerg-preparedness/in-radiological-emerg.html (accessed 23 November 2021).

¹⁷⁰ 'Opening remarks at press conference to launch the 2011 Global Assessment Report on Disaster Risk Reduction: Ban Ki-moon', 10 May 2021, UN website, www.un.org/sg/en/content/sg/speeches/2011-05-10/opening-remarks-press-conference-launch-2011-global-assessment-report (accessed 20 November 2021).