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NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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Cover photos: Ratification ceremony on 17 December 2021, OECD Conference Centre, Paris; An assessor of the regulatory authority seals a UVBA-type container before reposition (GNS).

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Reflections on the negotiations of the Protocols to amend the Paris and Brussels Supplementary Conventions

*by Marc Léger**

I was fortunate enough in my former position to take part as a member of the French delegation in the discussions that led from 1990 to the revision of the Vienna Convention on Civil Liability for Nuclear Damage¹ and from 1998 to the revision of the Paris Convention on Third Party Liability in the Field of Nuclear Energy² and the Brussels Supplementary Convention.³

Following the eagerly awaited entry into force, after 18 years,⁴ of the Protocols amending the Paris and Brussels Conventions that were adopted in February 2004, I am delighted to now have the opportunity to share the exceptional experience in the field of international law and nuclear law to which I was a party. The aim here is not to discuss the content of the Protocols in detail, which has already been done in more academic articles, but to recount the discussions occasioned by the provisions of the Protocols.

However, before this trip down memory lane can begin, it is necessary to place the adoption of these protocols in a historical framework, which began with the accident that occurred on 26 April 1986 at the Chernobyl Nuclear Power Plant in Ukraine, which was in those days a part of the Union of Soviet Socialist Republics (USSR) and was followed by several important milestones that eventually led to their signature in 2004.

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1. Vienna Convention on Civil Liability for Nuclear Damage (1963), IAEA Doc. INFCIRC/500, 1063 UNTS 266, entered into force 12 Nov. 1977 (Vienna Convention); Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage (1997), IAEA Doc. INFCIRC/566, 2241 UNTS 302, entered into force 4 Oct. 2003 (1997 Protocol to Amend the Vienna Convention).
2. Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982, and by the Protocol of 12 February 2004, entered into force 1 Jan. 2022, unofficial consolidated text available at: NEA (2017), “Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982 and by the Protocol of 12 February 2004”, NEA Doc. NEA/NLC/DOC(2017)5/FINAL (Paris Convention).
3. Convention of 31 January 1963 Supplementary to the Paris Convention of 29 July 1960, as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982 and by the Protocol of 12 February 2004, entered into force 1 Jan. 2022, unofficial consolidated text available at: NEA (2017), “Convention of 31 January 1963 Supplementary to the Paris Convention of 29 July 1960, as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982 and by the Protocol of 12 February 2004”, NEA Doc. NEA/NLC/DOC(2017)6/FINAL (Brussels Supplementary Convention).
4. The main reason for this delay was that one of the amendments introduced by the Protocol revising the Paris Convention concerned the jurisdiction of states, which is now a matter for the European Union.

Chernobyl: The trigger

Given the difficulties involved in concluding an international convention, regardless of the reasons for doing so, the signatories are rarely inclined to spontaneously consider a revision thereto, meaning that a revision most often occurs as a result of external events whose importance and impact make it necessary to make changes to the convention in order, based on a common desire, to improve the provisions thereof.

This is exactly what happened with the Paris and Brussels Supplementary Conventions. Their revision came after discussions by the international community on the consequences that had to be drawn from the Chernobyl accident. In addition to the need to establish an international legal framework for the creation and operation of nuclear power plants, which led to the adoption of the Convention on Nuclear Safety in 1994,⁵ the accident had shown the limits of the civil liability for nuclear damage (CLND) regimes arising, on the one hand, from the Paris Convention signed in 1960 through the OECD Nuclear Energy Agency (NEA) and, on the other, from the Vienna Convention signed in 1963 through the International Atomic Energy Agency (IAEA).

Two observations were made at the time. First, these two regimes were juxtaposed without any link with each other, which divided the CLND world into Paris and Vienna countries,⁶ even though the regimes were based on a similar concept and on the same principles. Second, the accident revealed certain shortcomings in their arrangements, namely that the amounts of liability proved to be very inadequate in relation to the potential damage and did not cover compensation for environmental damage.⁷

This was compounded by the fact that many countries using nuclear energy, starting with the USSR and, subsequently, the central European countries of the so-called “Communist Bloc”, had not acceded to any of these conventions, thus depriving some populations that had been directly exposed to the fallout from the Chernobyl accident of potential compensation. However, while this was a sovereign decision of these states and not due to an intrinsic deficiency of the CLND regimes, the fact remained that the Paris and Vienna regimes, due to both their coexistence and separateness, could not offer universal coverage on their own. This seriously undermined the attractiveness of CLND, given that its universal application was a key element.

A first step towards a global CLND regime: The Joint Protocol

The first step that was envisaged at the international level shortly after the accident was to create a novel gateway between the two regimes. This was the purpose of the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention,⁸ which was negotiated in a few months and, in an exceptional move, adopted in September 1988, i.e. a little over two years after the accident. The purpose of the Protocol was to extend the benefits of the application of one of the two conventions to which the installation state was a party (i.e. the state in which the accident occurred either on an installation located on its territory or during transport to or from the said installation) to the states that were parties to the other convention, on the condition that the states concerned had ratified the Joint Protocol. In this manner, the victims of an accident occurring in a Paris country could benefit from the compensation provided for by the Paris Convention, regardless of whether they belonged to a Paris or a Vienna country, as long as these countries were bound by the Joint Protocol.

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5. Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, 1963 UNTS 293, entered into force 24 Oct. 1996.
 6. This expression refers to the states parties to the Paris Convention or the Vienna Convention.
 7. Even if the notion of “property” referred to by the conventions in the definition of nuclear damage did not a priori exclude compensation for damage to the environment.
 8. Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (1988), IAEA Doc. INFCIRC/402, 1672 UNTS 293, entered into force 27 Apr. 1992 (Joint Protocol).

Despite the fact that the Protocol provided the missing link in making CLND, based on the Paris Convention and the Vienna Convention, a universal civil liability regime, few states acceded to it immediately. The fact that the core conventions, and in particular the Vienna Convention, which in its 1963 version provided for a fairly low minimum amount of compensation, had not at that time been revised undoubtedly contributed to curbing the enthusiasm that this new instrument should, in principle, have generated.

The necessary revision of the Vienna Convention

As a result, discussions continued in the IAEA expert group and many states agreed on the need to revise the Vienna Convention, which had not been amended since its signature. The discussions were extended to all IAEA member states, whereas they could have been restricted to signatory parties. This allowed all states to participate, those without nuclear programmes and those which, despite having programmes, had not yet acceded to either of the two existing conventions, as well as those that had acceded to the Paris Convention and were therefore, in principle, not directly concerned by the outcome of the discussions.

All issues were addressed, with an unprecedented emphasis on thoroughness and exhaustiveness that covered: the question of the concept of nuclear accident or damage; the geographic scope of the Convention; the transport of radioactive materials; jurisdiction for accidents occurring during transport, in particular shipping (with the introduction of the concept of the exclusive economic zone); and the amount of financial liability to be borne not only by the operator of a nuclear installation or the transport operator but also by the states. Numerous working groups were set up to work on these issues alongside the plenary sessions, in Vienna and in other host countries, in which the representatives of the Paris countries were actively involved. These groups made proposals that made it possible, on the basis of consensus, to advance discussions between states.

The states parties to the Paris and Brussels Supplementary Conventions obviously discussed whether it would be appropriate to start discussions on the revision of these conventions, which had already been amended twice in the past, either at the same time or at a later date. Very quickly, the conclusion was reached that it was preferable to wait for the outcome of the discussions on the revision of the Vienna Convention, even if it was impossible to ascertain the date on which they might be completed.

The Convention on Supplementary Compensation (CSC): An unexpected innovation

Just as the discussions within the IAEA on the amendment were beginning to run somewhat long, mainly due to the technical complexity of the issues involved, a significant development occurred with the United States' proposal for a new convention with a dual purpose. On the one hand, the new convention aimed to provide supplementary funding, on the model of the Brussels Supplementary Convention (hence the name of the convention, the so-called "Convention on Supplementary Compensation"). On the other hand, it aimed to allow all states to accede thereto if either they were already signatories to the Paris or Vienna Conventions, or at the time of their accession they had CLND legislation that complied with the principles laid down by these conventions as set out in the Annex, or if before the adoption of the CSC they had legislation that was considered equivalent, in application of a so-called "grandfather clause" under Anglo-Saxon law. In practice, this clause was only designed for the United States, which due to domestic law felt that it could not accede to either the Paris or the Vienna Convention. The sudden involvement of the United States in the international field of CLND undoubtedly spurred the process of revision of the Vienna Convention, which culminated in a diplomatic conference in September 1997 on both the draft protocol amending that convention and the draft protocol amending the CSC.

It is impossible in just a few lines to relate the full extent and scope of the discussions, one of the merits of which was to serve, so to speak, as the preparatory rounds for the subsequent talks that took place in Paris and Brussels. I nevertheless remember two fiercely

debated topics: firstly, the issue of the extension from 10 to 30 years of the statute of limitations on the right to compensation for personal injury, which at first sight appeared to be a good idea but which ran into some serious practical difficulties in terms of its implementation, given the length of time cancerous diseases take to develop; secondly, the issue of the geographic scope of application of the Revision Protocol, which made it possible to extend the application of its provisions to non-contracting states, under certain conditions. Some states considered that this extension violated a principle of international law to which they were attached, namely the limitation of the benefit of treaty provisions to contracting states only. In the end, a last minute consensus was reached on this extension, which today constitutes a fundamental characteristic of the CLND regime.

The revision of the Paris Convention

After the negotiations within the IAEA framework ended with the adoption of the Protocol amending the Vienna Convention on 12 September 1997,⁹ the question of a revision of the Paris and Brussels Conventions was raised again. If truth be told, the answer was self-evident for several reasons.

The first could be described as political. The Paris Convention, which is the counterpart of the Vienna Convention as a basic convention, could not appear to be lagging *vis-à-vis* the latter, given the sort of simmering competition that had developed between the two systems since their adoption; and which had increased since the disappearance of the Communist Bloc. Indeed, the political environment had changed considerably after the fall of the Berlin Wall and the disappearance of the USSR: the nuclear countries of central Europe had massively adhered to the Vienna Convention,¹⁰ and some even to the Joint Protocol,¹¹ making the Vienna Convention the regime with the largest number of contracting states, while the Paris Convention covered the largest number of nuclear installations. The second reason was legal, given the existence of the Joint Protocol designed to link the two conventions. It would have been difficult to imagine that an accident occurring in a Paris country could give rise to more favourable compensation for victims in a Vienna country, not to mention the difficulties linked to disparities in the concept of nuclear damage.

Discussions on the revision of the Paris and Brussels Supplementary Conventions therefore began in 1998, but only between states parties, and were completed at the very beginning of 2004, with the revision protocols officially signed in Paris on 12 February. The short duration of the discussions is naturally explained by the fact that many subjects had already been extensively discussed within the framework of the revision of the Vienna Convention. That said, the new provisions adopted by the protocol amending this Convention were not integrated into the Paris Convention as they stood, and several of them led to in-depth discussions (the concepts of nuclear accident and damage, and in particular the aspects of environmental damage and economic loss; the scope of the reference to the “law of the competent court”; the concept of nuclear installation, in particular low-risk installations, etc.).

However, much of the debate naturally focused on the issues concerning the amounts of liability and the structure of the different tranches and their respective responsible parties. In the end, a consensus was reached on what was a considerable increase at the time in the amount to be borne by the operator, from the SDR 150 million¹² recommended in 1990 to EUR 700 million. This figure, which may appear to have been plucked out of thin air, in fact

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9. Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage (1997), IAEA Doc. INFCIRC/566, 2241 UNTS 302, entered into force 4 Oct. 2003.
 10. Between 1989 and 1998, 12 Central European States acceded to the Vienna Convention.
 11. Between 1990 and 1994, 8 of the 12 aforementioned states also acceded to the Joint Protocol.
 12. SDR stands for “Special Drawing Rights”, which is a unit of account used by the International Monetary Fund (IMF) and is based upon a basket of five weighted currencies. As of 10 March 2022, SDR 1 equals approximately EUR 1.25. IMF (2022), “SDRs per Currency unit and Currency units per SDR last five days”, www.imf.org/external/np/fin/data/rms_five.aspx (accessed 10 March 2022). Therefore, SDR 150 million is approximately equal to EUR 187.5 million.

corresponded to the capacity of the insurance market as it was perceived through the statements by the representatives of the insurers. Nevertheless, once the protocol had been signed, the insurers very quickly contested the insurability of this amount, not only per se but especially with regard to the categories of damage retained in the new definition of nuclear damage (whether it be “damage to the environment”, considered uninsurable per se, or the extension to 30 years of the statute of limitations, making it impossible, as they saw it, to anticipate any fund management). Fortunately, over time, insurers have now come to consider that they are able to meet all the needs of operators. My only regret, however, is that the convention did not provide for an adjustment mechanism that would have made it possible to adapt to economic and financial developments.

In conclusion, there are two points worth noting. The first is that at no time during the discussions were the principles on which the regime of civil liability for nuclear damage was based in 1960 called into question, whether it be the channelling of liability to the operator, which has its corollary in the field of nuclear safety, in which the operator is considered to have the prime responsibility for the safety of its installation, or the limitation of its liability, even if states are allowed to adopt a principle of unlimited liability (as is the case in Germany). This shows, if proof were still needed, how relevant the legal construction made by our predecessors more than 60 years ago remains. Secondly, it should be emphasised that the discussions were held by a group of experts in CLND, some of whom had a great deal of experience in the area, which made it possible to facilitate the pace of discussions, and that all of them were driven by a desire to improve the system for potential victims of a nuclear accident.

I cannot end without mentioning the part played in this outcome by the NEA Nuclear Law Committee. Its regular meetings not only enabled an ongoing review of the progress made in discussions, thanks in particular to the summaries or ad hoc reports produced by its secretariat, but also provided an opportunity for meetings and therefore discussions, both formal and informal, between delegations.

The protocols to amend the Paris and Brussels Conventions that were signed in 2004 finally came into force on 1 January 2022. We can only welcome this, while at the same time paradoxically hoping that they never need to be applied.

Significant legal developments concerning “independent” regulatory agencies in the United States and what it could mean for the Nuclear Regulatory Commission

by Eric Michel*

Introduction

Multiple sources of international nuclear law, including binding instruments such as the Convention on Nuclear Safety (CNS)¹ and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention),² stress the importance of the independence of the regulator, as well as the effective separation of that regulatory body from others tasked with the promotion or utilisation of nuclear energy. Since its creation in 1974, the United States (US) Nuclear Regulatory Commission (NRC) has been characterised as an “independent agency” within the US government. One of the hallmarks of this independence is that, by law, members of the Commission cannot be removed at will by the President over policy disagreements. However, recent decisions by the US Supreme Court have declared that restrictions on the President’s ability to remove the heads of certain agencies are incompatible with the nation’s constitutional structure and are therefore invalid and unenforceable. As of this writing, these decisions have been limited to independent regulatory agencies headed by a single administrator, not multi-member boards or commissions such as the NRC. However, the Court’s legal reasoning sweeps broadly, and if the holding of these decisions were to be applied to multi-member regulatory bodies (as legal scholars predict), it would shake the organisational bedrock upon which the Commission has rested since its creation. It may also risk transforming the Agency’s public image into that of a political or promotional actor, whose activities are closely overseen by the President who is also responsible for setting energy-related national priorities and goals.

Part I of this article discusses the “independence principle” in international nuclear law, drawing features and characteristics of “effectively independent” nuclear regulators from binding and non-binding sources. Part II briefly recounts the origins of the NRC, which was created in 1974 as an independent regulatory commission from the fission of its predecessor that had possessed both regulatory and promotional responsibilities. Part III examines generally the history of “independent agencies” in the United States, which rose to prominence in the early 20th century out of a desire for apolitical, objective solutions to novel regulatory issues. Part IV turns to the present and describes two recent Supreme Court decisions interpreting the US Constitution that have thrown into doubt the validity

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1. Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, 1963 UNTS 293, entered into force 24 Oct. 1996 (CNS).
2. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste management (1997), IAEA Doc. INFCIRC/546, 2153 UNTS 357, entered into force 18 June 2001 (Joint Convention).

of the *sine qua non* of “independent” regulators – statutory protection from at-will removal. Part V considers what such a loss would mean for the NRC and its status as an effectively independent nuclear health and safety regulator, and Part VI concludes by pondering what, if anything, could be done.

I. The “independence” principle in nuclear law

Safety is the paramount consideration in nuclear law. Indeed, “nuclear law” exists as its own unique, specialised legal framework in recognition of the particular health and safety risks inherent in activities utilising nuclear energy and ionising radiation. The principal objective of nuclear law is to appropriately balance the risks of these activities against their benefits, but safety remains the primary requisite.³ And while primary responsibility for ensuring safety rests with the licensee or operator engaged in nuclear activities (nuclear law’s “responsibility” principle),⁴ such activities must be licensed or authorised in advance (the “permission” principle) by a national regulatory authority “whose decisions on safety issues are not subject to interference from entities involved in the development or promotion of nuclear energy” (the “independence” principle).⁵

The independence principle, which “reflects the consensus of experience in nuclear governance”,⁶ is embedded directly into the preeminent binding nuclear law instruments, albeit in brief. The CNS, which establishes the internationally-accepted framework for safety and regulatory oversight of land-based civil nuclear power plants, obliges each contracting party to “take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion of nuclear energy.”⁷ Likewise, the Joint Convention – the “sister convention” to the CNS that similarly establishes the fundamental safety and regulatory oversight principles concerning spent fuel and radioactive waste management – obliges contracting parties to ensure the “effective independence” of the safety regulator.⁸ These general principles (“effective” independence and “effective” separation between the functions of safety regulation and promotion of nuclear activities) are the full extent to which these instruments describe the components of an independent regulator.⁹ Further definition or explanation in the convention text was avoided to preserve flexibility and

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3. Stoiber, C. et al. (2003), *Handbook on Nuclear Law*, IAEA, Vienna, pp. 3-5.
 4. CNS, *supra* note 1, Art. 9, “Each Contracting Party shall ensure that prime responsibility for the safety of a nuclear installation rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.”
 5. Stoiber, C. et al. (2003), *supra* note 3, pp. 7-9 (“Given the significant risks associated with nuclear technology, other interests must defer to the regulator’s independent and expert judgment when safety is involved.”).
 6. Burns, S. (2012), “The Fukushima Daiichi Accident: The International Community Responds”, *Washington University Global Studies Law Review*, Vol. 11, No. 4, Washington University, St. Louis, p. 757.
 7. CNS, *supra* note 1, Art. 8(2).
 8. Joint Convention, *supra* note 2, Art. 20(2). Unlike the CNS, the Joint Convention uses the term “independence”, rather than “separation”, because at the time the convention was being negotiated some states had regulatory structures such that “the same governmental organisation involved in waste management also include[d] a division or office dealing with safety.” Stoiber, C. (2018), “Inside nuclear baseball: Reflections on the development of the safety conventions”, *Nuclear Law Bulletin*, No. 100, OECD Publishing, Paris, p. 68.
 9. Other non-binding instruments contain analogous provisions. See, e.g., IAEA (2006), *Code of Conduct on the Safety of Research Reactors*, IAEA Doc. IAEA/CODEOC/RR/2006, IAEA, Vienna, p. 5 (“The regulatory body should be effectively independent from organizations or bodies charged with promotion of nuclear technologies or with operation of research reactors”); IAEA (2004), *Code of Conduct on the Safety and Security of Radioactive Sources*, IAEA Doc. IAEA/CODEOC/2004, IAEA, Vienna, p. 8 (each state shall establish a regulatory body “whose regulatory functions are effectively independent of other functions with respect to radioactive sources”).

help establish consensus,¹⁰ which is understandable given the wide range of national constitutional structures and legal frameworks among the contracting parties.

In order to promote a more common understanding of the concept of independent regulatory decision making, in 2003 the International Atomic Energy Agency (IAEA) published a report, prepared by its International Nuclear Safety Advisory Group (INSAG),¹¹ which identified a number of measures and basic principles that should be present. The IAEA has also published, as part of its Safety Standards Series, guidance for the “essential aspects” of the “framework for establishing a regulatory body”, including effective independence.¹² The 2003 INSAG report identified three basic functions of nuclear safety regulators, which must be performed “without pressure from interests that may conflict with safety”: 1) development and enactment of “appropriate, comprehensive and sound regulations”; 2) verification of compliance with such regulations; and 3) enforcement and imposition of “appropriate corrective measures” in the event of a departure from the established safety framework.¹³ The report also identified several “key features” that independent regulators performing these functions must possess, including (among others) an “[i]nsusceptibility to unwarranted external influences”.¹⁴ The INSAG report further provides measures that can be taken – either by the regulator itself or political decision-makers within government – to ensure that the regulator is fully equipped to overcome challenges to independent decision making. These measures include the establishment of an appropriate legal framework that clearly articulates the basis for the regulator’s “objectives, principles and values”; “clearly defined processes for regulatory decision making”; and ensuring the regulator has the necessary means (i.e. human resources and programmatic competence) to “secure independent scientific and technical support”.¹⁵

With respect to potential external influences, which “may include unwarranted interaction and attempts to influence regulatory decision making by”, among others, “individual politicians and political groups,” the INSAG report emphasises the importance of the “unwarranted” qualifier.¹⁶ That is, the report recognises that constitutional or legal constraints may mean that “a regulatory body cannot be absolutely independent in all respects of the rest of government”.¹⁷ However, the “credibility and effectiveness” of the regulator depends upon ensuring that any “political guidance and oversight” is clearly

10. See e.g. Stoiber, C. (2018), *supra* note 8, p. 65 (explaining that the term “independence” was not used in the text of the CNS because of its ambiguity, particularly when translated into other languages).

11. IAEA (2003), *Independence in Regulatory Decision Making*, International Nuclear Safety Group (INSAG)-17, IAEA, Vienna (INSAG-17).

12. IAEA (2016), *Governmental, Legal and Regulatory Framework for Safety*, IAEA Safety Standards Series, General Safety Requirements, No. GSR Part 1 (Rev. 1), IAEA, Vienna. See also Nuclear Energy Agency (NEA) (2014), *The Characteristics of an Effective Nuclear Regulator*, OECD Publishing, Paris, p. 14 (stating that the “basic requirements for regulatory body independence” are set out in the CNS and the IAEA’s GSR Part 1).

13. INSAG-17 (2003), *supra* note 11, pp. 1-2.

14. *Ibid.*, pp. 3-4. Other “key features” include decision making “on the basis of science and proven technology and relevant experience” accompanied by clear and rational explanations; “consistency and predictability” in decisions grounded in clear safety objectives and legal and technical criteria; and “transparency and traceability”.

15. *Ibid.*, pp. 4-5.

16. *Ibid.*, p. 3.

17. *Ibid.*, p. 2. See also IAEA (2016), *supra* note 12, p. 6 (“An independent regulatory body will not be entirely separate from other governmental bodies. [...] However, the government shall ensure that the regulatory body is able to make decisions under its statutory obligation for the regulatory control of facilities and activities, and that it is able to perform its functions without undue pressure or constraint.”).

defined in law and limited “to ensure a high degree of professional independence” in the regulator’s decision making.¹⁸

In sum, “[n]o single approach can ensure effective independence and separation of the functions of the regulatory bodies in all States.”¹⁹ An effectively independent regulator is one that is designed and empowered to transparently issue standards and make determinations based on health and safety considerations, free from the unwarranted interference of those who may have motivations other than safety (economic, political, promotional or otherwise).²⁰ There is no universal formula to achieve this outcome. Rather, “effective independence” for purposes of international nuclear law exists on a spectrum and must be holistically measured based on the presence or absence of key attributes and features, recognised by the international community through best practices and experience. Effective independence of the regulator requires “watchful attention”, for lack of effective independence, if not timely addressed, can result in significant consequences.²¹

One of the key features of effective independence, not yet mentioned but the focus of the ensuing sections of this article, is the process for designating and removing the head of the regulatory body. Consistent with the discussion above, the basic structure and composition of a nuclear regulatory body will differ from state to state, with some opting for an agency or ministry headed by a single individual whereas others (such as the United States) opting for a multi-member commission or board of directors.²² However, in all cases the head of the regulatory body will consist of a government official or officials whose appointment and tenure is prescribed by law. Same as with any other individual factor, “[t]he process of designating and removing the head of a regulatory body is not determinative of the body’s independence,” but it can nonetheless serve as “an indication of how the safety function is viewed” within the state.²³ Where the head of the regulatory body “can be removed at the discretion of the president, the cabinet or a minister without the showing of a cause ... the real and perceived independence of that person will be affected.”²⁴

18. INSAG-17 (2003), *supra* note 11, p. 2. See also Stoiber, C. et al. (2003), *supra* note 3, p. 27 (“The fact that the regulatory body is located within the administrative structure of another organization, or is supervised by it, does not necessarily mean that the regulatory body lacks independence. The question is whether the necessary effective separation or effective independence of key regulatory functions and decision making exists.”).

19. Stoiber, C. et al. (2003), *supra* note 3, p. 26.

20. IAEA (2016), *supra* note 12, p. 7 (the regulatory body is to “be free from any pressures associated with political circumstances or economic conditions, or pressures from government departments, [the operator], or other organizations”); NEA (2014), *supra* note 12, p. 21 (“Independence from any undue influence on the part of the nuclear industry and those sectors of government that sponsor this industry is vital to an effective regulator.”).

21. See Burns, S. (2012), *supra* note 6, p. 758 (recounting the “blistering criticisms” of the Japanese regulatory body in the aftermath of the Fukushima Daiichi accident, which was characterised by the Japanese legislature as a “manmade disaster” resulting from “collusion” between the operator and the regulator, whose independence was deemed a “mockery” (citing National Diet of Japan (2010), “The official report of The Fukushima Nuclear Accident Independent Investigation Commission”)).

22. See Burns, S. et al, (2022), “Regulation, licensing and oversight of nuclear activities”, *Principles and Practice of International Nuclear Law*, OECD Publishing, Paris, pp. 169-70 (listing states utilising multi-member agencies or commissions versus a regulatory authority headed by a single director or administrator). See also Sexton, K.A. (2015), “Crisis, criticism, change: Regulatory reform in the wake of nuclear accidents”, *Nuclear Law Bulletin*, No. 96, OECD Publishing, Paris, pp. 38-42.

23. Stoiber, C. et al. (2003), *supra* note 3, p. 27.

24. *Ibid.*, pp. 26-27.

II. The independent foundations of the NRC

The NRC was established as an “independent regulatory commission” with the passage of the Energy Reorganization Act of 1974.²⁵ This Act abolished the NRC’s predecessor, the Atomic Energy Commission (AEC), whose creation dated back to the dawn of the atomic age in 1946 for the principal function of producing fissionable material for the development and manufacture of nuclear weapons.²⁶ The AEC’s functions were significantly revised via the Atomic Energy Act of 1954, which ended the federal government’s monopoly on nuclear technology and assigned to the AEC the dual functions of both encouraging the commercial development of nuclear energy within the United States as well as protecting public health and safety through licensing and oversight of civilian nuclear activities.²⁷ This dual role had subjected the AEC to increasing public scrutiny and criticism in the years preceding its abolition, “like letting the fox guard the henhouse” in the words of a contemporaneous critic.²⁸ One of the main purposes of the Energy Reorganization Act was to “upgrade the regulation of nuclear power” in the United States by “separating the regulatory functions of the AEC from its developmental and promotional functions – a response to growing criticism that there is a basic conflict between the AEC’s regulation of the nuclear power industry and its development and promotion of new technology for the industry.”²⁹

In order to effectuate this separation, the Energy Reorganization Act transferred to the NRC “all the licensing and related regulatory functions” of the former AEC.³⁰ All other functions of the AEC were transferred to a newly-created Energy Research and Development Administration (ERDA), including responsibility for “encouraging and conducting research and development, including demonstration of commercial feasibility and practical applications” of nuclear energy, among other energy sources.³¹ ERDA’s functions would be transferred a few years later to the newly-created Department of Energy (DOE), the cabinet-level department of the executive branch that still exists today, headed by a Secretary reporting directly to the President.³²

By contrast, when establishing the NRC, Congress provided the members of its Commission with statutory protection from removal. Although members of the Commission are appointed by the President and confirmed by the US Senate,³³ once in office they may only be removed by the President for “inefficiency, neglect of duty, or malfeasance in office.”³⁴ The precise meaning of this phrase has never actually been settled, but it has served as the basic removal provision for heads of “independent” agencies in the United States for well over a century, dating back at least to the Interstate Commerce Commission, which was created in 1887 to regulate the nation’s burgeoning railroad industry.³⁵ Indeed, the AEC possessed the same statutory removal protection

25. Pub. L. No. 93-438, tit. II, section 201, 88 Stat. 1233, 1242 (1974) (codified at 42 *United States Code* (USC) 5841) (Energy Reorganization Act of 1974).

26. Mazuzan, G. and S. Walker (1984), *Controlling the Atom: The Beginnings of Nuclear Regulation, 1946-1962*, University of California Press, Berkeley, California, p. 4; see also Atomic Energy Act of 1946, Pub. L. No. 79-585, 60 Stat. 755 (1946).

27. Mazuzan, G. (1984), *supra* note 26, pp. 24, 30; see also Atomic Energy Act of 1954, Pub. L. No. 83-703, 68 Stat. 919 (1954).

28. Walker, S. and T. Wellock (2010), *A Short History of Nuclear Regulation, 1946-2009*, NRC, pp. 47-49.

29. S. Rep. 93-980, 1974 *United States Code Congressional and Administrative News* (USCCAN) 5470, 5471 (1974).

30. 42 USC 5841(f).

31. 42 USC 5813(2).

32. Department of Energy Organization Act, Pub. L. No. 95-91, tit. III, 91 Stat. 565, 577 (1977) (codified at 42 USC 7151).

33. US Constitution, Art. II, section 2, cl. 2; 42 USC 5841(b)(1).

34. 42 USC 5841(e).

35. Sunstein, C. and A. Vermeule (2021), “Presidential Review: The President’s Statutory Authority over Independent Agencies”, *Georgetown Law Journal*, Vol. 109, No. 3, Georgetown Law, p. 644.

dating back to the Atomic Energy Act of 1946, which was then carried over to the NRC upon the AEC's abolition.³⁶

At the time Congress first created the AEC in 1946, and certainly by the time it created the NRC in 1974, the permissibility of providing “independent” regulatory commissions with statutory removal protection was considered a solid bedrock of constitutional and administrative law. However, over time this bedrock has been exposed and weathered from increasing judicial scepticism (perhaps even cynicism) over the perceived expanse and lack of “accountability” of the modern American administrative state.

III. The history of “independent agencies” in the United States

The Constitution of the United States divides its federal government into three co-equal branches (the “separation of powers”). Article I establishes the legislative branch, a bicameral Congress consisting of a House of Representatives and Senate empowered to pass laws;³⁷ Article II establishes the executive branch, headed by a President tasked with ensuring the “faithful execution” of those laws;³⁸ and Article III establishes the judicial branch, headed by a Supreme Court empowered to resolve “cases or controversies” that arise under federal law.³⁹ Regulatory agencies (such as the NRC) fall within the confines of the executive branch, as they are entities created by the legislature to administer and enforce the laws it promulgates (such as the Atomic Energy Act).⁴⁰ Per the “Appointments Clause” of the Constitution, the President is solely empowered to nominate the heads of executive departments and agencies (generally referred to as “principal officers”), and such appointments are subject to the “advice and consent” of the Senate.⁴¹

However, the Constitution does not expressly address the power over removal of such principal officers. This issue (i.e. whether such removal authority inherently resides with the President, whether the Senate’s consent function applies to removal just as it applies to appointment or whether constitutional silence means that Congress retains discretion to enact removal provisions into law as it sees fit) was considered early in US history during the so-called “Decision of 1789,” when Congress first debated whether and how to include a removal provision in legislation involving a department secretary (though the extent to which anything was actually “decided” remains up for debate).⁴² The early consensus that emerged was that the Constitution’s grant of executive power to the President also provided concomitant authority to remove executive officials at will.⁴³ However, this

36. See Atomic Energy Act of 1946, *supra* note 26, section 2(a)(2); Atomic Energy Act of 1954, *supra* note 27, section 22(a) (repealed by Energy Reorganization Act of 1974, *supra* note 25, section 104(a)).

37. US Constitution, Art. I, section 1.

38. *Ibid.*, Art. II, section 3, cl. 5 (the “Take Care Clause”).

39. *Ibid.*, Art. III, section 2.

40. The US Congress also possesses the “power of the purse” within the US constitutional structure – no money can be drawn from the US Treasury, including appropriations for agency operations, unless done so in accordance with an act of Congress. *Ibid.*, Art. I, section 9, cl. 7. This authority is widely recognised as a tool to set or influence the priorities of regulatory agencies, in that Congress may restrict the use of appropriated funds for specific purposes or may withhold funds for certain activities altogether. See Congressional Research Service (2021), *Congress’s Authority to Influence and Control Executive Branch Agencies*, pp. 14-15. This is discussed further in this Article, *infra* Part VI.

41. US Constitution, Art. II, section 2, cl. 2.

42. Prakash, S. (2006), “New Light on the Decision of 1789”, *Cornell Law Review*, Vol. 91, No. 5, Cornell University, p. 1024; see also Birk, D. (2021), “Interrogating the Historical Basis for a Unitary Executive”, *Stanford Law Review*, Vol 73, No. 1, Stanford University, p. 188 (“[T]he Decision of 1789 primarily demonstrates only that there was no more agreement about the existence of, or limits on, the President’s removal power at time of the Framing than there is today.”).

43. Prakash, S. (2006), *supra* note 42, p. 1023 n.10 (quoting *Myers v. US*, 272 US 52, 115 (1926), in which the Court stated “the power of removal must remain where the Constitution places it, with the President, as part of the executive power, in accordance with the legislative decision of 1789”).

constitutional theory would eventually be challenged in the early twentieth century with the rise of “independent” agencies.

“Independent” regulatory commissions began to materialise in the United States during what is referred to as the “Progressive Era,” a period in the late 19th through the early 20th century associated with significant industrialisation, urbanisation and social and political reforms. During this era, Congress began to increasingly pass legislation creating “independent” agencies, staffed by “expert administrators with technical competence” who would be free to make “logical decisions based on empirical data”, free from “political melee” and “partisan politics”.⁴⁴ That is, the genesis for independent regulatory commissions was to empower new agencies to focus on discrete and narrow subject matters, “without consideration of competing programmatic interests” and with “[i]nsulation from political control”.⁴⁵ Congress employed various statutory tools to provide such insulation and promote independent decision making within these agencies. These included, for example, partisan balance requirements with respect to commission membership; tenure for a term of specified years for individuals serving on an independent commission; and independent authority for the commission to represent itself before courts of law, rather than reliance on the representation of the Department of Justice.⁴⁶ Some (not all) were also afforded the “legal touchstone”, or “*sine qua non*”, of agency independence: statutory protection from removal from office, except for instances of “inefficiency, neglect of duty, or malfeasance in office.”⁴⁷

The creation of multi-member commissions accelerated during the “New Deal” era, which arose out of the Great Depression of the 1930s, a period during which Congress created seven such agencies in a few short years to regulate novel issues of the day. This included the Federal Communications Commission to regulate wire and radio communication services; the Securities and Exchange Commission to protect financial investors from fraud and market manipulation; and the National Labor Relations Board to oversee collective bargaining and the prevention of unfair labour practices.⁴⁸ It was during this time period, in 1935, when a decision of the US Supreme Court concerning one of the era’s other “Progressive-technocratic” creations – the Federal Trade Commission (FTC), established in 1914 to regulate antitrust and unfair business practices – constitutionally legitimised the concept of “independent agencies” and paved the way for the modern administrative state that exists today.⁴⁹

Oddly enough, the dispute that reached the Supreme Court and resulted in this seminal decision had nothing to do with the substantive authority of the FTC, nor was it driven by any specific regulatory decision issued by the Commission. Rather, one of the members of the FTC (William E. Humphrey) had recently died. Five months prior to his death, the President (Franklin D. Roosevelt) had fired him, after Humphrey had ignored multiple rounds of correspondence in which the President had requested his resignation over policy disagreement. Humphrey had been appointed by Roosevelt’s predecessor to serve a seven-year term on the Commission – Roosevelt fired him with nearly five years of the term remaining. The executor of Humphrey’s estate filed suit against the United States,

44. Breger, M. and G. Edles (2000), “Established by Practice: The Theory and Operation of Independent Federal Agencies”, *Administrative Law Review*, Vol. 52, No. 4, American Bar Association, pp. 1130-31.

45. Datla, K. and R. Revesz (2013), “Deconstructing Independent Agencies (And Executive Agencies)”, *Cornell Law Review*, Vol. 98, No. 4, Cornell University, p. 777. See also Crane, D. (2015), “Debunking Humphrey’s Executor”, *The George Washington Law Review*, Vol. 83, No. 6, p. 1844 (describing the “heart of the Progressive vision for administrative agencies” as “politically detached and independent, uniquely expert and objective”); Breger, M. (2000), *supra* note 44, p. 1113 (“[I]n traditional theory, [independent agencies’] stock-in-trade is the expert, apolitical resolution of regulatory issues.”).

46. Vermeule, A. (2013), “Conventions of Agency Independence”, *Columbia Law Review*, Vol. 113, No. 5, *Columbia Law School*, pp. 1165, 1168.

47. *Ibid.*, pp. 1166 n.7, 1170, 1219.

48. Corrigan, P. and R. Revesz (2017), “The Genesis of Independent Agencies”, *New York University Law Review*, Vol. 92, No. 3, New York University, p. 670.

49. Crane, D. (2015), *supra* note 45, pp. 1835-36.

arguing that Humphrey's removal from the Commission was unlawful, and thus the government was required to pay the five months of salary which Humphrey had been entitled to receive between his improper dismissal and his death. Hence, the atypical name for the case that would become the "iconic judicial pillar" of the independent regulatory state: *Humphrey's Executor*.⁵⁰

In *Humphrey's Executor*, the Supreme Court ruled in a unanimous decision that the President could only remove members of the FTC for the reasons enumerated in the law – "inefficiency, neglect of duty, or malfeasance in office" – and not at will over policy disagreements.⁵¹ The Court grounded its reasoning in several factors. First, the Court stated that the FTC was, by design, intended to be nonpartisan and act with "entire impartiality", "free from political domination or control", and "separate and apart from any existing department of the government – not subject to the orders of the President."⁵² The President's only role, the Court stated, was to select members of the Commission, who would then be "free to exercise [their] judgment without the leave or hindrance of any other official."⁵³ Additionally, the Court described the functions of the FTC as "neither political nor executive, but predominantly quasi judicial and quasi legislative"; in other words, according to the Court, the FTC did not engage in executive decision making that necessitated presidential oversight, but instead was tasked with non-executive powers such as issuing reports to Congress based solely on an objective and nonpartisan basis, and enforcing laws through impartial trial-like activities.⁵⁴ Lastly, the Court noted that one of the purposes of the law establishing the FTC was to "create a body of experts who shall gain experience by length of service", a purpose that would be frustrated if the President was free to dismiss its members at will prior to the specified end date of their terms.⁵⁵

Humphrey's Executor constituted a relative about-face from another Supreme Court decision, *Myers v. United States*, in which the Court had held just a decade earlier that the President could unilaterally remove a postmaster from office, notwithstanding a law requiring Senate consent to removal.⁵⁶ In *Myers*, the Court had broadly proclaimed that under the Constitution the President's power of removal of executive officers "was incident to the power of appointment", and that "those in charge of and responsible for administering functions of government, who select their executive subordinates, need in meeting their responsibility to have the power to remove those whom they appoint."⁵⁷ The Court in *Humphrey's Executor* justified the differing result in that case by contrasting the office of the postmaster (a "purely executive" and subordinate official) from the members of the FTC, a collection of nonpartisan experts separated from executive control by design.

Humphrey's Executor would stand the test of time and become "bedrock precedent" for the administrative state,⁵⁸ establishing the legal foundation for Congress to continue creating independent commissions, including the AEC and the NRC, over the ensuing decades. However, the Court's reasoning in *Myers* would nonetheless endure and become championed by jurists and legal scholars who support what is referred to as the "unitary executive theory" of the presidency.⁵⁹ Advocates of this theory contend that under the Constitution all (not some, but all) "executive power" of the federal government is vested in the President alone and that while Congress may create offices and departments within the executive branch to assist the President in carrying out his or her duties, those

50. *Ibid.*, pp. 1836, 1840-42; *Humphrey's Executor v. United States*, 295 US 602 (1935).

51. *Humphrey's Executor*, 295 US at 626.

52. *Ibid.*, at 624-25.

53. *Ibid.*, at 625.

54. *Ibid.*, at 628.

55. *Ibid.*, at 625.

56. *Myers*, *supra* note 43.

57. *Ibid.*, at 119.

58. Crane, D. (2015), *supra* note 45, p. 1838.

59. Birk, D. (2021), *supra* note 42, p. 193. See also Sunstein, C. and A. Vermeule (2021), "The Unitary Executive: Past, Present, Future", *The Supreme Court Review*, The University of Chicago, p. 100 (stating that *Myers* is "the shining and fixed star" for modern defenders of the unitary executive).

subordinate officials must remain subject to the President's direction and control, including removal at will.⁶⁰ Under this theory, independent agencies are often criticised as a "headless fourth branch" of the US government, controlled by unaccountable bureaucrats who exercise executive authority without accountability, and do so removed from the supervision of the democratically elected President.⁶¹

The broad principle articulated by the Court in *Myers*, concerning the importance of presidential control of those executing the laws, would resurface in judicial decisions from time to time.⁶² Notably for the NRC (perhaps prophetically, in hindsight), this principle also surfaced in a judicial opinion amidst the controversy over DOE's 2010 attempt to withdraw its application for construction authorisation of the Yucca Mountain spent fuel geologic repository. Under US law, DOE is assigned the responsibility to construct and operate a nuclear waste repository at Yucca Mountain, to be licensed by the NRC.⁶³ DOE submitted its construction application to the NRC in 2008 but in 2010 filed a motion to rescind the application with prejudice, not because of safety concerns but because the site had been deemed an unworkable option as a matter of policy. A panel of the NRC Atomic Safety and Licensing Board declared that under the law DOE did not have discretion to withdraw its application as a matter of policy and denied its motion.⁶⁴ DOE's attempt to withdraw its application was also challenged in federal court, where it was ultimately dismissed as premature because the Commission had not yet reviewed the Board's determination at the time it was filed.⁶⁵ But in reaching this determination, one judge of the DC Circuit Court of Appeals wrote separately to express his puzzlement as to "how we got here, constitutionally speaking":

Taking a step back and reading the Constitution ... it seems odd that the Nuclear Regulatory Commission has the final word within the Executive Branch on this important issue. One would think that the President of the United States controls the Executive Branch and would be able to direct the interpretation of law and exercise of discretion by all agencies in the Executive Branch. [...] [O]ne would assume that the Nuclear Regulatory Commission would report to the President, not the President to the Nuclear Regulatory Commission. [...] But that conception of the constitutional chain of command turns out to be inaccurate with respect to independent agencies as the Nuclear Regulatory Commission – a consequence of the Supreme Court's 1935 decision in *Humphrey's Executor*.⁶⁶

Those words were written by circuit judge Brett Kavanaugh, who seven years later was elevated to an associate justice position on the US Supreme Court. Within a few short years thereafter, Justice Kavanaugh would find himself within a Supreme Court majority issuing two decisions that legal scholars predict may signal the imminent end of "independent" agencies in the United States altogether.

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60. Birk, D. (2021), *supra* note 42, p. 193. See also Breger, M. (2000), *supra* note 44, p. 1156.
61. See e.g. Shapiro, I. (2020), "Time to Rein in the Unconstitutional Fourth Branch of Government", *Administrative & Regulatory Law News*, Vol. 45, No. 2, American Bar Association, p. 9.
62. See e.g. *Bowsher v. Synar*, 478 US 714, 725-26 (1986) (citing *Myers* and holding that Congress "cannot reserve for itself the power of removal of an officer charged with the execution of the laws"); *Free Enterprise Fund v. Public Company Accounting Oversight Board*, 561 US 477, 492-95 (2010) (citing the "landmark case of *Myers*" as reaffirming the principle that the President must retain the power of removal over those executing the laws).
63. See generally Nuclear Waste Policy Act of 1982, as amended, Subtitle A (codified at 42 USC sections 10131-10145).
64. In the Matter of US Department of Energy (High-Level Waste Repository), LBP-10-11, 71 NRC 609 (2010). The Atomic Safety and Licensing Board is a panel of administrative judges authorised to conduct licensing hearings as directed by the Commission. See 42 USC 2241.
65. In re Aiken County, 645 F.3d 428 (DC Cir. 2011). The Commission would later divide evenly on whether to take any action overturning or upholding the Board's decision, thus leaving it in place. In the Matter of US Department of Energy (High-Level Waste Repository), CLI-11-07, 74 NRC 212 (2011). Due to lack of appropriated funds, the Yucca Mountain adjudication has been suspended since 2011.
66. In re Aiken County, 645 F.3d at 439-440.

IV. Significant recent judicial developments concerning “independent agencies”

The first of these two cases, *Seila Law LLC v. Consumer Financial Protection Bureau*,⁶⁷ concerned an independent agency which had been created by Congress in 2010 in the wake of the 2008 global financial crisis.⁶⁸ This agency – the Consumer Financial Protection Bureau (CFPB) – was tasked with enforcing various laws and regulating activities in the financial sector concerning consumer protections, such as fair credit reporting, debt collection practices and preventing any other “unfair, deceptive, or abusive act or practice”.⁶⁹ Congress provided the agency with broad enforcement powers, such as the authority to conduct investigations, issue subpoenas, impose administrative sanctions and prosecute civil actions in federal court.⁷⁰ Congress also provided the head of the agency with the same “inefficiency, neglect of duty, or malfeasance in office” statutory removal protection that had been deemed permissible decades earlier in *Humphrey’s Executor*, but with one key (and, as it turned out, fatal) distinction: the CFPB is led by a single individual, a Director, and is not structured as a multi-member commission or board like traditional “independent” agencies.⁷¹ In 2017, the CFPB began investigating the business practices of a California-based law firm (Seila Law LLC) and issued a civil demand to the firm requiring it to produce certain records and information. Seila Law challenged the issuance of the demand, arguing that the CFPB was powerless to act because the organisational structure of the agency violated the Constitution, thus rendering the demand invalid.⁷² The dispute eventually reached the Supreme Court.

In an opinion written by the Chief Justice, the Supreme Court agreed that the CFPB’s structure – a single Director who serves a fixed term of five years, “wields significant executive power,” and is only removable by the President for cause – was indeed unconstitutional.⁷³ In reaching its decision, the Court utilised substantial “unitary executive” rhetoric and reasoning, asserting that “[u]nder our Constitution, the ‘executive power’ – all of it – is ‘vested in a President,’ who must ‘take Care that the laws be faithfully executed’”, and that “‘as a general matter,’ the Constitution gives the President ‘the authority to remove those who assist him in carrying out his duties’”.⁷⁴ The Court stated that the single-Director structure of the CFPB contravened the “carefully calibrated” constitutional design of government, by “vesting significant governmental power in the hands of a single individual accountable to no one.”⁷⁵ Individual executive officials other than the President may “wield significant authority” under the laws of the United States, but such authority must, according to the Court, remain “subject to the ongoing supervision and control of the elected President.”⁷⁶ Thus, the Court held that the CFPB may “continue to operate, but its Director, in light of our decision, must be removable by the President at will.”⁷⁷

In addition to the majority opinion, two justices of the Court wrote separately to express their views on the continued vitality of *Humphrey’s Executor*. This is because the majority did not overrule *Humphrey’s Executor*, but instead characterised the 1935 decision as a “recognized exception” to the “general rule” that the President’s removal power over executive officials is absolute.⁷⁸ In doing so, the Court described the legal principle of *Humphrey’s Executor* as permitting Congress to provide for-cause removal protections “for multimember expert agencies that do not wield substantial executive power”⁷⁹ – a

67. 140 S.Ct. 2183 (2020) (*Seila Law*).

68. Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, tit. X, 124 Stat. 1376, 1955 (2010) (codified at 12 USC sections 5481-5603).

69. *Seila Law*, *supra* note 67, at 2193.

70. *Ibid.*

71. See 12 USC 5491.

72. *Seila Law*, *supra* note 67 at 2194.

73. *Ibid.*, at 2192.

74. *Ibid.*, at 2191 (quoting US Constitution, Art. II, section 1, cl. 1 and *Free Enterprise Fund*, *supra* note 62).

75. *Ibid.*, at 2203.

76. *Ibid.*

77. *Ibid.*, at 2192.

78. *Ibid.*, at 2198.

79. *Ibid.*, at 2199.

significant narrowing of the holding of that prior decision, since the phrase “substantial executive power” appears nowhere in *Humphrey’s Executor*. In essence, since the CFPB was not a multi-member agency, there was no reason for the *Seila Law* majority opinion to specifically revisit *Humphrey’s Executor*.⁸⁰ But for Justices Thomas and Gorsuch, this was not good enough, and their separate opinion argued that the Court should overrule *Humphrey’s Executor* altogether as an “erroneous precedent” that enables a “*de facto* fourth branch of Government” consisting of unaccountable independent agencies and posing a “significant threat to individual liberty and to the constitutional system of separation of powers and checks and balances.”⁸¹

Just one year later, the Court revisited essentially the same issue when it decided *Collins v. Yellen*,⁸² a case involving an identical challenge to the constitutionality of the structure of the Federal Housing Finance Agency (FHFA). Congress created the FHFA in 2008 during a national housing and mortgage crisis, for the purpose of closely regulating two of the country’s largest government-sponsored financial institutions to stabilise the secondary mortgage market. Shortly after its creation, the FHFA put these two institutions into conservatorship and transferred a sizeable amount of their net worth to the Treasury Department, which triggered lawsuits from private shareholders. Like the CFPB in *Seila Law*, Congress had designed the FHFA as an independent agency headed by a single individual with statutory protection from removal.⁸³ The plaintiffs in *Collins* argued that the FHFA’s organisational structure was unconstitutional, no different than the CFPB in *Seila Law*. The Supreme Court agreed, holding that the FHFA’s statutory removal protections were unconstitutional, viewing the case as dictated by a “straightforward application of our reasoning in *Seila Law*”⁸⁴ and parroting much of the same rationale from the prior decision:

The removal power helps the President maintain a degree of control over the subordinates he needs to carry out his duties as the head of the Executive Branch, and it works to ensure that these subordinates serve the people effectively and in accordance with the policies that the people presumably elected the President to promote. [...] In addition, because the President, unlike agency officials, is elected, this control is essential to subject Executive Branch actions to a degree of electoral accountability.⁸⁵

On the surface, *Collins* did indeed seem like an indistinguishable case from *Seila Law*: two agencies, each headed by a single individual rather than a multi-member commission, with statutory protection from at-will presidential removal. But the defenders of the FHFA’s “independent” status sought to distinguish the two cases by contrasting the relative power and authority of the two agencies. In *Seila Law*, the court had characterised the CFPB as an agency with “authority to bring the coercive power of the state to bear on millions of private citizens and businesses” through investigations, issuance of industry standards, enforcement actions and civil sanctions.⁸⁶ Conversely, the proponents of the FHFA argued that it comparatively exercised much more limited authority than the CFPB, in that its primary mission was to regulate government-sponsored enterprises, not directly regulate private citizens.⁸⁷ The Court deemed this difference irrelevant, stating: “the nature and breadth of an agency’s authority is not dispositive in determining whether Congress may limit the President’s power to remove its head. [...] Courts are not well-suited to weigh the relative importance of the regulatory and enforcement authority of disparate agencies, and we do not think that the constitutionality of removal restrictions hinges on such an inquiry.”⁸⁸

80. *Ibid.*, at 2206 (“[W]e do not revisit *Humphrey’s Executor* or any other precedent today”).

81. *Ibid.*, at 2111-12.

82. 141 S.Ct. 1761 (2021) (*Collins*).

83. 12 USC 4512(b)(2) (“The Director shall be appointed for a term of 5 years, unless removed before the end of such term for cause by the President.”).

84. *Collins*, *supra* note 82 at 1785.

85. *Ibid.*

86. *Seila Law*, *supra* note 67 at 2200-01.

87. *Collins*, *supra* note 82 at 1784.

88. *Ibid.*

Two Justices who dissented from the majority in *Collins* noted that in the Court's prior *Seila Law* decision, it had declared the CFPB to be unconstitutional because the agency exercised "significant executive power" while being insulated from presidential control.⁸⁹ "Remarkably," said one Justice, "those words ['significant executive power'] appear nowhere in today's decision. Instead, the Court appears to take the position that exercising essentially any executive power whatsoever is enough" to render removal protections unconstitutional.⁹⁰

V. What this means for the NRC

Returning to field of international nuclear law: what is to be made of these legal developments in the United States, as applied to its independent nuclear health and safety regulator? The short answer is nothing – yet. To date, the Supreme Court has not yet opined on the constitutional legitimacy of statutory removal protections for independent multi-member commissions such as the NRC. The *Seila Law* and *Collins* decisions are expressly limited to independent agencies headed by a single individual. Additionally, shortly after the *Collins* decision, the Office of Legal Counsel (OLC) – the component within the US Department of Justice that furnishes legal advice to the President and heads of executive departments – issued a memorandum opinion concluding that, based on the Court's decisions, the President could also remove at-will the head of the Social Security Administration, another independent agency led by a single individual with statutory removal protection.⁹¹ (The President did indeed remove him shortly thereafter.) In that opinion, OLC expressly stated that its views were limited to the Social Security Administration and not the head of any other agency that does not share its "specific combination of features", which would exclude independent multi-member boards and commissions.⁹²

However, if one reads the tea leaves – or, in the words of two leading scholars on the subject of the President's removal power, the "neon signs"⁹³ – the continued vitality of *Humphrey's Executor* in US constitutional law is in serious doubt. In the *Collins* case, the proponents of the FHFA's constitutionality cautioned the Court that a decision otherwise would call into question the legitimacy of many other aspects of the federal government, including multi-member agencies. The Court's effective response? "No comment."⁹⁴ Legal scholars are now increasingly predicting that *Humphrey's Executor* will either be imminently overruled by the current Supreme Court, or at the very least chiselled away and

89. *Ibid.*, at 1800-01 (opinion of Kagan, J.) ("Without even mentioning *Seila Law*'s 'significant executive power' framing, the majority announces that, actually, 'the constitutionality of removal restrictions' does not 'hinge[]' on the 'nature and breadth of an agency's authority'"); *ibid.* at 1805 (opinion of Sotomayor, J.) ("*Seila Law* did not hold that an independent agency may never be run by a single individual with tenure protection. Rather, that decision stated, repeatedly, that its holding was limited to a single-director agency with 'significant executive power.'").

90. *Ibid.*, at 1808 (opinion of Sotomayor, J.).

91. See 42 USC 902(a)(3); Office of Legal Counsel (OLC) (2021), "Constitutionality of the Commissioner of Security's Tenure Protection", Memorandum Opinion for the Deputy Counsel to the President, US Department of Justice.

92. *Ibid.*, p. 10 (slip op.).

93. See Nielson, A. and C. Walker (2021), "Congress's Anti-Removal Power", (working draft available at SSRN: <https://ssrn.com/abstract=3941605>), p. 3.

94. *Collins*, *supra* note 82, at 1787 n.21 ("None of these agencies is before us, and we do not comment on the constitutionality of any removal restriction that applies to their officers.").

depreciated to the point where it no longer has any modern relevance, a once iconic pillar of a now bygone era, spared from destruction but no longer supporting anything.⁹⁵

Should these predictions come to fruition, they will no doubt be accompanied within legal circles in the United States by lamentations (or celebrations, depending on whom one asks) of the “death of the independent agency,” or something akin. And if *Humphrey’s Executor* is in fact overruled, and statutory removal protections nullified across the executive branch of government in favour of its “unitary executive”, it would no doubt be an immense fissure in the foundation of the NRC that was laid decades ago, the evaporation of a key assumption underlying the Agency’s organisational structure since its creation. Indeed, for years the United States has traditionally relied on the Commission’s statutory removal protections when describing the NRC’s “effective independence” in its CNS national report.⁹⁶ Members of the Commission, for the first time, would be vulnerable to removal from office as a result of regulatory decisions or policy judgements that do not align with the sitting President’s views or priorities, or even for purely partisan reasons. In a post-*Humphrey’s Executor* world, any such removals would be permissible under domestic law, but would of course raise significant questions concerning the “effective independence” of the NRC under international nuclear law standards.⁹⁷ Even in the absence of actual removals, the spectre of the possibility of removal for reasons other than good cause may raise new questions for the NRC’s “effective independence” never before confronted.

But in a post-*Humphrey’s Executor* world, at least on paper, the NRC would be no different. Its fundamental mission, as defined in the Atomic Energy Act – the licensing and regulation of the civilian use of radioactive materials in a manner that reasonably ensures the adequate protection of public health and safety – would remain unchanged.⁹⁸ And the Commission would still retain other organisational features that promote effective independence. Foremost is its multi-member status, a structure that inherently promotes collegial reflection,

95. See e.g. Nielson, A. (2021), *supra* note 93, pp. 3-4 (“[O]bservers across the ideological spectrum predict that the Court is preparing to overrule *Humphrey’s Executor* outright, or at least limit it to its facts.”); Sunstein, C. (2021), *supra* note 59, p. 117 (“In *Seila Law*, the Court wholeheartedly accepted the strongly unitary position, in an opinion that appeared to accept *Humphrey’s Executor* but that read the case so narrowly that it left a great deal of room for constitutional challenges to many independent regulatory commissions in their present form.”); Murphy, R. (2021), “The DIY Unitary Executive”, *Arizona Law Review*, Vol. 63, No. 2, University of Arizona James E. Rogers College of Law, p. 446 (*Humphrey’s Executor* and agency decisional independence are “skating on melting ice.”).

96. See e.g. NRC (2019), “The United States of America Eighth National Report for the Convention on Nuclear Safety”, NUREG-1650, Rev. 7, p. 78 (“The President cannot ordinarily direct the agency’s regulatory decisions. The President can remove an NRC Commissioner only for cause—namely, “inefficiency, neglect of duty, or malfeasance in office”); p. 96 (“Given the NRC’s status as an independent regulatory agency, the NRC’s Commissioners, in contrast to the heads of cabinet-level agencies like DOE, may be removed by the U.S. President only for “inefficiency, neglect of duty, or malfeasance in office.”).

97. See e.g. MacKenzie, B. (2010), “The Independence of the Nuclear Regulator, Notes from the Canadian Experience”, *Nuclear Law Bulletin*, No. 85, OECD Publishing, Paris, p. 36 (discussing the 2008 removal of the President of the Canadian Nuclear Safety Commission over the handling of the licensing of a medical radioisotope facility, which “provok[ed] debate within Canada and internationally about whether the Canadian Government had improperly interfered with the independence of Canada’s nuclear regulator.”).

98. 42 USC 2201(b) (empowering the Commission to establish standards governing the possession of radioactive materials “as the Commission may deem necessary or desirable to promote the common defense and security or to protect health or to minimize danger to life or property”); *ibid.*, section 2232(a) (authorising the Commission to issue licences for facilities that produce or utilise fissionable materials upon a finding that the facility “will be in accord with the common defense and security and will provide adequate protection to the health and safety of the public”). See also Ostendorff, W.C. and K.A. Sexton (2013), “Adequate protection after the Fukushima Daiichi accident: A constant in a world of change”, *Nuclear Law Bulletin*, No. 91, OECD Publishing, Paris, pp. 23-26.

deliberation and consensus-based decision making.⁹⁹ While a regulatory body headed by a single director is not inherently less “independent” than a multi-member commission, it is undoubtedly easier to influence the decision making of one individual than several.¹⁰⁰ Second, section 201 of the Energy Reorganization Act prohibits any more than three of the five members of the Commission to be of the same political party.¹⁰¹ This partisan balance requirement makes it more unlikely that a newly-elected President would simply remove Commission members for partisan reasons, or be able to fully “stack” the Commission with partisan allies, as the President may not be able to replace or add members of his or her preference depending on the existing composition and balance of the Commission at the time. Additionally, the Commission possesses independent litigating authority when its final decisions involving the issuance of licences or regulations are challenged in the federal courts. Any party to such a proceeding who is aggrieved by the final decision may file a petition for review in the federal courts of appeals, where the Agency is entitled as of right to be represented by its own counsel.¹⁰² This ensures that the Commission’s views and interests are represented and that the Agency is not solely reliant on representation that is outside of its control, when its decisions are challenged.

In terms of “effective independence” from those regulated, the Energy Reorganization Act prohibits Commissioners from engaging in any outside “business, vocation, or employment” during their term of office,¹⁰³ and regulations issued by the NRC prohibit its Commissioners (and most of its staff) from owning stocks or any other financial securities that are issued by companies engaged in nuclear fuel cycle activities.¹⁰⁴ This NRC-specific requirement is in addition to the generally-applicable federal laws governing conflicts of interest, which prohibit all government employees from personally participating in any matters that would directly and predictably affect their personal financial interests, including other imputed financial interests such those of a spouse or child.¹⁰⁵ In other words, Commissioners are required by law to be full-time civil servants, with no active or passive financial ties to the companies they regulate.¹⁰⁶

The Commission also engages in transparent decision making, a key feature of effective regulatory independence identified in the 2003 INSAG report.¹⁰⁷ The Commission issues all adjudicatory orders, regulations and statements of policy in publicly available and accessible

99. There was substantial debate in the United States following the accident at the Three Mile Island Nuclear Station as to whether to restructure the NRC as an independent agency headed by a single administrator. See Sexton, K.A. (2015), *supra* note 22, pp. 42-46. Such comprehensive restructuring was ultimately rejected, in favour of other organisational reforms that provided more singular authority to its Chairman in terms of the Agency’s day-to-day executive functions and in emergency situations, but preserved the functions of policy formulation and issuing rules and orders to the Commission as a collegial body. See Reorganization Plan No. 1 of 1980, 5 USC Appendix.

100. See e.g. Seila Law, *supra* note 67 at 2243 (separate opinion of Kagan, J.) (“It’s easier to get one person to do what you want than a gaggle. [...] The same is true in bureaucracies. A multimember structure reduces accountability to the President because it’s harder for him to oversee, to influence—or to remove, if necessary—a group of five or more commissioners than a single director.”).

101. 42 USC 5841(b)(2).

102. 28 USC sections 2342, 2344, 2348.

103. 42 USC 5841(e).

104. 5 *Code of Federal Regulations* (CFR) 5801.103.

105. 18 USC 208; 5 CFR 2635.402.

106. See IAEA (2016), *supra* note 12, p. 7 (“The staff of the regulatory body shall have no direct or indirect interest in facilities and activities or [licensees] beyond the interest necessary for regulatory purposes.”).

107. INSAG-17, *supra* note 11, p. 9 (“Transparency is a means to promote independence in regulatory decision making and to demonstrate such independence to politicians, licensees and other stakeholders, as well as the general public. [...] [T]his serves to fulfil the requirement for the regulatory body to be accountable to the public, whose health and safety it is responsible for protecting.”).

formats, per the Freedom of Information Act.¹⁰⁸ Per the Administrative Procedure Act, the Commission is required to publish all its proposed regulations in draft form for public comment by interested stakeholders before finalisation.¹⁰⁹ When the Commission is acting in its adjudicatory capacity (i.e. overseeing contested hearings concerning the issuance of a licence or the issuance of a sanction), it is prohibited from entertaining communications from persons outside the Agency on the merits of the licensing proceeding, unless the communication has been served upon all parties.¹¹⁰ Lastly, the Commission is required by the Government in the Sunshine Act to hold all of its meetings as a collegial body in public settings, with prior announcement and record-keeping obligations, unless an exception applies.¹¹¹ That is to say, the Commission transacts its business publicly and candidly, with open channels of communication with its licensees and other stakeholders.¹¹²

Should the Supreme Court eventually declare that all statutory removal protections for principal executive officers are unconstitutional, the Commission would be much more likely to suffer in terms of its public perception, rather than any actual impacts on the effective independence of its day-to-day activities. The constitutional logic in the recent *Seila Law* and *Collins* decisions is that no individual principal officer can ever be truly “independent” from the President, who is responsible for overseeing the entirety of the implementation and execution of the nation’s laws and must be able to freely remove those with whom the President has lost faith. In the view of the Supreme Court, centralising ultimate responsibility for the entire administrative state into this one elected official protects individual liberty and safeguards the citizenry from an overzealous, unaccountable “fourth branch” that answers to no one. Even if there is merit to this rationale, which is disputed,¹¹³ it may have unintended consequences in the current era of extreme partisanship and increasing distrust in government institutions. The President is, for better or for worse, undeniably viewed as a partisan symbol. By characterising NRC Commissioners as the President’s “subordinates,” no different in the grand scheme than members of his or her cabinet or closest hand-picked advisor, the public may be more inclined to view the Commission through a similar partisan lens and lose faith in its health and safety determinations as nothing more than appeasements to a President to whom they owe fealty or must stay in good graces.¹¹⁴

This is potentially exacerbated by increasing entanglement between the NRC and DOE in recent years, if both are held to be ultimately “accountable” to the same individual. To be sure, the NRC and DOE have always been closely linked, ever since both agencies were born from the same fission of the AEC in 1974. The NRC has licensing and regulatory authority over certain types of DOE facilities, including reactors operated for the purpose of demonstrating their commercial suitability.¹¹⁵ The two agencies – one regulatory, one promotional – are no strangers when it comes to nuclear energy and activities, but are

108. 5 USC 552(a), (b) (requiring federal agencies to make such documents proactively available).

109. 5 USC 553.

110. 10 CFR 2.347.

111. 5 USC 552b.

112. NRC (2021), “Principles of Good Regulation”, www.nrc.gov/about-nrc/values.html (accessed 22 Mar. 2022) (“[I]ndependence does not imply isolation. All available facts and opinions must be sought openly from licensees and other interested members of the public ... Final decisions must be based on objective, unbiased assessments of all information, and must be documented with reasons explicitly stated.”).

113. See e.g. Schweber, H. (2021), “The Roberts Court’s Theory of Agency Accountability: A Step in the Wrong Direction”, *Belmont Law Review*, Vol. 8, No. 2, pp. 495-496 (“[T]o say that without the threat of removal there is no accountability is to ignore the realities of government operations and the incentives of officials. Presidents can reward as well as punish; officials are concerned with their future positions as well as their present ones; Congress has the ability to change the rules of operation for an agency at any time”).

114. Stoiber, C. et al. (2003), *supra* note 3, p. 28 (“Regulatory bodies headed by persons who are perceived ... as holding their position for purely political reasons will have difficulty in maintaining internal employee morale and external confidence.”).

115. 42 USC 5842.

increasingly being brought closer together in significant ways through legislation concerning US development of advanced reactor technologies and decarbonisation goals.

For example, in 2018 Congress passed the Nuclear Energy Innovation Capabilities Act, to better enable and accelerate the development of advanced nuclear energy technologies.¹¹⁶ As part of this legislation, DOE was required to establish a grant programme for the purpose of partially funding fees charged by the NRC to advanced reactor licence applicants seeking review of their designs.¹¹⁷ The recently enacted Infrastructure Investment and Jobs Act of 2021 authorises over USD 3 billion to DOE, through 2027, to continue carrying out its advanced reactor demonstration programme, which provides funding opportunities for applicants developing advanced reactor technologies that are expected to be licensed by the NRC and commercially operational within seven years.¹¹⁸ This same infrastructure legislation also created and appropriated USD 6 billion to DOE through 2026 to establish a “civil nuclear credit program,” through which owners or operators of existing reactors can apply for credits to help ensure continued operation if they meet certain economic and other criteria.¹¹⁹ In setting up this credits programme, DOE has stated that further closures of the existing nuclear fleet in the United States will threaten the “national goal of carbon pollution-free electricity by 2035, and cost the nation thousands of high-quality union jobs.”¹²⁰ One prerequisite for plants to receive DOE credits is a determination that the NRC has “reasonable assurance that the nuclear reactor will continue to be operated in accordance with the current licensing basis” and that it “poses no significant safety hazards.”¹²¹ To be clear, there is nothing inappropriate or inherently problematic with any of these policy goals or objectives, but the point being that significant amounts of resources are currently being provided through DOE, at a critical juncture for the American nuclear industry, to develop new technologies that will ultimately require NRC authorisation, or to financially support existing activities that require NRC oversight. It is imperative for its credibility that the NRC remain free and able to make its health and safety determinations without undue pressure or constraint from political or economic considerations. Any such pressure – actual or perceived – placed upon the NRC to deliver positive results and provide a return on these significant financial investments¹²² would correspondingly do significant damage to its status and reputation as an effectively independent regulator.

VI. What can be done

In terms of remedial solutions, should the Supreme Court eventually overrule *Humphrey’s Executor* and render the Commission’s statutory removal protections invalid, there would be no avenue to directly counter such a decision and restore this traditional feature of agency independence. Such a ruling would be based on an interpretation of Article II of the Constitution, an area where the Supreme Court has the final say (barring a constitutional amendment, which is not practical). Other potential solutions to at least counteract the decision to some degree may also be unavailable under established constitutional law, such as the option to condition the President’s removal decision on the approval of others,

116. Pub. L. No. 115-248, 132 Stat. 3154 (2018).

117. *Ibid.*, section 3. The NRC is required by law to recover the costs associated with its licensing and inspection services through fees. See 10 CFR Part 170.

118. Pub. L. No. 117-58, section 41002, 135 Stat. 1127 (2021).

119. *Ibid.*, section 40323.

120. “Notice of Intent and Request for Information Regarding Establishment of a Civil Nuclear Credit Program”, 87 Fed. Reg. 8570 (15 Feb. 2022).

121. Pub. L. No. 117-58, section 40323(c)(2)(A)(ii)(III).

122. See e.g. Meyer, R. (2021) “Nuclear Is Hot, for the Moment”, www.theatlantic.com/science/archive/2021/11/nuclear-power-hot-moment/620665 (accessed 23 Mar. 2022) (quoting DOE Secretary Jennifer Granholm as saying “We are very bullish on these advanced nuclear reactors ... We have, in fact, invested a lot of money in the research and development of those.”).

a method employed by Japan after its recent restructuring of its nuclear safety regulator but unavailable in the United States.¹²³

It is possible that Congress may begin taking a more active role in prescribing the NRC's regulatory priorities if concerns emerged over its effective independence from the President. After all, if the logic is that the President has the authority to remove all principal officers at will because it is his or her constitutional responsibility to "take Care that the Laws be faithfully executed," Congress remains the one who determines what the law is and establishes national policy via legislation. Congress may, for example, begin to more expressly direct the NRC to undertake certain activities via appropriations legislation (an area where it "exercises virtually plenary control" over agencies)¹²⁴ or enacting laws directing the NRC to engage in specific regulatory activities, in an effort to limit discretion that could be impermissibly influenced by non-health and safety considerations.¹²⁵ However, if not done cautiously and leaving ample room for the NRC to make its own judgements, this may end up just exchanging the unwarranted influence of the executive in favour of the unwarranted influence of the legislature.¹²⁶ Alternatively, Congress may increase its oversight and impose further reporting requirements on the Commission in an effort to more closely monitor its activities.¹²⁷

One potential remedial legislative solution is that Congress could amend statutory removal protections (not just for the NRC, but across all independent agencies) requiring the President to provide a *reason* whenever the President chooses to remove an executive official who Congress has intended to insulate from unwarranted influence. This is not a novel idea; Congress has already established such a reason-giving requirement in the Inspector General Act of 1978.¹²⁸ Inspectors general are "independent and objective officials" appointed by the President on a nonpartisan basis to conduct audits and investigations of executive branch agencies to prevent fraud, waste and abuse in their programmes and operations. An inspector general may be removed by the President without restriction, but the President must "communicate in writing the reasons for any such removal" to Congress within 30 days.¹²⁹ Presidents have generally been reluctant to remove inspectors general, with this reason-giving requirement perhaps providing an

123. Myers, *supra* note 43. In Japan, the Chairman and Commissioners of its independent Nuclear Regulation Authority (NRA) are appointed by the head of its executive branch (the Prime Minister), with the consent of its national legislative body (both Houses of the Diet). However, dismissal of the Chairman or its Commissioners requires the consent of both Houses of the Diet, as well as a requirement to obtain the opinion of the NRA prior to dismissal. Act for Establishment of the Nuclear Regulation Authority, No. 47, 27 June 2012, arts. 7(1), 9.

124. Congressional Research Service (2021), *supra* note 40, p. 14.

125. Congress has, in recent years, been enacting legislation directing specific priorities and activities. See e.g. Further Consolidated Appropriations Act, 2020, Pub. L. No. 116-94, div. C, tit. IV, 133 Stat. 2683 (directing the NRC to spend "not less than" USD 15.478 million appropriated in fiscal year 2020 for "activities related to the development of regulatory infrastructure for advanced nuclear technologies"); Nuclear Energy Innovation and Modernization Act, Pub. L. No. 115-439, tit. I, section 103, 132 Stat. 5571 (directing the NRC, no later than the end of 2027, to establish a "technology-inclusive, regulatory framework for optional use by commercial advanced nuclear reactor applicants for new reactor license applications.").

126. See IAEA (2016), *supra* note 12, p. 7 ("No responsibilities shall be assigned to the regulatory body that might compromise or conflict with its discharging of its responsibility for regulating the safety of facilities and activities.")

127. The Commission regularly appears and testifies before various Congressional committees and subcommittees to discuss matters concerning the Agency's budget, topics of specific interest or general oversight of its activities. This includes the Senate Committee on Environment and Public Works; the Senate Appropriations Committee, Subcommittee on Energy and Water Development; and the House Energy and Commerce Committee, Subcommittee on Energy and Subcommittee on Environment and Climate Change.

128. Pub. L. No. 95-452, 92 Stat. 1101 (codified at 5 USC Appendix).

129. *Ibid.*, section 3(b).

important constraining role.¹³⁰ A President with an unpopular, unpersuasive or improper motivation for removing an “independent” regulatory official would certainly be more reluctant to do so if required to explain the action in writing to Congress, which may result in the loss of political capital. The Senate may also signal an unwillingness to confirm a replacement where an unsatisfying reason has been given, diminishing the benefits of the removal in the first place. There is no reason to think that the *Seila Law* or *Collins* decisions would invalidate such reason-giving requirements, as they do not actually prevent the President from removing officials from office.

Lastly, as previously discussed in Part I, one of the fundamental attributes of an effectively independent regulator is the ability to develop and enact “appropriate, comprehensive and sound regulations” without undue pressure from non-safety interests.¹³¹ In this regard, another remedial measure that would bolster the independent stature of the Commission in a post-*Humphrey’s Executor* world is a commitment by the President to not include the NRC in the executive branch’s centralised interagency regulatory review process, known as the “EO 12866 process”. Executive Order 12866 was issued by President Clinton in 1993 to “reform and make more efficient the regulatory process” by enabling better “planning and coordination” among executive agencies with respect to the issuance of draft and final regulations.¹³² It requires executive branch agencies to submit drafts of any proposed “significant regulatory action”, with an assessment of the potential costs and benefits of that action, to the Office of Information and Regulatory Affairs (OIRA), which is a regulatory assistance office within the Executive Office of the President.¹³³ A “significant regulatory action” includes, among other things, any action that is likely to have an annual effect on the economy of USD 100 million or more or otherwise “adversely affect” the economy in a material way.¹³⁴ As part of the EO 12866 process, OIRA reviews and circulates agency actions to other interested agencies within the executive branch to ensure the action is consistent with the President’s priorities, “do not conflict with the policies or actions of another agency”, and are otherwise generally consistent with the Executive Order’s principles, which includes prevention of “unacceptable or unreasonable” regulatory costs. Although OIRA does not formally approve or disapprove any actions, the Executive Order generally prevents agencies from issuing rules prior to addressing concerns raised during the review process. “Independent agencies,” including the NRC, have always been exempt from this centralised review process, though the appropriateness of this exemption has frequently been debated or even criticised.¹³⁵

In 2019, the OLC issued a memorandum concluding the President has the authority to direct independent regulatory agencies to comply with EO 12866 if he or she so chooses.¹³⁶ Calls for the President to revisit or end this historical exemption from OIRA review will only intensify should independent agency heads uniformly lose their statutory removal protections. However, the NRC already engages in its own cost-benefit analyses, as

130. Nielson, A. (2021), *supra* note 93, p. 31 (providing examples of occasions where Presidents have either retreated from inspector general removals “in the face of congressional opposition” or otherwise faced “considerable political scrutiny”).

131. INSAG-17, *supra* note 11, p. 1.

132. “Regulatory Planning and Review”, 58 Fed. Reg. 51,735 (30 Sep. 1993).

133. *Ibid.*, section 6.

134. *Ibid.*, section 3(f).

135. See e.g. Coglianese, C. (2018), “Improving Regulatory Analysis at Independent Agencies”, *American University Law Review*, Vol 67, No. 3, American University Washington College of Law, p. 742 (“[I]ndependent regulatory agencies have come under considerable criticism for failing to conduct extensive or even adequate benefit-cost analyses”); Dooling, B. (2020), “Bespoke Regulatory Review”, *Ohio State Law Journal*, Vol. 81, No. 4, The Ohio State University, pp. 703-705 (noting scholars and practitioners who have called for independent agencies to be subject to the OIRA review process).

136. OLC (2019), “Extending Regulatory Review Under Executive Order 12866 to Independent Regulatory Agencies”, Memorandum Opinion for the Counsel to the President, US Department of Justice.

appropriate, when making regulatory decisions or considering regulatory alternatives.¹³⁷ Folding the NRC's health and safety determinations into a government-wide, centralised review process that is expressly rooted in economic considerations risks creating a significant appearance concern that the NRC's decision-making process is in fact being unduly influenced by such considerations.

Conclusion

Recent decisions by the US Supreme Court have raised considerable legal questions as to whether insulating the heads of independent regulatory commissions from at-will presidential removal is constitutional and whether such provisions are enforceable. However, as of this writing, the Supreme Court's decisions have been expressly limited to independent agencies headed by single individuals, not multi-member regulatory bodies such as the NRC. Should this "unitary executive" jurisprudence eventually reach where legal scholars increasingly predict it will – the overturn of the Court's 1935 decision in *Humphrey's Executor*, and with it the nullification of statutory removal protections for heads of all independent agencies, including multi-member agencies – such a decision would profoundly shake the structural foundation on which the NRC was built nearly 50 years ago. All would not be lost, and even without such removal protections the Commission as an institution would still retain significant qualities and attributes of an effectively independent nuclear health and safety regulator. But in a post-*Humphrey's Executor* world, with that key pillar removed, it would be incumbent on all relevant government actors – Congress, the President and the NRC itself – to take all appropriate measures to preserve that status in the eyes of the public and international community.

137. See NRC (2020), "Regulatory Analysis", www.nrc.gov/about-nrc/regulatory/rulemaking/regulatory-analysis.html (accessed 22 Mar. 2022).

Slovak legal system for ensuring feasible nuclear back-end system implementation

Part 2: Outlook for future development

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I. Introduction

The nuclear industry recognises the need for a present-day solution to the future needs in decommissioning and spent nuclear fuel and radioactive waste management. The end state for spent fuel and radioactive waste must be reached by future technical capabilities, but executable based on today's sound legal system for decades of fund accumulation. Strictly perceived through the perspective of technical implementation, all existing nuclear facilities can be decommissioned by today's means. Funding, however, is the issue. Each country sets up different systems to ensure financing and implementation of these projects. The adoption of various nuclear back-end strategies results from each country's different legal system, economic ability and the national nuclear industry's historic development.

As explained in Part 1 of this study, "Description of the current status",¹ the Slovak Republic established its nuclear back-end system (NBES) in 1995, and it has been in effect, and evolving, without interruption ever since. Its current legislative basis, the Act on the National Nuclear Fund (Act No. 308/2018 Coll.) (NNF) continues to ensure long-term financial safety and stability for implementation of the NBES over a 50-to-100 year time span and is the cornerstone for NBES planning and implementation. The Act on the NNF is organically intertwined with two other relevant acts – the Atomic Act (Act No. 541/2004 Coll.) and the Act on Radiation Protection (Act No. 87/2018 Coll.) – providing a sound, well-structured legal ecosystem.

The NNF was established by law as a "state fund", a special-purpose-vehicle, and owned by the state. This ensures its long-term survivability, as its founder is the most durable entity: the Slovak Republic itself. By definition, all state funds must keep their finances in the National Treasury – a state bank – that handles the state budget and finances of all state agencies and bodies. This set-up aims to guarantee that the funds will not be mismanaged and that the "bank" safekeeping the deposits will not go bankrupt or cease to exist.

The previous two decades of NNF existence prove that a system created to last for a century must be able to evolve over time. The experience with NNF implementation shows that the changes discussed in Part 1 of this study have fulfilled their purpose and that the current legislation forms a solid and workable solution for the nuclear industry's long-term

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1. Macáček, M., V. Slugeň and M. Šnírer (2020), "Slovak legal system for ensuring feasible nuclear back-end system implementation: Part 1: Description of the current status", *Nuclear Law Bulletin*, No. 105, OECD Publishing, Paris, pp. 79-86.

needs. However, there remains the potential for further improvements, to be discussed in this second part of the study, which identifies small changes that can be made today that will have a major impact in future decades.

II. Areas for future legal development

The preparation and the drafting of the Act on the NNF were carried out from 2015 to 2018 based on prior experience. However, global understanding of nuclear back-end financing underwent another major evolution during the period of 2015-2020, with changes in views on the goals, financial safety and optimisation, technical implications, obligations and stakeholders. Also during this period, the polluter pays principle, the basic element of the NBES, was reassessed internationally. Similarly, the opinions of non-nuclear experts of public interest (social, economic, environmental) are now taken into consideration when deciding on the non-technical issues of the NBES infrastructure development. The “concerned stakeholders” cease to be just the inhabitants of the directly affected area or community. Instead, society as a whole becomes a relevant stakeholder.

Based on this, the following six areas within the Slovak NBES legislation are due for further development:

- the “narrow” (conservative) understanding of the polluter pays principle;
- absence of financial contingencies in the present-day calculation of future decommissioning costs;
- ultraconservative management of the funds being accumulated in the NNF;
- legal enforceability to pay 100% of the prescribed contribution to the NNF in the case of premature shutdown of the nuclear facility;
- knowledge management concerns over the departure of relevant professional staff of an entity legally authorised to implement the NBES activities during the period 2025-2045; and
- existence of a nuclear fund as a state special-purpose fund.

A. *The narrow understanding of the polluter pays principle*

The polluter pays principle aims to directly link responsibility for environmental and social harms to the producers who cause those harms. This principle has also been used to allocate responsibility to nuclear facility operators to decommission their facilities, along with continued management of the spent nuclear fuel, radioactive waste and its disposal. “While the State has to ensure that the consequences of its energy policy will not harm present or future generations, in nearly all countries, the owners/operators of nuclear power plants are responsible for fully covering the costs of decommissioning.”² This responsibility (in the form of financial contributions) is, however, still reflected in the final price of the product (the electricity) and thus it is, in the end, financially channelled back to the consumers.

Continuous accrual of funds from operators helps to fulfil yet another environmental standard: as part of the sustainable development principle, present generations owe a duty of care to future generations. Naturally, operation of a nuclear facility is a long-term prospect (most often for 40-60 years, though some facilities in the United States have been authorised for operation up to 80 years). Therefore, many of the activities associated with the life cycle of a nuclear power plant (decommissioning, spent nuclear fuel and radioactive waste treatment and disposal) are applicable only in the distant future, once the facility has been shut down. Also, the physical properties of fresh spent nuclear fuel do not allow for immediate disposal (albeit the major obstacle is the lack of suitable

2. NEA (2003), *Decommissioning Nuclear Power Plants: Policies, Strategies and Costs*, OECD Publishing, Paris, p. 49.

disposal sites). Due to these factors, the current generation must, for the sake of future generations, ensure not only that spent nuclear fuel and radioactive waste is safely managed and stored, but that a decommissioning fund is established, paid into during operation and available when needed in the future.

However, with the rise of public participation in decision-making processes through stakeholder involvement, there is a call for a broader and more complex definition of the polluter pays principle. The operator is no longer considered to be the only “polluter”; instead, all those who enjoy the benefits of the operator’s activities (which can be considered the provision of safe, economical, reliable, diversified, carbon neutral and emissions free electricity), i.e. the public, may be considered to be polluters as well. It is therefore mandatory that the public, which allowed the installation of the nuclear power plant during the environmental impact assessment (EIA) and public participation processes in expectation of exploiting its benefits (reliable source of electricity, high income jobs with high added value, development of the region’s economy, technological and knowledge development, etc.), also begins to acknowledge and accept its share of the overall responsibility.

There are other forms of responsibility to be discussed in addition to the financial responsibility of the operator. These include the responsibility of the population to accept the necessary existence (i.e. siting and operation) of NBES infrastructure facilities: radioactive waste treatment centres and, most importantly, spent nuclear fuel and radioactive waste disposal sites. Operators can usually only directly influence the cost of decommissioning the facility itself, while the state/nuclear fund cannot unilaterally mandate where the disposal site will be. Siting has become a society-wide issue that can endure beyond the life of the operator and is primarily influenced not by technical and economic factors, but rather by social and political views. Since the entity with the greatest influence or persuasive power in this area is the state (government), it must step in and assume its share of responsibility for setting and influencing limitations on the industry. Only the government and parliament, as the highest executive and legislative bodies of the state, have the legitimacy, capability and competency to fairly assign responsibilities between the operator, the general public and the state itself.

This division of responsibility is in some way and to some extent present in every legal system, albeit usually only to the extent of selecting the entity(ies) responsible for providing financial means and the entity(ies) that can, under specific circumstances, draw from the accumulated funds. Thus, the need to amend NBES legislation in the Slovak Republic is due to the existing imbalance of control and accountability for failure to carry out assigned activities by specific concerned parties. In terms of the current Slovak NBES system, the parties and responsibilities are as follows:

- a. The operators of nuclear facilities (companies SE³ and JAVYS⁴) must make contributions to the NNF, which will be put towards the future decommissioning of their facilities, storage and treatment of spent nuclear fuel and radioactive waste and its (future) disposal. The scope of the operators’ activities is rigorously governed by law and satisfactory accomplishment of assigned duties is subject to continuous oversight by a number of state authorities. Providing financial contributions to the NNF is the most important duty, from a financial perspective, but failure to meet any of the operators’ other assigned duties is also subject to clear and immediate sanctions, enforceable by law.
- b. JAVYS, as the operator of NBES infrastructure facilities, is mandated by law to implement any and all NBES activities in the Slovak Republic, i.e. decommissioning, radioactive waste treatment and disposal, spent nuclear fuel storage, siting of a future deep geologic repository (DGR), and operation of the existing NBES infrastructure facilities. It also communicates these activities with stakeholders and

3. SE is the abbreviation for Slovenske elektrarne, a.s. (Slovak Electricity Company), the major electricity producer in the Slovak Republic.
 4. JAVYS is the abbreviation for Jadrova a vyradovacia spolocnost, a.s. (Nuclear and Decommissioning Company). JAVYS is fully state-owned.

is bound to construct and operate the DGR. However, the farther these activities are in the future, the less directly enforceable they are.

- c. The Slovak Republic's government, as the supreme executive body, makes the key economic, social and political decisions for current and future NBES activities. The government implements its decisions through individual ministries and other specialised governmental bodies. Based on the government's recommendation, the Slovak parliament may pass new legislation and it has also empowered the Ministry of Economy to appoint the company JAVYS to implement all NBES activities. JAVYS' sole shareholder is the Ministry of Economy of the Slovak Republic.
- d. However, while JAVYS has been tasked by the government and parliament to execute the state's NBES activities, its legal form is only that of a public joint stock company. As such, it does not possess the necessary powers and authority to carry out its assigned duties. Instead, JAVYS is reliant upon the government to draft a clear roadmap for NBES development, which would then be used for communicating with stakeholders and helping to share public opinion. Thus, while the government's direct responsibilities are not always evident, the responsibility for execution and oversight remains fully with the government (e.g. the government, through the Ministry of Economy, appoints members of JAVYS' Board of Directors).
- e. The National Nuclear Fund is the designated body for calculating the future financial needs of NBES activities, their accumulation, management and use. However, as key NNF bodies are collective (Board of Governors, Supervisory Board), no direct or personal responsibility can be called upon. Also, the Act on the NNF defines many actions that the bodies of the NNF must deliver, but it lacks enforceability. For example, the NNF has the legal obligation to present an update of the National Policy and National Programme to the Government every six years. However, the Act on the NNF does not define a corresponding sanction upon failure to meet this obligation. As a result, the primary focus is on current and short-term activities, which can be easily verified by supervisory bodies within the process, yet without the knowledge of the wider long-term plan. Implementation of longer-term commitments with ambiguous milestones, accompanied by a lack of enforceability, is thus verified only on a general level.

Taking all of this into consideration, it is evident that the polluter pays principle cannot be applied just to the nuclear operators in the Slovak Republic (i.e. that all the financial, economic, technical, social, environmental, etc. obligations are to be met only by the operator or the designated NBES implementation entity). The operator(s) simply does not have the necessary legal authority or tools to execute these activities. Therefore, the polluter pays principle must be understood and implemented based on the following principles:

- a. The operator's primary NBES responsibility is to provide financial means for all NBES activities for its facilities. It maintains this ultimate responsibility, which is not transferable.
- b. Decommissioning is the operator's ultimate responsibility. However, by Slovak law, the operator must transfer this obligation to a designated entity (i.e. the decommissioning company JAVYS). The authority to use decommissioning funds is transferred to the new entity as well. Any transfer of legal ownership of the site is at the discretion of the legislator or operator.
- c. The obligation to provide NBES infrastructure – i.e. to construct and operate spent nuclear fuel and radioactive waste storage, treatment centres and disposal sites – must be delegated to the most competent subject with the strongest legal and technical position to implement such activities. In the Slovak Republic, this entity is the decommissioning company JAVYS, which should share responsibility with the government.

Based on the above analysis, the Slovak Republic must acknowledge the need for specific and quantifiable obligations with clearly defined milestones and deadlines for all concerned parties, including the public⁵ and the government. These obligations are best enumerated in the National Policy and National Programme, which is currently undergoing an update.⁶ The government is not only the executive authority, defining tasks for subordinated entities through the National Programme, but is itself one of the bound subjects. The government must therefore accept and execute its share of the specific duties.

B. Absence of financial contingency in the present calculation of future decommissioning costs

According to the Joint Convention, the state has the primary responsibility for the implementation of NBES activities.⁷ As these activities are to be ensured and taken over by the state, it is essential that the operator provides the state with the necessary financial security. The accumulation of funds happens over time through the operators' obligatory contributions.

The Slovak Republic retains the right to determine the amount of funds that will be necessary to cover the NBES activities. The Act on the NNF stipulates that the amount of the mandatory contributions "shall be determined by the government by a regulation issued based on the proposal of the Ministry of Economy".⁸ This amount is proposed by the Ministry of Economy on the basis of a calculation carried out by the Board of Governors of the NNF (the NNF Board of Governors calculates this amount in co-operation with the operator of nuclear power reactors, SE, and the operator of NBES infrastructure facilities, JAVYS).

The amount of contributions (i.e. compulsory payments and levies) is to be updated:

- whenever an update of the National Policy and National Programme is approved;
- when technical, economic or legal conditions change; or
- at the request of the permit holder for the operation of a nuclear facility.

This is the greatest power, but also the greatest responsibility, of those in charge of the NNF, as it is extremely difficult to appropriately set today's plans for future implementation. Sixty years of collecting mandatory contributions (considered for new nuclear power plants and facilities) is, in a way, a unique responsibility for what would potentially be the longest project in any country.

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5. For example, on 16 February 2022, the majority shareholder of operator SE, Slovak Power Holding, signed a Memorandum of Understanding (MOU) with the Slovak Ministries of Economy and Finance on the implementation of extraordinary measures to eliminate the impact of rising electricity prices on selected customer groups. At the time of the MOU, electricity prices rose to EUR 140 per MWh. Under the MOU, a set number of terawatt hours produced by the nuclear new build nuclear power plant Mochovce 3 (due to start operation in 2022) will be set aside for selected customer groups at a price of EUR 61.20. SE, Press Release, "Akcionári elektrární sa s vládou dohodli na zmiernení dopadov rastu cien elektriny" [Power plant shareholders have agreed with the government to mitigate the effects of rising electricity prices] (16 Feb. 2022), available at: www.seas.sk/tlacove-spravy/memorandum-elektrarne-vlada-cena-elektriny/. By taking this benefit, there is a moral obligation on the public to accept siting and operation of corresponding NBES infrastructure, including a deep geological repository.
 6. The update of the National Policy and National Programme is due in 2022 and will be subject to International Atomic Energy Agency ARTEMIS (Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation) peer review mission in 2023.
 7. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997), IAEA Doc. INFCIRC/546, 2153 UNTS 357, entered into force 18 June 2001 (Joint Convention), preambular para. (vi), "Reaffirming that the ultimate responsibility for ensuring the safety of spent fuel and radioactive waste management rests with the State".
 8. Act No. 308/2018 Coll., Art. I, sec. 10(4).

As history shows, radiation, health, safety and social requirements often become more stringent over time, leading to additional increases in costs beyond today's expectations. The key risk at this point is that the Act on the NNF requires calculating only a specific amount of costs for future planned NBES activities, including only the contingency for "known unknowns". These provisions do not cover future "unknown unknowns", like the risk of a nuclear incident, which can happen not only up through the last minute of operation, but also during the post-operation or decommissioning period, thus severely increasing the originally expected costs.

In this context, rational judgement and political courage was demonstrated by the German government when it restructured its NBES financing system in 2016 to assume responsibility for building a DGR for all nuclear power plants in the country. It set the condition that it will assume this responsibility only if all operators also pay a special additional "risk surcharge" to cover future unknown risks in addition to the amount already collected and transferred to the state. This risk surcharge amounted to an additional 35.47% of the total individual costs each operator had to accrue for its facility(ies) according to the original calculations. Only after full payment of this risk surcharge would the German operators be completely relieved of all potential future liabilities and responsibilities for sufficiency of NBES financing and future DGR construction and operation. The amount collected by the individual German operators until the time of the transfer was EUR 17.93 billion and this additional "risk premium" amounted to another EUR 6.17 billion. Despite this significant one-off surcharge, the German nuclear industry accepted the new system without reservations and all the required payments, including the additional EUR 6.17 billion, were made without delay in 2017.⁹

Another sound financial insurance mechanism was introduced in Japanese legislation. Following the accident at the Fukushima Daiichi Nuclear Power Plant in 2011, the country comprehensively revised all safety and legislative regulations governing the use of nuclear energy. In the area of sufficient accumulation of NBES funds, Japan adopted the "40 + 20" model. Its principle is that all nuclear power plants are authorised to operate for a period of 40 years. Before the end of its authorised period of operation, the facility can apply, based on positive safety indicators, for a one-time-only extension of the operation period, but for a maximum of 20 years. At the latest, after 60 years of operation, the nuclear power plants must be shut down and decommissioned. However, this new legislation also set a ground-breaking rule that by the end of the 40th year of a facility's operation, each nuclear facility must have already accumulated 100% of the estimated costs of their share in NBES activities. If the given nuclear power plant is allowed to extend its service life, during this additional period (i.e. the maximum 20 years), the collected 100% amount will be checked, re-evaluated and, if necessary, updated and supplemented.

It is therefore necessary, to ensure the highest possible level of nuclear and radiation safety in the Slovak Republic, that a similar amendment be made to the Act on the NNF. The amendment must introduce the allocation of equal responsibility and diligent planning, requesting that "the proposed amount of the compulsory contributions shall consist of two parts: the currently calculated future costs, including the rationally applied reserve (base), and an extraordinary reserve of at least 30 percentage points of the calculated base." Both of these parts will also have to be paid in full a sufficient amount of time in advance of the scheduled shutdown of the facility.

It can be assumed that the operators will not be open to any increase in their mandatory contributions, as such an obligation will decrease their profits. However, in the interest of the long-term sustainability of the NBES, as well as of nuclear and radiation safety and the need to secure sufficient financial resources for these activities, such change is crucial. Also, from the point of view of the state and society, such additional contribution can be understood as an "insurance premium" that the state applies for today's acceptance of its future liabilities and unforeseen risks (for example, also in the event of bankruptcy or termination of the operator).

9. NEA (2021), *Ensuring the Adequacy of Funding Arrangements for Decommissioning and Radioactive Waste Management*, OECD Publishing, Paris, p. 132.

In some cases, the law considers the non-performance of any action to be an “act” in itself and consequently calls for resulting liability. In the case of the Slovak Republic and the NNF, the call for responsibility should be in the question of “Who will pay for the activities of the NBES, if the absolute value of the accumulated funds will not cover 100% of the real expenses?” By creating the current legislative system to cover future funding of the NBES, the state has concluded a social *sui generis* agreement with the operators and the population, which the state will have to fulfil in the future: the state defines the costs, the operators pay the costs and the state takes care of all the activities if the required amount is fully paid. It is therefore in the state’s best interest, as well as in the interest of society as a whole, to have the necessary and sufficient tools ready when needed, as the legislation specifically states that the “[l]icence holder is not liable for management of funds paid into the National Nuclear Fund.”¹⁰

C. Ultraconservative management of the funds being accumulated in the NNF

In every country with an existing central administrator of NBES funds, this administrator has an obligation to perform its duties with due care and ensure sound investment and appreciation of managed funds. But, every country must find an acceptable balance between risk-free investment and profitable investment, as risk-free investments can result in no returns or on some occasions even in a negative yield. Just as the nuclear industry does not rely on a one-size-fits all approach to ensuring nuclear safety, neither should such an approach be applied to the investment strategy for collected NBES funds. For this reason, the Slovak Republic needs to begin allowing the investment of managed funds not only in risk-free financial market instruments available through the National Treasury, but also in (slightly) riskier, but still well-known and established, financial vehicles.

The last decade was characterised by extremely low (even negative) yields in the so-called risk-free financial instruments (while stock market value multiplied). Reality has disrupted states’ original assumptions that the interest on risk-free investment instruments would be sufficient to cover planned NBES costs. Thus, an approach allowing different investment strategies over the full accumulation period, with a higher risk ratio at the beginning and a lower risk ratio in its final phases, must be adopted. Naturally, as the disbursement horizon approaches, it will be necessary to move investments from riskier to more conservative ones. But, the current strategy where NNF funds are invested only in State Treasury term deposits is not effective; while the money will not be “lost” due to failed investments, funds are, in reality, lost every day due to inflation.

Thus, it is recommended that various investment strategies are prepared for individual sub-accounts of specific nuclear facilities managed by the Slovak NNF, based on their estimated end of operation. Different investment strategies should be adopted for: facilities in decommissioning (A1 Nuclear Power Plant and V1 Nuclear Power Plant); facilities already in operation (V2 Nuclear Power Plant, with an estimated start of decommissioning (ESD) in 2045 and EMO 1 and 2, with an ESD in 2060); and facilities under construction (EMO 3 and 4 (just before start of operation)).¹¹ Such a tiered approach will enable the NNF to carry out a more efficient, financially advantageous and safer management of entrusted funds.

In conclusion, the main purpose of a conservative approach to the management of money accrued for NBES activities is to prevent its misuse or improper management decisions during the accumulation period. However, the greatest risk in securing sufficient funds for future NBES activities is not the protection of funds, but rather an inefficient long-term investment strategy.

10. Act No. 308/2018 Coll., Art. I, sec. 3(1).

11. More details regarding the nuclear facilities in the Slovak Republic can be found in Macáček, M., V. Slugeň and M. Šnír (2020), *supra* note 1, Figure 1, p. 80.

D. Enforceability of the financial responsibility of the operator's shareholder to pay 100% of the amount of contributions to the NNF in case of early termination of the operation of the nuclear facility

The general assumption is that nuclear power plant operators have no interest in prematurely stopping operation as it would cut the projected overall economic profit of the plant. Yet recent history shows that the operation of a nuclear power plant can, under certain circumstances, also become uneconomical and thus the operator may decide to prematurely shut down the facility. Additional factors may play a role in decisions to prematurely shut down a facility, such as political or social pressure, changes in economic or market conditions, bankruptcy or dissolution of the company, or the personal aims of the owner. However, under existing Slovak legislation, the last remaining part of the facility's entire calculated NBES amount will be collected only in the final payment at the end of the facility's planned operation.

To resolve the situation of a unilateral decision by the operator on the early shutdown of the nuclear facility, the Act on the NNF states:

If the holder of a permit for the operation of a nuclear installation... shuts down that installation for the purpose of its decommissioning before the deadline specified in the applicable decommissioning conceptual plan... by its own decision or for safety reasons based on the decision of the [Nuclear Regulatory] Authority, the operator shall reimburse to the nuclear fund its obligatory contributions... in the amount of estimated total costs of the [NBES] part of the nuclear installation concerned, by the date of its shut down.¹²

In case of non-payment of mandatory payments or mandatory contributions, the Act on the NNF states that the operator's sanction will be determined in accordance with Act No. 523/2004 Coll. on Financial Rules of Public Administration as follows: "For breach of financial discipline... a levy is imposed in the amount of contribution due and a penalty of 0.1% from the whole due amount for every day until its payment in full."¹³ This legal construction assumes that the operator/owner will want and be able to pay the remaining contribution. But, there is a reasonable risk that the operator/owner will not be able to, let alone want to, transfer the due amount, along with the calculated surcharge, to the NNF.

In such a case, the Act on the NNF should be amended such that in addition to the liability of the legal person – the operator – it is necessary to also establish personal liability on the individual people – members of its statutory body (the operators' board of directors). Such evolution of legislation will be natural, as the statutory body acts on behalf of the company (the operator) and it is its duty to ensure that the company is able to meet its obligations and required level of nuclear safety.

Since failure to transfer the calculated contribution to NNF in full creates a risk of nuclear damage to health, property and environment, it is also recommended to directly assert criminal liability against the operator in accordance with Act No. 91/2016 Coll. on Criminal Liability of Legal Persons, as well as the criminal liability of natural persons (i.e. the individual members of the operators' board of directors) in accordance with the Criminal Code, Act. No. 300/2005 Coll.

Based on the above, in such a case it would be necessary to proceed in accordance with the Criminal Procedure Code, Act No. 301/2005 Coll., due to committing a criminal offense of unauthorised waste management, pursuant to Section 302 of the Criminal Code, commanding that "[w]hoever, even through negligence, disposes [of] waste in contradiction to generally binding legal regulations shall be punished by imprisonment". The procedure under Section 302 of the Criminal Code is justified by the fact that the operator, by its decision on early shutdown and non-payment of 100% of the due planned contributions to NBES, causes it to "dispose [of] waste.... in violation of generally binding legal regulations."

12. Act No. 308/2018 Coll., Art. I, sec. 10(5).

13. Act No. 523/2004 Coll., Part 9, sec. 31(4).

Such an approach is also in line with Article 5(1)(e) of the Euratom Waste Directive, which states:

Member States shall establish and maintain a national legislative, regulatory and organisational framework ... that allocates responsibility and provides for coordination between relevant competent bodies. The national framework shall provide for ... (e) enforcement actions, including the suspension of activities and the modification, expiration or revocation of a licence together with requirements, if appropriate, for alternative solutions that lead to improved safety[.]¹⁴

Article 9, “Financial resources”, further provides: “Member States shall ensure that the national framework require that adequate financial resources be available when needed for the implementation of national programmes referred to in Article 11, especially for the management of spent fuel and radioactive waste, taking due account of the responsibility of spent fuel and radioactive waste generators.”¹⁵

E. Knowledge management and departure of relevant professional staff of a legally authorised legal entity to implement the NBES activities within the period of 2025-2045

According to the requirements specified in Article 4, paragraphs 11 and 12 of the Atomic Act No. 541/2004 Coll., the decommissioning of nuclear power plants and the management of spent nuclear fuel and radioactive waste can be carried out only by JAVYS, which has been directly appointed by the Slovak Republic as the legal entity with the final responsibility. The currently available infrastructure and today’s experience with decommissioning are all concentrated in this one company. This setup aims to provide for sufficient competence and the future implementation of other activities of NBES.

The prepared cost calculations are made reflecting this system, taking for granted that the information, knowledge, experience and staff of JAVYS that are available today will be available in full when it is time to decommission other nuclear power plants. However, a closer examination of the system from the point of view of scheduled future decommissioning projects identifies a significant risk to the process of safe and effective decommissioning in future decades.

This risk is the existence, in the worst case scenario, of up to 20 years of time between the finalisation of one decommissioning project and the beginning of the next, and the resulting loss of professional knowledge, experience and personnel due to this long gap. Another risk arises from the potentially inefficient planning associated with the construction of new radioactive waste treatment facilities. This is due to the existence of the following timetable:

- decommissioning of Bohunice V1 is to be completed by the end of 2025, with completion of the treatment of radioactive waste by the end of 2027;
- decommissioning of Bohunice A1 is to be completed (by a general contractor, not JAVYS) by the end of 2033.

However, the next decommissioning project (Bohunice V2) is set to begin in 2045, according to the currently valid National Programme. Given this timeline, there is a resulting “window” of 20 years (in the best case scenario “only” 12 years if the Bohunice A1 decommissioning project is counted in) where no decommissioning activities will occur in the Slovak Republic. During this period, the staff, their knowledge and experience will disappear. The decommissioning of Bohunice A1 will help to shorten this period to some extent, but the method of its implementation is specific and substantially different from

14. Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, *Official Journal of the European Union* (OJ) L 199 (2 Aug. 2011) (Waste Directive).

15. *Ibid.*

the technical design and radioinventory present in the rest of the reactor fleet in the Slovak Republic.

The legislation itself cannot define what actions JAVYS or the NNF must take to maintain the existing knowledge and current professional staff, or how to ensure its own development during the 12-20-year period where there will be no decommissioning activities in the Slovak Republic. It is therefore a critical responsibility of the NNF, as the main author and guarantor of the viability of the National Policy and National Programme, to prepare the next update of the National Programme in such a way that it will bind JAVYS, as the decommissioning implementer, with specific and verifiable milestones in setting up a viable knowledge management system. Also, the NNF should ensure that JAVYS takes appropriate measures to organise its activities, in co-ordination with other nuclear operators and universities, so that this gap will have as few negative impacts as possible on the current high level of knowledge and experience.

F. Existence of a nuclear fund as a state special-purpose fund

The legislation has always defined the NNF as a “state fund” (i.e. a special-purpose-vehicle established by specific law passed by the parliament for fulfilling essential tasks of the state), which is by definition a part of the state budget. It also provides that the state fund is not responsible for the liabilities of the state and the state is not responsible for the liabilities of the state fund. Although such a definition of the NNF helps ensure maximum (state) protection of the accumulated funds, it can also pose a certain risk.

On one hand, the state, as the entity with the ultimate responsibility for comprehensive, correct, safe and economically efficient implementation of NBES activities, has a natural interest in setting up a system that it can absolutely control, so it can ensure the proper use of funds over decades. From this point of view, the creation of a nuclear fund as a state fund, held in the State Treasury, is the safest way to keep its resources (physically and legally) safe. On the other hand, because the nuclear fund is part of the “public finance” and is counted as part of the national “wealth”, its high financial volumes have a direct and visible impact on the capital side of the overall state budget. Therefore, it affects the state’s preparation of its budget in accordance with the fiscal requirements for budget deficit.

Both of these facts are independent of each other and they bring positive effects in several economic and fiscal areas at the same time, yet they may also provide means for manipulating state budget policy to allow financing of other state activities at the expense of withholding NBES. This in no way implies a misuse of NNF resources for purposes other than those explicitly defined and rigorously controlled. The risk, however, lies in highlighting the full amount of available NNF funds when there is a need to meet a particular fiscal limit when preparing the annual state budget, particularly regarding the amount of deficit that can be accepted in the state budget. If the volume of deposited NNF funds is sufficient enough to allow the approval of a higher deficit than would otherwise be acceptable, the government may prefer delaying payment of planned expenses from the NNF for the concerned budgetary period, i.e. slowing down the NBES activities by providing lesser amounts of funds than scheduled for the upcoming year.

This is due to the fact that the government and parliament must first approve the state budget and then, once the budget is approved, the NNF can only use the specified and approved amount of funds. However, this may not correspond to the reality of the NBES in a given year, as this is planned years in advance under the National Programme. The activities and their schedules are approved by the National Regulatory Authority in the specific Decommissioning Licence and are required to be available by Council Directive 2011/70/Euratom.¹⁶

16. *Ibid.*, Article 9, “Financial resources”.

Experience from decommissioning projects in which the availability of necessary funds fluctuated due to a unilateral decision of a third party shows that these projects suffered because of this underfunding in all monitored indicators: there was an extension of project schedules, overpricing of works due to their stopping and restarting, as well as cost increases due to longer periods of maintenance of the controlled area. Due to the shutdown and restart of work, workers received increased doses in comparison to the original radiation protection plan and thus the health of workers was impacted. At the same time, the existence of a nuclear facility with interrupted decommissioning activities leads to a higher risk of a radiation event and a threat to the overall public and the environment.

As reasoned above, it can be stated that one of the key facts influencing the successful course of decommissioning is a constant and predictable financial flow, coming in planned volumes and at planned times. Therefore, it should be a priority of the state to eliminate even theoretical conflicts.

III. Conclusion

The Slovak Republic has implemented the necessary NBES legislation without interruption since 1995, with the last major update being the Act on the NNF in 2018. It continues to provide a solid and workable solution for the industry's needs. This resulted in positive acceptance of the system by all parties: operators, regulators and the public.

Yet, the new system also requires constant evolution and updating to reflect changes in the international environment and an increase of knowledge. A present opinion based on the current level of knowledge finds that several additional improvements can be made, but that the overall system is set up in a generally efficient way. There is no simple solution to any part that still needs an update, as every listed aspect needs to be considered from a number of perspectives.

The current system defines roles and responsibilities for all concerned parties, mostly in an efficient and comprehensive way. However, the development of societal awareness in legal, social, economic and environmental matters has shown that a certain change of perspective in several issues will be necessary. These changes will have to be accepted by all participants, including the highest tier bodies: the government, relevant ministries, Nuclear Regulatory Authority and the Board of Governors of the NNF. It is not justified to expect that NBES tasks will be implemented solely through activities of two commercial joint stock companies: one responsible for operating nuclear power reactors, SE, and the other responsible for decommissioning, as operator of spent nuclear storage and radioactive waste treatment and disposal facilities, JAVYS.

Acceptance of the need to assign responsibilities to competent entities is one of the key elements of the sustainability of Slovak NBES financing and implementation that needs to be embraced further. The key points to consider to support and increase nuclear and radiation safety are:

- The polluter pays principle must be interpreted not in a narrow but rather in a broad sense. Just as it is necessary to assign NBES activities to competent entities, these entities, as well as the whole society, are obliged to accept their share of responsibility for implementation.
- Individual responsibilities in the implementation of NBES activities must be assigned to participants with real competencies and legitimacy.
- The system of defining the NBES properties and financing is a complex one. The future costs calculated today are not an absolute value, but a number determined on the basis of current scientific and technical knowledge, as well as social and political values, which may change over time. It is crucial that contingencies for “unknown unknowns” are created.
- A sustainable system of NBES financing is one that is inherently adaptable to future changes. Changes can occur in any number of key areas, e.g. in the technical

solution, location, costs, results of long-term financial investment, non-existence of the operator, a nuclear incident, emergence of new interest groups in population, etc.

The polluter pays principle must be seen in a more complex way, balancing new public rights in relevant decision-making processes (the EIA process, the active and passive political rights, etc.) with the population's new obligations (e.g. moral obligation to accept siting of a deep geological repository).

The risk of the premature shutdown of a nuclear facility that has not yet paid its NBES contributions in full must be explicitly addressed. For this reason, it is necessary to adopt a model similar to those of Japan and Germany, where the defined funds (including the substantial reserve for unknown unknowns) would be collected by the NNF at the beginning of the last third of the planned life of the nuclear facility, at the latest. Similarly important will be fine-tuning legislation to be prepared to prosecute criminal liability of individuals – members of the statutory bodies of operators, as well as of the operators' owners – for failing to meet their financial obligations.

CASE LAW

Canada

Regan Dow v. Canadian Nuclear Safety Commission

In June of 2021, the Federal Court of Appeal (FCA) of Canada released a decision that illuminates the role of the nuclear regulator in the context of a would-be whistleblower at a regulated entity.¹ In 2017, an employee of one of the Canadian Nuclear Safety Commission's (CNSC) licensees complained to the CNSC, alleging that her former employer, the licensee, had taken disciplinary action against her for giving information to the CNSC regarding the conduct of the company. It is an offence under paragraph 48(g) of the Nuclear Safety and Control Act (NSCA, or Act)² to take "disciplinary action against a person who assists or gives information to an inspector, a designated officer or the Commission in the performance of the person's functions or duties under this Act." It was pursuant to this provision of the Act that the complainant would come to argue the CNSC was obligated to her as a whistleblower. Among other things, the complainant alleged that the licensee terminated her employment because of information she provided to the CNSC about her employer's actions relating to alleged environmental damage.

The CNSC investigated the complaints. Not finding an evidentiary basis to substantiate the claims or to ground the prosecution of a regulatory offence under the NSCA, the CNSC informed the complainant that no further action would be taken in regards to the complaint. The complainant applied to the Federal Court (FC) for judicial review of that determination. The Federal Court dismissed the application for judicial review, finding that the complainant lacked standing to bring the application for judicial review because she was not directly affected by the decision. The application was dismissed on that ground.

The Federal Court's decision notes that an administrative body's conduct does not trigger a right to bring a judicial review application where the conduct attacked "fails to affect legal rights, impose legal obligations, or cause prejudicial effects."³ Put another way, if the disposition of the complaint does not have any independent legal or practical effect for the complainant herself, it is not reviewable at her behest. The Court recognised that the complainant did not suggest any legal obligations were imposed on her in this matter and that while she claimed that her professional reputation could have been affected, she did not provide the Court with any evidence that the disposition of the complaint affected her professional reputation in any way. The Court also determined that the disposition of the complaint does not deprive the complainant of a legal remedy to which she might otherwise have had recourse, and therefore ultimately found that she does not have standing to bring this application for judicial review.

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1. *Regan Dow v. Canadian Nuclear Safety Commission*, 2021 FCA 117.
 2. S.C. 1997, c. 9.
 3. *Regan Dow v. Canadian Nuclear Safety Commission*, 2020 FC 376, at para. 9 (citing *Air Canada v. Toronto Port Authority*, 2011 FCA 347, [2013] 3 FCR 605, at paras. 28-29; *Bernard v. Close*, 2017 FCA 52, at para. 2; *Democracy Watch v. Canada (Attorney General)*, 2018 FCA 194, at para. 29; *Laurentian Pilotage Authority v. Corporation des Pilotes de Saint-Laurent Central Inc.*, 2019 FCA 83, at para. 31).

Importantly, the Court also confirmed the CNSC's position that the CNSC has no power to order personal remedies to a party against whom unlawful disciplinary measures were taken. The Court confirmed that the offence provision in the NSCA and the powers of the CNSC stand in marked contrast to the powers of other administrative tribunals in Canada, like the Public Servants Disclosure Protection Tribunal, which, according to the Public Servants Disclosure Protection Act (PSDPA),⁴ may order a personal remedy for someone who has suffered a reprisal for having disclosed alleged wrongdoing. The PSDPA imposes obligations on the Public Sector Integrity Commissioner to "receive, review, investigate and otherwise deal with complaints made in respect of reprisals" (paragraph 22(i)). Under subsections 19.4(1), (2) and (3), the Commissioner "must decide whether or not to deal with a complaint", and must provide written notice and reasons to the complainant for a decision not to deal with a complaint. This is consistent with the purpose of the PSDPA, which is, in part, to protect public servants who disclose wrongdoing and to provide remedies to whistleblowers who are subject to reprisal.⁵

Here, even if the CNSC had concluded that there was evidence that the licensee had committed an offence under the NSCA and had proceeded with a charge, there could be no personal remedy for the complainant from the CNSC. The Court agreed with the CNSC that the disposition of the complaint by the CNSC did not prevent the complainant from pursuing other kinds of legal recourse in relation to her employment, including an action for wrongful dismissal.

The complainant appealed the decision of the Federal Court. In upholding the lower court's decision, the Federal Court of Appeal confirmed the CNSC's and the lower court's understanding of the NSCA and its offence provision 48(g). The Court stated, of the regulatory regime and the CNSC's authorities:

The steps that the CNSC may take in relation to an allegation that an offence has been committed under paragraph 48(g) of the NSCA are consistent with the object of the NSCA, which is to regulate the nuclear industry, and not to resolve disputes between employers and employees. The CNSC addresses non-compliance through orders, licence revocations, administrative monetary penalties, and prosecutions. The regulatory and enforcement actions contemplated in the NSCA affect the rights and interests of the regulated entities, and not their individual employees. The CNSC is not empowered to sit as an adjudicator to decide disputes between private parties, nor does it have the ability to grant remedies to those who submit external complaints.⁶

This case is an important decision for the Canadian nuclear regulator in that it confirms the regulator's role vis-à-vis a would-be whistleblower at one of its licensees, strongly supporting the view that the nuclear regulatory regime does not include whistleblower protections for employees of the regulators' licensees.⁷

The Court opined that "Nothing in the NSCA creates rights on the part of whistleblowers, nor does it provide for any form of remedy or recourse to persons in [the complainant's] position."⁸ It went on to add that "the CNSC's role in investigating potential violations of the NSCA is more analogous to that of the police investigating crimes, and their investigators

4. S.C. 2005, c. 46.

5. Both the Federal Court and Federal Court of Appeal decision refer to this PSDPA and the obligations therein, and contrast the provisions that are indicative of a whistleblower protection regime to that of the NSCA. 2020 FC 375, at para. 15; 2021 FCA 117, at paras. 31 and 38.

6. Regan Dow, 2021 FCA 117, at para. 36, *supra* note 1.

7. The CNSC's regulatory approach to the safety culture of its licensees, as outlined in Regulatory Document REGDOC-2.1.2, *Safety Culture*, emphasises the importance of promoting a collective commitment to safety that includes a questioning attitude and a commitment to excellence in all activities that are important to safety. CNSC (2018), *Management System: Safety Culture*, REGDOC-2.1.2, Ver. 1.0, CNSC, Ottawa. This judicial review application did not implicate these important considerations.

8. Regan Dow, 2021 FCA 117, at para. 24, *supra* note 1.

share many of the same powers in investigating offences. Whether and how the CNSC decides to prosecute a regulated entity does not ‘directly affect’ a complainant.”⁹ It was also noted that, “[t]he only parties ‘directly affected’ by decisions to investigate or prosecute offences are those allegedly in breach of the law, [the licensee] in this case, and those responsible for investigating or prosecuting them”.¹⁰

This decision of the Federal Court of Appeal confirms that the offence provision is to prevent and punish a licensee for taking action against any would-be whistleblower and presumably therefore to discourage licensee retaliation. The Court confirmed, however, that the offence provision is not a true whistleblower protection provision, nor can it be, in that the NSCA provides no remedial powers relevant to the employee/whistleblower.

Germany

Federal preemption versus Länder competences: Ruling by the Federal Constitutional Court in Karlsruhe of 7 December 2021 regarding the ban on the handling of nuclear fuel in the ports of Bremen¹¹

I. The ban on the handling of nuclear fuel in the ports of Bremen

In January 2012, the Government of the *Land* Bremen (the “Senate”) decided to amend its Port Operations Act (*Bremisches Hafенbetriebsgesetz*), published on 6 February 2012. The newly introduced Section 2(3) “de-dedicated”¹² the seaports of the city of Bremen and the city of Bremerhaven for loading, unloading and transshipment of nuclear fuel. Thus, the handling of nuclear fuel was no longer allowed in both ports. However, exceptions were allowed by law.

This decision was not motivated by safety or security considerations, but solely by political reasons. The intention of Bremen (as a *Land*) was to rely only on alternative energies and to force the Federal Government to accelerate the energy turnaround.

The decision was precedential for the following four reasons:

- no German seaport had ever been “de-dedicated” for any goods;
- the use of roads or railroads owned by a *Land* could also then be de-dedicated for specific goods;
- seaports could be de-dedicated in the future for other goods, for instance coal or tropical woods. It had already been suggested that the Bremen Senate de-dedicate the ports for the handling of non-nuclear weapons; and

9. *Ibid.*, para. 41.

10. *Ibid.*

11. Contribution by Ms Ulrike Feldmann, who since 1980 has served as a Legal Adviser at Kerntechnik Deutschland e.V. (KernD), a merger between Wirtschaftsverband Kernbrennstoff-Kreislauf und Kerntechnik e.V. (Association of the German Nuclear Fuel Cycle and Nuclear Technology Industry) and Deutsches Atomforum e.V. (German Atomic Forum). The views expressed in this article are those of the author and do not necessarily reflect the official position of KernD.

12. Dedication (*Widmung*) is a legal term that means the public assignment of public property of a *Land*. By public assignment, a public property of a *Land* (for example a railroad, parking area, motorway or seaport) becomes a “public place”. Dedication defines the public purpose and the scope of the place. De-dedication is the opposite act of the state. In principle, partial de-dedication (*Teilentwidmung*) is also possible. The act of dedication and de-dedication can be formally enacted or may be implied. De-dedication as the *actus contrarius* must always follow the form of the dedication.

- other *Länder* with major seaports on the German coast might follow the example of the *Land* Bremen. In April 2012, the Government of Hamburg already discussed the possibility of de-dedicating the handling of nuclear fuel in its port, but – for the time being – did not follow the example of Bremen. Similar considerations arose in Cuxhaven, a seaport in Lower-Saxony.

Nevertheless, Bremen (as a *Land*) modified its Port Operations Act and thus in the view of the German nuclear industry, it:

- disregarded the federal competence for nuclear energy, including radiological protection and transport of radioactive material, under Article 73(1)14. of the German Basic Law (*Grundgesetz*);¹³
- disregarded the unwritten, but nevertheless constitutional, “principle of federal loyalty” of the *Länder* towards the Federal State (*Bundestreue*);
- disregarded Article 93 of the Euratom Treaty, which prohibits “customs duties on imports and exports or charges having equivalent effect”;¹⁴ and
- disregarded Article 56 of the Treaty on the Functioning of the European Union prohibiting “restrictions on freedom to provide services within the [European] Union”.¹⁵

II. The right to sue against laws

According to Article 93(1)2. of the Basic Law, either the Federal Government or a Government of a *Land* or at least one quarter of the members of the *Bundestag* (Federal Parliament) may bring action before the Federal Constitutional Court in the event of doubts as to the compatibility of a federal law or a *Land* law with the Basic Law. Therefore, the Federal Government represented by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety could have sued the *Land* Bremen before the Constitutional Court and should have done so to defend its exclusive legislative competence. However, because of political reasons, the Federal Government refrained from taking action. Also for political reasons, no action was brought against the Bremen Port Operations Act by a *Land* Government or by members of the *Bundestag*.

13. In Germany, the division of powers between the Federation and the *Länder* is regulated in Articles 70-74 of the Basic Law of 23 May 1949, last amended by the Law of 29 September 2020, *Bundesgesetzblatt* (BGBl) [Federal Law Gazette] I p. 2048, which is the constitution of the Federal Republic of Germany. The Basic Law distinguishes between the exclusive legislative competence of the federation and concurrent legislation. Article 71, “Exclusive legislative power of the Federation”, of the Basic Law states: “On matters within the exclusive legislative power of the Federation, the *Länder* shall have the power to legislate only when and to the extent that they are expressly authorised to do so by a federal law.” Article 72(1), “Concurrent legislative powers”, of the Basic Law states: “On matters within the concurrent legislative power, the *Länder* shall have power to legislate so long as and to the extent that the Federation has not exercised its legislative power by enacting a law.” The matters under exclusive competence of the federation are listed in Article 73 of the Basic Law. Nuclear energy is mentioned in Article 73(1)14. of the Basic Law as follows: “The Federation shall have exclusive legislative power with respect to: ... the production and utilisation of nuclear energy for peaceful purposes, the construction and operation of facilities serving such purposes, protection against hazards arising from the release of nuclear energy or from ionising radiation, and the disposal of radioactive substances.” Matters under concurrent legislative competence are listed in Article 74. Mining (including the mining of uranium) is one of a number of economic matters listed under Article 74(1)11.

14. Treaty Establishing the European Atomic Energy Community (1957), 298 UNTS 167, entered into force 1 Jan. 1958 (Euratom Treaty) (latest consolidated version in *Official Journal of the European Union* (OJ) C 203 (7 June 2016), p. 36).

15. Treaty on the Functioning of the European Union, OJ C 202 (7 June 2016), p. 70 (consolidated version).

Pursuant to Article 140(1) of the State Constitution of the Free Hanseatic City of Bremen,¹⁶ in connection with Section 24 of Bremen's State Court Act, either the Senate, the *Bürgerschaft* of the *Land* Bremen (the Parliament of the *Land* Bremen) or at least one fifth of the statutory number of members of the *Bürgerschaft* or of a public-law corporation of the *Land* Bremen may, in the event of doubt as to the interpretation of the constitution of the State, bring action before the Bremen State Court.

In May 2012, with regard to nuclear energy but even more so with regard to the principle of the universal port to which Bremen has been committed for many generations and which with the ban on the loading and unloading of nuclear fuel in the ports of Bremen (as a *Land*) was at stake, the Christian Democratic Party in Bremen (as a *Land*) brought an action before the Constitutional Court of Bremen requesting the court to review the constitutionality of the Port Operations Act amendment. On 12 April 2013, the Court rejected the request with a tight majority of four judges against three, ruling that the Constitutional Court of Bremen has the competence to only address whether the law of the *Land* Bremen is in line with the constitution of the *Land* Bremen; it has no competence to address the constitutionality of Bremen's law *vis-à-vis* the federal constitution.¹⁷ That means that the Constitutional Court of Bremen only decided on the admissibility of the request of Bremen's Christian Democratic Party; it did not decide on the federal constitutionality of the amendment of Bremen's Port Operations Act. According to the Constitutional Court of Bremen, this is a matter for the Federal Constitutional Court to decide.

The three judges in their dissenting opinion argued that because of Article 64 of Bremen's constitutional law, the *Land* Bremen must not only respect the constitutional law of the *Land* Bremen but also federal constitutional law. In Article 64, the *Land* Bremen declares that it forms part of the Federal Republic of Germany.¹⁸ Thus, as a "part of the whole", Bremen accepts the principle federal constitutional law. The three judges therefore held in their dissenting opinion that the Constitutional Court of Bremen not only has the right but also the duty to check whether the law of the *Land* Bremen, namely the Port Operations Act, is in line with the federal constitutional law.

As there was no legal certainty that the action of the Christian Democrats in Bremen before the Constitutional Court of Bremen (as a *Land*) would be successful, the German nuclear industry decided to take legal action in parallel to the proceedings before the State Court of Bremen. Three companies – ANF Advanced Nuclear Fuels GmbH, GNS Gesellschaft für Nuklear-Service GmbH and Orano NCS GmbH – indicated their interest in bringing a case; however, there was no legal way for these companies to directly challenge the newly introduced Section 2(3) Port Operations Act before the Federal Constitutional Court. Instead, they had to seek redress through administrative law.

As the amendment of Bremen's Port Operations Act provides for exceptions from the prohibition of loading, unloading and transshipment of nuclear fuel, the first step was to request the Bremen Senate to grant such exemptions. Not surprisingly, the requests for exemptions from the ban were rejected in spring 2013.¹⁹ With these rejections, the path was cleared for lawsuits before the Administration Court of Bremen as first instance.

16. State Constitution of the Free Hanseatic City of Bremen of 21 October 1947, last amended by the law of 11 May 2021, *Gesetzblatt der Freien Hansestadt Bremen* (Brem.GBl.) [Bremen Law Gazette] p. 475).

17. *Bremen Staatsgerichtshof* (BremStGH), 12 Apr. 2013, St 1/12, E 8, 198 ff.

18. Not every *Land* in Germany has such a declaration in its constitution.

19. In reaction to the three nuclear companies' requests for exemptions, the left wing party in the *Land* Bremen filed a request to the *Bürgerschaft* (Parliament of Bremen) asking for another amendment to the Port Operations Act to clarify that the transports of nuclear fuel the nuclear companies asked exceptions for are forbidden. In November 2013, the Parliament of the *Land* Bremen rejected the left wing party's request knowing that the Senate had already rejected the requests for exemptions.

III. The decision of the Administration Court of Bremen (First Instance)

In the spring 2013, ANF, GNS and Orano NCS filed suit before the Administration Court of Bremen as the first instance against the rejection of the requests for granting exemptions from the ban on the handling of nuclear fuel in the ports of Bremen. The suit claimed that the rejections violated the exclusive competence of the Federation stated in Articles 71 and 73(1)14. of the Basic Law concerning matters in the field of nuclear energy and also violated the fundamental principle of federal loyalty (*Bundestreue*). In July 2015, the Administration Court of Bremen found in favour of the plaintiffs that the ban on the handling of nuclear fuel in Bremen is unconstitutional and that the principle of federal loyalty was violated.²⁰ Therefore, the court decided to submit the question of constitutionality of the ban on handling nuclear fuel in Bremen's ports to the Federal Constitutional Court. Only the Federal Constitutional Court has the power to take such a decision on the scope of federal competence and on the question of whether a legal norm set by a *Land* is unconstitutional or not.

IV. The decision of the Federal Constitutional Court

In an order of 7 December 2021, published on 11 January 2022, the Federal Constitutional Court declared the ban on handling nuclear fuel in the ports of Bremen incompatible with the Basic Law and therefore void.²¹ The Court stated that the *Land* Bremen does not have the legislative competence to adopt such a ban. The exclusive power to enact legislation on the utilisation of nuclear energy lies with the Federation. As the ban in Bremen's Port Operation Act primarily deals with the peaceful use of nuclear energy, the *Land* Bremen is not authorised to legislate on this matter.

The Court underlined in its considerations on the exclusive power of the Federation for enacting legislation on nuclear energy that the utilisation of nuclear energy necessarily requires the transport of radioactive materials. Therefore, such transport is included in the exclusive power of the Federation for enacting legislation. On the other hand, as the Court stated, the *Länder* have the competence to enact legislation governing their public property or governing "public purpose assets". With its ports, the *Länder* are, in principle, free to determine the scope of their designated use; the *Länder* are not obliged to establish and operate ports with particular infrastructure or with use designation of a certain scope. But, as the Court underlined, the *Länder* are not permitted – under the pretext of use designation under public law – to create provisions that in substantive terms essentially amount to legislation in the area of exclusive competence of the Federation for nuclear energy.²²

20. *Verwaltungsgericht der Freien Hansestadt Bremen*, 9 July 2015, 5 K 171/13.

21. *Bundesverfassungsgericht* (BVerfG) (Federal Constitutional Court), Decision of the Second Senate of 7 Dec. 2021, 2 BvL 2/15, Rn. 1-111, ECLI:DE:BVerfG:2021:ls20211207.2bvl000215; BVerfG, Press Release, "Ban on the handling (loading, unloading and transshipment) of nuclear fuel in the ports of Bremen is incompatible with the Basic Law", BVerfG Press Release No. 1/2022 (11 Jan. 2022), www.bundesverfassungsgericht.de/shareddocs/pressemitteilungen/en/2022/bvg22-001.html.

22. Not surprisingly, conflicts of competences also arise in other countries with a federation structure. Not every country that is organised on a federal level has a written constitution in which the competences of the federal government and the *Länder* are regulated as precisely as is the case in Germany (see *supra* note 3). In Germany, for example, the mining of uranium falls under concurrent legislation competence. *Ibid.* As the Federation has enacted the Federal Mining Act, the *Länder* are not entitled to enact their own mining law. In the United States, however, the case of *Virginia Uranium, Inc. v. Warren*, 139 S. Ct. 1894 (17 June 2019), shows that the legal situation is not clear as to whether federal law also takes precedence over state law with regard to the mining of uranium. Nevertheless, in cases where there is room for interpretation as to whether the regulation by a state falls within an area for which the federal government has legislative competence or has made use of its legislative competence, the criteria that are weighed (e.g. factual connection or overriding interest in uniform federal regulation, see Congressional Research Service (CRS) (2019), *Federal Preemption: A Legal Primer*, pp. 17, 28, available at: <https://crsreports.congress.gov/product/pdf/R/R45825>, or the classical methods of interpretation, see *ibid.*, p. 28) appear to be quite comparable.

The Federal Constitutional Court also made it clear that the divided competences set out in the Basic Law and also the Atomic Energy Act prevent a *Land* from partially restricting a port's designated use or even closing a port – provided that this decision of a *Land* is not primarily touching upon subject matters for which the Federation has exclusive competence. However, driven by the strong determination of the Green Party in Bremen's Parliament to overtake the Federation by pulling out of nuclear energy, the *Land* Bremen's ban clearly violated the Federation's exclusive legislative competence in matters of atomic energy law.

Furthermore, the Court held that – while banning the handling of nuclear fuel due to political reasons concerning the phasing out of nuclear energy and due to a different risk management than the Federation – the *Land* Bremen is contradicting Section 4 Atomic Energy Act which states that the transport of nuclear fuel is in principle permissible subject to compliance with strict safety provisions. With this order the Federal Constitutional Court fully underlined the legal view of the Administration Court in Bremen and – of course – of the three plaintiffs.

Shortly after the release of this order, the Senate of Bremen declared that in accordance with the ruling of the Federal Constitutional Court, Bremen's Port Operations Act will be amended. Furthermore, the Senate of Bremen acknowledged the claim of the plaintiffs for a determination that Bremen's Ports Operations Act does not require approval for the loading, unloading as well as transshipment in the ports of the *Land* Bremen.

On 16 February 2022, the Administration Court of Bremen issued a judgment of acknowledgement accordingly.

V. Conclusion

With the decision of the Federal Constitutional Court it is crystal clear that no approval is needed for the loading, unloading and transshipment in Bremen's ports. The decision of the Federal Constitutional Court also supports the principle of Bremen's all-purpose ports (principle of the universal port) and has effect not only in Bremen's ports but also in every other port in Germany. Whether the decision of the Federal Constitutional Court will impact the self-restriction on the handling of nuclear fuel in Hamburg's port, which the Hamburg port handling operators agreed on (strongly urged by the Senate of Hamburg), is now subject of legal analysis.

Japan

Injunction against nuclear power plant operation based on inadequate evacuation plans (Tokai-2)

Since the Fukushima Daiichi Nuclear Power Plant accident (“the Fukushima accident”), several lawsuits have been filed to enjoin the operation of nuclear power plants. Most recently, on 18 March 2021, the Mito District Court issued an injunction against Japan Atomic Power Company (JAPC) to prohibit the operation of the Tokai No. 2 Nuclear Power Plant, which has been offline since the March 2011 Fukushima accident. The previous decisions on other nuclear power plants focused on the existence of a specific risk of a serious accident at such plant. Here, the Mito District Court granted an injunction based on a finding that the evacuation plans in the event of a nuclear accident were inadequate.

This decision differs from previous cases in that it explicitly indicates that inadequate evacuation plans alone are a reason for an injunction. The court determined that the five levels of defence must be fully applied in accordance with the concept of defence in depth. If any of the defence levels are lacking or insufficient, the nuclear power plant should not be considered safe and therefore there is a specific danger to the life and health of residents around the plant. Furthermore, the evacuation plans formulated by local governments based on the Nuclear Emergency Response Guidelines (NERG) have been evaluated according to their actual effectiveness.

I. Status of evacuation plans in the Japanese legal system

According to the International Atomic Energy Agency's (IAEA) *Fundamental Safety Principles*,²³ the primary means of preventing accidents at a nuclear power plant and mitigating the consequences of accidents if they do occur is the application of the concept of defence in depth.²⁴ To make the principles legally binding, they need to be incorporated into national and/or local regulations. In Japan, the Installation Approval Standard Rules under the Reactor Regulation Act require items corresponding to the first to third levels of defence as a "facility subject to design standards" and ones corresponding to the fourth level of defence as a "facility subject to a severe accident".

On the other hand, items corresponding to the fifth level of defence, such as the preparation of evacuation plans, are stipulated in the Basic Act on Disaster Management (BADM) and the Act on Special Measures Concerning Nuclear Emergency Preparedness (ASMCNEP). The Nuclear Regulation Authority (NRA) does not require them for a Reactor Installation Permit.²⁵ These acts impose taking the following measures on the national and local governments and nuclear operators.

The national government is responsible for taking thorough measures for nuclear emergency preparedness under the BADM and the ASMCNEP. The Central Disaster Management Council in the Cabinet Office formulates a basic disaster management plan, and the NRA sets the specialised and technical aspects of the NERG to ensure the smooth implementation of nuclear emergency preparedness by the national and local governments and nuclear operators.

Local governments²⁶ are responsible for formulating and implementing area disaster management plans against nuclear emergencies, based on the basic disaster management plan and the NERG. Prefectural Disaster Management Councils are responsible for this in each prefecture. In addition, they prepare area-wide evacuation plans relating to the evacuation of residents within the "Precautionary Action Zone" (PAZ)²⁷ and the "Urgent Protective Action Planning Zone" (UPZ),²⁸ and stipulate evacuation routes and means for each municipality. Municipal Disaster Management Councils in municipalities similarly formulate their area disaster management plans and evacuation plans according to the area-wide evacuation plans. Therefore, local governments are mainly responsible for formulating evacuation plans.

Nuclear operators prepare nuclear operator emergency action plans for each nuclear site to implement nuclear emergency preparedness under the ASMCNEP.

23. IAEA (2006), *Fundamental Safety Principles*, IAEA Safety Standards Series, No. SF-1, IAEA, Vienna.

24. *Ibid.*, p. 13, para 3.31. "Defence in depth" generally refers to the preparation of several barriers with certain goals (levels of defence), each barrier being required to function independently and effectively for protecting people from harmful effects.

25. A Reactor Installation Permit is one of three different permits required to construct and operate a reactor in Japan. A Reactor Installation Permit addresses, inter alia, siting conditions for the reactor facilities, basic design of the reactor, certain technical criteria and financial resources of the operator.

26. Local governments comprise prefectures and municipalities. Prefectures are relatively wider areas of local government that are made up of municipalities. Prefectures handle broader regional administration, as well as work that is not suitable for handling at the municipal level.

27. PAZ refers to an area where protective measures, such as evacuations, are carried out as a precaution prior to the release of radioactive materials. The area covers an approximately five kilometre (km) radius around the nuclear power plant.

28. UPZ refers to an area where protective measures, such as sheltering, evacuations and the preventative administration of stable iodine tablets, are carried out to minimise the risk of radiation exposure in the event of a general emergency. The area covers an approximately 30 km radius around the nuclear power plant.

The NERG sets the nuclear emergency preparedness priority zones consisting of the PAZ and UPZ as areas where evacuation plans shall be formulated. To prepare for evacuation depending on the progress of an accident, the guidelines set an emergency action level (EAL)²⁹ as a standard, which classifies emergencies as alerts, site-area emergencies, and general emergencies, according to the status of the accident. The guidelines stipulate that protective measures must be prepared as well as how those measures are to be carried out in the PAZ, UPZ, and outside the UPZ, based on the EAL classifications. The national government, including the NRA, supports local governments in the formulation of evacuation plans.³⁰ The formulation of evacuation plans is not meant to be a one-time-only endeavour; rather, municipalities are responsible for continuously revising the plans through testing, such as conducting disaster prevention drills.

II. Summary of the case

The residents living around the Tokai No. 2 Nuclear Power Plant filed a lawsuit against JAPC seeking an injunction due to an infringement of the personal rights of the residents, because of the plant's operation.³¹

III. The Court's decision

The court held that if any of the five levels of the defence in depth is deficient or insufficient, there is a specific risk of an infringement of personal rights. Although it held that the safety of the nuclear power plant is reasonable among the first four levels of defence, the fifth level of defence was insufficient.³² Therefore, it ruled that there is a specific risk and ordered injunctive relief enjoining operation of the nuclear power plant. On the issue of the evacuation plans, the court held and reasoned as follows:

▪ A. Location review guidelines

Before the Fukushima accident, the location review guidelines were used for determining the suitability of site conditions as one of the guidelines containing examination criteria for a Reactor Installation Permit. One of the requirements in these guidelines was that a certain radius around a nuclear reactor should be set as a low-population area so that residents living in that area can easily take disaster prevention activities. Since the Fukushima accident, the NRA has not adopted these guidelines as criteria because the nuclear emergency preparedness system has been significantly strengthened by the BADM and the ASMCNEP and the requirement was determined not to be effective for actual disaster prevention. The court held that the NRA's decision not to adopt these location review guidelines is not unreasonable for the same reason.

However, it is difficult for the hundreds of thousands of residents around the nuclear power plant to evacuate immediately in the event of an emergency involving an abnormal release of radioactive material. It is also clear that an evacuation of densely populated areas is not easy, given that an accident may be accompanied by natural disasters, as was

29. For example, a general emergency is declared in the event where all functions to shut down a nuclear reactor are lost when an emergency shutdown of that reactor is required.

30. For example, residents in the PAZ would evacuate prior to the release of radioactive materials if an incident at the nuclear power plant has a high possibility of radiological effects on the public (i.e. a general emergency). Residents in the UPZ would shelter in place to reduce the effect of the radioactive release and take protective measures, such as temporary relocations if the radiation dose rate increases above a certain level after radioactive materials have been released.

31. An affected individual may seek an injunction against the infringing act based on their personal rights, i.e. the right to life and health.

32. According to the International Nuclear Safety Advisory Group (INSAG) of the IAEA, the objective of Level 5 is "Mitigation of radiological consequences of significant releases of radioactive materials" and the essential means of achieving this is to have appropriate "[o]ff-site emergency response". INSAG (1996), *Defence in Depth in Nuclear Safety*, INSAG-10, IAEA, Vienna, p. 6.

the case with the Fukushima accident. Therefore, it is doubtful whether practical and effective evacuation plans could be formulated even if the areas around the nuclear reactor are heavily populated and those plans could ensure the fifth level of the defence in depth.

- B. The evacuation plans

- 1. *Decision framework*

In order for the fifth level of defence to be achieved, it is not enough that an evacuation plan has simply been formulated, but an effective evacuation plan must be set and a structure to implement it must be established. On the other hand, there are various ways of determining what preconditions should be used to formulate the plan, depending on the surrounding and residential conditions. In this regard, the ASMCNEP requires the NRA to establish the basic measures to be taken as nuclear emergency preparedness and criteria for setting areas where nuclear emergency measures should be formulated in the NERG. Local governments formulate area disaster management plans and evacuation plans based on the guidelines; accordingly, it can be said that the guidelines are the main rules on the fifth level of defence.

The NERG sets the levels of emergency and emergency zones, and evacuation plans for each emergency zone at each emergency level are decided step-by-step. Setting such step-by-step evacuation plans is reasonable considering that it is based on the international standards set by IAEA and there is a difference in levels of exposure risks among the PAZ, the UPZ and areas outside the UPZ. Therefore, achieving the fifth level of defence requires the existence of practical and effective evacuation plans as well as a system in place to implement them while assuming a nuclear accident caused by a natural disaster. If these are not present, a specific risk is identified in relation to the residents inside the PAZ and the UPZ.

- 2. *On the evacuation plan effectiveness*

In Ibaraki Prefecture, where the Tokai No. 2 Nuclear Power Plant is located, municipalities in the PAZ and UPZ reveal that there are approximately 64 000 people in the PAZ and approximately 874 000 people in the UPZ, for a total of approximately 940 000 people subject to evacuation. As a result, the following problems are identified.

- (a) *People subject to evacuation*

In principle, residents in the PAZ should evacuate outside the UPZ by their private cars, but if they all leave at once, it is easily assumed that the evacuation routes would be confused and congested. Furthermore, if residents in the UPZ voluntarily evacuate in a disorderly manner, this would cause severe traffic congestion, making it difficult for them to evacuate in a short time. Therefore, it is necessary to take the protective measures for those in the UPZ, which ensures the safety of sheltering in place and establishes emergency monitoring, rapid evacuation order transmission systems and evacuation exit screening systems. In addition, those in the UPZ should be informed that their safety could be secured by taking similar measures as those taken to evacuate residents in the PAZ and UPZ step-by-step.

- (b) *Status of evacuation plan formulation*

The area-wide evacuation plan for Ibaraki Prefecture was formulated in March 2015; however, only 5 out of 14 municipalities in the PAZ and UPZ have set their evacuation plans, and these municipalities have relatively small populations. Moreover, they are all within the UPZ, which suggests that it is not easy for heavily populated municipalities to formulate feasible evacuation plans.

For example, Mito City, the prefectural capital of Ibaraki, has the largest population subject to evacuation (approximately 270 000 people). The city has prepared a draft of an evacuation plan; however, the city has not yet been able to explicitly indicate when it will finalise its plan because the evacuation destinations for residents are other cities outside the UPZ in Ibaraki Prefecture, as well as cities in Tochigi, Gunma, Chiba and Saitama Prefectures, and there is a wide range of matters to be co-ordinated with these cities and

prefectures. Also, actual shelters, relaying points, temporary meeting places and evacuation routes have not been set in this draft.

(c) *Contents of the formulated evacuation plan*

The evacuation plans should assume the possibility that houses may be destroyed and roads may be severed due to a large-scale earthquake. However, these formulated plans do not specifically address sheltering in place when houses are collapsed and the way to provide information to residents on available roads is regarded as a future issue. There is also no preparation for multiple evacuation routes in case of a natural disaster. In the event of a complex disaster, maintaining the monitoring functions, disaster countermeasures headquarters functions and securing secondary evacuation destinations are regarded as issues for future investigation. Securing personnel for evacuation exit screening, the procurement of equipment and the securing of a place to implement them are also considered issues for future investigation.

▪ C. Conclusion

Based on the above, it cannot be said that practical evacuation plans have been formulated to enable the implementation of the protective measures for the gradual evacuation of residents in the PAZ and UPZ assumed in the NERG and that a system to implement the plan is in place. Therefore, the fifth level of the defence in depth is not enough and there is a specific risk of infringement of personal rights in the relation to the residents inside the PAZ and the UPZ.

JAPC filed an appeal with the Tokyo High Court on 19 March 2021.

Prosecution on charges of professional negligence resulting in death and injury for the former TEPCO executives

In 2016, three former executives of Tokyo Electric Power Co. (TEPCO) were indicted on charges of professional negligence resulting in the death and injury of people living in the Fukushima prefecture at the time of the Fukushima Daiichi Nuclear Power Plant accident (“the accident”). The three former executives (the former TEPCO chairman and two vice-presidents) were acquitted on 19 September 2019 by the Tokyo District Court, the court of first instance. Following an appeal, a hearing began on 2 November 2021 at the Tokyo High Court.

To be convicted of professional negligence, the Criminal Law of Japan states: “a person who fails to exercise due care required in the pursuit of social activities and thereby causes the death or injury of another person.” To be convicted of “failing to exercise due care”, the person must have the obligation of taking actions necessary to avoid consequences. The existence of such obligation is decided when a person is judged to have been able to foresee the consequences and the basic causality beyond a reasonable doubt.

The Tokyo District Court determined that in order to avoid the consequences from the accident, the defendants would have had to take certain actions before early March 2011, such as installing alternative equipment to cool the reactors on higher ground. However, the court stated that it is doubtful that TEPCO could have completed these measures before the accident, taking into account that the defendants had the information about the potential for such a tsunami only around 2008, at the earliest. Therefore, the court determined that the only way to avoid the consequences from the accident was to have suspended the operation of the Fukushima Daiichi Nuclear Power Plant before early March in 2011 because other measures were not realistic.

Based on the court’s determinations, the main issue before the Tokyo District Court was whether the defendants should have foreseen the accident, which is necessary to determine the existence of an obligation. The determination of foreseeability consists of two factors: 1) the height of a tsunami that the defendants should take into account and 2) the reliability of the basis for the occurrence of such tsunamis.

For the first factor, the court said that the defendants must have been able to foresee a tsunami that reaches the main grade level of OP + ten metres,³³ because the accident was caused by flooding of the critical buildings caused by such a tsunami, which resulted in the loss of cooling function of the reactors.

As for the second factor, the court considered the reliability of the commonly accepted concepts of nuclear power plant safety, the knowledge of tsunamis, the role of nuclear power plants in society and so on. The Fukushima Daiichi Nuclear Power Plant met the applicable safety requirements contained in various regulations, guidelines and technical standards, and these regulations set the safety requirements regarding the type of tsunamis that may occur. Moreover, TEPCO continued re-evaluating the safety of its nuclear power plants using the latest knowledge gathered from scientists, other operators and the government. In the course of re-evaluation, the defendants had been informed from staff about “the long-term assessment on earthquake activities from the Sanriku coast to the Bousou coast”, which was released in 2002 by the Ministry of Education, Culture, Sports, Science and Technology (Prime Minister’s Office at the time). This long-term assessment refers to the possibility of a tsunami that reaches the main grade level of OP + ten metres. Staff reports about this assessment in 2008 and 2009, at the earliest, were an important opportunity for the defendants to consider the foreseeability.

However, the court determined that this assessment was not reliable beyond a reasonable doubt in early March 2011, as it did not give practical evidence on the possibility of earthquakes around 8.2 magnitude accompanied by tsunamis occurring in any areas around the coast and on the differences in the submarine crustal structure along the coast. Also, scientists, operators and the government had some doubts as to the reliability of this assessment, so the government did not take this assessment into account when forming its disaster prevention plans and nuclear power plant operators, including TEPCO, did not make modifications to their plants based on this assessment. In addition, suspending operation of the Fukushima Daiichi Nuclear Power Plant was not something that could be easily decided by the defendants alone because of the internal and external procedures for such a suspension as TEPCO was an electricity supplier.

Based on the reasons above, the court concluded that the former TEPCO executives did not have an obligation to suspend operation of the Fukushima Daiichi Nuclear Power Plant before early March 2011 because it was not possible to foresee, beyond a reasonable doubt, the occurrence of a tsunami that reaches the main grade level of OP + ten metres. The appeal is ongoing and the next hearing was scheduled for February 2022.

United States

DC Circuit decision involving subsequent licence renewal of Turkey Point Nuclear Generating Station

On 4 March 2021, the United States (US) Court of Appeals for the District of Columbia Circuit (DC Circuit) dismissed a petition for review submitted by three environmental organisations concerning the US Nuclear Regulatory Commission’s (NRC) renewal of the operating licences for two nuclear power reactor units in the state of Florida.

The case involved the Turkey Point Nuclear Generating Station and the NRC’s first issuance of a “subsequent licence renewal” (SLR). Section 103 of the US Atomic Energy Act (AEA) of 1954 authorises the NRC to issue initial licences for nuclear power reactors for

33. “The reference marker for all plant elevations in the region corresponds to the Onahama Port datum line (Onahama Port, or OP), located about 50 km south of the Fukushima Daiichi Nuclear Power Plant. TEPCO selected a main plant grade level of OP +10.00 m for the nuclear island and main buildings of Units 1–4 ... For Units 5 and 6, this main plant grade level was defined as OP +13.00 m.” International Atomic Energy Agency (IAEA) (2015), *The Fukushima Daiichi Accident: Technical Volume 2: Safety Assessment*, IAEA, Vienna, p. 5.

terms of up to 40 years. NRC regulations permit the renewal of power reactor licences for up to 20 years beyond the previous licence term and do not limit the number of times a licence can be renewed. The operator of the Turkey Point facility (Florida Power & Light Company, or FPL) had previously sought and obtained a 20-year renewal of its 2 nuclear power reactor licences. In January 2018, FPL submitted an application seeking approval of a second 20-year renewal of its licences – a “subsequent” licence renewal – to extend the licensed operation of the plant through 2053.

Three environmental organisations sought to intervene in the Turkey Point proceeding, seeking a hearing concerning the environmental impacts of the continued use of the plant’s cooling canal system, as well as challenging the sufficiency of the NRC staff’s analysis of potential groundwater contamination during the proposed extended period of operation. After a series of decisions from the NRC’s Atomic Safety and Licensing Board (Board), the environmental organisations were denied a hearing. The Board ruled that the NRC staff’s Environmental Impact Statement sufficiently provided information that the organisations alleged was missing and that the organisations were improperly challenging the validity of generic environmental impact determinations the NRC had previously codified into its regulations.

After the Board dismissed the organisations’ hearing request and terminated the adjudication, the NRC staff issued the renewed licences to FPL. Pursuant to NRC regulations, the staff’s approval was immediately effective, though expressly subject to further revision or revocation “upon further administrative or judicial appeal.” While the environmental organisations’ administrative appeals before the Commission were still pending, they also sought judicial review of the staff’s decision to issue the licences.

In *Friends of the Earth v. NRC*, the DC Circuit dismissed the organisations’ petition for judicial review as premature.³⁴ Under US law, only “final orders” of NRC licensing decisions can be challenged in federal court. The DC Circuit held that the environmental organisations could not simultaneously seek judicial review during the pendency of their separate administrative appeal of the denial of their hearing request. Thus, the Court dismissed the petition as “incurably premature,” because there was not yet a “final order” in the proceeding. As of this writing, the organisations’ administrative appeals remain pending before the Commission.

Commission decisions in two consolidated interim storage facility licensing proceedings

The NRC issued two adjudicatory decisions in two separate licensing proceedings concerning applications to construct and operate a consolidated interim storage facility (CISF) for the storage of spent nuclear fuel. Both adjudications had previously been terminated by the Board, and in each proceeding, the same petitioners – Fasken Land and Minerals, Ltd. and Permian Basin Land and Royalty Owners (together, Fasken) – sought to reopen the record and submit new issues for litigation (“contentions”) on the basis of alleged newly available information. In each proceeding, the Commission denied Fasken’s petitions.

The first proceeding involved the application of Holtec International for a licence to build and operate a CISF in southeastern New Mexico. Fasken had previously sought to intervene in the proceeding, but in May 2019 the Board denied its hearing request.³⁵ Fasken appealed this denial and subsequently sought to reopen the record of the proceeding and admit new and amended contentions concerning the status of land use and mineral rights development in the vicinity of the proposed CISF. Principally, Fasken argued that the proposed CISF would interfere with mineral development in the area, which could not proceed safely alongside the CISF and that the NRC staff had not sufficiently independently analysed this issue.

34. *Friends of the Earth, et al. v. US Nuclear Regulatory Commission*, No. 20-1026 (DC Cir. 2021).

35. *Holtec International (HI-STORE Consolidated Interim Storage Facility)*, LBP-19-4, 89 NRC 353 (2019).

On 28 April 2021, the Commission denied Fasken’s appeal and motion to reopen the record of the terminated adjudication.³⁶ The Commission upheld the Board’s previous determination that this new contention was untimely because it was not based on information that was previously unavailable, nor did the contention raise an “exceptionally grave issue” that warranted waiving this timeliness requirement.³⁷ The Commission also rejected Fasken’s motion to reopen the record to litigate issues concerning the NRC staff’s analysis of land use, rights and restrictions under and around the proposed facility. Fasken argued that reopening the record was warranted based on new and materially different information that had come to light in the form of public comments on the NRC’s draft Environmental Impact Statement submitted by parties located in the vicinity of the CISF, including oil and gas developers. The Commission denied the motion because it found Fasken had not shown the information was materially different from previously available information, nor did Fasken raise a significant environmental issue that would make a material difference in the proceeding.³⁸

The second proceeding involved the application of Interim Storage Partners LLC (ISP) for a licence to construct and operate a CISF in Andrews County, Texas. In this proceeding, Fasken had also previously sought to intervene and request a hearing, but the Board denied this request in August 2019 and subsequently terminated the adjudication.³⁹ Fasken moved to reopen the adjudication on the basis of allegedly new information concerning the adequacy of the NRC staff’s environmental analysis of transportation routes to and from the proposed CISF. The Board found that this new challenge to the proposed issuance of the licence was not based on new and materially different information, but rather could have been raised at the outset.⁴⁰ The Board also found that the contention was virtually identical to one that had previously been determined to be inadmissible and therefore did not raise a significant safety or environmental issue that would warrant the reopening of the record. Fasken appealed these determinations to the Commission. On 22 June 2021, the Commission upheld the Board’s determinations and denied Fasken’s petition for review.⁴¹

On 13 September 2021, the NRC issued the licence to ISP to construct and operate the CISF in Andrews County, Texas. The licence authorises the company to receive and store up to 5 000 metric tonnes of spent nuclear fuel for a period of 40 years.

As of this writing, the NRC’s issuance of the licence is being challenged by Texas state officials before the United States Court of Appeals for the Fifth Circuit. Texas has argued that storage of spent nuclear fuel at the site is illegal under a newly enacted state statute. This lawsuit is currently pending. In addition, several petitioners before the Commission, including Fasken, whose contentions had previously been dismissed by the Commission, have filed petitions for review of the Commission’s decisions in the DC Circuit, which have since been consolidated into a single case. That case is likewise currently pending.

The NRC’s licensing decision on the Holtec CISF application is currently expected in January 2022. Several of the same petitioners who challenged the ISP licence before the DC Circuit have filed petitions to review the Holtec adjudicatory decision. Those petitions have also been consolidated, and the case is being held in abeyance pending a decision on the licence by the agency.

36. *Holtec International (HI-STORE Consolidated Interim Storage Facility)*, CLI-21-07, 93 NRC __ (28 Apr. 2021) (slip op.).

37. *Ibid.*, slip op. at 13.

38. *Ibid.*, slip op. at 20.

39. *Interim Storage Partners LLC (WCS Consolidated Interim Storage Facility)*, LBP-19-7, 90 NRC 31 (23 Aug. 2019).

40. *Interim Storage Partners LLC (WCS Consolidated Interim Storage Facility)*, LBP-21-2, 93 NRC __ (Jan. 29, 2021) (slip op.).

41. *Interim Storage Partners LLC (WCS Consolidated Interim Storage Facility)*, CLI-21-09, 93 NRC __ (22 June 2021) (slip op.).

Subsequent licence renewal adjudicatory decisions

The NRC's Atomic Safety and Licensing Board recently issued two decisions denying intervention in SLR proceedings. In each decision, the Board found that the petitioners' contentions had failed to meet the NRC's admissibility standards.

The first proceeding concerned an application submitted by Virginia Electric and Power Company (VEPCO) for a second 20-year renewal of its operating licences for 2 nuclear power reactor units at the North Anna Power Station in Virginia. Various environmental organisations filed a hearing request, contesting portions of VEPCO's SLR application on the basis that it failed to discuss the environmental significance of the 2011 Mineral, Virginia earthquake. These petitioners claimed that the 2011 Mineral earthquake, a 5.8 magnitude quake whose epicentre was located a short distance from the facility, demonstrated a significant risk of exceeding the two reactors' "design-basis earthquake" during the extended SLR term.

On 29 March 2021, the Board denied the request for a hearing on the grounds that the safety impact of the 2011 Mineral earthquake had already been fully assessed by VEPCO and the NRC staff.⁴² Specifically, both a post-incident review and a seismic probabilistic risk assessment that considered the 2011 Mineral earthquake found that the design basis for the facility remained suitable to support continued operation. As a result, VEPCO's SLR application incorporating those findings satisfied the NRC's regulations. As of this writing, an appeal of this decision is currently pending before the Commission.

The second Board decision concerned an application submitted by NextEra Energy Point Beach, LLC (NextEra) for a second 20-year renewal of its operating licences for two nuclear power reactor units at its Point Beach Nuclear Plant in Wisconsin. Physicians for Social Responsibility Wisconsin filed a hearing request, seeking to admit various contentions challenging the adequacy or accuracy of safety-related and environmental information provided by NextEra in its SLR application.

On 26 July 2021, the Board denied the organisation's hearing request.⁴³ With respect to the environmental issues raised, the Board found that one contention (asserting that NextEra failed to consider cooling towers as a reasonable alternative to the plant's existing once-through cooling system) was inadmissible because, by regulation, the NRC cannot second-guess the choice of plant cooling systems that have been approved by other federal or state water permitting agencies. The Board also dismissed the organisation's other environmental contention (arguing that NextEra failed to adequately evaluate other renewable energy sources as an alternative to licence renewal) because it had failed to demonstrate that such alternatives were reasonable on a utility scale. With respect to the safety issues raised, the Board found that both contentions were inadmissible because they raised issues beyond the scope of the licence renewal proceeding. The Board found that one safety-related contention (concerning neutron embrittlement in the reactor pressure vessel) was an impermissible challenge to NRC regulations governing embrittlement calculations as well as an impermissible challenge to the facility's compliance with its current licensing basis. The other safety-related contention (arguing that the facility has an elevated risk of a turbine missile accident) was likewise dismissed as an impermissible challenge to the original design of the facility. As of this writing, an appeal of the Board's denial is pending before the Commission.

On 4 May 2021, the NRC staff issued a subsequent renewed licence to VEPCO, authorising the operation of two nuclear power reactor units at the Surry Power Station in Virginia through 2052 and 2053. The NRC also received an application in August 2021 for the subsequent licence renewal of the licences for the St. Lucie Nuclear Generating Station in Florida, which is currently undergoing an acceptance review by the NRC staff. To date, the NRC has issued subsequent renewed licences to three nuclear power reactor facilities.

42. Virginia Electric and Power Company (North Anna Power Station, Units 1 and 2), LBP-21-04, 93 NRC __ (29 Mar. 2021) (slip op.)

43. NextEra Energy Point Beach, LLC (Point Beach Nuclear Plant, Units 1 and 2), LBP-21-05, 93 NRC __ (26 July 2021) (slip op.).

NATIONAL LEGISLATIVE AND REGULATORY ACTIVITIES

Belarus

General legislation, regulations and instruments

New licensing regulations for the civilian use of atomic energy and radiation sources

Presidential Decree No. 137 “On Regulation of Activities in the Field of Use of Atomic Energy and Sources of Ionising Radiation” (with the Regulation on Licensing of Activities in the Field of Use of Atomic Energy and Sources of Ionising Radiation) of 5 April 2021 came into force on 10 October 2021. Previously, the system of licensing activities in the field of nuclear energy, sources of ionising radiation, and nuclear and radiation safety was governed by Presidential Decree of 1 September 2010, No. 450 “On Licensing of Certain Types of Activities”, which determined licence requirements and conditions for Belarus’s economic entities. Activities in the field of use of nuclear energy and sources of ionising radiation, including radioactive waste and spent nuclear materials management, were defined as licensed types of activity.

Presidential Decree No. 137 now forms the basis for regulation of all aspects of licensing of atomic energy-related activities and sources of ionising radiation (issuing licences, introducing amendments to them, extending the validity period, terminating validity, etc.), but it is not applicable to radiation sources for defence purposes carried out by military units of the Belarussian armed forces and other military formations. The document contains a number of key definitions, including the following:

- documents substantiating nuclear and radiation safety (“documents justifying safety”): documents submitted by a licence applicant (licensee) to obtain a licence, make changes to it, extend the validity period and/or justify the safety of facilities for the use of atomic energy, sources of ionising radiation, radiation facilities, including facilities for radioactive waste management, and/or work performed and/or services provided, which constitute a licensed activities (“works and/or services”);
- pre-licensing requirements and conditions: a set of requirements and conditions established by this Regulation that the applicant must comply with in order to make a decision on issuing a licence;
- licensing authority: the Ministry on Emergency Situations of the Republic of Belarus;
- licensing requirements and conditions: a set of requirements and conditions established by this Regulation and conditions imposed on the licensee when carrying out licensed activities, as well as special licensing requirements and conditions;
- special licence requirements and conditions: licence requirements and conditions that are indicated in the specific licence;
- assessment of the compliance of the licence applicant with the pre-licensing requirements and conditions and of the licensee with the licensing requirements and conditions (“conformity assessment”): determination by the Department of Nuclear and Radiation Safety (Gosatomnadzor) of the Ministry on Emergency Situations of the Republic of Belarus on compliance by the licence applicant with the pre-licensing requirements and conditions established by this Regulation and of the licensee with the licensing requirements and conditions established by this Regulation;

- periodic safety assessment of a nuclear installation or storage facility: a comprehensive assessment of the safety status of a nuclear installation or storage facility for compliance with regulatory legal acts, including for compliance with mandatory technical regulatory legal acts in the field of nuclear and radiation safety, carried out on a regular basis, as well as the assessment of cumulative actions of ageing processes (effects) and modification of nuclear equipment;
- safety examination in the field of the use of atomic energy and sources of ionising radiation (“safety examination”): an assessment of the safety justification for nuclear facilities, sources of ionising radiation, radiation facilities, including facilities for radioactive waste management, and/or work performed and/or services, the subject of which is the analysis of documents justifying safety, determination of safety deficiencies and the compliance of documents justifying safety with the requirements of regulatory legal acts, including those mandatory for compliance with technical regulatory legal acts in the field of nuclear and radiation safety.

The licensing authority has the following main responsibilities:

- defines a list of works performed for operating organisations and/or services rendered to operating organisations that affect the nuclear and radiation safety of nuclear facilities, for performance and the provision of which a licence is required; a list of technological equipment for nuclear facilities, the design and manufacture of which requires a licence; and the procedure for the periodic safety assessment of a nuclear installation or storage facility;
- establishes requirements for composition and content of documents justifying safety and documents containing the results of the periodic safety assessment of a nuclear installation or storage facility;
- establishes the forms of applications for the issuance of a licence, its duplicate, amendments to it and the extension of the licence;
- determines the procedure for conducting conformity assessments;
- establishes requirements for the content of the report on the assessment of the current state of safety of a nuclear installation, storage facility, or work and/or services being performed;
- makes a decision on the issuance or refusal to issue a licence, the introduction or refusal to amend it, the extension or refusal to extend the term, suspension, renewal, termination and revocation of the licence.

Gosatmnadzor is responsible for state oversight in the field of nuclear and radiation safety as well as control over the implementation of licensing activities in the field of use of atomic energy and sources of ionising radiation. It has the following main responsibilities:

- accepts applications for the issuance of a licence, a licence amendment, extension of the validity term, renewal, termination of the licence and the documents attached to them in the manner prescribed by this Regulation;
- conducts conformity assessments and safety examinations;
- based on the documents submitted by the licence applicant/licensee, sets the terms for the conformity assessment and safety examinations;
- notifies the licence applicant/licensee in writing about the decisions taken by the licensing authority;
- issues a licence, its duplicate, including after making changes to the licence, to the licence applicant/licensee;
- ensures that information about issued licences is entered into the Unified Register of Licenses;

- exercises control over the implementation by licensees of the legislation on licensing, licensing requirements and conditions for carrying out activities in the field of the use of atomic energy and sources of ionising radiation, including special licensing requirements and conditions, in the manner determined by the Council of Ministers of the Republic of Belarus;
- issues to licensees requirements (instructions) on elimination of identified violations of licensing legislation, licensing requirements and conditions, including special licensing requirements and conditions;
- forms a commission on licensing activities in the field of the use of atomic energy and sources of ionising radiation, establishes the procedure for its activities and powers;
- at the stage of making a decision on issuing a licence to the operating organisation for the siting, construction, operation, decommissioning of nuclear installations (power units) of the Belarusian nuclear power plant, organises and conducts public hearings in the manner determined by the Council of Ministers of the Republic of Belarus.

With regard to works and/or services for the design, siting, construction, operation and decommissioning of nuclear installations and storage facilities for nuclear materials, spent nuclear materials and/or radioactive waste, a licence is issued/extended for a period during which safety activities and/or the facility is supported by the licence applicant/licensee and confirmed by the results of the safety examination. With respect to other works and/or services specified in Appendix 1 to the Regulation on Licensing Activities in the Field of the Use of Atomic Energy and Sources of Ionising Radiation, a licence is issued for a period not exceeding ten years, taking into account the results of the conformity assessment and/or safety examination. The Regulation on Licensing of Activities in the Field of Use of Atomic Energy and Sources of Ionising Radiation contains general and specific parts for both pre-licensing requirements and conditions as well as licensing requirements and conditions.

Brazil

Organisation and structure

Establishment of the Brazilian company ENBpar

The state-owned Brazilian Nuclear Participation and Binational Energy Holding Company (Empresa Brasileira de Participações em Energia Nuclear e Binacional S.A. – ENBpar) was established by Decree No. 10,791 of 10 September 2021. ENBpar is a public limited company under the authority of the Ministry of Mines and Energy. According to Article 9 of Law No. 14,182 of 12 July 2021, ENBpar's headquarters will be located in the Federal District of Brasilia. ENBpar's purpose is to:

- keep the operation of nuclear installations under the control of the Federal Union;
- uphold the provisions of the Treaty between the Federative Republic of Brazil and the Republic of Paraguay for the Hydroelectric Use of Water Resources from the Paraná River, from and including the Great Waterfall of Sete Quedas or the Guairá Waterfall to the Mouth of the Iguazu River, promulgated by Decree No. 72,707 of 28 August 1973;
- manage contracts for the commercialisation of energy generated under contract within the Incentive Programme for Alternative Sources of Electric Energy (Programa de Incentivo às Fontes Alternativas de Energia Elétrica – PROINFA), referred to in Law No. 10,438, of 26 April 2002;
- administer the property of the Federal Union under the auspices of Centrais Eléctricas Brasileiras S.A – Eletrobras, according to the provisions of Decree-Law No. 1,383 of 26 December 1974.

The main financial resources of ENBpar are:

- the income generated by equity ownership in companies;
- the income from the development of its public programme management activities as well as the formalisation of contracts;
- the investment income and reimbursement of administrative and supervision fees of Itaipu Binacional; as well as
- income from financial applications and other sources of income.

The decree entered into force on the date it was published in the *Official Gazette of the Federal Union* (13 September 2021).

Greece

Nuclear safety and radiological protection (including nuclear emergency planning)

Transposition of the Euratom Basic Safety Standards¹

The following Ministerial and Greek Atomic Energy Agency (EEAE) Decisions are part of the secondary legislation issued upon the publication of Presidential Decree (PD) 101/2018 in the *Official Government Gazette* on 20 November 2018:²

Ministerial Decisions

- Ministerial Decision 43374/2020, “National action plan for addressing long-term risks from radon exposure”, *Official Government Gazette* No. 1881/B/18.05.2020.

This Decision defines the principles, procedures and related actions for the implementation of the national action plan for addressing long-term risks from radon exposure.

- Ministerial Decision 135966/2019, “Implementation of existing exposure situation strategies”, *Official Government Gazette* No. 5116/B/31.12.2019.

This Decision specifies the manner in which the existing exposure situation strategies are implemented at the national level in accordance with the provisions of PD 101/2018.

EEAE Decisions

- Decision 4/266/2020, “Description of incidents involving or possibly involving accidental or unintentional exposure during medical exposures to be reported directly to the Greek Atomic Energy Commission (EEAE)”, *Official Government Gazette* No. 214/B/03.02.2020.

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1. Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom, *Official Journal of the European Union* (OJ) L 13 (17 Jan. 2014) (Euratom Basic Safety Standards).
 2. Presidential Decree 101/2018, “Adaptation of Greek legislation to Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom (OJ L 13 / 17.1.2014) – Establishment of radiation protection regulations”, *Official Government Gazette* No. 194/A/20.11.2018.

This Decision defines the type of events (in line with point b of Article 96 of PD 101/2018) that imply or possibly imply exposure due to an accident or unintentional exposure during medical exposures and for which the organisation is obliged to report immediately to EEAE.

- Decision 4a/261/2019, “Mechanisms for the recognition of radiation protection experts, medical physics experts and occupational health services, authorisation of dosimetry services and acceptance of radiation protection officers”, *Official Government Gazette* No. 2460/B/21.06.2019.

This Decision lays down the necessary mechanisms, according to par. 1 of Article 79 of PD 101/2018, that allow the recognition of radiation protection experts and medical physics experts, the recognition of occupational health services, the authorisation of dosimetry services and the acceptance of radiation protection officers.

- Decision 4b/261/2019, “Determination of dose constraint for individual dose that members of the public receive from the planned operation of a specified radiation source”, *Official Government Gazette* No. 2460/B/21.06.2019.

This Decision lays down the dose constraints for the members of the public from the planned operation of a specified radiation source, in accordance with point b of par. 1 of Article 6 of PD 101/2018.

- Decision 4c/261/2019, “Specific measures for the safe management and control of high-activity sealed sources”, *Official Government Gazette* No. 2460/B/21.06.2019.

This Decision specifies, in line with point a of Article 87 of PD 101/2018, the measures to be taken by organisations possessing high-activity sealed sources for their safe management and control, including cases where these sources are no longer in use.

- Decision 4d/261, “Determination of the ways that individual monitoring results are submitted to EEAE”, *Official Government Gazette* No. 2460/B/21.06.2019.

This Decision defines the means of disposal and submission of individual monitoring results based on individual measurements performed by a dosimetry service, or estimates derived from either individual measurements taken from other exposed workers or from workplace monitoring results or using calculation methods approved by EEAE.

Radioactive waste management

Ministerial Decision 97529/2020, “National Programme for the management of spent fuel and radioactive waste – Second version”, Official Government Gazette No. 4317/B/02.10.2020.

This Decision lays down the methodology for the implementation, through specific objectives, of the national policy for the responsible and safe management of spent fuel and radioactive waste in compliance with the corresponding requirements of Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, OJ L 199 (2 Aug. 2011). The National Programme is a key reference for the bodies involved in the practical implementation of the national policy and covers all types, currents and stages of spent fuel and radioactive waste management under the jurisdiction of the Greek State, from production to disposal.

Slovak Republic

Nuclear installations

The amendment of the Act No. 541/2004 Coll. on the Peaceful Use of Nuclear Energy (Atomic Act) and on amendments and alterations of several acts as amended, elaborated by the Members of Parliament, was published in the *Collection of Laws of the Slovak Republic* under No. 363/2021 and entered into force on 12 October 2021. The purpose of this amendment is to create conditions for the specific approval procedure of the siting of the nuclear installation by the “envelope method”. The siting process in this case will be stricter and be undertaken on two consequent levels. The amendment will enable fluent progress of the project for a new nuclear installation in the location Jaslovske Bohunice. Also, this amendment will contribute to the rectification of findings of the Compliance Committee of the Aarhus Convention in case ACCC/C/2013/89/Slovakia by removing contested parts of the Atomic Act.

International co-operation

After successful negotiations, on 22 September 2021 during the 65th General Conference of the International Atomic Energy Agency, a Memorandum of Understanding between the United States Nuclear Regulatory Commission and the Nuclear Regulatory Authority of the Slovak Republic was entered into for the exchange of technical information and co-operation in nuclear safety matters. The scope of the Memorandum comprises mainly:

- unclassified technical information exchange;
- co-operation in nuclear safety research; and
- training and assignments.

The Memorandum was concluded for five years of validity and parties will protect the information obtained in accordance with the terms of this Memorandum after this Memorandum is no longer effective, has expired or has been terminated, unless the participants jointly determine otherwise in writing.

United States

Nuclear installations

NuScale Small Modular Reactor Design Certification

On 1 July 2021, the United States (US) Nuclear Regulatory Commission (NRC) solicited public comment on a proposed rule to certify NuScale’s small modular reactor (SMR) design for use in the United States.³ NuScale submitted an application for design certification on 31 December 2016, the first SMR design reviewed by the NRC. The design utilises natural, “passive” processes such as convection and gravity in its operating systems and safety features, while producing approximately 600 megawatts of electricity. The design includes several first-of-a-kind approaches for safety functions, resulting in no need for emergency diesel generators, no need for pumps to inject water into the core for post-accident coolant injection, and reduced need for control room staffing. The SMR’s 12 modules, each producing 50 megawatts, are all submerged in a safety-related pool built below ground level. The NRC staff completed its safety evaluation of NuScale’s application in August 2020 and determined the design met the applicable requirements to proceed to design

3. NuScale Small Modular Reactor Design Certification, 86 *Federal Register* (Fed. Reg.) 34999 (1 July 2021).

certification, which is a rulemaking process that, once completed, approves the design of a nuclear power plant, thereby enabling future applicants to reference the design in applications to construct or operate a plant.

American Centrifuge Plant

On 11 June 2021, the NRC approved a licence amendment authorising the production of high-assay low-enriched uranium (HALEU) using a cascade of 16 centrifuges at the site of the proposed American Centrifuge Plant on the Department of Energy (DOE) reservation in Piketown, Ohio. The licensee for the facility is American Centrifuge Operating, LLC (ACO), a wholly-owned subsidiary of Centrus Energy Corp. In October 2019, ACO entered into a three-year contract with the Department of Energy to demonstrate the capability to produce HALEU enriched in uranium-235 up to 19.75% (the HALEU Demonstration Project). ACO previously obtained a licence to operate a centrifuge enrichment facility at this location (which, for economic reasons, was never fully constructed), but that licence did not authorise enrichment to the levels required for the HALEU Demonstration Project. After conducting safety, security, safeguards, and environmental reviews of the proposed project, the NRC staff approved a licence amendment authorising ACO to operate a 16-centrifuge cascade with enrichment levels up to 25% to allow for process fluctuations, which can create small amounts of higher weight percent material within the cascade. As of this writing, issuance of the licence is being challenged before the United States Court of Appeals for the District of Columbia Circuit.⁴

Organisation and structure

Establishment of Environmental Justice Review Team

On 23 April 2021, the Commission directed the NRC staff to conduct a systematic review of how the NRC's programmes, policies, and activities address "environmental justice," which refers to identifying and addressing disproportionately high and adverse human health or environmental effects of federal programmes, policies, and activities on minority and low-income populations. Since the issuance of Executive Order (EO) 12898 in 1994, federal agencies have been directed to "make achieving environmental justice part of its mission," to the greatest extent practicable and permitted by law.⁵ Independent executive branch agencies, such as the NRC, were not bound by the terms of EO 12898 but were requested to comply with its provisions. Since August 2004, the NRC has operated under a Commission policy statement explaining that the NRC has committed to the general goals of EO 12898 and strives to meet those goals through its existing review processes under the National Environmental Policy Act.⁶

A multidisciplinary Environmental Justice review team is tasked with assessing whether the agency appropriately considers environmental justice in its programmes, policies, and activities, and providing the results of its review and recommendations, if any, to the Commission. The NRC is also engaging with stakeholders and interested persons representing a broad range of perspectives to solicit views that will inform any subsequent Commission decisions.⁷ The results of the review are expected by February 2022.

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4. *Ohio Nuclear-Free Network v. NRC*, DC Cir. No. 21-1162 (2 Aug. 2021).
 5. Executive Order 12898 of 11 February 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Fed. Reg. 7629 (16 Feb. 1994).
 6. Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions, 69 Fed. Reg. 52040 (24 Aug. 2004).
 7. The NRC published a *Federal Register* notice in July 2021 requesting public comments to inform its assessment. Systematic Assessment for How the NRC Addresses Environmental Justice in Its Programs, Policies, and Activities, 86 Fed. Reg. 36307 (9 July 2021).

INTERGOVERNMENTAL ORGANISATION ACTIVITY

European Atomic Energy Community (Euratom)

Euratom Community activities

*Commission Decision setting up the group of experts on financial aspects of nuclear decommissioning and spent fuel and radioactive waste management*¹

The European Commission set up on 7 April 2021 the group of experts on financial aspects of nuclear decommissioning and spent fuel and radioactive waste management, which will deal with aspects such as cost estimations, financing mechanisms, fund management and their securing. The abbreviated title of the group is “Nuclear Backend Financial Aspects expert group (NuBaFA)”.

This new group of experts will take over from the former Decommissioning Funding Group, which operated on an informal basis. It provided advice on the preparation of situation reports on the national funds for decommissioning. NuBaFA will operate on a formal basis and will continue to fulfil tasks in line with Recital 23 of Commission Recommendation 2006/851/Euratom, which announced the European Commission’s intention to establish a permanent group on decommissioning funding to exchange information between national experts concerning the various approaches to, and financial arrangements for, decommissioning.²

The group will increase the focus on waste management funding aspects. In particular, NuBaFA will focus on financial aspects related to the pre-decommissioning and decommissioning of nuclear installations and other facilities using radioactive material and to the management of spent fuel and radioactive waste generated throughout the life cycle of facilities, until disposal and post-closure.

The membership of NuBaFA is composed of representatives appointed by the member states having competence in the financial aspects of nuclear decommissioning and spent fuel and radioactive waste management. The group is chaired by a representative of the European Commission’s Directorate-General for Energy.

The first meeting of the group took place on 24 June 2021. In this first meeting, the expert group adopted its rules of procedure and accepted the proposal to invite observers from the International Atomic Energy Agency, the OECD Nuclear Energy Agency, Switzerland and the United Kingdom.

The new Rules of the Euratom Supply Agency

The Euratom Supply Agency (ESA), established directly by the Euratom Treaty, has the mission to ensure a regular and equitable supply of nuclear materials, for power and non-

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1. Commission Decision C(2021) 2109 final of 7 April 2021 setting up the group of experts on financial aspects of nuclear decommissioning and spent fuel and radioactive waste management.
 2. Commission Recommendation of 24 October 2006 on the management of financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste (2006/851/Euratom), *Official Journal of the European Union (OJ)* L 330 (28 Nov. 2006), p. 31.

power applications, to all Community users. To that end, taking responsibility for the common supply policy, under Chapter 6 of the Euratom Treaty, the ESA, notably, has the power to conclude supply contracts for nuclear materials, acknowledges contracts for services in the nuclear sector and operates a Nuclear Market Observatory.

The manner in which the ESA is to balance demand against supply, in other words, how it will act as a market player, is determined by the “Rules of the Supply Agency of the European Atomic Energy Community determining the manner in which demand is to be balanced against the supply of ores, source materials and special fissile materials” (“Rules”), issued by the Agency following consultation with its Advisory Committee and subject to approval by the European Commission.

The Agency’s previous Rules, in force until 30 June 2021, were first drafted in 1960. They were partially revised in 1975 to establish a simplified procedure for the conclusion of certain supply contracts. But, since the original rules were adopted, the context in which the ESA operates has changed. In particular:

- the nuclear fuel market has evolved, becoming increasingly complex, especially as new market players (such as the intermediaries) and new trade practices (book transfers, electronic trading or bundled contracts) have emerged that needed to be taken due account of; and
- the Agency’s 2008 Statutes enhanced significantly its market-monitoring role and its duty to provide relevant expertise, information and advice to the Community, hence rendering it necessary to improve the collection of the required market data.

For these reasons, new Rules were adopted by the ESA in 2021,³ subsequently approved by the Commission,⁴ and then entered into force in July 2021. The new Rules aim to respond to the needs identified by appropriately taking into account the new market realities and the Agency’s missions. Moreover, they aim to increase legal certainty in the interest of the industry, Euratom member states, the ESA and the European Commission. In particular, they:

- provide new definitions in order to add clarity;
- formally extend the scope of the Simplified Procedure (as opposed to the “Centralised Procedure” whereby the ESA acts as a mandatory intermediary between the parties), allowing for it to also cover special fissile materials and to apply by default, unless the regular supply is endangered;
- require a formal decision to be adopted and published before the Centralised Procedure can exceptionally apply;
- set conditions related to the Agency’s potential refusal to conclude a contract;
- specify that any modification (under whatever denomination) of a supply contract must be concluded by the ESA, in accordance with the procedure used for the original contract;
- streamline procedures for the collection of information from users and producers, in the interest of clarity and of more efficient data collection; and
- advise intermediaries on information they should provide.

3. Decision of the Supply Agency of the European Atomic Energy Community adopting the Agency Rules determining the manner in which demand is to be balanced against the supply of ores, source materials and special fissile materials, and repealing the Rules of the Supply Agency of the European Atomic Energy Community of 5 May 1960, as amended by the Regulation of 15 July 1975, OJ L 218, (18 June 2021), pp. 56-57.

4. Rules of the Supply Agency of the European Atomic Energy Community determining the manner in which demand is to be balanced against the supply of ores, source materials and special fissile materials, OJ L 218 (18 June 2021), pp. 58-64.

EU Taxonomy Regulation

Background

The EU taxonomy is a science-based transparency tool for companies and investors. It introduces clear performance criteria for determining which economic activities make a substantial contribution to the EU Green Deal objectives, i.e. make Europe the first climate-neutral continent by 2050. The EU Taxonomy Regulation,⁵ in force since 12 July 2020, establishes the EU taxonomy framework by setting out six environmental objectives:

- climate change mitigation;
- climate change adaptation;
- the sustainable use and protection of water and marine resources;
- the transition to a circular economy;
- pollution prevention and control; and
- the protection and restoration of biodiversity and ecosystems.

It also sets out four conditions that an economic activity must meet in order to qualify as environmentally sustainable:

- contribute substantially to one or more of the six environmental objectives;
- do no significant harm to any of the other environmental objectives;
- be carried out in compliance with minimum (social) safeguards; and
- comply with technical screening criteria established by the European Commission through delegated acts.

The EU Taxonomy Regulation empowers the European Commission to adopt delegated and implementing acts in order to establish the actual list of environmentally sustainable activities along with the associated technical screening criteria for each environmental objective.

Inclusion of nuclear energy in EU Taxonomy

Inclusion or exclusion of nuclear energy in the EU taxonomy was a debated subject throughout the negotiations on the EU Taxonomy Regulation. While there are indirect references in the regulation to the issue of nuclear energy (including on radioactive waste), co-legislators ultimately left the assessment of nuclear energy to the European Commission as part of its work on the delegated acts establishing the technical screening criteria.

The Technical Expert Group on Sustainable Finance (TEG) was tasked with advising the European Commission on the technical screening criteria for the first two environmental objectives: climate change mitigation and climate change adaptation. It reviewed energy generation activities such as solar photovoltaic, wind power, hydropower and nuclear energy. Although the TEG recognised nuclear energy as “climate-neutral energy”, it did not provide a conclusive recommendation on nuclear energy and indicated that a further assessment of the “do no significant harm” aspects of the nuclear energy life cycle, and in particular the disposal of radioactive waste, was necessary.

5. Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, OJ L 198 (22 June 2020), pp. 13-43. More information on the EU Taxonomy is available at EC (n.d.), “EU taxonomy for sustainable activities”, https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en (accessed 30 Nov. 2021).

JRC report on the “do no significant harm” (DNSH) aspects of nuclear energy

As the in-house science and knowledge service of the European Commission with extensive technical expertise on nuclear energy and technology, the TEG invited the Joint Research Centre (JRC) to draft a technical assessment report on the “do no significant harm” aspects of nuclear energy, including those related to the long-term management of high-level radioactive waste and spent nuclear fuel.⁶

The report includes an extensive review of the current environmental and nuclear legal frameworks both at the international and EU level featuring international agreements, standards and tools, Euratom and EU Directives, and the national nuclear legislative and regulatory frameworks.⁷ It also offers a comparative analysis of the legal frameworks for carbon capture and sequestration and radioactive waste and spent fuel disposal, as well as a comparative analysis of the legal frameworks for management of radioactive waste and hazardous waste.

Two expert groups – the Group of Experts on radiation protection and waste management under Article 31 of the Euratom Treaty⁸ and the Scientific Committee on Health, Environmental and Emerging Risks (SCHEER)⁹ – were tasked to review the JRC report by the end of June 2021.

Next steps in developing the EU Taxonomy

Given the inconclusiveness of the TEG on nuclear energy, the EU will adopt consecutive delegated acts supplementing the EU Taxonomy Regulation. A first delegated act on sustainable activities for climate change adaptation and mitigation objectives, the EU Taxonomy Climate Delegated Act,¹⁰ was adopted on 4 June 2021 and entered into force on 1 January 2022. As for other activities like specific energy sectors, the European Commission informed that it:

will adopt a complementary Delegated act ... covering activities not yet covered in the EU Taxonomy Climate Delegated Act such as agriculture, certain energy sectors and certain manufacturing activities. This complementary Delegated Act will cover nuclear energy subject to and consistent with the results of the specific review process underway in accordance with the EU Taxonomy Regulation. This process is based on the independent and scientific technical report published in March

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6. Abousahl, S. et al. (2021), *Technical assessment of nuclear energy with respect to the ‘do no significant harm’ criteria of Regulation (EU) 2020/852 (‘Taxonomy Regulation’)*, Publications Office of the European Union, Luxembourg.
 7. *Ibid.*, “Annex 1: Legal and regulatory background of nuclear energy”, pp. 304 to 342.
 8. “Opinion of the Group of Experts referred to in Article 31 of the Euratom Treaty on the Joint Research Centre’s Report Technical assessment of nuclear energy with respect to the ‘do no significant harm’ criteria of Regulation (EU) 2020/852 (‘Taxonomy Regulation’)”, adopted on 28 June 2021, available at: https://ec.europa.eu/energy/sites/default/files/opinion_of_article_31_goe_on_the_jrc_report_28_june_2021.pdf.
 9. Scientific Committee on Health, Environmental and Emerging Risks, SCHEER (2021), “SCHEER review of the JRC report on Technical assessment of nuclear energy with respect to the ‘do no significant harm’ criteria of Regulation (EU) 2020/852 (‘Taxonomy Regulation’)”, available at: https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/210629-nuclear-energy-jrc-review-scheer-report_en.pdf.
 10. Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives, C(2021)2800 final, OJ L 442 (9 Dec. 2021).

2021 by the Joint Research Centre, the European Commission's science and knowledge service.¹¹

Regarding the timeline of the complementary delegated act addressing certain energy sectors such as nuclear energy, the European Commission reported that it:

will adopt this complementary Delegated Act as soon as possible after the end of the specific review process expected in summer 2021. [Finally a] separate Delegated Act will cover activities making a substantial contribution to the other four environmental objectives as set out in the EU Taxonomy Regulation (sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, protection and restoration of biodiversity and ecosystems).¹²

International Atomic Energy Agency

Nuclear safety

Outreach on the Convention on Nuclear Safety

The Agency facilitated a virtual Educational Workshop on the Convention on Nuclear Safety (CNS)¹³ from 13 to 17 September 2021. The workshop was focused on contracting parties that recently joined the CNS or have difficulties fulfilling their obligations under the Convention, especially embarking ones, such as Angola, Congo, Cuba, Kuwait, Madagascar, Montenegro, Syria, Qatar and Uruguay, to enhance their participation in the peer review and understanding of their obligations.

Open-ended Meeting of Legal and Technical Experts on Implementation of the Guidance on the Management of Disused Radioactive Sources

The Agency hosted virtually an Open-ended Meeting of Legal and Technical Experts on Implementation of the Guidance on the Management of Disused Radioactive Sources from 17 to 20 August 2021. The objective of the meeting was to share with member states the results of the four Regional Virtual Meetings on the Implementation of the Guidance on the Management of Disused Radioactive Sources that took place in Africa, Asia, Europe and the Pacific and the Americas, as well as to further discuss the challenges in this area faced by regulatory bodies and other stakeholders.

Nuclear security

Outreach on the Convention on the Physical Protection of Nuclear Material (CPPNM) and its Amendment

From 2 to 6 August 2021, the IAEA hosted a series of webinars to promote adherence to and full implementation of the CPPNM¹⁴ and its Amendment.¹⁵ Information was provided on the scope and obligations of, as well as the benefits of joining, the CPPNM and its

11. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – EU Taxonomy, Corporate Sustainability Reporting, Sustainability Preferences and Fiduciary Duties: Directing finance towards the European Green Deal, COM(2021)188 final (21 Apr. 2021), pp. 6-7.

12. *Ibid.*, p. 7.

13. Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, 1963 UNTS 293, entered into force 24 Oct. 1996.

14. Convention on the Physical Protection of Nuclear Material (1980), IAEA Doc. INFCIRC/274 Rev. 1, 1456 UNTS 125, entered into force 8 Feb. 1987 (CPPNM).

15. Amendment to the Convention on the Physical Protection of Nuclear Material (2005), IAEA Doc. INFCIRC/274/Rev.1/Mod.1, entered into force 8 May 2016.

Amendment, on synergies between the CPPNM and its Amendment and the International Convention for the Suppression of Acts of Nuclear Terrorism,¹⁶ on establishing a national legal and regulatory framework to implement the CPPNM and its Amendment, and on the IAEA's available legislative and technical assistance. Nearly 200 participants from 61 states took part in the webinar series.

The IAEA further continued to promote universal adherence to the CPPNM and its Amendment through virtual regional and national workshops.

IAEA General Conference Side Events on Preparations for the 2022 Conference of the Parties to the Amendment to the CPPNM and on Strengthening Global Nuclear Security

During the 65th General Conference, the designated Co-Presidents of the 2022 Conference of the Parties to the Amendment to the CPPNM gave a briefing to provide information and updates on the preparations for the Conference, which is scheduled to take place from 28 March to 1 April 2022. In addition, the European Union, in co-operation with the IAEA, organised a side event focused, *inter alia*, on the importance of universal adherence to and full implementation of the CPPNM and its Amendment as a fundamental aspect of strengthening global nuclear security.

Nuclear liability

The Bureau of the Second Meeting of the Contracting Parties and Signatories to the Convention on Supplementary Compensation for Nuclear Damage (CSC)¹⁷ held several virtual meetings since the preparatory meeting in February 2021 to discuss the arrangements for the Second Meeting, which is expected to be held in person in 2022.

The IAEA in co-operation with the Government of Indonesia organised a Sub-regional Virtual Workshop on Civil Liability for Nuclear Damage for ASEAN Plus Three from 29 June to 1 July 2021. The workshop, addressing the international nuclear liability regime, with a focus on the CSC, was implemented by the Secretariat together with expert members of the IAEA International Expert Group on Nuclear Liability.

65th session of the IAEA General Conference

The 65th regular session of the IAEA General Conference was held in a hybrid format in Vienna, Austria, from 20 to 24 September 2021. This year, around 1 670 delegates registered to attend the General Conference from 148 of the IAEA's 173 member states and from international organisations, non-governmental organisations and the media. A total of 83 side-events took place during the week, highlighting the innovative work underway at the IAEA and in member states using nuclear techniques.

Resolutions of the Conference

A number of resolutions were adopted by the Conference. As in previous years, resolution GC(65)/RES/8 on Nuclear and Radiation Safety, as well as resolution GC(65)/RES/9 on Nuclear Security, include sections that are of legal relevance. All resolutions adopted during the 65th regular session of the General Conference are available on the IAEA website.

- **Nuclear and Radiation Safety (GC(65)/RES/8)**

Regarding the CNS, the General Conference urged "all Member States that have not yet done so, especially those planning, constructing, commissioning or operating nuclear power plants, or considering a nuclear power programme, to become Contracting Parties to the

16. International Convention for the Suppression of Acts of Nuclear Terrorism (2005), 2445 UNTS 137, entered into force 7 July 2007.

17. Convention on Supplementary Compensation for Nuclear Damage (1997), IAEA Doc. INFCIRC/567, 36 ILM 1473, entered into force 15 Apr. 2015.

CNS”. Concerning the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management,¹⁸ the Conference likewise urged “all Member States that have not yet done so, particularly those managing radioactive waste or spent fuel, to become Contracting Parties to the Joint Convention”.

The Conference stressed “the importance of CNS and Joint Convention Contracting Parties fulfilling their respective obligations stemming from these Conventions and reflecting these in their actions to strengthen nuclear safety and in particular when preparing National Reports, and actively participating in peer reviews for CNS and Joint Convention Review Meetings”. In addition, the Conference requested “the Secretariat to provide full support for the CNS and Joint Convention Review Meetings, and to consider addressing their outcomes in the Agency’s activities, as appropriate and in consultation with Member States”.

The Conference further urged “all Member States that have not yet done so to become Contracting Parties to the Early Notification Convention and the Assistance Convention”, and stressed “the importance of Contracting Parties fulfilling the obligations stemming from these Conventions, and actively participating in regular meetings of the Representatives of Competent Authorities”.

In this context, the Conference requested “the Secretariat, in collaboration with regional and international organisations and Member States, to continue its activities to promote the importance of conventions concluded under the auspices of the IAEA and to assist Member States upon request with adherence, participation and implementation as well as strengthening of their related technical and administrative procedures”.

With respect to the Code of Conduct on the Safety and Security of Radioactive Sources,¹⁹ its Guidance on the Import and Export of Radioactive Sources,²⁰ and its Guidance on the Management of Disused Radioactive Sources,²¹ the General Conference encouraged “all Member States to make political commitments to the non-legally binding Code of Conduct on the Safety and Security of Radioactive Sources, and its Guidance on the Import and Export of Radioactive Sources, and its Guidance on the Management of Disused Radioactive Sources, and to implement these, as appropriate, in order to maintain effective safety and security of radioactive sources throughout their life cycle”. The Conference also requested “the Secretariat to continue supporting Member States in this regard”.

Similarly, the Conference encouraged member states “to apply the guidance of the Code of Conduct on the Safety of Research Reactors at all stages in their life, including planning” and “to freely exchange their regulatory and operating information and experience with regard to research reactors”. In this context, the Conference requested the Secretariat “to continue to support Member States, upon request, in [the] application of the guidance of the Code of Conduct on the Safety of Research Reactors”.

With regard to civil liability for nuclear damage, the General Conference encouraged “Member States to give due consideration to the possibility of joining the international nuclear liability instruments, as appropriate, and to work towards establishing a global nuclear liability regime”.

In this context, the Conference requested “the Secretariat, in coordination with the OECD/NEA when appropriate, to assist Member States, upon request, in their efforts to adhere to any international nuclear liability instruments concluded under the auspices of

18. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997), IAEA Doc. INFCIRC/546, 2153 UNTS 357, entered into force 18 June 2001 (Joint Convention).

19. IAEA (2004), *Code of Conduct on the Safety and Security of Radioactive Sources*, IAEA Doc. IAEA/CODEOC/2004, IAEA, Vienna.

20. IAEA (2012), *Guidance on the Import and Export of Radioactive Sources*, IAEA Doc. IAEA/CODEOC/IMO-EXP/2012, IAEA, Vienna.

21. IAEA (2018), *Guidance on the Management of Disused Radioactive Sources*, IAEA Doc. IAEA/CODEOC/MGT-DRS/2018, IAEA, Vienna.

the IAEA or the OECD/NEA, taking into account the recommendations of the INLEX²² in response to the IAEA Action Plan on Nuclear Safety”. In addition, the Conference recognised “the valuable work of INLEX”, took note “of its recommendations and best practices on establishing a global nuclear liability regime, including through the identification of actions to address gaps in and enhance the existing nuclear liability regimes”, encouraged “the continuation of INLEX, especially for its support for the IAEA’s outreach activities to facilitate the achievement of a global nuclear liability regime” and requested “that INLEX, via the Secretariat, informs Member States on a regular and transparent basis about the work of INLEX and its recommendations to the Director General”.

- Nuclear Security (GC(65)/RES/9)

In the context of nuclear security, the Conference affirmed “the central role of the Agency in strengthening the nuclear security framework globally and in coordinating international activities in the field of nuclear security, while avoiding duplication and overlap”. The Conference called upon the Secretariat “to continue to organize [International Conference on Nuclear Security: Sustaining and Strengthening Efforts] ICONS every four years”. In addition, the Conference welcomed “the ongoing preparatory process for the 2022 Conference, which is being convened in accordance with article 16.1 of the CPPNM, as modified by its 2005 Amendment”, and encouraged “all States Parties and EURATOM to engage actively”.

The Conference also encouraged “all Parties to the CPPNM and its 2005 Amendment to fully implement their obligations thereunder” and encouraged “States that have not yet done so to become party to this Convention and its Amendment”. It further encouraged “the Agency to continue efforts to promote further adherence to the Amendment with the aim of its universalization”.

The Conference welcomed “the organization by the Secretariat of CPPNM meetings” and encouraged “all Parties to the Convention to participate in relevant meetings” as well as reminded “all Parties to inform the depositary of their laws and regulations which give effect to the Convention”.

IAEA Treaty Event

The eleventh Treaty Event took place during the 65th regular session of the Agency’s General Conference. It provided member states with a further opportunity to deposit their instruments of ratification, acceptance or approval of, or accession to, the treaties deposited with the Director General, including those related to nuclear safety, security and civil liability for nuclear damage. At the Treaty Event, Zimbabwe deposited instruments of ratification of the Convention on Early Notification of a Nuclear Accident²³ and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency,²⁴ as well as instruments of accession to the Joint Convention and the CPPNM.

Legislative assistance

Given the ongoing pandemic, the Agency continued to provide legislative assistance to member states to support the establishment of adequate national nuclear legal frameworks and to promote adherence to relevant international legal instruments, through national workshops, review of legislation and awareness raising activities, mainly in a virtual format. In addition, during 2021, three virtual regional workshops on nuclear law were successfully implemented for member states in Africa and Latin America and the Caribbean, and one is planned for the last quarter.

22. INLEX is the IAEA’s International Expert Group on Nuclear Liability.

23. Convention on Early Notification of a Nuclear Accident (1986), IAEA Doc. INFCIRC/335, 1439 UNTS 276, entered into force 27 Oct. 1986.

24. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986), IAEA Doc. INFCIRC/336, 1457 UNTS 134, entered into force 26 Feb. 1987.

The Nuclear Law Institute, which was planned to be held in Vienna, Austria, from 4 to 15 October 2021, had to be postponed due to the continuing Global COVID-19 pandemic. However, alternative training opportunities in nuclear law are available to member states, including through a series of eight topical webinars that started on 28 October 2021. Conducted within the framework of the IAEA legislative assistance programme, the webinars will address a number of topical issues in nuclear law.

OECD Nuclear Energy Agency

2004 Protocols to amend the Paris and Brussels Supplementary Conventions entered into force on 1 January 2022

The Protocols to amend the Paris Convention on Third Party Liability in the Field of Nuclear Energy and the Brussels Convention Supplementary to the Paris Convention were formally ratified in Paris on 17 December 2021 at the OECD headquarters by all the contracting parties, except for the Republic of Türkiye, which deposited its instrument of ratification on 4 January 2022. The Protocols entered into force on 1 January 2022.

These revised conventions combined ensure that those suffering damage resulting from an accident in the nuclear energy sector will be able to seek more compensation; the operator liability will be of at least EUR 700 million under the Paris Convention and the public funds provided under the Brussels Supplementary Convention will complement up to EUR 1.5 billion, a sharp increase from the previous 5 million Special Drawing Rights (SDR) (approximately EUR 6.2 million as of 4 January 2022) and SDR 125 million (approximately EUR 155 million as of 4 January 2022) respectively. The revised Paris Convention also provides now for a minimum of EUR 70 million and EUR 80 million in case of accidents at low-risk installations and during transport of nuclear substances, respectively.

It will become the international nuclear liability regime that provides the highest guaranteed amount of compensation available in case of a nuclear accident. It is important to note, however, that a number of parties to the Paris Convention have already amended their national laws to increase the nuclear liability amounts to the required minimum or beyond, in accordance with the specificity of each country.

Claims may be filed over a longer period of time (30 years following a nuclear accident, instead of 10 years) for personal injury or loss of life, and for a wider range of damage suffered, such as economic loss, the cost of preventive measures and of measures of reinstatement of impaired environment.

The revised Paris Convention will also broaden its geographic scope allowing affected persons situated in certain countries that are not parties to the Paris Convention to make claims in case they suffer damage or loss as a result of ionising radiation emitted from an accident in a nuclear installation or the transport of nuclear substances, that are under the responsibility of a nuclear operator situated in a Paris Convention state. This will be the case, for example, of countries with no nuclear installations and countries with national nuclear liability regimes similar to the one set up by the Paris Convention that afford equivalent reciprocal benefits to the Paris Convention State where the accident occurred.

A total of 16 countries will be parties to the amended Paris Convention, covering 105 operating reactors and 7 under construction out of a total of 442 operating reactors worldwide and 51 under construction. Of those countries, 13 are also parties to the amended Brussels Supplementary Convention.

2021 International School of Nuclear Law (ISNL)

The 2021 edition of the International School of Nuclear Law (ISNL) was held from 23 August to 3 September 2021. This year's 40 participants were from very diverse countries and included graduate students and professionals from across the world to enhance their knowledge and understanding of the legal framework and major topics related to the

peaceful uses of nuclear energy. Due to the continuing worldwide public health situation, the NEA held the ISNL in a videoconference format for the first time in its 20-year history. This year's session was attended by participants from 19 countries, including several from beyond the NEA membership. Some participants received support to attend the ISNL from the International Atomic Energy Agency (IAEA), which also provided several lecturers.

Despite not being able to meet in person in Montpellier, the 2021 programme delivered on the same rigorous educational objectives as it has for the past 20 years through a mixture of live programming, pre-recorded video lectures, group assignments, preparatory coursework, digital resources and social engagement. Comprehensive lectures were delivered by specialists in nuclear law from international organisations, governments, academia and private industry. The course lectures focused on areas such as nuclear safety, environmental law, security, safeguards and nuclear liability.

While the programme itself has concluded, many participants are continuing their studies by completing a multiple choice test and writing dissertations on a topic relevant to international nuclear law in order to apply for the University Diploma (*Diplôme d'université* – D.U.) in International Nuclear Law from the University of Montpellier.

Meeting of the NEA Working Party on Nuclear Liability and Transport (WPNLT)

The WPNLT organised its sixth meeting, remotely, on 23-24 November 2021 to discuss and review its ongoing work on the practical challenges related to the nuclear liability regimes applicable to transport and transit of nuclear substances. The meeting gathered more than 40 participants representing 14 member countries, 1 non-NEA member country, the European Commission and the Centre for International Law of the National University of Singapore. Representatives from the nuclear insurance industry, the International Nuclear Law Association (INLA), the World Nuclear Association (WNA) and the World Nuclear Transport Institute (WNTI) also participated.

The working party continued examining the challenges relating to the qualification of nuclear substances to be transported and discussed the path forward following the workshop on “The Qualification of Nuclear Substances and Nuclear Liability” held on 29-30 March 2021. Members also discussed the topic of denial of shipments with an overview of the relevant issues given by the EC, WNA and WNTI, and delegations presented on matters relating to their respective national legal and regulatory frameworks related to nuclear transport activities. Finally, an interactive discussion session was organised to exchange on a case study relating to the insurance coverage for a transboundary carriage of nuclear substances/material transiting through countries with different nuclear liability amounts and financial security limits.

The WPNLT was established in 2016 to examine issues relating to the interpretation and application of international nuclear liability instruments to nuclear transport. The working party promotes the exchange of legal information relating to nuclear liability as applicable to nuclear transport and the sharing of related experience among member countries. For this purpose, several country sheets on national legislation and regulations applicable to nuclear transport and transit were published on the NEA website at: www.oecd-nea.org/jcms/pl_51360/legislation-and-rules-applicable-to-nuclear-transport-and-transit.

NEA publications of interest

Since the publication of *Nuclear Law Bulletin* No. 106, the NEA has issued a number of publications of interest, many having to do with the topic of nuclear energy and climate change, which the NEA has been actively working on for over a decade. It is featured in a wide range of NEA publications and reports that provide analysis and advice for policymakers and the energy industry, and most notably in the following three reports.

Nuclear Energy in the Circular Carbon Economy (CCE) highlights the potential role of nuclear in contributing to the circular carbon economy as a low-carbon source of electricity, but also as a source of heat and system integration services. It further highlights the essential role played by the existing nuclear reactor fleet in supporting the resilience of the electricity

system through the COVID-19 crisis, and the significant role that the nuclear sector can play in post-COVID-19 recovery efforts.

Nuclear Energy: An ESG Investable Asset Class was developed from discussions of a finance industry taskforce convened by the Economic Modelling Work Group of the Generation IV International Forum (GIF) to consider the nuclear industry's ability to report against Environmental, Social and Governance data collection and accounting metrics (ESG), and therefore whether nuclear energy should be considered as an investable asset class, thereby allowing nuclear companies and projects to access climate finance. ESG reporting is undertaken by individual companies and projects rather than by an industry as a whole. This publication is, therefore, intended to provide guidance to the finance community and wider stakeholders on how nuclear assets could report against ESG, rather than removing the requirement for each company to report against ESG. This report establishes not only how nuclear energy, as an asset class, has the potential to report well against a wide range of ESG; it highlights the importance of wide ranging, consistent and standardised ESG reporting to determine the credentials of all energy companies across their lifecycles and throughout their supply chains.

The long-term operation (LTO) of nuclear power plants is a topic of growing interest as more and more countries using nuclear energy are committing to increasingly ambitious decarbonisation targets. Decisions regarding extending the operating licences for these facilities are complex and require the simultaneous evaluation of multiple factors. In response to this growing interest, the NEA published in 2019 *Legal Frameworks for Long-Term Operation of Nuclear Power Reactors*, a first-of-a-kind report that provides a comprehensive review of the legal and regulatory implications of LTO of nuclear reactors. Consistent with the holistic approach necessary for LTO of nuclear reactors, *Long-Term Operation of Nuclear Power Plants and Decarbonisation Strategies* addresses the key policy, regulatory, technical, human and economic aspects necessary to enable licence extensions during the transition towards a low-carbon economy. This publication is crucial for two reasons. First, with an average age of more than 30 years, the bulk of the existing nuclear fleet worldwide will inevitably be faced with operation decisions in the next decade. Second, the timeline is becoming tighter to achieve carbon neutrality because of the increase in government pledges to reach such objectives sooner, and in most cases by 2050.

NEWS BRIEFS

2022 Fundamentals of International Nuclear Law

The first edition of the Fundamentals of International Nuclear Law (FINL) course was held on 16-18 February 2021. The FINL is an online course developed by the NEA to provide a high-level, introductory review of the central aspects of international nuclear law in a condensed, three hours per day programme. In particular, it was developed to provide a virtual educational offering, as a complement to the NEA's in-person education programmes, to ensure continuity in its mission of providing nuclear law information and education during the global pandemic.

The NEA's one-week in-person programme, the International Nuclear Law Essentials, has once again been cancelled for 2022. Instead, another edition of the FINL will be held on 14-18 February 2022, with 14 February featuring a welcome and introductory session where the participants can meet each other and some of the lecturers in an informal atmosphere, while the academic programme will run 15-18 February. The FINL will take place entirely online on the teleconferencing platform Zoom. Selected participants are expected to attend the entire 5-day programme.

The 2022 FINL was designed to accommodate the needs and interests of professionals working in the nuclear field and graduate students enrolled in an energy or international law-related LLM programme. The course will be limited to 40 participants.

2021 Nuclear Inter Jura Virtual Congress

Due to the coronavirus pandemic, the International Nuclear Law Association (INLA) Congress that was expected to take place in Washington, DC in October 2020 was postponed and instead a virtual Congress was held on 26-27 October 2021. The Virtual Congress presented key international industry speakers and representatives of the INLA working groups, all touching on important current day legal issues impacting global nuclear energy management and performance. INLA Virtual Inter Jura Congress 2021 topics, while acknowledging the first 50 years of INLA, particularly considered the next 50 years of nuclear energy law.

The Virtual Inter Jura Congress 2021 was divided into four sessions, two each day, of approximately two-three hours for each session, with principal speakers leading off each session followed by discussions and presentations on topics of note in co-ordination with INLA working groups.

- Working Group (WG) 1 (Safety and Regulation) and new WG8 (Nuclear Fusion) joined their sessions to conduct a panel session that looked at the licensing and regulatory aspects of fusion, as well as topical issues in relation to small modular reactors (SMRs) and lifetime extensions.
- WG2 (Nuclear Liability and Insurance) considered why nuclear liability is important to help develop new technologies and some of the current governmental initiatives, as well as the practical arrangements of claims handling and how the insurance sector is getting prepared to deal with a massive amount of claims.
- WG3 (International Nuclear Trade / New Build) addressed the evolution of new build, specifically new geographies and new technologies. WG3 speakers explored the

prospects for the use and regulation of SMR technology in new geographies ranging from space to the oil patch in Western Canada, ASEAN, and emerging economies.

- WG4 (Radiological Protection) addressed current issues reflecting the present status and/or the future developments of interest for the radiation protection community and others who might influence the overall quality of the global radiation protection framework.
- WG5 (Waste Management) presented a comparison of the regulation for decommissioning in several EU member states, triggering a discussion on its impact. The possibilities/advantages of a regional repository were also presented, as well as the siting process of a surface repository in Australia.
- WG6 (Nuclear Security and Non-Proliferation) presented its recently revised objectives and terms of reference and suggested a few possible topics for discussion with a view to consolidating its membership, develop its work plan and prepare for the 2022 INLA Congress.
- WG7 (Transport) discussed current issues and best practices for transport of radioactive waste and materials, including use of standard terms, and addressed transport issues for decommissioning projects and next-generation fuels.

The INLA Virtual Inter Jura Congress 2021 served as a step towards the full in-person INLA Inter Jura Congress 2022 to be held in Washington, DC, in the fall of 2022.

RECENT PUBLICATIONS

***Principles and Practice of International Nuclear Law* (OECD Publishing, 2022), edited by Kimberly S. Nick and Stephen G. Burns**

by Paul Bowden*

Principles and Practices of International Nuclear Law has been published at an opportune moment. In this century so far the prospects for the nuclear energy sector, even its future, have seemed to be ever-changing. This is despite – or perhaps because of – three constants of the past two decades:

- the continuous and accelerating global demand for energy;
- the imperative to shift, at speed and scale, from unabated fossil fuel sources to mitigate global climate change; and
- the need for public acceptance of nuclear technologies to be part of the solution to these challenges, paying particular regard to the, not unconnected, issues of safety and affordability.

These three constants have played out, for example, in national plans to extend the operating life of ageing nuclear power plants; the greater urgency to put in place both engineering and financial measures for long-term radioactive waste management; universal industry and governmental openness to public participation in decisions to allow nuclear projects; a more intense focus on nuclear security and non-proliferation in cross-border transfers of technology; and, not least, in technological innovation with the development of more diverse, variable scale and cost-effective forms of nuclear power generation, be they fleets of small modular reactors or “pink hydrogen” production plants.

These are not just jobs for engineers. They are equally tasks for lawyers. One of the biggest tasks for those who practice law in the nuclear sector is helping to design and operationalise the new “legal infrastructures” (particularly in the areas of plant licensing, project development and international trade) that are needed to deliver the physical infrastructures that are to be created and rolled out within the nuclear energy sector.

This, in turn, raises questions about what being a “nuclear lawyer” means today. It perhaps now means more than simply having an understanding and expertise in the great body of law, special to nuclear activities, which are conventionally put under safety, security, safeguards and nuclear liability law. It is having that understanding and expertise seated within a wider skill set which includes regulatory theory, administrative law, environmental law, commercial contracting, project finance, energy pricing and regulation, intellectual property law, dispute resolution processes, shipping and transport law, international criminal law and international trade law. This is what the practice of nuclear law means for many today and that is an insight that informs much of *Principles and Practice*

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of *International Nuclear Law* and what is contained in its 500 and more pages. It is a major work both in its treatment of the principles of what is traditionally regarded as nuclear law and also in its exploration of the now all-important cross-overs and connections with other areas of substantive law and legal practice. The result is a book that is both scholarly and vocationally educational and provides a contemporary and enlarged perspective of nuclear law. This accomplishment speaks to the keen insight of its editors, Nick and Burns.

With 25 different authors representing the NEA, the International Atomic Energy Agency (IAEA), the European Commission (EC), leading nuclear regulatory agencies, government authorities, academia and private practice, among others, this book brings together many of today's leading experts in the field of international nuclear law. The book contains 6 chapters and 19 articles covering the legal aspects of radiological protection, nuclear safety, environmental protection, nuclear transport, nuclear security, nuclear safeguards, nuclear third party liability and compensation for nuclear damage, insurance, nuclear trade and project development.

Most of the authors are either current or former lecturers at the International School of Nuclear Law (ISNL), the premier learning forum in the field for graduate students and professionals from around the world. Since it was established in 2001 by the NEA in co-operation with the University of Montpellier, more than 1 100 participants have graduated from this programme. As such, it seems fitting that the book begins with a history of the ISNL in Chapter 1.

Chapter 2 contains an introduction to nuclear law, featuring articles about the IAEA, the NEA, and the EC and Euratom. As the key international and regional institutions in the field of nuclear energy law and policy, a clear and complete treatment of their roles and functions is a necessary foundation before embarking on the rest of the book. This chapter concludes with an article discussing the impact of major nuclear power plant accidents on the international legal framework for nuclear power.

Chapter 3 provides a full review of the international system of radiological protection, written by two NEA technical experts in the subject. Two IAEA legal experts joined together with a leading national regulatory lawyer to provide both the theory and the practice of the international legal framework on nuclear safety. This article builds on the version originally published by the NEA in 2010 in *International Nuclear Law: History, Evolution and Outlook*, and examines the developments, challenges and opportunities that have arisen since that time and also considers newly emerging trends that may bear on the international framework for nuclear safety. This is followed by the first comprehensive study on the regulation, licensing and oversight of nuclear activities co-authored by four experts in the field, nationally and internationally. Full of practical insights, this article not only addresses construction and operation of nuclear power plants, but also decommissioning and radioactive waste management, the importance of public participation and stakeholder involvement, as well as matters of Indigenous rights and responsible business conduct. The chapter closes with a first-of-a-kind article on nuclear activities and environmental protection, which details the development, current status and future of environmental protection for nuclear activities not through the lens of the environmental lawyer, but rather the nuclear lawyer. It articulates the overarching legal framework and three key practical doctrines, details the historical development of environmental protection for nuclear activities and specifically the treaties and conventions, and concludes with a review and a look to the future.

Chapter 4 turns to the second and third parts of the IAEA's 3-S model: security and safeguards. The chapter starts with the most thorough and informative treatment to date of the IAEA Code of Conduct on the Safety and Security of Radioactive Sources, co-written by the technical and legal experts of the IAEA. Next, the international regulatory framework governing the safe and secure transport of nuclear and radioactive materials is addressed with an overview of the background, law and regulations applicable to international radioactive material transports, as well as some practical aspects and challenges of radioactive material transports as affected by such regulations. Nuclear security, and in particular physical protection, illicit trafficking and nuclear terrorism, is approached from both the international and national viewpoints in the next article. The international legal framework for nuclear security is clearly articulated, with challenges and proposals to

strengthen this framework highlighted. Further, observations are made on the development of national legislative and regulatory frameworks for nuclear security. The subject of safeguards is approached from different angles in two separate articles by current and former IAEA non-proliferation and policymaking lawyers. The first of the two sets the scene, through a detailed review of the legal framework for IAEA safeguards, including implementation and analysis. The second of the two addresses legal developments in the implementation of safeguards agreements and other IAEA verification activities, with a particular look at those activities in Iraq, Democratic People's Republic of Korea and the Islamic Republic of Iran.

Transitioning away from the 3 Ss, Chapter 5 tackles nuclear third party liability and compensation for nuclear damage and insurance. In two separate articles, the legal regime for nuclear liability is laid out, including the basic principles, the different regimes and the recent entry into force of the 2004 Paris and Brussels Protocols. The following article examines the connections between the development of the civil nuclear industry, its insurance arrangements and how the insurers assisted with the creation of the nuclear liability regimes that exist today and current issues with nuclear third party liability insurance.

Finally, Chapter 6 pivots to a new subject: nuclear trade and project development. The first article provides an overview of the main stages in the development of the international nuclear control regime since the entry into force of the Treaty on the Non-Proliferation of Nuclear Weapons and sets out the main features of the current regime. The second article addresses, from a very practical point of view, the nuclear lawyer's perspective on nuclear project development.

One aim of *Principles and Practice of International Nuclear Law* is to confer essential knowledge. Numerous figures are included to illustrate key points. Included as an annex is a non-exhaustive, but still quite lengthy and useful, inventory of international instruments in the field of nuclear law. Articles are extensively cited to allow the reader to learn more through further research. The book is, however, much more than this.

What should be clear after reading this book is that nuclear law is not a patchwork of different areas of law, but rather its own type of law that requires a very specific expertise. *Principles and Practice of International Nuclear Law* is the only textbook in this field to date that succeeds in bringing together both the theory and the practice of nuclear law, the national and the international elements, the hard law and soft law, and shows how this all combines to create a coherent framework of international nuclear law. Freely available online, this should be required reading not only for those just entering the field, but also those practising attorneys who wish to have a better understanding of the overarching framework of their world.

***International Arms Control Law and the Prevention of Nuclear Terrorism* (Edward Elgar Publishing Limited, 2021), by Jonathan Herbach**

by Marc Fialkoff and Madalina Man*

In his book, *International Arms Control Law and the Prevention of Nuclear Terrorism*, Jonathan Herbach provides an in-depth history and contemporary examination of the existing international framework for nuclear security. His work tackles the complex tapestry of international instruments, recommendations, and guidance documents that support states working to ensure the physical protection and security of nuclear and other radioactive materials. Reflective in its examination and evolution of nuclear security, Herbach's analysis addresses present-day challenges with nuclear security, namely the

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existing overlapping international instruments, the use of soft law approaches for physical security of radioactive sources, and the sufficiency of international frameworks to address emerging threats to nuclear security.

Herbach discusses the international legal framework for nuclear security in the context of international arms control law, making a subtle analysis of attributes of the concept of security central to both frameworks and illustrating how the basic objectives of arms control advance nuclear security aims, thus offering a wider perspective beyond what he calls “traditional” arms control. He further examines distinguishing features of the nuclear security framework, in particular its criminal justice component, and produces a compelling analysis of its intersection with the body of counter-terrorism treaties.

Skilfully framing nuclear security in the broader context of non-proliferation and international security, tracing its evolution back to the Treaty on the Non-Proliferation of Nuclear Weapons, Herbach explores how recommendations evolved to become the Convention on the Physical Protection of Nuclear Materials and subsequent International Atomic Energy Agency (IAEA) recommendations. Acknowledging the events of 11 September 2001 as a watershed moment in nuclear security, he analyses subsequent instruments such as the International Convention for the Suppression of Acts of Nuclear Terrorism, the Amendment to the Convention on the Physical Protection of Nuclear Materials, and the overlapping nature of these instruments. Although he focuses on hard law treaties and conventions, Herbach also explores the concept of soft law and its manifestation in the *Code of Conduct on the Safety and Security of Radioactive Sources*. On this point, Herbach addresses the role of soft law (such as the *Code of Conduct* and IAEA nuclear security guidance documents) and its ability to influence IAEA member states’ support of the objectives of nuclear security. Herbach acknowledges the flexibility of the legal framework for nuclear security to accommodate changing circumstances reflected in the multifaceted approach embodied in the concept of “governance”, which covers a multitude of tools that the book examines, from legally binding treaties and agreements to soft law, international organisations, and initiatives.

Recognising the myriad approaches and instruments involved in nuclear security, Herbach examines not only the text of these documents but also the implementation challenges. Highlighting issues such as criminalisation of nuclear security offences, the role of international organisations such as the IAEA in enforcing international obligations, and evolving threats that require re-evaluation of the nuclear security framework, Herbach’s work offers the reader an opportunity to contemplate the future of the legal framework for nuclear security. The book is an essential reference for nuclear security professionals and legal experts working in the field of nuclear law.

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