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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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In search of the elusive conflict: The (in-)compatibility of the Treaties on the Non-Proliferation and Prohibition of Nuclear Weapons

by Michael J. Moffatt*

I. Introduction

“In the long run, international law, and with it the stability of the international order which it is intended to govern, are bound to suffer from the continuing difference of views with regard to the legal status of weapons as deadly as nuclear weapons. It is consequently important to put an end to this state of affairs: the long-promised complete nuclear disarmament appears to be the most appropriate means of achieving that result.”¹

Viewed against the backdrop of the International Court of Justice (ICJ) opinion on the legality of the threat or use of nuclear weapons, there is little reason to take measures directed towards complete nuclear disarmament, i.e. elimination, lightly. If it is international law itself and the “stability of the international order” that are at stake, every initiative designed to “end ... this state of affairs” deserves careful consideration.

In the nearly 50 years that have passed since parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)² expressed their desire to eliminate nuclear weapons³ and entered into an obligation to negotiate and conclude a treaty to that end,⁴ there has been little progress towards fulfilling it. The recently adopted Treaty on the Prohibition of Nuclear Weapons (TPNW)⁵ represents the first instrument comprehensively prohibiting and devising a model for the total elimination of nuclear weapons. At the negotiating conference, 122 states voted in favour of the Treaty with 1 abstention and 1 negative vote.⁶ A total of 70 states have signed the TPNW, and to

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1. UNGA Doc. A/51/218, annex, p. 34, para. 98; see also *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, ICJ Reports 1996*, p. 226 (“Nuclear Weapons Advisory Opinion”).
2. Treaty on the Non-Proliferation of Nuclear Weapons (1968), IAEA Doc. INFCIRC/140, 729 UNTS 169, entered into force 5 Mar. 1970.
3. NPT, preambular para. 11.
4. On NPT, Article VI see *infra* notes 65 *et seq.*
5. Treaty on the Prohibition of Nuclear Weapons (2017), not in force, available at: https://treaties.un.org/doc/Treaties/2017/07/20170707%2003-42%20PM/Ch_XXVI_9.pdf.
6. United Nations (UN) Conference to Negotiate a Legally-Binding Instrument to Prohibit Nuclear Weapons (2017), “Draft Treaty on the Prohibition of Nuclear Weapons”, UN Doc. A/CONF.229/2017/L.3/Rev.1, adopted on 7 July 2017.

date 23 have expressed their consent to be bound by it.⁷ Though the Treaty will enter into force after the 50th instrument of consent is deposited, it requires the participation of states involved in nuclear weapon-related activities for it to unfold its full potential.

Among the concerns expressed by states hesitant to support the Treaty have been doubts pertaining to the compatibility of the TPNW with the NPT.⁸ Though individual aspects have already been subject to pertinent analysis,⁹ a comprehensive investigation has yet to be undertaken. The present contribution thus represents an effort to answer the following research questions:

Are the Treaties on the Non-Proliferation and Prohibition of Nuclear Weapons compatible?

Which provisions present potential grounds for pertinent concern?

If the Treaties do conflict, what are the resulting consequences under the law of treaties?

As a relatively new instrument, the TPNW has not yet been the subject of comprehensive interpretation. Analysing the compatibility of the two treaties may thus contribute added value towards efforts to increase legal security and the confidence of states as regards the legal basis of their positions. It is hoped that this contribution might ultimately confirm or dissuade compatibility concerns, without prejudice to further scientific debate and policy considerations.

The methodological approach will, in a first abstract step, identify the applicable rules governing conflicts between treaties under international law and propose a structure for their application to the present conditions. In a second step, the terms of the treaties will be interpreted and categorised with a view to facilitating comparison across treaties of substantive content and elucidating potential conflicts. These categories will first delineate the classes to which the respective treaty provisions apply and then divide rights and obligations between such owed to or by certain classes or all parties. Those provisions of the TPNW, which mirror such under the NPT, will be especially carefully read for common and distinguishing features. Where particular terms reveal an identifiable conflict potential, they will be selected for further analysis in tandem with similar provisions. Finally, identified incompatibilities will be tested against the applicable rules of treaty law in an effort to resolve them.

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7. UN Treaty Collection, "9. Treaty on the Prohibition of Nuclear Weapons", https://treaties.un.org/Pages/ViewDetails.aspx?src=%20TREATY&mtdsg_no=XXVI-9&chapter=26&clang=_en (accessed 30 Apr. 2019).
 8. See, e.g., Campaign for Nuclear Disarmament (2017), "CND UK", <https://cnduk.org/resources/tridents-compatibility-international-law> (accessed 9 Dec. 2018): "The UK government [...] states that it believes a treaty banning nuclear weapons is not compatible with the nuclear Non-Proliferation Treaty (NPT)".
 9. See, e.g., Giorgou, E. (2018), "Safeguards Provisions in the Treaty on the Prohibition of Nuclear Weapons", *Arms Control Law*, <https://armscontrollaw.com/2018/04/11/safeguards-provisions-in-the-treaty-on-the-prohibition-of-nuclear-weapons> (accessed 9 Dec. 2018); Malsen, S. (2017), "The Relationship of the 2017 Treaty on the Prohibition of Nuclear Weapons with other Agreements: Ambiguity, Complementarity or Conflict?", *EJIL Talk*, www.ejiltalk.org/the-relationship-of-the-2017-treaty-on-the-prohibition-of-nuclear-weapons-with-other-agreements-ambiguity-complementarity-or-conflict (accessed 9 Dec. 2018); Trezza, C. (2017), "The UN Nuclear Ban Treaty and the NPT: Challenges for Nuclear Disarmament", *IAI Commentaries*, Vol. 17, No. 15, Istituto Affari Internazionali, Rome, pp. 1-3.

II. Preliminary analysis of conflict potential

Any conflict¹⁰ between the two treaties implies that they are applicable at the same time. Determining under which conditions both treaties would simultaneously operate, requires an identification of the subjects of international law bearing rights and duties under these treaty regimes. All 190 parties to the NPT and 23 parties to the TPNW are states and the treaties exclusively govern rights and obligations between states.¹¹

To determine among which states the treaties create binding relations, three types of obligations may be envisaged. Obligations may be owed: 1) *vis-à-vis* each treaty party individually;¹² 2) to all states parties (*erga omnes partes*);¹³ or 3) to the international community as a whole (*erga omnes*).¹⁴ Treaties generally do not create rights or obligations for third states pursuant to the general *pacta tertiis* rule.¹⁵ Within the relevant provisions, there is no indication that the NPT parties intended to depart from it.¹⁶ In light of its wide acceptance, there has been some debate as to whether (certain) obligations contained within the NPT have become binding under customary international law.¹⁷ Convincing contrary arguments aside,¹⁸ conflicts

10. While the Vienna Convention on the Law of Treaties (see *infra* note 15) employs the term “conflict” only in the context of the invalidation of a treaty by a peremptory norm of international law (Articles 53 and 64) and “(in)compatibility” by reference to application of successive treaties (Article 30), “(illegal)” *inter se* modifications (Article 41) or suspension (Article 58), as well as termination (Article 59), the present contribution will occasionally use these terms (in addition to “(in-)consistency”) interchangeably.
11. Though one provision of the TPNW may serve as a basis to create rights for individuals upon national implementation (Article 6(1), pertaining to victim assistance and environmental remediation), it is complemented by a without-prejudice clause (Article 6(3)), and does not appear to intersect with the NPT. As a result, with respect to overlap, the treaties exclusively govern rights and obligations between states.
12. Article 42(a), Draft Articles on Responsibility of States for Internationally Wrongful Acts, Report of the International Law Commission on the Work of its Fifty-third Session, UN GAOR, 56th Session, Supp. No. 10, at 43, UN Doc. A/56/10 (2001) (ARSIWA).
13. *Ibid.*, Article 42(b), first case.
14. *Ibid.*, second case.
15. Article 34 of the Vienna Convention on the Law of Treaties codifying the principle *pacta tertiis nec nocent nec prosunt* (Vienna Convention on the Law of Treaties (1969), 1155 UNTS 331, entered into force 27 Jan. 1980 (VCLT)).
16. Intent constitutes a necessary requirement for both pursuant to Articles 35 and 36 VCLT. Whether or not the parties of the TPNW intended to stipulate rights or obligations for third states will be subject to further analysis below.
17. In particular, the fact that 188 of 193 UN member states are parties (*infra* note 40) to the NPT, may be considered indicative of its terms having become binding under customary international law based upon the requisite state practice and *opinio juris*. In this vein, the Marshall Islands have advanced the argument that NPT, Article VI reflects a customary obligation binding upon NPT non-parties (such as India and Pakistan) and NPT state parties (such as the United Kingdom) alike (see *Obligations concerning Negotiations relating to Cessation of the Nuclear Arms Race and to Nuclear Disarmament (Marshall Islands v. India)*, Jurisdiction and Admissibility, Judgment, ICJ Reports 2016, p. 225, paras 25 et seq.; *Obligations concerning Negotiations relating to Cessation of the Nuclear Arms Race and to Nuclear Disarmament (Marshall Islands v. Pakistan)*, Jurisdiction and Admissibility, Judgment, ICJ Reports 2016, p. 552, paras 25 et seq.; and *Obligations concerning Negotiations relating to Cessation of the Nuclear Arms Race and to Nuclear Disarmament (Marshall Islands v. United Kingdom)*, Jurisdiction and Admissibility, Judgment, ICJ Reports 2016, p. 833, paras 12 et seq.). In the absence of a dispute, all three proceedings were discontinued without a decision on the merits, including the objective question.
18. The fact that a state has concluded a treaty does not necessarily permit the inference that it considers non-parties bound by the same rules under customary international law.

between customary obligations and the TPNW cannot be equated to such between the treaties. Therefore, the following will operate under the understanding that conflicts between the treaties be understood as those arising between states that are parties to both.

There are a number of ways in which treaties may conflict, each tied to appropriate consequences and resolution methods. Pauwelyn¹⁹ proposes the following approach to the matter: one should first determine if one of the norms is invalid,²⁰ terminated²¹ or illegal.²² If not, priority rules govern prevalence otherwise rendering resolution via state responsibility a last resort.²³

Where treaties relate to the same subject matter, one may specify its prevalence over the other.²⁴ Otherwise, pursuant to the *lex posterior derogat legi priori* principle, provisions of a later treaty will prevail between mutual parties.²⁵ Under particular circumstances, a more specific norm may enjoy priority pursuant to the *lex specialis derogat legi generali* principle.²⁶ Both concluding an “illegal” or “invalid” treaty and acting upon it may constitute an internationally wrongful act.²⁷ The same may apply to concluding or applying incompatible treaty provisions.²⁸ Notwithstanding these considerations pertaining to invalidity, termination, “illegality” and prevalence, treaty interpretation²⁹ too may offer means to resolve apparent conflicts.

III. The terms of the treaties

This section presents a summary of the terms of the NPT and TPNW. An analysis of conflicts necessitates an understanding not only of what is owed under the treaties, but also to whom by whom. Given that both treaties envisage distinct rights and obligations for different “categories” of states, these will be outlined at the outset. In a second step, the terms of each treaty will be illustrated in a condensed fashion based

Moreover, the ICJ has emphasised the importance of “specially affected states” participating in the establishment of customary rules. In the present context, the circumstance that several states that are not parties to the NPT have acted contrary to its provisions by acquiring nuclear weapons (see on *de facto* nuclear weapon states *infra* note 42), speaks against the customary nature of the NPT (see *North Sea Continental Shelf (Germany/Denmark; Germany/Netherlands)*, Judgment, ICJ Reports 1969, p. 47, paras. 73-74.

19. Pauwelyn, J. (2003), *Conflict of Norms in Public International Law*, Cambridge University Press, Cambridge, p. 278.
20. For a treaty to be invalidated, its invalidity must be invoked. Relevant grounds include lack of consent (VCLT, Article 46), error (VCLT, Article 48), fraud (VCLT, Article 49), corruption (VCLT, Article 50), coercion (VCLT, Article 51) and conflict with a peremptory norm (VCLT, Article 52).
21. Similarly, termination of treaties too, must generally first be asserted and may be based upon material breach (VCLT, Article 60), impossibility of performance (VCLT, Article 61) fundamental change of circumstances (VCLT, Article 62), severance of relations (VCLT, Article 63), emergence of a conflicting peremptory norm (VCLT, Article 64) or conclusion of a later treaty (VCLT, Article 59).
22. A later treaty may be considered “illegal” if it is explicitly prohibited by the earlier treaty or constitutes a prohibited *inter se* modification (VCLT, Article 41) or suspension (VCLT, Article 58) of the earlier agreement. Pauwelyn, J. (2003), *supra* note 19, p. 298.
23. *Ibid.*
24. VCLT, Article 30(2).
25. *Ibid.*, Article 30(3) and (4)(a).
26. See Pauwelyn, J. (2003), *supra* note 19, pp. 385 *et seq.*
27. *Ibid.*, p. 276.
28. VCLT, Article 30(5).
29. VCLT, Articles 31 to 33.

upon these categories with a particular focus on provisions of significance to the respective corresponding treaty. These summaries will be complemented by commentary and remarks on notable or disputed interpretations, which are relevant for the purposes of the present analysis. The objective of this step is to identify provisions of potential conflict.

1. The Treaty on the Non-Proliferation of Nuclear Weapons (NPT)

The NPT has been the subject of many interpretations.³⁰ Overall,³¹ the following will primarily represent an endeavour to independently capture the content of the Treaty based upon the applicable primary rules of treaty interpretation codified in Article 31 of the VCLT.³² Though there can be great merit in considering well-established interpretations or such agreed upon by a number of parties,³³ for the purpose of comparing the NPT with the TPNW, it should be kept in mind that there are few interpretations upon which all NPT parties have been able to agree and even fewer that are binding. With this in mind, where appropriate, prior interpretations, including elaborations upon context and subsequent agreement, will be referenced, to inform what may be a *better* but nevertheless, strictly speaking, would be difficult to elevate as the only *correct* view. Importantly, for the sake of testing the compatibility of the NPT with the TPNW, it is not necessary and perhaps should even be avoided to compare the entire corpus surrounding both treaties with one another. In particular, this includes *travaux préparatoires* (which should be but often are not only supplementarily resorted to)³⁴ and review conference documents (which can, but often do not represent subsequent agreement or practice)³⁵. Primarily reviewing the provisions of the Treaty, the following interpretation will thus focus on the ordinary

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30. See, e.g., various review conference documents cited throughout and (references contained in) scholarly contributions such as Joyner, D.H. (2009), *International Law and the Proliferation of Weapons of Mass Destruction*, Oxford University Press, Oxford; Joyner, D.H. (2013), *Interpreting the Nuclear Non-Proliferation Treaty*, Oxford University Press, Oxford; Coppen, T. (2015), *Preventing the Spread of Nuclear Weapons*, T Coppen, Utrecht.
31. Under certain circumstances, particular importance may be attributed to individual “settled interpretive understandings” (see, e.g., Joyner, D.H. (2017), “Amicus Memorandum to the Chair of the United Nations Negotiating Conference for a Convention on the Prohibition of Nuclear Weapons”, available at <https://armscontrollaw.files.wordpress.com/2017/06/amicus-memorandum.pdf> (accessed 10 Dec. 2018): “The legal interpretation of the safeguards obligation in Article III of the NPT, and the related legal architecture of IAEA safeguards agreements, has developed through a long and complex history of normative evolution. This interpretation is highly dependent on the context in which the safeguards obligation provisions appear in the NPT”).
32. The VCLT entered into force in 1980, does not apply retroactively as per its Article 4 and thus cannot govern the NPT, which entered into force ten years prior. Nevertheless, many provisions of the VCLT have been recognised as reflecting customary international law, and the ICJ has in fact never found that any provision of the Treaty does not (see Mendelson, M. (1996), “The International Court of Justice and the Sources of International Law”, in V. Lowe and M. Fitzmaurice (eds.), *Fifty Years of the International Court of Justice. Essays in Honour of Sir Robert Jennings*, Cambridge University Press, Cambridge, p. 66). As a result, this contribution will apply the terms of the VCLT as a reflection of customary international law.
33. Joyner, D.H. (2017), *supra* note 31.
34. VCLT, Article 32.
35. See *infra* notes 265 *et seq.* on the relevant criteria for determining whether such conduct represents agreement on a case-by-case basis.

meaning of the terms, remaining aware of their context, the object and purpose of the Treaty³⁶ and the requisite good faith.³⁷

1.1. Categories of states parties to the Treaty

One characteristic feature of the Treaty is its division into “nuclear-weapon states” (NWS) and “non-nuclear-weapon states” (NNWS). Facing predictions of as many as 25 nations possessing nuclear weapons within the next decade,³⁸ one principal objective of the Treaty was to halt further proliferation by “freezing” the number of states with nuclear-weapon capabilities. As a result, NWS are defined in Article IX as such that have “manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January 1967”.³⁹ Often referred to as *de jure* NWS these are China, France, the former Soviet Union (Russian Federation), the United Kingdom and the United States.

All of the other, currently 190, parties to the Treaty are NNWS.⁴⁰ Though the United Nations Office for Disarmament Affairs does still list 191 parties, including the DPRK by virtue of divergent views on the effectiveness and date of its withdrawal, the non-party status of the DPRK appears to have been accepted by now.⁴¹ The only UN member states that are not parties to the Treaty are those that (are believed to) currently possess nuclear weapons, having acquired the capability after the NPT reference date (the DPRK, India, Israel and Pakistan – often referred to as *de facto* NWS)⁴² and South Sudan.

1.2. Rights and obligations of NWS

Contrary to popular belief,⁴³ the NPT does not contain any rights that are exclusively enjoyed by NWS. The Treaty enshrines rights and obligations incumbent upon all parties, such pertaining exclusively to NNWS and also obligations exclusively binding

36. Understood as the three pillars of the NPT: non-proliferation, disarmament and peaceful use. See, e.g., Joyner, D.H. (2013), *supra* note 30, pp. 33-34.

37. Subsequent agreement (and practice establishing it) as well as relevant rules of international law will be taken into account with the context in addition to any special meanings.

38. Nye, J.S. (1985), “The Logic of Inequality”, *Foreign Policy*, No. 59, Slate Group, LLC, Washington, DC, p. 123.

39. NPT, Article IX. For the sake of brevity and simplicity, the phrase “nuclear weapon or other nuclear device” is reduced to “nuclear device” below, given that the latter includes the former. Wherever treaty language does deviate from this standard term (such as “nuclear explosions” referenced in Article V of the NPT or simply “nuclear-weapons” in Article 7(3) of the TPNW, this will be indicated accordingly.

40. These include 188 of the currently 193 UN member states in addition to the Holy See and Palestine. The UN Office for Disarmament Affairs has compiled a list based upon information provided by the depositary states (Russia, the United Kingdom and the United States), denominating all parties at present (on the Democratic People’s Republic of Korea (DPRK) see *infra*), including those that have gained that status by state succession (UNODA (n.d.), “Status of the Treaty”, <http://disarmament.un.org/treaties/t/npt> (accessed 15 Nov. 2018)).

41. The Security Council has *demand*ed that the DPRK “return” to the NPT, thus implying that it has recognised withdrawal (UN Security Council Resolution (UNSCR) 1718 (2006), “Non-proliferation/Democratic People’s Republic of Korea”, UN Doc. S/RES/1718, adopted 14 Oct. 2006).

42. The term should be understood without prejudice to the question of the legality of such acquisition. Kile, S.N. et al. (2011), “World nuclear forces” in SIPRI (ed.), *SIPRI Yearbook 2011: Armaments, Disarmament and International Security*, Oxford University Press, Oxford, pp. 319-353.

43. Joyner, D.H. (2017), *supra* note 31: “Some nuclear weapons states have for some time argued that the NPT gives them a ‘right’ to possession and to further production and refinement of nuclear weapons. In my view this assertion is totally unsupported by the text of the NPT.”

upon NWS. But there is no provision within the Treaty that stipulates a particular right of an NWS and thus also none granting NWS a right to nuclear weapons. While a comprehensive interpretation of the entire Treaty would reasonably come to the conclusion that all parties accept that the NWS may maintain nuclear weapons until the obligation to negotiate has become obsolete by virtue of complete nuclear disarmament having been achieved, that acceptance is not identical to a right being conferred by the parties under the terms of the Treaty. The absence of a prohibition cannot be equated with the stipulation of a right.⁴⁴

NWS are subject to three types of obligations, reflecting the three “pillars” of the NPT: non-proliferation, peaceful use and disarmament. Falling within the first category is the obligation of NWS not to contribute to the acquisition of or control over nuclear explosive devices⁴⁵ by NNWS pursuant to Article I.⁴⁶ Given that the essence of the non-proliferation component of the Treaty is to prevent further states from acquiring (control over) nuclear explosive devices, this represents the core of the obligation. The first clause of the provision, pertaining to the transfer of (control over) entire nuclear explosive devices, relates not only to NNWS but to “any recipient whatsoever”, thus other NWS as well. Therefore, it is substantively narrow (only entire nuclear explosive devices) and wide in terms of the number of relevant parties (NWS and NNWS alike). As the second clause includes assistance, not limiting itself to entire nuclear explosive devices, but also manufacture and other modes of acquisition, it is, materially speaking, the wider of the two clauses, but governs only interactions with NNWS. In summary, it is a narrow obligation versus all states and a wide one versus NNWS. Article I enshrines a comprehensive obligation as regards acquisition of (control over) nuclear explosive devices by NNWS and a more limited undertaking regarding contributions for the benefit of NWS. The purpose of this distinction has been understood to permit trading components (thus not entire nuclear explosive devices) between NWS.⁴⁷ Considering that such activity would not increase the number of states possessing (control over) nuclear explosive devices, it might be considered less significant from a proliferation point of view. Preambular paragraphs 1, 2 and 3 provide especially relevant context to this provision (and its counterpart,

44. In this context the absence of a right under the Treaty should be distinguished from the absence of a right *per se*. Pursuant to what is widely referred to as the *Lotus principle*, cited, *inter alia*, by the ICJ in its Nuclear Weapons Advisory Opinion, “restrictions upon the independence of States cannot ... be presumed’ and ... international law leaves to States ‘a wide measure of discretion which is only limited in certain cases by prohibitive rules’” (Nuclear Weapons Advisory Opinion, *supra* note 1, p. 12, para. 21, citing *The Case of the S.S. “Lotus” (France v. Turkey)*, *Publications of the Permanent Court of International Justice (1927)*, Series A, No. 10, pp. 18-19.

45. The phrase employed in the first half of the first clause “nuclear weapon or other nuclear explosive device” implies that under the Treaty, nuclear weapons are considered a type of nuclear explosive device. Yet, the second half of the clause proceeds with the wording “such weapons or explosive devices”. Given that the first portion of the clause can be understood to explain the relationship between nuclear weapons and nuclear explosive devices, presumably, any further reference to these terms must be informed by that understanding. Therefore, the use of the word “or” as opposed to “or other” may be understood not to modify the initial explanation in the first half of the first clause.

46. This wording is designated to summarise Article I. The term “contribute” should be understood to include both the act of directly or indirectly transferring, as well as assisting, encouraging or inducing. Given that the provision defines manufacture as one of several modes of acquisition, the latter includes the former.

47. Joyner, D.H. (2009), *supra* note 30, p. 11.

Article II),⁴⁸ referencing both the devastation of nuclear war being exacerbated by proliferation and an agreement to prevent it.

This is in fact the only obligation within the Treaty that is explicitly exclusively addressed to NWS. Of course, other obligations, which are incumbent upon “each” or “all” parties, are more relevant to NWS than NNWS. This includes the important disarmament obligation (Article VI), the prohibition on sharing equipment or material in absence of safeguards (Article III(2)) and also the significantly less meaningful provision governing sharing benefits of peaceful nuclear explosions (Article V). Due to the fact that these nevertheless represent undertakings of all states they will be addressed below (*infra*, “1.4 Rights and obligations of all parties”).

1.3. Rights and obligations of NNWS

Similar to what has been described above in the context of the absence of rights explicitly and exclusively conferred upon NWS, the Treaty does not stipulate any notable rights enjoyed solely by NNWS. Logically, certain provisions, such as Article VII, relating to the right of establishing Nuclear-Weapon-Free Zones (NWFZ), bear less meaning for NWS. Also, while disarmament (Article VI) is, as indicated, addressed to “[e]ach of the Parties”, it might be viewed as a burden to NWS and a privilege for NNWS and thus bearing the character of an obligation for one and a right for the other. Nevertheless, the relevant article is phrased as an obligation undertaken by each of the parties and will thus be further analysed as such (see *infra*, “1.4 Rights and obligations of all parties”). One exception, strictly speaking, to the suggested absence of any rights enjoyed only by NNWS, are the second and fourth sentences of Article V, stipulating the right of NNWS to obtain the benefits of peaceful nuclear explosions subject to certain conditions. Read in isolation, these would suggest that the Treaty does enshrine a right that only NNWS enjoy. Due to the fact that this right is subject to several modifiers contained in the provision, which as a whole merits a more comprehensive analysis and obliges “[e]ach Party”, it will be discussed in greater detail below (see *infra*, “1.4.2 Obligations of all parties”).

NNWS too, are bound by undertakings relating to the three pillars of the NPT. Contrary to NWS, they are subject to two obligations addressed to them exclusively, pertaining to non-proliferation and peaceful use. For one, Article II represents a counterpart provision to Article I. It enshrines the obligation of NNWS not to acquire (control over) nuclear explosive devices. Compared to Article I, this provision contains three, as opposed to two, clauses and does not employ distinctions widening and narrowing substantive applicability versus NWS and NNWS. It simply reproduces its counterpart from the perspective of NNWS, while omitting the portion relevant only between NWS (the implicit “privilege” illustrated above in the text at *supra* note 47). The terms of the article divide the obligation into three aspects: that 1) not to receive nuclear explosive devices or control over them directly or indirectly; 2) not to acquire them (by manufacture or otherwise); and 3) not to seek or accept assistance in their

48. Throughout the Treaty’s review cycle (envisaged by Article VIII (3)), these three paragraphs have been linked to Articles I and II. Initially, the provisions of Article III (concerning safeguards) and thus corresponding preambular paragraphs four and five were (designated to be) reviewed together with Articles I and II. Since the 1985 Review Conference, the linkage between Articles I and II on the one hand and preambular paragraphs one and three on the other has been consistent (with the exception of the 2010 Review Conference, which referenced only paragraphs one and three). For the various final documents indicating which articles and preambular paragraphs were tied to one another when (setting the agenda for) reviewing the operation of the Treaty, see NPT/CONF/35/I (Part I) [1975], NPT/CONF/II/22/I (Part I) [1980], NPT/CONF.III/64/I (Part I), Annex I [1985], NPT/CONF.IV/45/I (Part I), Annex I [1990], NPT/CONF.1995/32 (Part III) [1995], NPT/CONF.2000/28 (Part I) [2000], NPT/CONF.2005/57 (Part I) [2005], NPT/CONF.2010/50 (Vol. I) [2010] and NPT/CONF.2015/50 (Part I) [2015].

manufacture. Given that a prohibition to manufacture may be understood to include pertinent assistance while manufacture constitutes but a mode of acquisition, the phrase “not to acquire (control over) nuclear explosive devices” reasonably summarises the content of the provision.

For the purposes of verification, Article III(1) obliges NNWS to conclude safeguards agreements with the International Atomic Energy Agency (IAEA), without impeding peaceful use of nuclear energy (3) and within a predetermined period of time (4).⁴⁹ Though each party to the Treaty is subject to an obligation not to provide equipment or material to other NNWS under paragraph (2) (addressed *infra* under “1.4 Rights and obligations of all parties”), only NNWS themselves are obliged to accept safeguards.⁵⁰ Paragraph (3) explicitly refers to the Preamble and the “principle of safeguarding” (preambular paragraph 5), which supports further bolstering of safeguards.⁵¹

1.4. Rights and obligations of all parties

The majority of the substantive provisions of the Treaty are phrased as binding upon “each”, “any” or “all” of the parties alike. Nevertheless, as indicated above, not all of these objectively phrased provisions do, in fact, create the same rights and obligations for both NWS and NNWS. As a result, where appropriate, the following will distinguish what is required or permitted for each class.

1.4.1. Rights of all parties

Article IV(1) is, essentially, a “without prejudice-clause”, recognising the right of all the parties to pursue various activities associated with peaceful purposes of nuclear energy. Though the provision does refer to “parties”, considering that an “inalienable” right is referenced, which shall not be “affected” by the Treaty, it seems to, for one, simply reiterate that a right enjoyed by all states is enjoyed by the parties too. For another, it contains a modifier, namely “in conformity with Articles I and II”. Thus, the provision evidently aims to confine the right that it restates within the limits of the non-proliferation obligation under the Treaty. Considering that Articles I and II govern nuclear explosive devices and Article III relates to peaceful purposes, it would seem that both are mutually exclusive in any event. Insofar as paragraph (1) thus simply reiterates a right and, if at all, limits it pursuant to Articles I and II, there may be reason to doubt that it stipulates a distinct right at all.

The first sentence of Article IV(2) contains both a right (“to participate in”) and an obligation (“to facilitate”) the exchange of peaceful nuclear capabilities.⁵² As both NWS and NNWS can provide and benefit from individual capabilities, this provision appears balanced in that both the right and obligation may be relevant to NWS and NNWS alike.

49. Article III(2) is the only of the four paragraphs of the Article that is not exclusively addressed to NNWS, but rather “[e]ach State Party”. It will thus be further elaborated upon (see *infra* “1.4 Rights and obligations of all parties”).

50. *Ibid.*

51. While the first two review conferences linked paragraphs one through five, corresponding with Articles I, II and III, later conferences first isolated Article III linked with preambular paragraphs four and five (1985) and then began referencing their relationship with Article IV and preambular paragraphs six and seven (peaceful use) (1990, 1995, 2000 and 2005). Though some Conferences have framed reviewing the operation of the Treaty in other variations of relationships between individual (provisions of) Articles (including with regard to Article III(3) and Article IV (e.g. 1990, 2005 and 2015)), preambular paragraphs four and five have always remained linked with Article III as a whole since. For the relevant final documents illustrating these linkages, see *supra* note 48.

52. The term “capabilities” should be understood to summarise the physical (i.e. equipment and materials) and knowledge-related components (i.e. technological and scientific information) of exchange referenced in the provision.

Preambular paragraph 6 reinforces the right, referencing “benefits” that “should be available [...] to all” (in addition to a specific reference to such which only NNWS are able to provide), while the first two clauses of paragraph seven emphasise the right (“entitled to”) as regards scientific information in particular (one of the components of capabilities).⁵³ The second sentence stipulates an obligation to co-operate in developing applications, “especially” in NNWS and “with due consideration for” developing areas (the latter portion of preambular paragraph 7 conversely envisages a right (“entitled [...] to contribute to”).⁵⁴ Because the second sentence does include the term “also”, it would be reasonable to infer that the co-operation obligation is distinct from the right and obligation of the first sentence, its modifiers thus not piercing what could otherwise be construed as a robust right and obligation to exchange. In any event, the sentence is phrased as an obligation, not a right, thus directed at those providing, not those receiving the benefits of co-operation.

Similar to Article III(1), Article VII is phrased as a “without prejudice-clause”, restating the right of states to conclude treaties banning nuclear weapons on their territory. Though the provision refers to a right enjoyed by “any group of States”, it would seem unreasonable to interpret the clause as implicitly limiting the right of each state to “assure the total absence of nuclear weapons” on their territory individually (as Mongolia has, by declaring a one-state NWFZ).⁵⁵ Similarly, it would appear inappropriate to understand the following reference to “regional treaties” implying a prohibition on a ban via treaty between states that are not located in the same geographical region. Finally, the nature of this Article, as a “without prejudice-clause” beginning with the words “[n]othing in this Treaty affects the right”, is such that it does not create any new rights or modify existing ones. Contrary to Article III(1), which also sets out as a “notwithstanding provision” but contains a modifier (“in conformity with...”), Article VII restates a right without referencing a possible limitation. Thus, the meaning of the provision appears to be limited to restating, for the purpose of avoiding any misunderstanding, that the Treaty does not hamper an existing right. Nevertheless, to verify the compatibility of this provision of an explicitly regional scope with the TPNW, it will be subject to closer analysis below.

In summary, Article VII (right to establish NWFZ) is a restatement of a right. The same applies to Article IV(1) (right to peaceful use) at best, including a limitation at worst. The second sentence of Article IV(2) stipulates a rather soft co-operation obligation. Thus, the right to participate in the exchange of peaceful nuclear capabilities under the first sentence of Article IV(2), may be considered to constitute the only significant right enjoyed by all parties under the Treaty.

1.4.2. Obligations of all parties

Paragraph (2) of Article III is the only portion of that Article phrased as an obligation binding upon “[e]ach State Party”. While it is only NNWS that are required to conclude

53. Initially, during the first two review conferences (1975 and 1980), preambular paragraphs six and seven were linked to Article V. As an understanding of the facts relevant to Article V matured (*infra*, “1.4.2 Obligations of all parties”), it was replaced by Article IV in this regard (1985). Later conferences then began to reference the relationship between Articles III and IV, while maintaining the link between Article IV and preambular paragraphs six and seven (for the relevant review conference documents, see *supra* note 48).

54. While it may be challenging to attribute a specific meaning to these qualifiers that would widen the obligation for the benefit of NNWS and developing states, the sentence also includes a reference to parties “in a position to do so”. The phrase may be interpreted as either referring to a state that simply possesses capabilities, or pointing to the discretion of states as regards the factors that would render them in such a position. The latter would significantly limit the rigorousness of what is at the outset a mere co-operation obligation.

55. Enkhsaikhan, J. (2000), “Mongolia’s Nuclear-Weapon-Free Status: Concept and Practice”, *Asian Survey*, Vol. 40, No. 2, University of California Press, Oakland, California, pp. 342-359.

safeguards agreements (paragraph (1)), under paragraph (2) all parties are prohibited from providing certain equipment or material unless it will be subject to safeguards. With regard to the purpose of safeguards as intended to prevent NNWS from diverting resources employed for peaceful uses towards a nuclear weapons programme of their own, it seems only reasonable to forego any such requirement for NWS in light of Article II. NWS already have nuclear weapons programmes; it thus would not make sense to verify that they are not diverting peacefully employed resources to that end. Yet, as regards the function of safeguards as preventing parties from sharing resources with other states that may then use them for nuclear weapons, it would appear prudent to verify that NWS are using their equipment and material for their own nuclear programmes exclusively and not diverting those resources to illicit foreign nuclear weapons programmes. Article III(2), however, references only “safeguards required by this Article”, the other paragraphs of which create obligations for NNWS only. Therefore, pursuant to the ordinary meaning of the provision, the only obligation created for an NWS by paragraph (2) is not to provide resources to NNWS unless they will be subject to safeguards on the receiving end. Thus, for NNWS, any resources they provide are subject to safeguards both on the sending and the receiving end, while NWS are bound only by half that obligation. As of yet, NWS have concluded a variety of voluntary offer and model additional protocol-based (similarly voluntary) safeguards agreements.⁵⁶ Whether these meet the threshold of comprehensive safeguards agreements or the model additional protocol, thus verifying non-diversion of all declared and absence of any undeclared materials or activities may be subject to doubt. The provision thus stipulates an obligation of parties to ensure that certain shared resources will be subject to safeguards on the receiving end. Preambular paragraph 4 reinforces this understanding, referring to an “[u]ndertaking to co-operate”.

Article IV(2), governing the exchange of peaceful nuclear capabilities, is phrased both as a right and an obligation (see *supra* “1.4.1 Rights of all parties”). As an obligation, the first sentence requires all parties to “facilitate” such exchanges. The second sentence obliges parties “in a position to do so” to co-operate in further developing peaceful applications. Thus, similar to what has been described above in terms of the provision as creating a right, the first sentence stipulates a distinct obligation too. The co-operation obligation in the second sentence is of a more equivocal and perhaps elusive nature.

In the furthest sense, Article V governs the obligation to make benefits of peaceful nuclear explosions available to NNWS. Sentence two stipulates a right of NNWS, with sentences three and four further elaborating upon that right. As far as the last three sentences of the provision and thus, the right of NNWS is concerned, obtaining “such” (i.e. “potential”, see below) benefits would require either concluding a prior special international agreement and setting up an international body or a bilateral agreement, which would both arguably necessitate prior negotiations.⁵⁷ The first sentence of the provision, on the other hand, is phrased as an obligation of “[e]ach Party”. It is similar to Article VI (disarmament), in that both, though addressed to all parties, primarily bear significance as an obligation for NWS. After all, pursuant to Articles I and II only the NWS may dispose of nuclear explosive devices. There are a number of reasons not to attribute great significance to Article V at the outset. For one, the obligation in the first sentence is highly equivocal. It would not have been difficult to phrase this provision as an obligation “to make available”, instead, at its

56. IAEA (2018), “Status List: Conclusion of safeguards agreements, additional protocols and small quantities protocols”, available at www.iaea.org/sites/default/files/status-sg-agreements-comprehensive.pdf (accessed 19 Dec. 2018).

57. The only known agreement of this nature is the Treaty Between The United States of America and The Union of Soviet Socialist Republics on Underground Nuclear Explosions For Peaceful Purposes (and Protocol Thereto) (1976), entered into force 11 Dec. 1990.

core, it requires taking mere “appropriate measures to ensure”. What may be considered “appropriate” could well be narrowly, and as a generic term, evolutively interpreted.⁵⁸ The provision is additionally narrowed by the requirements of the object and purpose of the Treaty, and also the context of the provision, which is further emphasised by an explicit reference (“in accordance with this Treaty”). Additionally, the wording of the Treaty does not definitively state that there are any benefits to peaceful nuclear explosions at all, instead referencing “potential benefits”. Moreover, for these to be made available, both “international observation” and “international procedures” would have to be in place, each themselves “appropriate”. In summary, the wording of the provision alone describes an obligation of conduct, not result, relating to the provision of something that may not exist, under procedures that must be installed, while preserving discretionary power. For another, history has demonstrated that the implied suspicion of the drafters, that there may, in fact, not be any benefits to peaceful nuclear explosions (“potential benefits”) was justified. Though both US and Soviet programmes did, for a number of years, explore applications, including such intended to create harbours,⁵⁹ seal oil wells⁶⁰ or release carbon gases,⁶¹ those programmes have been abandoned.⁶² The prevailing view is that all relevant applications can be achieved with conventional explosives at a fraction of the cost and contamination.⁶³ Over the 48-year history of the NPT there has not been a single instance of a peaceful nuclear explosion being made available as envisaged by Article V.⁶⁴ Nevertheless, the Treaty has not been formally amended so as to delete the provision. As a result, its compatibility with the TPNW merits further analysis.

Article VI constitutes the perhaps most controversial and, with respect to the TPNW, likely most significant provision of the NPT. It enshrines three negotiation-related obligations⁶⁵ of each party relating to: i) a “cessation of the nuclear arms race”; ii) “nuclear disarmament”; and iii) “a treaty on general and complete disarmament”. Preambular paragraphs 8 through 12 have been consistently linked to Article VI throughout the Treaty’s review cycle.⁶⁶ In addition to referencing co-operation towards arms race cessation and nuclear disarmament, banning nuclear tests as well as refraining from the threat or use of force, these importantly refer to the “elimination [...] of nuclear weapons [...] pursuant to a Treaty”. The provision has

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58. On the evolutive interpretation of generic treaty terms see *Aegan Sea Continental Shelf Case (Greece v. Turkey)*, *Judgment*, ICJ Reports 1978, p. 3, para. 77.
 59. O’Neill, D. (1989), “Project Chariot: how Alaska Escaped Nuclear Excavation”, *Bulletin of the Atomic Scientists*, Vol. 45, No. 10, Taylor and Francis, Chicago, pp. 28-37.
 60. Nordyke, M.D. (2000), *The Soviet Program for Peaceful Uses of Nuclear Explosions*, US Department of Energy, California, p. 35.
 61. *Ibid.*, p. 24.
 62. US Department of Energy (n.d.), *Executive Summary: Plowshare Program*, US Department of Energy, p. 1; Nordyke, M.D. (2000), *supra* note 60.
 63. On benefits of peaceful nuclear explosions see, in particular, *infra* note 252.
 64. *Ibid.*, no requests are known to have been received since.
 65. Elaborating upon various arguments pertaining to the interrelationship between the elements of Article VI and concluding that it delineates three separate obligations, rather than one sequenced undertaking, see Joyner, D.H. (2001), *Interpreting the Nuclear non-Proliferation Treaty*, Oxford University Press, Oxford, pp. 97-102.
 66. Without exception, the final documents of all review conferences have maintained this link when (setting the agenda for) reviewing the operation of individual provisions of the Treaty (for the relevant documents see *supra* note 48).

been subject to notable disagreement, commentary and a variety of interpretations. To elucidate its compatibility with the TPNW, it will be analysed in detail below.⁶⁷

1.5. Final provisions

In addition to the substantive provisions illustrated above (Articles I through VII), the final Articles of the Treaty might include grounds for concern in terms of compatibility with the TPNW. They are also relevant for the interpretation of the Treaty (e.g. as regards the consideration of review conferences and the amendment procedure when discussing subsequent agreement or practice) and will therefore be briefly referenced insofar as of interest to the present analysis. Although subsequent agreement (or practice establishing such agreement) is relevant to the interpretation of treaties pursuant to VCLT, Article 31(3)(a) and (b), such agreement may, in fact, represent an amendment. “[I]f ... interpretation ... diverges ... from the natural and ordinary meaning ... there may be a blurring of the line between the *interpretation* and the *amendment* of a treaty by subsequent practice”.⁶⁸ Non-observance of an amendment procedure envisaged by a treaty does not render amendment by subsequent agreement impermissible. The perhaps most conspicuous relevant example concerns Article 27(3) of the UN Charter, which envisages “concurring votes” of permanent members of the UN Security Council, but has in fact by subsequent practice been modified to require the absence of a negative vote (veto).⁶⁹

Paragraphs (1) and (2) of Article VIII govern the amendment procedure of the Treaty. Any party may propose amendments, which are discussed at specially convened conferences if supported by at least one-third of all parties, where they are passed by majority vote including all NWS and current members of the Board of Governors of the IAEA. The review cycle mechanism is illustrated in paragraph (3). For the purpose of reviewing the operation of the Treaty “with a view to assuring that the purposes of the Preamble and the provisions of the Treaty are being realised”, a quinquennial conference is convened five years after entry into force (first in 1975) and may, upon submission of majority proposal, be repeated at such intervals.

In addition to governing consent and entry into force, Article IX designates the Soviet Union (Russia), United Kingdom and United States as Depositaries (paragraph (2)). The second sentence of paragraph (3) contains the above-mentioned definition of an NWS, namely any state “which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January 1967”. Paragraph (1) stipulates that every party enjoys the right to withdraw from the Treaty. Such withdrawal is envisaged where i) “supreme interests” of a state are jeopardised by ii) “extraordinary events” that are iii) “related to the subject matter of [the] Treaty”. These three elements are complemented by three references to the subjective determination of a withdrawing state, one implicit, two explicit. The first indicates that the right to withdraw is practised “in exercising [...] national sovereignty”, while the second clarifies which body possesses the authority to determine when the relevant elements are met, namely the withdrawing state itself (“if it decides”). A third reference to the discretion of such states is integrated in the notification procedure,

67. Analysis will be performed under particular consideration of the relevant preambular paragraphs, the appropriate interpretation by the ICJ and subsequent conduct of the parties at various review conferences.

68. Waldock, H. (1964), *Third Report, Yearbook of the ILC*, Vol. II, p. 60, para. 25 (footnote omitted) (emphasis in the original).

69. *Legal Consequences of the Continued Presence of South Africa in Namibia (South West Africa), Advisory Opinion*, ICJ Reports 1971, p. 16, para. 22. On these and similar instances, see Gardiner, R.K. (2015), *Treaty Interpretation*, Oxford University Press, Oxford, pp. 275-280. For further elaborations on subsequent agreement and practice establishing it in the context of the NPT see *infra* notes 252 *et seq.*

requiring a mere subjective statement pertaining to the three elements listed above (“events it regards as having jeopardized”). Withdrawal is effected with three months’ notice. The provision has been the subject of some controversy in the context of the only withdrawal to date, that of the DPRK.⁷⁰ Paragraph (2) envisages convening a conference for the purposes of a majority decision upon the further duration of the Treaty 25 years after its entry into force. At the 1995 Review and Extension Conference, the Treaty was extended indefinitely.⁷¹

2. The Treaty on the Prohibition of Nuclear Weapons (TPNW)

2.1. Categories of states parties to the Treaty

Unlike the NPT, the TPNW does, in a sense, significantly contain one set of standards that applies to all states equally. While the strict unconditional non-proliferation obligation of NPT, Articles I and II mirrors a disarmament obligation interposed by prior negotiations under Article VI, the TPNW establishes rules that apply to all parties alike. Conversely, acknowledging that different states must also take different steps to comply with one and the same prohibition, elimination or remediation standard, not all rules of the TPNW are relevant to every state. Distinguishing based upon a number of factors pertaining to conducted nuclear weapon-related activities, the TPNW thus too establishes a number of state party “categories”.

For the purposes of the Treaty, the primary distinction drawn is that between armed, disarmed and sharing states. The applicability of individual provisions attaches to various reference dates, meaning that temporal aspects are essential for understanding the operation of the Treaty. Because the TPNW does not distinguish between open and covert activity, it should be kept in mind that particular terms could also apply to certain (future) parties not previously known to have engaged in relevant conduct.

2.1.1. Disarmed States (DS)

Article 2(1)(a) refers to states that “owned, possessed or controlled” (hereinafter “disposed of”) “nuclear weapons or nuclear explosive devices” but eliminated relevant programmes prior to subjective entry into force of the Treaty. Perhaps most significantly, this definition applies to states that are known to have once disposed of such weapons or devices, namely Belarus, Kazakhstan, South Africa and Ukraine

70. On 12 March 1993, the DPRK notified the three depositary states that it would withdraw from the NPT upon lapse of the three-month notice period envisaged under Article X. After 89 days, on 11 June 1993, one day before withdrawal would have become effective, the DPRK suspended “effectuation” of withdrawal. On 10 January 2003, the DPRK notified the UN Security Council that it would withdraw from the NPT within one day, representing the unelapsed portion of the notice period. A variety of theories on the effectiveness of withdrawal have been advanced. Some pertain to the fact that the DPRK may have been required to observe the full three-month period when it notified its intention to withdraw in 2003. Others refer to the lack of withdrawal notification versus the three depositary states (in 2003), which is required in addition to such versus the Security Council under Article X of the NPT. Others again posit that Article X may include objective elements, which must be fulfilled and not merely invoked by a withdrawing state (Kirgis, F.L. (2003), “North Korea’s Withdrawal from the Nuclear Nonproliferation Treaty” in *ASIL Insights*, Vol. 8, Issue 2). To date, not all parties have been able to agree on the effectiveness or date of the withdrawal. Still, in light of various statements, including a Security Council resolution (*supra* note 41), referring to the “return” of the DPRK to the NPT, the parties seem to have arrived at an understanding that the DPRK has withdrawn. On the chronology of the DPRK’s withdrawal see IAEA (2018), “IAEA and DPRK: Chronology of Key Events”, www.iaea.org/newscenter/focus/dprk/-chronology-of-key-events (accessed 19 Dec. 2018).

71. 1995 Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, NPT/CONF.1995/32 (Part I), Annex, Decision 3.

(Known Formerly Armed States).⁷² Moreover, considering that the TPNW is yet to enter into force, current NWS, whether *de jure* or *de facto*,⁷³ may, by the entry into force of the TPNW, have disarmed and thus fall within this category (Newly Disarmed States). Additionally, the provision would apply to states that at the time the Treaty enters into force, reveal that they at one time disposed of nuclear weapons or nuclear explosive devices without that circumstance having become known (Covertly Disarmed States). Finally, it would also be possible that further states establish themselves as known *de facto* NWS, e.g. by withdrawing from the NPT or gaining statehood, and then disarm before the TPNW enters into force for them (Future Disarmed States). One notable difference between this category and those illustrated below⁷⁴ is that it employs only the word “or” as opposed to “or other” when referring to nuclear weapons and nuclear explosive devices.⁷⁵

2.1.2. Continuingly Armed States (CAS)

Article 2(1)(b) complements the prior provision by reference to states that have not abandoned their disposition by the time the Treaty subjectively enters into force. The same category is also employed by Article 4(2). It would thus apply to the *de jure* NWS and current (as well as potential future known) *de facto* NWS, provided that they do not disarm by the time the Treaty enters into force for them. Moreover, states which reveal that they dispose of nuclear explosive devices at such time without that circumstance having been known beforehand (Covertly Armed States) would fall within this category as well.

2.1.3. Sharing States (SS)

Finally, paragraph (c) of Article 2(1) as well as Article 4(4) concern states that do not dispose of nuclear explosive devices, but do have such on their territory or a place under their jurisdiction or control. These devices must also be disposed of by another

72. Potter, W.C. (2010), “The NPT & the Sources of Nuclear Restraint”, *Daedalus*, Vol. 139, No. 1, The Global Nuclear Future, Vol. 2, The MIT Press, Cambridge, Massachusetts, p. 69. The former Soviet Republics destroyed or transferred their arsenals to Russia under the Lisbon Protocol to the 1991 Strategic Arms Reduction Treaty (Protocol to the Treaty between the United States of America and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms (1992), entered into force 5 Dec. 1994; Reif, K. (2014), “The Lisbon Protocol At a Glance”, Arms Control Association, www.armscontrol.org/node/3289 (accessed 20 Dec. 2018)), while South Africa also voluntarily disarmed by 1993 (Pike, J. (2011), “Nuclear Weapons Program – South Africa”, Global Security, www.globalsecurity.org/wmd/world/rsa/nuke.htm (accessed 20 Dec. 2018)).

73. As envisaged by NPT, Article IX; Kile S.N. et al (2011), *supra* note 42. The idea and term of a *de facto* NWS can only apply to the NPT regime. As indicated above, it is not settled whether “being an NWS” outside the NPT regime may be considered generally illegal (*supra* notes 17 and 18). Arguments positing that it is not, in light of the lacking requisite participation of “specially affected states” for the emergence of a customary rule of international law, appear convincing. Pursuant to that view, it would seem inappropriate to deprive a non-NPT NWS of the “*de jure*” adjective. Within the TPNW it is impossible for a state to constitute a *de jure* NWS. Under the Treaty it is illegal to, *inter alia*, dispose of or engage in sharing of nuclear weapons. Of the various reference dates relevant to obligations contained within the TPNW (such as the date of its adoption or the date of its entry into force), the critical date establishing *de jure* NWS under the NPT, 1 January 1967, is not one of them. As a result, for the purposes of the TPNW, the distinction between *de jure* and *de facto* NWS is irrelevant and only maintained here due to its significance as regards the NPT.

74. By reference to Articles 2(1)(b) and (c) as well as 4(1) and (4).

75. It is unclear whether this provision, contrary to others within the Treaty, thus envisages nuclear weapons that are not explosive devices, every pertinent reading of “or” should be informed by the prior “or other”, there is another intended meaning, or the difference simply does not bear significance at all (or may represent an unintentional omission).

state.⁷⁶ In any event, at present, there are five NNWS states, namely Belgium, Germany, Italy, Netherlands and Turkey, which are known to fall within this category by virtue of “Sharing Agreements” concluded with the United States (Known Sharing States). Under these agreements between NATO allies, nuclear weapons are stationed on the territory of allied states, while physical possession and operational control remain with the United States.⁷⁷ Although the launch codes of and thus ability to deploy these weapons remain at the exclusive discretion of the President of the United States in peacetime, the United States has taken the position that such authority could permissibly be delegated to NATO command in times of general war. It has asserted that relevant conduct complies with the terms of NPT, Articles I and II, given that control is maintained in times of peace and that the Treaty would no longer prevail during a situation of armed conflict. Citing the work of Sir Ian Brownlie as Special Rapporteur of the International Law Commission on the Effects of Armed Conflicts on Treaties, Joyner has noted that the possibility of suspension or termination of the NPT under such conditions would be contingent upon the intention of the parties as evidenced at the conclusion of the Treaty.⁷⁸ A component of the arguable object and purpose of the NPT is to “prohibit the further spread of nuclear weapons, and thus limit the extent and severity of any nuclear exchange between belligerents”. Transferring control over nuclear weapons to NNWS would arguably increase the extent and severity of an exchange. Thus, one might conclude that if the parties indeed intended to reserve the right to contravene the object and purpose of the NPT once hostilities had broken out that intention would be clearly reflected under the terms of the Treaty.

Moreover, it is also conceivable that unknown sharing takes place or that by the time the TPNW enters into force, new sharing will have been pursued (Future and/or Covertly Sharing States). While the Treaty is concerned with all Disarmed States, including such that have disarmed long before the TPNW was conceived, it does not contain any provisions that apply to states that once, but no longer, were the beneficiaries of sharing arrangements, such as Korea.⁷⁹

2.1.4. Newly Disarmed States (NDS)

Similar to what has been illustrated above in the context of Article 2(1)(a),⁸⁰ Article 4(1) too refers to states that have disarmed by the time the Treaty enters into force (Disarmed States). One important difference is that Article 4(1) is limited in its application to states that disposed of nuclear explosive devices on the date the TPNW was adopted, 7 July 2017. As a result, for one, this category may include the five *de jure* NWS and four known *de facto* NWS if they do disarm in time. For another, it may apply to states which reveal that they were armed on the reference date and have since disarmed (Newly Covertly Disarmed States). It would also apply to Future Disarmed States, given that such would have acquired disposition after 7 July 2017. Contrary to Article 2(1)(a) the category does not include Known Formerly Armed States and states that were covertly armed but eliminated their programmes before the adoption of the TPNW (Historic (Covertly) Disarmed States).

76. This means that devices that are owned, possessed or controlled by, e.g. a non-state actor, would not be encompassed by the ordinary meaning of the phrase.

77. For the content of the following elaborations on sharing see Joyner, D.H. (2009), *supra* note 30, pp. 13-15 (with further references).

78. *Ibid.*

79. Kristensen, H.M. (2005) “The Withdrawal of U.S. Nuclear Weapons from South Korea”, The Nuclear Information Project: Documenting Nuclear Policy and Operations, www.nukestrat.com/korea/withdrawal.htm (accessed 20 Dec. 2018).

80. *Supra* “2.1.1 Disarmed States”.

2.1.5. States Unarmed on the Reference Date (SURD)

Article 3 governs obligations of states to which Article 4(1) and (2) do not apply, thus any party that is not a Newly Disarmed or Continuingly Armed State. Therefore, any state that disposed of nuclear weapons or nuclear explosive devices after 7 July 2017 and later becomes a party, will not be subject to this obligation (provided that the Treaty enters into force).

2.1.6. States Affected by Use or Testing (SAUT)

One set of obligations under Article 6(1) is relevant to such states that practise jurisdiction over individuals affected by nuclear weapons.⁸¹ Article 6(2) refers to states that practise jurisdiction or have control over contaminated areas. Tests (or use) that may have caused contamination are known to have been carried out on the territory of *de jure* NWS⁸² and states such as Algeria, Australia, DPRK, India, Japan, Kazakhstan, Kiribati, the Marshall Islands, Pakistan, Turkmenistan, Ukraine and Uzbekistan.⁸³

2.1.7. States that have Used or Tested (SUT)

Employing yet another variation of the relationship between nuclear weapons and nuclear explosive devices (“or any other” as opposed to the otherwise used “or” and “or other”),⁸⁴ Article 7(6) mirrors Article 6 by stipulating a “responsibility” incumbent upon states that have used or tested. In addition to the five *de jure* and four *de facto* NWS,⁸⁵ South Africa has been suspected to have conducted a test (“Vela incident”).⁸⁶

2.2. Rights and Obligations under the TPNW

2.2.1. Rights under the TPNW

True to its name, the TPNW predominantly stipulates obligations rather than rights. Reference to existing “rights” is made on three occasions⁸⁷ within the comprehensive

81. Especially in light of the fact that the Preamble explicitly includes a reference to “hibakusha” (i.e. survivors of the Hiroshima and Nagasaki bombings), Japan would be an example of a state subject to this obligation if it became a party to the Treaty.

82. Mikhailov, V.N. (ed.) (1999), *Catalog of Worldwide Nuclear Testing*, Begell House, New York (<https://web.archive.org/web/20140715015355/http://www.iss-atom.ru:80/ksenia/catalog/2.htm> (accessed 20 Dec. 2018)).

83. UN Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards their Total Elimination (2017), “Victim Rights and Victim Assistance in a Treaty Prohibiting Nuclear Weapons: A Humanitarian Imperative”, UN Doc. A/CONF.229/2017/NGO/WP.14, adopted 13 Mar. 2017, para. 4. Interestingly, this paragraph, pertaining to “areas”, includes a reference to “nuclear weapons or other nuclear explosive devices”, while the prior provision refers only to the former (on the potential significance of this distinction, *supra* “2.1.1 Disarmed States”).

84. *Supra* “2.1.1. Disarmed States” and “2.1.6 States Affected by Use or Testing”.

85. CTBTO (n.d.), “Nuclear Testing 1945 – Today”, www.ctbto.org/nuclear-testing/history-of-nuclear-testing/nuclear-testing-1945-today/ (accessed 20 Dec. 2018).

86. CTBTO (n.d.), “Glossary”, “Vela incident”, www.ctbto.org/glossary/?letter=v&cHash=efd777666e (accessed 20 Dec. 2018).

87. Including such to “international human rights law” in preambular paragraph 8, a “[limited] right of parties to an armed conflict to choose methods or means of warfare” in preambular paragraph 9 and the right to peaceful use of nuclear energy (mirroring the language of NPT, Article IV(1)) in preambular paragraph 21.

preamble.⁸⁸ Once the Treaty has been implemented at the domestic level as envisaged by Article 5, further rights based upon it may be effected through national statutes.⁸⁹ The obligation under Article 6(1) (victim assistance), contains a reference to “applicable international human rights law”, while being preceded by “in accordance with” and thus appears to reiterate existing rights.⁹⁰ The right of states parties to withdraw under Article 17(2), almost exactly corresponds to NPT, Article X(1) and is of similar procedural rather than substantive nature. Thus, the only genuine right stipulated by the Treaty is that contained in Article 7(2) granting each party a right to “receive assistance” “[i]n fulfilling its obligations under [the] Treaty”. This right is limited by inclusion of the modifier “where feasible”, which could arguably open it to a great variety of good faith feasibility concerns raised by a requested state party.⁹¹ The right is particularly relevant in the context of remediating effects of use and testing, being embedded in⁹² and following⁹³ relevant provisions.

2.2.2. Obligations under the TPNW

Though it does employ a greater variety of state “categories”, obligations specific to a particular one are, as opposed to the NPT, rather the exception than the rule under the TPNW. Instead, the Treaty establishes one set of standards generally applicable to all parties, while accommodating the exigencies of parties not yet in a position to, or uniquely in a position to, meet those standards due to their involvement with various nuclear weapon or explosive device-related activities, in a clearly determined manner within a defined period of time.

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88. While the preambular paragraphs of the NPT may generally (for a more nuanced division, see especially *supra* notes 48, 51 and 53) be grouped into such most relevant to non-proliferation (1-3), followed by peaceful use (4-7) and disarmament (8-12), thus emulating the structure of the Treaty, determining the relationship between the individual provisions of the TPNW and its preambular paragraphs represents a more awkward affair. Not all preambular paragraphs correspond with any particular treaty provision (such as paragraph 22, which focusses on gender equality or 23, devoted to education). Similarly, what might be considered the three main pillars of the Treaty – prohibition, elimination and remediation – intermingle within individual paragraphs.
89. On the non-self-executing character of the Treaty and the near identity of language in Articles 9 of the Ottawa (Mine Ban) and Oslo (Cluster Munitions) Treaties, see Rietker, D. and M. Mohr (2018), “Treaty on the Prohibition of Nuclear Weapons: A Short Commentary Article by Article”, Swiss Lawyers for Nuclear Disarmament (SLND), www.ialana.info/wp-content/uploads/2018/04/Ban-Treaty-Commentary_April-2018.pdf (accessed 20 Dec. 2018), p. 23 citing the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction (1997), 2056 UNTS 211, entered into force 1 Mar. 1999 and the Convention on Cluster Munitions (2008), 2688 UNTS 39, entered into force 1 Aug. 2010.
90. Because it proceeds to specify particular types or acts of assistance, it might be questioned whether such assistance must only be rendered as required by the existing right the provision under the Treaty elaborates upon and thus may serve to inform a more comprehensive understanding of a given right, or whether the provision even creates an independent and individual right.
91. Depending on the particular assistance sought, it may be possible to envisage settings where a requested state would be at pains to explain why it refused such assistance, if it could have been easily rendered and was highly important in light of the object and purpose of the Treaty. For instance, a requesting party seeking to draft national legislation implementing Article 5 by enacting prohibition statutes envisaged under Article 1 might request another state party to share information on its own legislation. The requesting state may well consider its right under Article 7(2) of the Treaty breached if no reasonable feasibility doubts are present as regards the requested state.
92. See Article 7(3) and (4) in particular.
93. Article 6.

All parties must disclose via declaration whether they dispose or disposed of, or benefitted from sharing of nuclear weapons or (other) nuclear explosive devices (Article 2).⁹⁴ Newly Disarmed States are subject to unique verification (Article 4(1)) and Continuingly Armed States to such disarmament (Article 4(2)), or Sharing States to pertinent removal (Article 4(4)) measures. Only States Affected by Use or Testing and States that have Used or Tested are subject to direct assistance and remediation obligations under Article 6.⁹⁵

Finally, as regards safeguards, only States Unarmed on the Reference Date are subject to the maintenance of existing (Article 3(1)) and conclusion of comprehensive agreements (Article 3(2)), while Newly Disarmed States and Continuingly Armed States are required to conclude such agreements that are “sufficient to provide credible assurance” (Article 4(1) and (3)). Pertinent distinctions, appear to, for one, accommodate the terms of the NPT and, for another, may be interpreted to impose less specific but more stringent safeguards obligations upon Newly Disarmed States and Continuingly Armed States (see *infra* notes 236 *et seq.*). Thus, these provisions do not grant particular rights to a class of parties but might instead be considered to impose obligations commensurate with conduct involving nuclear explosive devices. These provisions too will be further analysed below. As a result, rather than first illustrating unique and then general obligations (as above in the context of the NPT), the following will first discuss general obligations prior to those applicable only to a particular “category” of parties.

2.3. Obligations of all parties

Article 1 reflects one of what may be considered the three key pillars of the Treaty: prohibition (along with elimination and remediation).⁹⁶ Defining the core prohibitions and substance of the Treaty, Article 1⁹⁷ denominates 21 nuclear explosive device-related⁹⁸ acts⁹⁹ divided into seven paragraphs, (a) through (g), which the parties

94. I.e. whether they may be considered Disarmed States, Continuingly Armed States or Sharing States.

95. Notwithstanding the co-operation obligation under Article 7(1), right under Article 7(2) and assistance obligations under Article 7(3) and (4). Contrary to the non-proliferation provisions under the NPT (Articles I and II), the assistance and remediation obligations under the TPNW do not exempt a category of states from an otherwise sweeping prohibition, but impose additional obligations that appear pragmatic considering unique conduct involving or affectedness by nuclear explosive devices.

96. Though these are all evidently interrelated, preambular paragraph 15 is explicit in clarifying the relationship between prohibition and elimination, citing a “legally binding prohibition” as a “contribution towards [...] elimination”.

97. Strictly speaking, the relevant provisions are contained within the one and only paragraph (1) of the article. Given that the Treaty itself, however, omits the paragraph when referring to its subparagraphs (see, e.g., Article 4(2) “[n]otwithstanding Article 1 (a)”), its provisions will be referenced herein accordingly.

98. Article 1 consistently uses the wording “nuclear weapons or other nuclear explosive devices”, with the exception of the latter portion of paragraph (b) where reference is made to “such weapons or explosive devices”. Due to the fact that the latter is preceded by the consistent wording earlier in the same sentence, “such” may be interpreted to refer to the earlier “or other” as well. As a result, Article 1 consistently employs the term nuclear explosive device, as encompassing nuclear weapons, which may therefore, where appropriate, be understood accordingly herein for the sake of simplicity.

99. To (a) develop [1], test [2], produce [3], manufacture [4], otherwise acquire [5], possess [6] or stockpile [7]; (b) transfer [8] or transfer control [9]; (c) receive transfer [10] or control [11]; (d) use [12] or threaten to use [13]; (e) assist [14], encourage [15] or induce [16]; (f) seek [17] or receive assistance [18]; (g) allow stationing [19], installation [20] or deployment [21]. These comprehensive and programmatic prohibitions, read together with the preamble of the Treaty (*supra* notes 87, 88, 143, 173, 175, 183 and 194), lend credence to the view that the prohibition, along with remediation and elimination, constitutes one of the three pillars that together reflect the object and purpose of the Treaty.

undertake to “never under any circumstances” perform. Among the various implications of this particular wording, one of the perhaps most integral is that upon the legality of a threat or use of nuclear weapons in the context of an “extreme circumstance of self-defence, in which the very survival of a State would be at stake”, which was neither confirmed nor denied by the ICJ in its Nuclear Weapons Advisory Opinion.¹⁰⁰ Between the parties of the TPNW, such conduct is definitively prohibited. It has also been posited that the phrase extends prohibitions to acts versus non-parties.¹⁰¹ There is an important distinction to be made here, between obligations being owed to third states and conduct versus third parties being prohibited between the parties of the Treaty. Though treaties do not, in principle, create rights or obligations for third states pursuant to the *pacta tertiis* rule codified in VCLT, Article 34, where the parties to a treaty do intend to confer such rights upon third states (in the case at hand, for instance, one might imagine a possible right of third states versus the parties of the TPNW for the latter to refrain from prohibited acts), or even the international community as a whole (rights *erga omnes*), the agreement of such states is presumed (as envisaged by VCLT, Article 36(1)). Rights thus conferred may not be unilaterally revoked unless so intended beforehand (VCLT, Article 37(2)). As a result, in that setting, prohibitions under TPNW, Article 1 would not only be owed to the parties of the Treaty but third or even all states. The function of the introductory clause (i.e. “never under any circumstances”), however, seems to be of a different nature. It does not appear to confer rights or obligations upon third states. Instead, it indicates that the prohibitions under the following TPNW, Article 1 operate with regard to acts of a state party versus third states and, for instance, the involvement of states parties in otherwise perfectly permissible acts between third states.¹⁰²

The prohibitions themselves may be roughly grouped into five categories: i) acquisition and possession;¹⁰³ ii) transfer;¹⁰⁴ iii) use;¹⁰⁵ iv) support;¹⁰⁶ and v) sharing.¹⁰⁷ Transfer comprises both direct and indirect acts,¹⁰⁸ while sharing extends beyond territory to places under jurisdiction or control of a party¹⁰⁹. Support is tied to three qualifiers: “in any way”,¹¹⁰ “anyone” and “any activity prohibited to a State Party under this Treaty”.¹¹¹ The last two qualifiers are of particular interest and raise a series of questions. Is reference to “anyone” meant to extend the applicability of this obligation to acts taken versus third states and perhaps even non-state actors as well (insofar as this is not already the case by virtue of the introductory phrase “never under any circumstances”)?¹¹² If “never under any circumstances” does not comprise both “anyone” and “in any way”, do paragraphs (e) and (f) (as well as perhaps (b) “any recipient”)¹¹³ then support an interpretation whereby the other provisions are not

100. Nuclear Weapons Advisory Opinion, *supra* note 1, p. 37, para. 105.

101. Rietker D. and M. Mohr (2018), *supra* note 89, p. 13.

102. See text at *infra* notes 111 *et seq.* in this regard.

103. For the purpose of simplicity, the acts of developing, testing, producing and manufacturing might be understood as such conducted within a process of acquisition, while stockpiling implies possession (TPNW, Article 1(a)).

104. This includes transferring (control over) devices or receiving them (or it) (*ibid.*, (b) and (c)).

105. Including the threat of use (*ibid.*, (d)).

106. Comprising assistance (as well as seeking or receiving it), encouragement or inducement (*ibid.*, (e) and (f)).

107. Limited to the passive acts of allowing stationing, installation or deployment (*ibid.*, (g)).

108. *Ibid.*, (c) and (d).

109. *Ibid.*, (g).

110. “[I]n any way” is also employed by the corresponding second clause of NPT, Article I.

111. TPNW, Article 1(e) and (f).

112. See text at and after *supra* note 101 and preceding *infra* note 122 for a more likely interpretation in light of the corresponding provision under the NPT.

113. See *infra* note 121 and text after *infra* notes 124 *et seq.*

intended to operate versus third parties? Would it not have been more appropriate to refer to “any State Party” or simply omit this qualifier, as the other paragraphs do, if no such effects were desired? Reading the relevant provisions of the NPT together with those of the TPNW, it appears probable that these qualifiers serve the purpose of extending the prohibitions under the NPT and introducing related new ones by using wider terms than those in the corresponding NPT provisions or compensating their absence. In this context it should be kept in mind that there have been controversial instances of NPT NWS parties trading components between one another (such as between the United Kingdom and the United States),¹¹⁴ or engaging in conduct with third states that may have been prohibited between the parties of the Treaty (such as supply arrangements between India and the United States).¹¹⁵ Moreover, rather than inferring that the absence of these qualifiers in other paragraphs of TPNW, Article 1 should limit their operation versus third parties, the better view might be to conclude that the interpretation would conflict with the context of paragraphs (e) and (f) within Article 1 (such as the introductory clause),¹¹⁶ the further provisions of the Treaty (including Article 4 “[t]owards total elimination of nuclear weapons”), its object and purpose (which likely includes total elimination of nuclear weapons) and a good faith interpretation (considering that it would be unreasonable to suggest that the parties desired to reserve the right of taking acts in contravention of the object and purpose of the Treaty, so long as they were performed versus third states). Therefore, these qualifiers should be read as additional, even if redundant, clarification, rather than inviting adverse inference. In any event, the final qualifier is the perhaps most significant, given that it extends the operation of the support prohibition not only to acts listed throughout the Article, but prohibitions under the entire Treaty (though the remainder of the Treaty does not contain any further explicit “prohibition(s)” as opposed to further obligations). The phrase “any activity prohibited to a State Party under this Treaty” is, furthermore, most likely not meant to limit applicability to instances where prohibitions under the Treaty undoubtedly operate, namely between the parties. Instead, it should be understood as clarifying that parties to the Treaty may not participate in (support) acts between third parties that may be perfectly legal between those parties, but would be prohibited under the Treaty (such as, perhaps, the stationing of nuclear weapons (which Article 1 of the Treaty prohibits under paragraph (g))). Thus, the provision is arguably best interpreted as prohibiting support in any act between two third states that *would* be prohibited if the states involved were parties.¹¹⁷ It does not appear to create obligations owed *erga omnes*. Further questions of state responsibility aside, one might otherwise envisage a setting where, for instance, an obligation would be owed to non-state party A by state party B not to induce non-party C to allow stationing on the territory of the latter by non-party D. Rather, if state party B engaged in such acts, only other parties to the Treaty would be in a position to perhaps invoke responsibility (considering that the character of the obligation is of an integral rather than bilateral nature, it would seem reasonable to infer that any party could invoke a relevant breach pursuant to ARSIWA, Article 42(b)(ii),¹¹⁸ thus basing themselves upon an obligation owed *erga omnes partes*. With a view to compatibility, TPNW, Article 1 as a whole evidently invites comparison with NPT, Articles I and II. The following will thus contrast the corresponding provisions, moving from most similar components to those more unique under the TPNW. This approach is intended to clearly elucidate where substantive provisions may overlap.

114. See Joyner, D.H. (2009), *supra* note 30, p. 11.

115. See Squassoni, S. (2010), “The U.S.-Indian Deal and Its Impact”, Arms Control Today, www.armscontrol.org/act/2010_07-08/squassoni (accessed 20 Dec. 2018).

116. See text at and after *supra* note 101.

117. *Ibid.*

118. ARSIWA, *supra* note 12.

Though it may, at first glance, seem unnecessary to include a provision prohibiting the transfer of (control over) nuclear explosive devices under a treaty, which already prohibits acquisition and possession, there are good reasons to include it. For one, the TPNW is open to states that do (until further time-bound measures are taken) dispose of nuclear explosive devices.¹¹⁹ Despite that provision clarifying that it applies “[n]otwithstanding Article 1(a)”, there is a need to stipulate that these states may not transfer (control over) such devices prior to disarmament. For another, the provision also establishes one standard that is (with the exception of the aforementioned time-bound accommodation under Article 4(2)) contrary to that of the NPT, applicable to all parties and thus also possible non-NPT TPNW parties that may possess control over nuclear explosive devices. Though there is no known instance of this being the case, there is one significant gap both within the NPT and the TPNW worth noting: that of possessing control over nuclear explosive devices prior to becoming a party to the treaties. Given that both, with regard to control, merely prohibit transferring or receiving it, a state that already has control over nuclear explosive devices, but is never involved in a transfer, might be considered to comply with the ordinary meaning of the treaties (though this view may hardly withstand a comprehensive interpretation in good faith, considering the context and especially the object and purpose of the TPNW, which encompass elimination).

Article 1(b) (active transfer) incorporates the exact wording of the first clause of NPT, Article I, with two significant differences. First, the relevant provision of the NPT is an obligation of NWS only, while that of the TPNW is binding upon each party. Second, the obligation under the TPNW is further widened by the introductory qualifier.¹²⁰ Thus, the obligation under the TPNW is both wider in terms of its substance and the circle of states to which it may apply. Similarly, Article 1(c) (passive transfer) too is modelled after the corresponding first clause of Article II of the NPT. Though it may seem negligible, contrary to its NPT, Article II and TPNW active transfer counterparts, this provision does not include a reference to the other party engaged in a transfer (see NPT, Article II “any transferor whatsoever”), which also produces the modified and more compact structure of the provision. This circumstance may arguably give rise to an unlikely argument that the provisions of the NPT extend to transferors not captured by the TPNW.¹²¹ Compared with active transfer, passive transfer provisions under the TPNW too are subject to a wider circle of potential

119. On Continuingly Armed States see Article 4(2).

120. “[U]ndertakes never under any circumstances to”, see text at and after *supra* note 99. Though TPNW, Article 17(3) removes all doubt, the phrase may be particularly relevant as regards transfer of control during an armed conflict. NPT states presently engaging in sharing of nuclear weapons (see, e.g., *supra* “2.1.3 Sharing States”) take the view that the Treaty would be rendered inoperable in such times. Notwithstanding the TPNW withdrawal clause, by incorporating the introductory reference in TPNW, Article 1, the pertinent and other similar interpretations would be even more difficult, if not impossible, to convincingly uphold.

121. It may appear remote to interpret the Treaty as intending to thus permit the possibility of receiving (control over) nuclear explosive devices from certain transferors. The introductory qualifier would seem to pre-empt any such interpretation, but for the fact that paragraph (b) of TPNW, Article 1 does include a similar specification. If that provision had simply left out the reference to “any recipient whatsoever”, there would be even less reason to question the scope of paragraph (c). Further interpretation of the provision may well dissuade these concerns (see in particular text after *infra* note 123 *et seq.* and on a more general note, *supra* notes 111 *et seq.*). In any event, for the purposes of the present analysis, at this stage, it would suffice to establish that the objective provisions under the NPT and TPNW either establish the same standard (as regards the parties bound by it), or (an, especially in light of the introductory qualifier at the outset of TPNW, Article 1, unlikely theory) that the NPT exceeds what is required under the TPNW in terms of the scope of possible transferors.

parties, in light of NPT, Article II being applicable only to NNWS. In terms of substance, the introductory qualifier supports a presumption of a wider obligation under the TPNW as well, though the absence of a reference to “any transferor whatsoever” may provide grounds for pause in one particular respect. Whether or not these observations disclose a conflict with the NPT will be analysed below.

In relation to active support, Article 1(e) ventures even further from its complementary provision under the second clause of NPT, Article I. Both pertain to the same secondary (supporting) acts (to “[a]ssist, encourage or induce”, “in any way”). Yet, they differ as regards the circle of states potentially bound by the obligation (only NWS versus all parties to the TPNW), the “principal” (only NNWS versus “anyone”) and primary acts (to manufacture or acquire (control over) versus all TPNW prohibitions). When read in parallel with the corresponding provision of the NPT, this reference to “anyone”, might be most simply interpreted as intended to “replace” the pertinent corresponding limitation to any NNWS in the second clause of NPT, Article I with all parties of the TPNW. Due to the fact that the drafters did not choose that term, it would seem more appropriate to understand this provision as prohibiting support in primary acts performed, not only by *any* state (including non-parties), but literally, *anyone*, including non-state actors.¹²²

Further compounded by the introductory clause,¹²³ the TPNW thus stipulates significantly more stringent obligations in terms of active support than the NPT. Both treaties are also limited to the same secondary acts of passive support (“[s]eek or receive any assistance”) under TPNW, Article 1(f) and the final clause of NPT, Article II, respectively. This provision too, is applicable to all states parties (as opposed to merely NNWS), defines a supporting entity (unspecified within the NPT versus “from anyone” under the TPNW) and encompasses further reaching primary acts (merely to manufacture under the NPT versus all TPNW prohibitions). Compared to the provision on active support, the use of the term “anyone” in this context, might be considered to inform a slightly different interpretation than that of Article 1(e) read in conjunction with the second clause of NPT, Article I alone. As illustrated above, in the context of active support, reference to “anyone” may be considered to “replace” the limitation contained in NPT, Article I to NNWS. Yet, NPT, Article II contains no such limitation. While the term thus might be considered to have been included simply for the purposes of coherence or removing doubt, it appears sensible to consider the implication of its absence. If it were only paragraph (f) that specified which state or entity the provision were relevant to as regards an act of support, but paragraph (g) omitted such reference, this would invite an interpretation whereby seeking or receiving support from certain entities might not be prohibited, while furnishing them with it would be. As a result, it appears that inclusion of the reference to a supported counterpart (“anyone”) in TPNW, paragraph (e) may be understood to remove all doubts in light of the corresponding limitations under NPT, Article I, and its inclusion under TPNW, paragraph (f) thus prompted by coherence and pre-empting adverse inference. As a result, passive support is more stringent under the TPNW in four respects similar to those illustrated above regarding active support.

Article 1(a) of the TPNW is drafted in a similar manner to the provisions on transfer and support, building upon the foundations of the NPT and broadening them. In terms of substance, contrary to the NPT, which prohibits only to “manufacture or otherwise acquire”, the TPNW adds prior, further and subsequent acts. Prior or in addition to

122. For a discussion on the breadth of such an understanding, other possible interpretations and implications upon third states see *supra* notes 111 *et seq.*

123. See text at and after *supra* note 99 and text at *supra* notes 111 *et seq.*

acquisition, these include development,¹²⁴ testing¹²⁵ and production.¹²⁶ Unlike the NPT, the TPNW also prohibits possession and the act of stockpiling.¹²⁷ The NPT was apparently drafted on the premise that all states that possessed nuclear weapons at that time would be subject to a separate class of obligations (those of NWS, including Article I, limited to prohibiting transfer and support). Because no other state possessed such weapons, all states *defined* as (potential) NNWS, did in fact, at the time, match that definition. Thus, there may, at the time, have been no need to include a prohibition on possession and NPT, Article II, applicable only to NNWS, envisaged merely the act of acquiring but not possessing. Pursuant to the ordinary meaning of Article II, any state that now possesses nuclear weapons, but would take no further measures towards manufacture or further acquisition, could become a party to the Treaty without breaching any explicit prohibition under Article II. That would not be possible (beyond a defined deadline)¹²⁸ under TPNW, Article 1(a). Perhaps most importantly, paragraph (a) is binding upon all parties (as opposed to NNWS only under the second clause of NPT, Article II). Generally speaking, rather than perpetuating what has been characterised as the “grand bargain” of the NPT, namely all NNWS foregoing nuclear weapons in exchange for the disarmament of NWS,¹²⁹ the TPNW sets one comprehensive prohibition standard. Both the stipulation of two classes of obligations for two classes of states and the following lacking implementation of the disarmament obligation, while non-proliferation has been upheld, have been denominated as evidencing “double standards”.¹³⁰ It should still be pointed out that neither NPT, Article VI nor TPNW, Article 1 contain an (absolutely) unequivocal disarmament obligation.¹³¹ While the room left for interpretation under the NPT disarmament obligation has caused NWS to defer significant progress for an extended amount of time, TPNW, Article 4(2) is drafted in a manner ensuring that failure to disarm within a limited period will unequivocally breach the terms of the Treaty.¹³² Overall, the TPNW thus extends the acquisition prohibition envisaged by the NPT to several related acts, thus filling gaps, while establishing one universal standard without lasting¹³³ exceptions.

124. Development might be understood as referring to an early stage, which may precede a decision to produce and thus could include preliminary research.

125. Mentioned only in the tenth preambular paragraph of the NPT.

126. Production constitutes a wider term than manufacturing and thus may include intangible acts, such as developing software, which fall short of manufacturing. Stockpiling itself is mentioned only in NPT, preambular paragraph 11, where the liquidation of stockpiles is cited as a component of future disarmament envisaged by paragraphs 8 through 12.

127. Though stockpiling does imply possession, it requires an additional act, namely continuing to add further devices to an arsenal. Under Article 4(2), the distinction may be relevant to Continuingly Armed States, which, due to the “notwithstanding” exception pertaining to Article (a), would not be in breach of the Treaty for possession until the relevant elimination deadline had lapsed. If, such a state did, however, during such time continue to stockpile, that act may constitute a breach.

128. See *supra* note 127.

129. See, e.g., Joyner, D.H. (2013), *supra* note 30, p. 76.

130. See, e.g., ElBaradei, M. (2012), *The Age of Deception: Nuclear Diplomacy in Treacherous Times*, Picador, London, p. 236; Bunn, G. (2006), “The Nuclear Nonproliferation Regime and Its History” in G. Bunn, C.F. Chyba and W.J. Perry (eds.), *U.S. Nuclear Weapons Policy: Confronting Today's Threats*, Brookings Institution Press, Washington, DC; McGwire, M. (2005), “The Rise and Fall of the NPT: An Opportunity for Britain”, *International Affairs*, Vol. 81, No. 1, p. 121.

131. See *infra* note 242 on the obligation to conduct and conclude disarmament negotiations under the NPT.

132. See text at *supra* notes 137 *et seq.*

133. Article 4(2).

Article 1(g) of the TPNW stipulates an obligation not to “[a]llow any stationing, installation or deployment”,¹³⁴ terms upon which the NPT is silent.¹³⁵ Several NPT parties have engaged in nuclear sharing arrangements, citing a disputed interpretation of the Treaty.¹³⁶ The corresponding provision of the TPNW pre-empts any such conduct by explicitly prohibiting it. It clarifies that relevant acts are illegal not only on the territory, but also at any place under the jurisdiction or control of a party. This may include disputed or occupied territories beyond the territory of a state,¹³⁷ or any other areas where a state practises effective control. Given that this is the only paragraph that contains any such territorial specifications, similar considerations may apply as regards those expressed above in relation to other unique qualifiers (such as “anyone” or “any activity”).¹³⁸ Specifically, the absence of such characterisations in other paragraphs begs the question whether it would be prohibited under the Treaty to, for instance, develop nuclear explosive devices in places where control is practised by a party but that lie outside its territory. In light of considerations similar to those illustrated above by reference to the introductory qualifier (“never under any circumstances”), the further context, object and purpose of the Treaty and also an interpretation in good faith, it would seem difficult to uphold such a reading.¹³⁹ The use of the term “any place” may provide reason to question whether the Treaty does, in fact, envisage application to areas that are not the territory of any state, for example (global) commons (such as the high seas, the seabed, the polar regions or outer space). In any event, it might also be doubted whether a state, in principle, enjoyed the prerogative to “allow” such conduct under general international law, in places that neither constituted its territory, nor were subject to its jurisdiction or control.

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134. Allowing stationing may be understood to comprise the act of even temporarily permitting nuclear explosive devices to be positioned with the permission of a state party. Though the Treaty does not define the term, other treaties, such as the Treaty of Pelindaba establishing the African NWFZ, define stationing as “implantation, emplacement, transport on land or inland waters, stockpiling, storage, installation and deployment” (Article 1(d), Treaty on the Nuclear-Weapon-Free Zone in Africa (1996), 35 ILM 698, entered into force 11 Apr. 1996 (Pelindaba Treaty)). Installation goes further, being of a more permanent nature, such as being stored within a base. In the context of Article IV of the Outer Space Treaty, “installation” has been interpreted to refer to “more than just sheer presence ... possibly presence coupled with some sense of permanence” (Gorove, S. (1973), “Arms Control Provisions in the Outer Space Treaty: A Scrutinizing Reappraisal”, in *Georgia Journal of International & Comparative Law*, Vol. 3, No. 114, University of Georgia, Athens, Georgia p. 117, citing Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979), 1363 UNTS 3, entered into force 11 July 1984). Deployment may be understood to constitute the act of removing a device from storage and bringing it into a state where it can be used. Specifically, it has been interpreted to mean “keeping ... warheads that contain nuclear explosives attached to delivery vehicles, ballistic missiles or aircraft, and having them ready to be used to attack a designated target” (Rajaraman, R., M.V. Ramana and Z. Mian (2002), “Possession and Deployment of Nuclear Weapons in South Asia: An Assessment of Some Risks”, in *Economic and Political Weekly* (22 June, 2002)).
135. Though falling short of transferring a device or shifting control over it, these acts of sharing have been interpreted as prohibited by the NPT (see *supra* “2.1.3 Sharing States”).
136. Sharing is currently known to take place between the United States and Belgium, Germany, Italy, Netherlands and Turkey (*ibid.*). The position of these states is that NWS, in this case the United States, maintain control over these weapons and that they have thus not been “acquired” by the receiving state. Further, these states consider that the NPT would not operate once a relevant armed conflict has erupted and thus control could be transferred in such a situation without breaching the terms of the NPT. Other states and experts dispute this interpretation (*ibid.*).
137. See, e.g., *Loizidou v. Turkey*, no. 15318/89, ECHR 1996-VI, para. 52; *Legal Consequences of the Construction of a Wall in the occupied Palestinian territory*, Advisory Opinion, ICJ Reports 2004, p. 136, para. 78.
138. See text at *supra* notes 111 *et seq.*
139. *Ibid.*

Representing a core tenet and a significant component of the object and purpose of the TPNW, Article 1(d) prohibits use and threatening it. The NPT does contain a reference to the threat or use of force in general within the final paragraph of its preamble, but lacks any nuclear explosive device-prohibition. There are two relevant aspects in particular, one pertaining to general international law and another, specific to the NPT, which the TPNW sets out to address. First, the prohibition of the threat or use even as an ultimate act of self-defence, left in abeyance by the ICJ.¹⁴⁰ Second, the operability of treaties during an armed conflict.¹⁴¹ The former is definitively prohibited by the introductory clause of Article 1¹⁴² and the latter solidified with respect to the TPNW by Article 17(3), foreclosing withdrawal from the Treaty by belligerents.¹⁴³ In these two respects the TPNW proceeds with the pattern of adding to the NPT, expressly banning what was previously merely implied or left out.

Yet, there is one literal, and taken at face value, undeniable, conflict between the TPNW prohibition of using nuclear explosive devices and the NPT: the right to obtain, or, as the case may be, share the benefits of peaceful nuclear explosions pursuant to NPT, Article V. The latter appears difficult if not impossible to harmonise with the prohibition treaty.¹⁴⁴ The reconcilability of these provisions will be subject to further detailed analysis below.

Upon subjective entry into force, pursuant to Article 2, every state party must declare to the depositary whether it disposed or still disposes of nuclear weapons or (other) nuclear explosive devices,¹⁴⁵ or currently benefits from sharing.¹⁴⁶ The NPT does not prohibit disclosing such information, meaning that this provision should be unobjectionable with respect to the NPT.

Two of the most far-reaching provisions under the Treaty are the general (paragraph (1)) and specific (paragraph (2)) national implementation obligations under Article 5. Designating nature (“legal, administrative and other”),¹⁴⁷ type (“including

140. See text at *supra* note 100.

141. See *supra* “2.1.3 Sharing States” and notes 120 and 136 on the position of the United States, whereby the outbreak of armed conflict would render the NPT inapplicable and thus transferring control over nuclear explosive devices permissible.

142. See text at and after *supra* note 99 on the implications of the terms “never under any circumstances” in the introductory clause of the provision as well as the relevant ICJ Advisory Opinion.

143. Similarly, in addition to referencing several specific principles (preambular para. 9) the preamble reiterates that such use would conflict with the law of armed conflict (preambular para. 10) and also be “abhorrent to the principles of humanity” (i.e. conflict with the relevant general principle known as the “Martens Clause”) (preambular para. 11). In addition, the “purposes and principles of the Charter of the United Nations” in general (preambular para. 1), thus including the prohibition on the use of force pursuant to Article 2(4), and that prohibition specifically (preambular para. 12) are referenced in the preamble as well.

144. On Article V see *supra* note 41.

145. While paragraph (a) (Disarmed States) employs “or”, the following two paragraphs use the common wording “or other” (see *supra* notes 45 and 98 on the significance of these differences).

146. Together with Article 4(1), (2) and (4), Article 2(1) denominates the most significant categories of states under the Treaty. By self-identification via declaration, paragraphs (a) (Disarmed States), (b) (Continuingly Armed States) and (c) (Sharing States) indicate the method for acquiring the information necessary to class states for the purpose of determining the applicability of Article 4 (elimination and safeguards) and on that basis, Article 3 (safeguards).

147. In addition to penal statutes sanctioning the participation (on the question of whom, see text at *infra* notes 150 *et seq.*) in relevant acts, further measures may include such as administrative statutes on import or export controls, reporting or licensing requirements.

penal sanctions”),¹⁴⁸ end (“prevent and suppress”),¹⁴⁹ scope (“any activity prohibited to a State Party under this Treaty”) and subject (“persons or on territory under its jurisdiction or control”) of measures, the Article stipulates an obligation to comprehensively transform the Treaty at the domestic level. Taken at face value, this provision, pertaining to persons and territory, may unfold particularly extensive and also controversial effects. First, it should be kept in mind that it entails an obligation to take measures where a party does not enjoy jurisdiction (i.e. “or control”).¹⁵⁰ Second, where a state does enjoy jurisdiction, it is important to distinguish between that to prescribe, adjudicate and enforce. The acts prohibited under the Treaty constitute such that are typically undertaken by and indeed often can only be undertaken by states. As a result, any state that would claim jurisdiction to adjudicate and enforce these prohibitions in its national courts may well do so only in conflict with the sovereign immunity of the affected state. Even if measures were carefully limited to such that do not interfere with the immunity of other states, given that measures must target persons “under [...] jurisdiction”, one further question would be that of extraterritorial jurisdiction where a state does not practise control. States regularly do seize jurisdiction over various settings exhibiting the customarily requisite territorial link, including over acts committed by their nationals, whether at home or abroad (active personality), persons committing acts directed against them (passive personality), facts pertaining to essential state interests (protective principle) or causing territorial effects (effects doctrine). In certain cases, states also seize jurisdiction over facts that do not exhibit any territorial link (which they are occasionally mandated to do by Treaty) (universal jurisdiction). All these are jurisdictional principles that may go beyond territorial jurisdiction. As a result, when a state has committed itself via the TPNW to take measures pertaining to persons under its jurisdiction, is it then required to analogously apply the jurisdictional principles to which it subscribes to facts that are relevant to the prohibitions under the Treaty? The provision may well be read as requiring a state to seize jurisdiction over its nationals, if they are engaged in conducting nuclear tests abroad, or if these affect the nationals of the seizing state.

Two subjects not encompassed by the Article, due to the fact that they neither constitute territory nor persons, are sea and air vessels. Although states occasionally subscribe to the fiction that vessels of their nationality constitute floating or flying “territory”, it remains a fiction. Exempting any of the prohibited acts from such vessels under the jurisdiction of a state party would appear extremely difficult to establish in light of the object and purpose of the Treaty, but it nevertheless may represent a challenge to identify the relevant textual foundation. For these and other reasons, Article 5(2) in particular may well be subject to further comprehensive interpretation.¹⁵¹

148. Manifestly referring primarily to fines and incarceration (or other sanctions appropriate within the national legal system of the respective state party).

149. In addition to measures mentioned above (*supra* notes 147 and 148), the collection of information will likely be essential to achieving prevention (including, for instance, intercepting communication). Especially with a view to suppression, furnishing courts, prosecutors and other authorities with powers enabling them to issue and enforce search warrants, injunctions, expropriations and similar measures may represent those envisaged by the Treaty.

150. See text at *supra* notes 137 *et seq.* on questions of extraterritorial application.

151. On the jurisdiction of states in general see, e.g., Oxman, B.H. (2017), “Jurisdiction of States”, in R. Wolfrum (ed.), *Max Planck Encyclopedia of Public International Law* (Online Edition), Oxford Public International Law.

As illustrated above, the relevant “prohibitions” may well be limited (extensive as they are) to those enumerated in Article 1.¹⁵² Presumably, the provision operates under the notion that the state itself is already bound by the prohibitions versus the other state parties at the international level and thus would primarily enact the relevant measures in an effort to prevent and suppress acts that are not taken at the behest or with the knowledge of the state. At the same time, given that many of the prohibitions of the Treaty do pertain to typically sovereign acts, the Treaty might, in principle, also require the enactment of measures that sanction the involvement of government officials in any relevant conduct. In this context, the perhaps most important historic example of note is that of Mr A.Q. Khan, known to have assisted several states in their clandestine nuclear activities, which may have been partially known to government officials.¹⁵³ Relevant national statutes under the TPNW would thus most likely seek to sanction both such actions as those undertaken by Mr Khan, as well as those of any government officials involved.

To make the implications of the provision tangible, one might, for instance, imagine an official of state A¹⁵⁴ sending an e-mail that contributes to assisting (Article 1(e)) with the stationing (Article 1(g)) of nuclear weapons controlled by state B while on the territory of TPNW-party C.¹⁵⁵ Another scenario may involve a scientist of state D who runs a computer simulation in the context of preparing (Article 1(e)) a test (Article 1(a)) later performed in state E while visiting TPNW-party F. As elaborate as the requirements of the provision may be, the inclusion of the word “appropriate” at the outset may well suffice to dissuade most reasonable concerns. The term is of decisive importance for the operation of the provision and the Treaty as a whole. For one, it may be understood as permitting delays and exceptions for Continuingly Armed States that have become parties to the Treaty but are yet to disarm.¹⁵⁶ For another, it reserves the high measure of discretion necessary to ensure that the provision may be implemented in a fashion tailored to the exigencies of the domestic legal order and unique set of international rights and obligations of a state party. Especially in light of concerns pertaining to sovereign immunity, seizing jurisdiction extraterritorially or sanctioning conduct by government officials,¹⁵⁷ this qualifier may well be of decisive importance. Yet, it also bears the danger of rendering the degree of national discretion excessively broad, leaving too much room for interpretation of what, in each individual case, is considered “appropriate” and the final determination of whom it is subject to. This question too will be gauged for its interference with the terms of the NPT.

In addition to a right (paragraph (2))¹⁵⁸ and an obligation specific to certain states only (paragraph (6)),¹⁵⁹ Article 7 contains three obligations binding upon all parties: to co-operate in the implementation¹⁶⁰ of the Treaty (paragraph (1)) and provide

152. See text at *supra* notes 111 *et seq.*, including remarks on the interpretation of the phrase “prohibited to a State Party under this Treaty”.

153. See, e.g., Coppen, T. (2015), *supra* note 30, p. 14.

154. Being a state engaged in nuclear sharing, e.g. having nuclear weapons that it does not control stationed on its territory.

155. See on these implications, text at *supra* notes 150 *et seq.*

156. See Article 4(2).

157. See text at *supra* notes 150 *et seq.*

158. See *supra* note 91.

159. Article 7(6).

160. As illustrated above, one particular instance of co-operation might be that rendered in the context of national implementation of the Treaty as required by Article 5 (see *supra* note 91). Most importantly though, the co-operation obligation extends to such required in the context of assistance and remediation pursuant to Articles 6 and 7.

assistance¹⁶¹ to “States Parties affected by”¹⁶² (paragraph (3)) as well as victims of (paragraph (4)) testing^{163, 164}. It also specifies particular avenues through which assistance may be provided (paragraph (5)). Nothing within the NPT prohibits providing co-operation and assistance to states or persons affected by testing.¹⁶⁵ Regarding NPT, Article V, it may seem paradoxical that a state would first be obliged to provide a nuclear explosive device to a state and then also assist in alleviating effects of its use.¹⁶⁶ Questions pertaining to the operation of NPT, Article V notwithstanding, these terms would not conflict.

2.4. Obligations applicable to distinct parties

As illustrated above, the TPNW does contain several provisions that are uniquely applicable to certain categories of states by virtue of their conduct involving, or affectedness, by nuclear explosive device-related activity.¹⁶⁷ These will be further illustrated and tested for conflicts with the NPT below.

2.4.1. Obligations of Newly Disarmed States (NDS)

Constituting the core provision applicable to Newly Disarmed States, Article 4(1) stipulates an obligation to negotiate,¹⁶⁸ conclude¹⁶⁹ and maintain¹⁷⁰ a safeguards¹⁷¹

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161. Assistance provided to victims is not further specified, while such versus affected parties is designated as “technical, material and financial”. Both assistance obligations are mitigated by the use of the terms “in a position to do so”. Though the assistance obligations under Article 7(3) and (4) are likely not only (see *infra* note 164) relevant to Article 6, they certainly do largely correspond with one another. Thus, read together, Article 6 may further inform what kind of assistance specifically states should render under Article 7. Whether or not a particular state will be “in a position to” render a given act of assistance in a certain situation is subject to interpretation and likely to afford assisting states a wide margin of discretion.
 162. With regard to use, this provision would operate, for instance, for the benefit of the State of Japan, or with regard to testing, the Marshall Islands (if these states were parties to the Treaty). Considering that more than 2 000 nuclear tests have been carried out across the globe, a variety of states might be considered “affected” (see *supra* note 83).
 163. While the obligation under paragraph (2), pertaining to states parties is limited to effects of use or testing of nuclear weapons only, under paragraph (3), the obligation relevant to victims extends to other nuclear explosive devices as well.
 164. Though the preceding Article 6 does also distinguish obligations relevant to areas or individuals affected by testing, the wording of the corresponding provision differs. This means that Article 7(3) (“States affected by”) may not be exclusively relevant to Article 6(2) (“areas under its control or jurisdiction contaminated”) and Article 7(4) (“victims”) not congruent with Article 6(1) (“individuals ... affected”).
 165. If other provisions of the TPNW did require a (certain) party to take acts that conflicted with the NPT and a second state co-operated in that regard, the co-operation obligation too might be considered problematic by perhaps widening the scope of conflicting provisions.
 166. Due to the fact that TPNW, Article 7(3) refers only to nuclear weapons but not nuclear explosive devices (see *supra* note 163), it would not operate with regard to peaceful nuclear explosions envisaged by NPT, Article V. The opposite is true for TPNW, Article 7(4).
 167. See, e.g., *supra* “2.1. Categories of States Parties to the Treaties” and “2.2.2 Obligations under the TPNW”.
 168. Newly Disarmed States are required to commence negotiations within 180 days of subjective entry into force of the TPNW.
 169. Safeguards agreements of Newly Disarmed States must enter into force within 18 months of subjective entry into force of the TPNW.
 170. Safeguards agreements concluded by Newly Disarmed States under Article 4(1) represent a minimum requirement under the provision and are without prejudice to future more stringent agreements.
 171. Such an agreement must be “sufficient to provide credible assurance” regarding the absence of any undeclared and non-diversion of declared material or activities.

agreement with the IAEA and co-operate with an authority¹⁷² that verifies disarmament. The latter will represent a newly-created authority and practise a function that the NPT itself did not yet enshrine, but already envisaged.¹⁷³ Nothing in that agreement would prohibit co-operating with an authority that verifies the elimination of relevant programmes. In terms of safeguards, the language of the TPNW does differ from that within the NPT. Whether or not this may represent grounds for conflict will thus be examined below. Additionally, pursuant to Article 4(5) Newly Disarmed States must submit a report at each review conference on their progress towards implementing Article 4(1).

2.4.2. Obligations of Continuingly Armed States (CAS)

For the purpose of achieving universal prohibition, the TPNW performs a balancing act between setting a single standard for all states parties and accommodating those that are not yet in a position to comply with those standards. The cornerstones of this approach are paragraphs (2) and (3) of Article 4, which set out an elimination road map for states that dispose of nuclear weapons or other nuclear explosive devices when the Treaty enters into force.¹⁷⁴ Paragraph (2) requires Continuingly Armed States to “immediately remove [such devices] from operational status”,¹⁷⁵ and “destroy them as soon as possible” though no later than a deadline¹⁷⁶ envisaged by a disarmament plan,¹⁷⁷ submitted within 60 days after entry into force of the Treaty, further negotiated and then approved by the parties.¹⁷⁸ Once a Continuingly Armed State has fully implemented its disarmament plan (3), it must have begun negotiations on a safeguards agreement¹⁷⁹ with the IAEA, which it then concludes¹⁸⁰ and further maintains.¹⁸¹ After all of these obligations have been fulfilled, Continuingly Armed States (by then no longer being such) must submit a final declaration to such end. These obligations, envisaged by Article 4(2) and (3) are equally subject to progress

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172. Article 4(6) envisages that the parties designate an authority (or several authorities) to negotiate and verify elimination of nuclear-weapon programmes.
173. NPT, Article VI and its 11th preambular paragraph both reference “general and complete disarmament under strict and international control”. That phrase is reiterated by preambular paragraph 16 and once more in the context of specifically “nuclear” disarmament in preambular paragraph 17 of the TPNW. Moreover, preambular paragraph 15 clarifies that the parties are acting towards “verifiable” elimination. These references to control and verification functions may be understood as being practised by the international authority that the Treaty envisages.
174. See Article 1(a) on the prohibition on acquisition and possession, which is referenced as “notwithstanding” by Article 4(2).
175. Presumably, “immediately” refers to the moment of subjective entry into force of the Treaty. This particular rule, being the only obligation specific to Continuingly Armed States which unfolds immediate effects, may perhaps best be read together with preambular paragraph 3, which references the risks of detonation, whether intentional or not.
176. An applicable deadline is determined at the first meeting of the parties (see Article 8) in accordance with a plan (*infra*).
177. Within 60 days of subjective entry into force of the Treaty, Continuingly Armed States must submit a plan on the “verified and irreversible elimination” of their nuclear-weapon programme to the parties or international authority (see Article 4(6)).
178. After the plan is submitted, it is further negotiated with the international authority, which then itself submits it for approval by the parties (at the following meeting or review conference). Such a plan, once approved, represents a legally binding and time-bound instrument.
179. The content of such safeguards agreements is analogous to that required by Article 4(1) (see *supra* note 171).
180. Relevant safeguards agreements must be concluded within 18 months of the beginning of negotiations.
181. Maintenance represents a minimum obligation without prejudice to future instruments.

reports, which must be submitted at every review conference pursuant to (5).¹⁸² Overall, these provisions constitute the core of what may be considered one of the three principal pillars of the Treaty: elimination.¹⁸³

With the exception of the obligations to negotiate and conclude under NPT, Article VI, the Treaty is silent on disarmament and safeguards¹⁸⁴ obligations of NWS. As illustrated above, these states also do not have a right to nuclear explosive devices under that Treaty.¹⁸⁵ As a result, there is nothing in the NPT that would prohibit rendering nuclear explosive devices inoperable or destroying them, submitting, negotiating and implementing a plan to eliminate relevant programmes and then concluding a safeguards agreement. On the contrary, these measures likely represent exactly the type of action envisaged by NPT, Article VI.

2.4.3. Obligations of Sharing States (SS)

Pursuant to Article 4(4) Sharing States are required to “ensure [...] prompt removal [...] as soon as possible but no later than a deadline to be determined by the first meeting of States Parties.”¹⁸⁶ Once removal has been performed, (former) Sharing States must communicate that circumstance via final declaration. Additionally, relevant progress reports are due at every review conference. As illustrated above (see, in particular, *supra* note 136), sharing is currently performed pursuant to a disputed interpretation of the NPT. Though the subject of a potential conflict of a sharing prohibition as envisaged by Article 1(g) will be further analysed below, an agreement of a Sharing State to remove devices by an undefined deadline would appear to constitute even less of a reason for concern, if there is one at all, as regards sharing under the NPT.

182. Although paragraph (5) does refer to reports to be submitted by “[e]ach State Party to which this Article applies” at every gathering and paragraph (6) contains an obligation of “[t]he States Parties” (i.e. all states parties) to designate an international verification authority, states that are not specifically addressed by the Article, i.e. neither Newly Disarmed States, Continuingly Armed States nor Sharing States, will not have to submit reports given that the international authority must either be designated by objective entry into force of the Treaty or decided upon at an extraordinary meeting convened for that purpose (see paragraph (6), *supra* note 172).

183. The other pillars being prohibition (see *supra* note 99) and remediation (see *supra* note 88). Elimination is explicitly cited in the title of Article 4 as well as several preambular paragraphs. These include reference to the “need to completely eliminate” (paragraph two, *infra*), “irreversible, verifiable and transparent elimination” (paragraph 15) and the call to eliminate both by the UN General Assembly (paragraph 13) and others (paragraph 24). Similarly, achieving and maintaining a “nuclear-weapon-free-world” is included in paragraphs 5 and 15. In addition, the Preamble repeatedly refers to (nuclear) disarmament, its “slow pace” (paragraph 14), a reaffirmed obligation on “negotiations leading to nuclear disarmament in all its aspects under strict and international control” (paragraph 17), “progress towards general and complete disarmament” (paragraph 16), as well as the NPT representing the “cornerstone” (paragraph 18) and the CTBT a “core element” (paragraph 19) of the relevant regime, with NWFZ (paragraph 20) contributing towards the appropriate objective.

184. The NPT NWS have concluded voluntary agreements, not envisaged by the Treaty (see *supra* note 56).

185. See *supra* notes 43 and 44.

186. The first meeting is set to be convened within one year of the objective entry into force of the Treaty (see Article 8). Similar to Article 4(2), paragraph (4) too is equipped with a notwithstanding clause referencing Article 1(b) (active transfer) and (g) (sharing, see *supra* notes 134 *et seq.*).

2.4.4. Obligations of States Unarmed on the Reference Date (SURD)

Article 3 enshrines the obligation of every party that is neither a Newly Disarmed State nor a Continuingly Armed State¹⁸⁷ to maintain pre-existing IAEA safeguards and negotiate,¹⁸⁸ conclude (if it has not yet done so) and maintain a Comprehensive Safeguards Agreement (CSA).¹⁸⁹ The terms and timing of these (and previously illustrated safeguards provisions under Article 4(1) and (3)) deviate from that envisaged by the NPT and thus will be gauged for potential conflict below.¹⁹⁰

2.4.5. Obligations of States Affected by Use or Testing (SAUT)

Pursuant to Article 6, the primary treaty burden for providing assistance to individuals¹⁹¹ and remediating areas contaminated¹⁹² by (activities related to) use or testing rests with parties enjoying jurisdiction (or control) over such persons and places.¹⁹³ These provisions are particularly significant in light of their preambular context and independence from NWS participation in the Treaty. For one, even if NWS do not become parties to the Treaty and thus comprehensive prohibition and elimination of nuclear weapons is not fully achieved, these provisions may well accomplish what has been suggested to represent the third principle pillar of the Treaty, namely remediation (see *supra* note 88) (the role of other states in co-operating and assisting pursuant to Article 7 interoperates with Article 6). For another, the Preamble of the Treaty reflects its humanitarian character and references civil society groups and organisations involved in relevant endeavours (such as the “hibakusha”

187. On the particular safeguards regimes for these states, see *supra* notes 168 *et seq.* and 179 *et seq.*, respectively.

188. Similar to Article 4(1) (Newly Disarmed States), the provision envisages commencement of negotiations within 180 days after the Treaty has entered into force and their conclusion within 18 months from that date.

189. Preambular paragraph 21 emphasises that the TPNW does not conflict with the right to peaceful use (enshrined in NPT, Article IV).

190. There are several differences between these safeguards obligations and those envisaged by Article 4(1) (on Newly Disarmed States, see *supra* notes 168 *et seq.*) and (3) (on Continuingly Armed States see *supra* notes 179 *et seq.*). First, the latter are not bound to maintain pre-existing safeguards agreements under the TPNW, though both *de facto* and *de jure* NWS have concluded various agreements (generally Voluntary Offer Agreements and Model Additional Protocol (AP)-based agreements (NPT NWS) or item-specific safeguards (see *supra* notes 43 and 44). Second, the latter are obliged to assent to the higher, AP standard, while the former are required to conclude mere CSA.

191. Paragraph (1) referring to “individuals under [...] jurisdiction”, raises the question whether it is only the territorial state, i.e. the state where such persons are present at a given time that is subject to this obligation, or other jurisdictional principles may apply (see on this question with regard to Article 1 text at *supra* notes 150 *et seq.*).

192. The term and relevant threshold are not defined within the Treaty and thus open to interpretation. In particular, it is not clear which level of contamination would trigger the relevant provisions under the Treaty.

193. The text “in accordance with applicable international humanitarian and human rights law” preceding the specific acts of assistance listed, may be interpreted in a number of ways. The provision may restate what the cited law, in any event, requires and thus simply refer to a minimum standard. References to humanitarian and international law may also be understood as reinforcing these sources as a basis for assistance, while further specifying or going beyond generally applicable minimum requirements where specific acts of assistance such as “psychological support” are cited. One further consideration might be whether, especially reading Article 6 together with Article 5 (national implementation), the former is meant to provide the basis for an individual right of affected individuals (once the Treaty has been transformed into national law).

and “non-governmental organizations” mentioned in paragraphs 6 (*infra*) and 24 (*supra* note 183)).¹⁹⁴

The question has been raised,¹⁹⁵ whether the reference in Article 6(2) to “result of activities related to [...] testing or use” may operate in relation to “activities such as uranium mining and milling [...] as well as practices for disposal [...] such as ocean dumping”. Due to the fact that these activities are neither specific to testing or using, nor nuclear explosive devices in general, and considering that the TPNW is careful not to infringe upon peaceful use (see e.g. preambular paragraph 21, modelled upon NPT, Article 4), this contribution would understand such activities as generally excluded from the ambit of the provision and the Treaty. Yet, given that Article 6(2) expressly refers to “activities related to”, while paragraph (1) does not, the former must extend to activities not encompassed by the latter. Therefore, it may seem arguable to perhaps interpret Article 6(2) as requiring environmental remediation of areas where activities such as mining, milling or disposal have taken place, those activities have in fact resulted in contamination and these activities were exclusively performed not for peaceful purposes, but only “related to [...] testing or use”. Moreover, a relevant state would enjoy a certain discretion in determining what it considered a “necessary and appropriate” measure. In addition, omitting “activities related to” from Article 6(1) clarifies that relevant affected states are not required to provide assistance to individuals affected by such activities under the Treaty, but direct use and testing only. One further similar peculiarity of note is that paragraph (1) (individuals) is limited to effects of nuclear weapons, while paragraph (2) (areas) extends to those of other nuclear explosive devices as well.

It may seem counterintuitive, but also pragmatic to allocate remediation obligations not to the using or testing but the affected state. In this regard, both paragraph (3), containing a “without prejudice”-clause¹⁹⁶ and Article 7, stipulating a right to receive (paragraph (2)) and a responsibility to provide assistance (paragraph (6)), as well as an obligation to render co-operation (paragraph (1)) should be kept in mind. In addition, the obligation is one to provide mere “adequate” assistance or take “necessary and appropriate” measures.¹⁹⁷ The NPT is largely silent on use and testing (see “use” under

194. In this regard, it might be pointed out that “catastrophic humanitarian consequences” are mentioned twice (paragraphs 2 and 4), in addition to “grave implications for human survival and the environment” (paragraph 4), suffering of victims of use and testing (paragraph 6), their impact upon indigenous peoples (paragraph 7), as well as various rules and principles of humanitarian international law (paragraphs eight and nine (*supra* note 87), as well as 10 and 11 (*supra* note 143)), including such referring to “protection of the natural environment” (paragraph 9, *supra* note 87).

195. Rietker D. and M. Mohr (2018), *supra* note 89, p. 27.

196. The provision thus clarifies that it adds to and does not subtract from relevant obligations. The reference to specifically *bilateral* agreements (emphasis added) may be attributed to existing agreements, such as that concluded between the Marshall Islands and the United States in 1983 and amended in 2003, which, under Section 177 stipulates the creation of a fund to “address [...] consequences of the Nuclear Testing Program” (Agreement between the United States of America and the Marshall Islands, Amending the Agreement of June 25, 1983, concerning the Compact of Free Association (2003), entered into force 1 May 2004). See TPNW, Article 7(6) on the “responsibility” to provide assistance to states that have used or tested.

197. Use of these modifiers increases the discretionary power of a state regarding the extent of its remediation obligations.

TPNW, Article 1(d)).¹⁹⁸ In any event, it does not contain provisions that intersect with the assumption of remediation obligations by states.

2.4.6. Obligations of States that have Used or Tested (SUT)

As a corollary¹⁹⁹ to Article 6, Article 7(6) stipulates a “responsibility”²⁰⁰ to assist²⁰¹ affected states.²⁰² With regard to the NPT, similar considerations as those applicable to other provisions concerning use and testing apply.²⁰³

2.5. Final provisions

For the sake of completeness and verifying the absence of any incompatibility with the NPT, in addition to the substantive provisions illustrated above (Articles 1 through 7), the final articles of the Treaty are reviewed as well. Moreover, some may be relevant with a view to the interpretation of substantive provisions. They are therefore briefly elaborated upon insofar as of interest to the present analysis.

Article 8 of the Treaty envisages three types of gatherings: i) biannual regular meetings (paragraphs (1) and (2)); ii) extraordinary meetings (paragraphs (1) and (3)); and iii) review conferences every six years (paragraph 4).²⁰⁴ Review is devoted to the operation of the Treaty and progress in achieving its purposes. Extraordinary meetings may most likely be convened for any purpose that would merit a regular meeting.²⁰⁵ The principal provision on (regular) meetings may be interpreted as stipulating two primary

198. On the relationship between providing nuclear explosive devices under Article V of the NPT and then alleviating the consequences of their use see *supra* note 166. Due to the fact that only paragraph (2) (areas) refers to “other nuclear devices”, while paragraph (1) (individuals) is limited to “nuclear weapons”, interoperability concerns under Article 6 relating to Article V NPT may be restricted to environmental remediation.

199. Linking “affected State Parties” to “victim assistance and environmental remediation” may be interpreted to refer to states described under Article 6(1) and (2) (see *supra* “2.4.5 Obligations of States Affected by Use or Testing”).

200. Whether employing this term gives rise to a binding obligation may be subject to doubt. Article 7(6) is the only provision of the Treaty which employs it. The single other passage of the Treaty including a reference to a “responsibility” is preambular paragraph 3 (see *supra* note 175), citing a “responsibility to prevent any use of nuclear weapons”, which is not an obligation under the TPNW or known to be one under general international law.

201. Given that the provision refers only to “adequate assistance”, the scope of this paragraph, which may not be binding (*ibid.*), is further narrowed down and opened to a greater degree of discretion by a relevant state.

202. Being “without prejudice”, similar to Article 6(3), the provision is designated to add to existing undertakings. Though Article 7(6) simply refers to “international law”, while Article 6(3) cites “international law or bilateral agreements”, it would not seem plausible to infer that bilateral agreements should be considered prejudicial to the relevant “responsibility”.

203. See, e.g., *supra* note 198. Two observations may be of particular note in this regard. First, while Article 7(6) does include a reference to “other nuclear explosive devices” and thus a “responsibility” of a state that has used a peaceful nuclear explosion to render victim assistance, the primary remediation obligation under Article 6(1) limits itself to “nuclear weapons” (see text at *supra* note 196). Second, it may indeed be the state that has requested benefitting from a peaceful nuclear explosion, rather than the state providing it, which would be the using state.

204. Under paragraph (5), a wide variety of observers, including non-states parties, are designated to be invited to gatherings.

205. The provision (Article 8(3)) does not specify for which purpose extraordinary meetings may be convened. Considering that extraordinary meetings too are “meetings” as designated by paragraph (1), presumably the Treaty envisages both being held for the same range of purposes. Additionally, under Article 4(5) and (6) the Treaty stipulates that an extraordinary meeting may be convened for the purpose of deciding upon an international verification authority (see *supra* note 172).

purposes: “to consider and [...] take decisions” on i) “the application or implementation of [the] Treaty”; and ii) “further measures for nuclear disarmament”, thus measures going beyond mere application or implementation. Three examples of relevant matters are further illustrated, comprising, *inter alia*, “[m]easures for the verified, time-bound and irreversible elimination of nuclear-weapon programmes”.²⁰⁶ The Treaty thus envisages taking decisions going beyond its mere application and implementation, being related to a subject matter that may well overlap with NPT, Article VI, meriting further analysis below.

In addition to provisions on costs,²⁰⁷ amendments,²⁰⁸ dispute resolution,²⁰⁹ consent and entry into force,²¹⁰ depositary functions and authenticity of texts,²¹¹ the Treaty contains an obligation to “encourage” other states to join the Treaty, in an effort to achieve the “goal of universality”.²¹² No reservations are permitted.²¹³ The Treaty is of indefinite duration and subject to withdrawal pursuant to Article 17 and a clause

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206. Example (a) refers to “implementation of [...] this Treaty” and (b) to “[m]easures for the verified, time-bound and irreversible elimination of nuclear-weapon programmes”. Though the language of the latter is analogous to that employed by Article 4 in the context of disarmament plans (see *supra* note 177), decisions on such plans do constitute implementation of the Treaty, meaning that such plans would be considered matters pursuant to (a), and it is other measures, not related to implementation, that are envisaged by (b). This may be understood as a basis for the parties to take decisions on matters going beyond the ambit of application and implementation, which may equally be inferred from the distinction between “application and implementation of this Treaty” and “further measures” at the outset.
207. Pursuant to Article 9, Newly Disarmed States and Continuingly Armed States carry the costs of destroying their own devices and elimination of their programmes as well as verification thereof. Costs of meetings, conferences and gatherings are borne by the parties (and observers).
208. The Treaty is amendable upon proposal supported by a majority and positive vote of two-thirds of parties (Article 10, Amendments). Unlike under the corresponding NPT provision, neither the consent of a particular class of states (NWS) nor that of current members of the Board of Governors of the IAEA is required (Article VIII).
209. Unlike the NPT, the TPNW does contain a dispute resolution clause (Article 11). Yet, it omits reference to any binding dispute resolution method, instead citing and largely reiterating the content of Article 33 of the UN Charter (peaceful resolution of disputes), while allocating certain functions to the meeting of states parties for the purpose of non-binding dispute resolution.
210. The Treaty is open for signature by all states, subject to standard (i.e. pursuant to VCLT, Article 14(1)(a) and (2) as well as Article 15(a)) means of consent and enters into force 90 days after the 50th state has consented (Articles 13 to 15).
211. Articles 19 and 20 denominate the Secretary General of the UN as the depositary (as opposed to three NWS state parties of the NPT) and stipulate the equal authenticity of texts in all six UN languages.
212. This provision may be understood to reflect the goal of achieving a “nuclear-weapon-free world” cited in preambular paragraphs 5 and 15 (*supra* note 173), or the “need to completely eliminate such weapons” under paragraph 2. Elimination is also cited by reference to the relevant Resolution of the General Assembly of the UN in paragraph 13 and as an end of prohibition under paragraph 15.
213. Article 16 renders reservations impermissible as envisaged by VCLT, Article 19(a), thereby maintaining the integrity of the Treaty and avoiding possible reservation disputes. Conversely, permitting certain reservations may have provided an avenue for states concerned by an alleged incompatibility with the NPT to reserve accordingly and also perhaps facilitated dissuading further doubts (e.g. pertaining to national implementation).

similar to that employed by the NPT, with one particularly important difference.²¹⁴ States may not withdraw from the Treaty while they are a party to an armed conflict.²¹⁵

A provision of eminent import is that governing the relationship with other agreements (Article 18). The NPT contains no such provision. Though the clause under the TPNW begins by stating that it “shall not prejudice”, it does so only where obligations are “consistent with the Treaty”. As a result, the TPNW stipulates its primacy over other agreements, including the NPT. The implications of TPNW prevalence will be subject to further analysis below.

IV. Analysis of identified instances of potential conflict

The previous section has elucidated the terms of the treaties and endeavoured to identify what might be perceived as conflicting provisions. This segment will recapitulate the significant content of these provisions, circumscribe the appropriate conflict theories, further analyse them and assess their merit. The next two sections will then seek to place prevailing conflicts within the relevant rules of international law and draw final conclusions.

1. NPT, Articles I and II (non-proliferation) in light of the acquisition and possession prohibition under TPNW, Article 1(a)

Although eminently difficult to identify within the language of the Treaty, NWS have argued that the NPT grants them a “right” to possess and produce such weapons.²¹⁶ Article 1(a) of the TPNW is unequivocal in this regard, stipulating comprehensive prohibitions, including those of production and possession under all circumstances.²¹⁷ It has been alleged that the TPNW is “not consistent with [the] NPT”, the “most conspicuous example” being the lack of a “distinction between states entitled to possess such weapons” and others.²¹⁸ If the NPT did in fact grant a right to possess nuclear weapons, that right would directly conflict with the TPNW.

As conceded above,²¹⁹ it would be unreasonable to interpret the NPT in any other manner than reflecting an acceptance by the parties that the defined NWS maintain nuclear weapons until they have fulfilled their disarmament obligations. Yet, that acceptance is by no means identical with conferring a right under the terms of the Treaty. The absence of a prohibition cannot be equated with the stipulation of a right.²²⁰

214. Notice of withdrawal is given to the depositary (i.e. the Secretary General of the UN) as opposed to both the other parties of the Treaty and the UN Security Council, becoming effective after 12 rather than 3 months. On the now widely considered resolved dispute regarding the withdrawal of the DPRK from the NPT, see *supra* note 70.

215. This clause is of twofold importance. First, it pre-empts arguments similar to those advanced by states according to which the NPT would no longer operate during a situation of armed conflict (see *supra* note 141 with further references), rendering an explicit reference to applicability at all times within the TPNW all the more significant. Second, it would likely frustrate the object and purpose of the Treaty if a state were able to simply withdraw, then acquire and use nuclear weapons (though it must be acknowledged that an NPT NWS or non-NPT state would possibly be able to pursue such a course of action after a 12-month withdrawal delay).

216. See *supra* note 43.

217. Notwithstanding TPNW, Article 4(2), which may be understood to constitute an exception for Continuingly Armed States until such time as these have completed the pertinent disarmament process (see TPNW, Article 4(2)).

218. Trezza, C. (2017), *supra* note 9, p. 2.

219. *Supra*, “1.2.1 Rights of NWS”.

220. See *supra* note 44.

It therefore appears unjustified to consider NWS as “entitled” to possess nuclear weapons under the NPT. The treaties are entirely compatible in that regard. What is not compatible with the TPNW, is proceeding with certain conduct whereupon the NPT was silent (such as possession) once Article 1(a) has taken effect. In this context it might be once more emphasised that TPNW, Article 4(2) is devised in a manner that permits Continuingly Armed States (potentially including NPT NWS) to disarm over time and thus would not render an NPT NWS in breach of Article 1(a) by virtue of mere possession once the TPNW has entered into force. Conversely, Continuingly Armed States too would be under an obligation to immediately remove all nuclear weapons or nuclear explosive devices from operational status. In any event, it is not NPT, Articles I and II but conduct not prohibited by those provisions (such as possession of nuclear weapons by NWS) that may conflict with TPNW, Article 1(a).

2. NPT, Articles I and II in light of the transfer prohibitions under TPNW, Article 1(b) and (c)

Both NPT, Articles I and II as well as TPNW, Article 1(b) and (c) contain provisions prohibiting active and passive transfer. The relevant rules differ from one another both in terms of the extent of the prohibition as well as the subjects between which such transfer may not be performed. Specifically, because NPT, Article I merely prohibits active transfer by NWS and Article II governs passive transfer by NNWS only, the universal transfer prohibitions under TPNW, Article 1(b) and (c) extend beyond the scope of the NPT. In addition, the introductory qualifier in TPNW, Article 1 “never under any circumstances” removes all doubt that transfer is prohibited both in peacetime and during armed conflict. Thus, due to the fact that transfer prohibitions within the TPNW might be considered more comprehensive than those under the NPT, both in terms of which states are bound by them and when they operate, they might be considered as conflicting with one another. In addition, some NPT parties engaged in sharing have taken the position that the NPT would cease to operate during “general war” thus rendering transfer of control permissible at such time.²²¹

Logically speaking, an NNWS that does not possess or control any relevant devices will not be in a position to engage in active transfer. Similarly, given that all NWS are prohibited from engaging in active transfer under the NPT, even though NWS are not subject to any passive transfer obligation under the Treaty, no other NWS would be in a position to provide a transfer without breaching the active transfer prohibition under Article I. As a result, it is difficult to envisage a transfer that would have been possible under the NPT alone, but is now prohibited under the TPNW due to its establishment of universal rather than symmetrical prohibitions. Moreover, if the NPT did in fact cease to operate during a situation of armed conflict, it could not conflict with the TPNW at such time. As a result, though the TPNW does formally provide for more stringent obligations in terms of subject matter (“never under any circumstances”) and extends prohibitions to all parties equally, these terms in no way conflict with the NPT.

One particular aspect, however, might not be governed by either Treaty. Given that both, with a regard to control, merely prohibit transferring or receiving it, a state that already has control over nuclear explosive devices, but is never involved in a transfer, might be considered to comply with the wording of the treaties. Still, it would seem highly unlikely that such understanding should survive a comprehensive interpretation in good faith, considering the context and especially the object and purpose of the TPNW.

221. See *supra* “2.1.3 Sharing States”.

3. **NPT, Articles I and II in light of the production assistance prohibition under TPNW, Article 1(a) and (e)**

Some NWS have understood NPT, Articles I and II as prohibiting only the transfer of entire devices, but not components (as well as materials and designs) between one another.²²² Specifically, the provisions may have been drafted in a manner designated not to hamper nuclear weapon development co-operation among NWS.²²³ Article 1 of the TPNW prohibits not only development (a) but also any assistance (e) rendered in such context. Given that the TPNW thus prohibits conduct which may have been intentionally not subjected to any prohibition under the NPT, applying a similar logic to that illustrated in the context of possession (see above), the treaties might be considered incompatible on these grounds as well.

Similar to what has been advanced as regards possession, any relevant conduct, hitherto considered not explicitly prohibited under the NPT, is now expressly prohibited under the TPNW. It is therefore the required conduct (or forbearance) and not the terms of the treaties that are incompatible. Indeed, this may be considered a recurring *motif* when comparing the two treaties. The TPNW imposes more stringent obligations that do not conflict with the NPT itself, but rather with conduct not explicitly prohibited by it. It would seem unsuitable to label such a relationship “inconsistent” or even “conflicting”. In essence, there is an important distinction to be drawn between conduct permitted by the NPT and that not prohibited by it. Several provisions of the TPNW extend to conduct not (explicitly) addressed by the NPT. For the sake of avoiding unnecessary redundancy, only some of these will be addressed below.

4. **NPT, Articles I and II in light of the sharing prohibition under TPNW, Articles 1(g) and 4(4), considering the transfer prohibition in Article 1(b) and (c), as well as national implementation pursuant to Article 5 and the withdrawal clause in Article 17(3)**

Certain NPT states parties engage in sharing arrangements, i.e. stationing of nuclear weapons on the territory of other parties without transferring possession or control.²²⁴ These states have interpreted the non-proliferation provisions of NPT, Articles I and II as not prohibiting such conduct. It is their conviction that transferring control over these weapons to sharing states “in times of general war” would be permissible, due to the fact that the NPT would then no longer operate. Conversely, TPNW, Article 1(g) explicitly prohibits both stationing (and other sharing) and transfer ((b) and (c)) under any circumstances, as well as withdrawal from the Treaty during armed conflict (Article 17(3)). Additionally, parties are subject to relevant national implementation obligations under Article 5. Moreover, parties to the TPNW that do benefit from sharing are required to ensure the removal of relevant weapons or devices by an undefined deadline pursuant to Article 4(4). If the cited provisions of the NPT are indeed interpreted as non-prejudicial to sharing, their compatibility with the relevant content of the TPNW, which certainly is prejudicial to it, may represent grounds for concern. Indeed, this discrepancy has been understood as “not consistent with” the NPT and contradicting it.²²⁵

Questions pertaining to the legality of such conduct under the NPT notwithstanding,²²⁶ the NPT certainly does not stipulate that its parties enjoy a right to transfer control over nuclear weapons to NNWS or station them accordingly even

222. Joyner, D.H. (2009), *supra* note 30.

223. *Ibid.*

224. *Supra* “2.1.3 Sharing States”.

225. Trezza, C. (2017), *supra* note 9, p. 2.

226. An interpretation in good faith may well render any transfer of control, whether during armed conflict or not, prohibited under the NPT (*supra* “2.1.3 Sharing States”).

without transferring control. By the same token, the Treaty is, at the very least, silent upon ensuring the removal of relevant weapons or devices. If it did, in fact, not operate in times of armed conflict then it could also not conflict with the TPNW in such times. As illustrated above, it is not difficult to envisage national statutes implemented pursuant to the TPNW as unfolding far-reaching consequences, particularly by penalising acts that constitute sharing assistance.²²⁷ Nonetheless, these acts have been hitherto performed in the absence of an explicit prohibition at best.

In a final analysis, whichever interpretation of the NPT is advanced, whether suggesting that it prohibits or is silent upon sharing and related activities, it would be impossible to read a right to such conduct into the Treaty. As a result, though the prohibition under the TPNW will certainly conflict with any sharing activities conducted by states parties that friction will not extend to the terms of the NPT.

Many wider concerns with respect to national implementation are likely to be dissuaded by virtue of the employed term “appropriate”.²²⁸ Interpretation would most suitably be informed not only by the context²²⁹ of the provision, including reference to the NPT,²³⁰ but also taking into account the provisions of the NPT itself as “rules of international law applicable between the parties”²³¹ where relations between two state parties to both treaties are concerned. Even when cross reading every individual provision of the NPT with all the prohibitions listed in TPNW, Article 1 and conceiving probable means of implementation pursuant to TPNW, Article 5, it would be difficult to envisage a conflict that cannot be resolved by reference to the term. Most importantly, it should be kept in mind that all the prohibitions under the TPNW relate to nuclear explosive device-related activity exclusively. Nothing within the NPT, with the exception of Article V (see below), grants rights associated with nuclear explosive devices or contains relevant conflicting obligations.

5. NPT, Article VII (NWFZ) in light of the comprehensive prohibition in TPNW, Article 1

Though NPT, Article VII explicitly recognises the “right of any group of States ... to assure the total absence of nuclear weapons in their respective territories”, such right expressly refers only to “regional treaties”. Yet, the prohibitions contained within TPNW, Article 1, including those devoted not only to possession ((a)) but also any form of sharing ((g)) and the universal ambition (Article 12) of the Treaty to achieve complete elimination of nuclear weapons as one of its three pillars, i.e. a component of its object and purpose,²³² go far beyond that of a regional treaty. The TPNW might therefore, continuing in a line of thought detailed above, be “inconsistent” with or even conflict with the NPT in this regard as well. A pertinent argument would suggest that not being limited to a regional prohibition, the TPNW may be incompatible with the provisions of the NPT.

Three aspects are of particular note in this context: First, NPT, Article VII does not limit any rights whatsoever. It cannot be construed to limit the right of states to ban nuclear weapons on their territory individually, nor can it be understood to restrict prohibition treaties to the regional level. Second, the provision references an unhampered right enjoyed by “any group of States”, and there is no reason to understand that reference as implying a right enjoyed only by certain groups, or particular combinations of states as a given group. “[A]ny group of States” thus

227. *Supra* notes 154 *et seq.*

228. TPNW, Article 5.

229. Including its preamble, see VCLT, Article 31(2).

230. TPNW, preambular para. 18.

231. VCLT, Article 31(3)(c).

232. See *supra* note 183.

references any combination of states, including all states. This means that the Treaty recognises the right of all states, including such currently disposing of nuclear weapons or having them on their territory, to conclude regional prohibition treaties at the very least. Third, the provision is also significant because even if it were applied as reserving a right to conclude strictly regional treaties, given that there is no limitation to particular regions, it would be equally possible to conceive a combination of regions practically spanning the globe. Aside from the fact that the Article thus does not in any way impair the right of each state to conclude a global treaty banning nuclear weapons on the territories of the parties, it even envisages that each and every state (“any group of States”) may conclude treaties applicable to any territory (“regional treaties”, i.e. arguably all regions in all possible combinations). There is thus not only nothing in the Article that would limit the right of every state to conclude a prohibition treaty with any other state, the provision also restates that right. Insofar as the content of the TPNW thus concerns “assuring the total absence of nuclear weapons” on the territory of its parties, it is not only compatible with but may even be envisaged by the NPT.

6. NPT, Article III (safeguards) in light of safeguards under TPNW, Articles 3 and 4(1) and (3)

The safeguards obligations in NPT, Article III differ from those envisaged in TPNW, Articles 3 and 4(1)²³³ and (3)²³⁴ in terms of wording, standards and timing. The latter are not bound to maintaining pre-existing safeguards agreements under the TPNW, though both *de facto* and *de jure* NWS have concluded various agreements.²³⁵ Under Article 4(1) and (3), the TPNW refers to safeguards that should be “sufficient to provide credible assurance” on the non-diversion of declared and absence of undeclared nuclear material or activities.²³⁶ Creating binding obligations for NNWS only, among other terms, Article III(1) of the NPT refers to “preventing diversion”, the “exclusive purpose of verification” pertaining to obligations under the NPT, focusing on “diversion of nuclear energy” and “material in [...] activities”. The content of what exactly is required by Article III has been the subject of extensive debate. Currently, the provision is understood to envision the conclusion of a Comprehensive Safeguards Agreement pursuant to the model CSA and not necessarily an AP.²³⁷ In essence, the former may be considered to verify non-diversion and the latter the absence of undeclared material or activities.²³⁸ Thus, Articles 4(1) and (3) may be read to require the conclusion of an AP by Newly Disarmed States and Continuingly Armed States, meaning that the latter are obliged to assent to the higher, AP standard, while other parties are required to conclude a mere CSA.²³⁹ In addition, the TPNW also sets out a different schedule for negotiating and concluding relevant agreements.

These differences have been subject to criticism, including that the terms of the TPNW conflict with the NPT. Specifically, the timing requirements under the TPNW have been interpreted as impermissibly extending those envisaged by the NPT (both in

233. On Newly Disarmed States see *supra* notes 168 *et seq.*

234. On Continuingly Armed States see *supra* notes 179 *set seq.*

235. Generally Voluntary Offer Agreements and Model AP-based agreements (NPT NWS) or item-specific safeguards.

236. See *supra* “2.4.1. Obligations of Newly Disarmed States (NDS)”.

237. I.e. INFCIRC/153 (Corrected) (Giorgou, E. (2018), *supra* note 9).

238. *Ibid.*

239. States Unarmed on the Reference Date are obliged to maintain pre-existing IAEA safeguards and negotiate (similar to Article 4(1) (Newly Disarmed States), the provision envisages commencement of negotiations within 180 days after the Treaty has entered into force and their conclusion within 18 months from that date), conclude (if they have not yet done so) and maintain a CSA.

terms of negotiation and entry into force deadlines). These criticisms identified by Giorgou²⁴⁰ include such suggesting that TPNW, Article 4 contradicts the universality of the CSA plus the AP in states that have eliminated nuclear weapon programmes (Action 30 as envisaged in the 2000 Review Conference Final Document, reaffirmed in 2010).²⁴¹ Though this does not constitute a question of incompatibility with the Treaty *per se*, it may perhaps be considered to impact subsequent agreement and thus also the Treaty. As Giorgou has illustrated, the Action Plan does not mandate the adoption of an AP and renders such action optional until “global zero” is achieved (citing Actions 24, 25 and 28). In addition, it is not clear whether these specific actions may be considered to represent subsequent agreement and equated with the NPT itself. Finally, as illustrated by Giorgou, even if the proposition of adoption of an AP as a universally mandatory standard under the NPT is accepted, the TPNW would simply set a lower compulsory standard. This would fall short of representing an inconsistency under Article 18 of the TPNW, in which case the higher standard of the NPT would simply continue to operate.

Though both treaties do envisage diverging timelines as regards deadlines for commencing negotiations on and entry into force of safeguards agreements, as Giorgou has demonstrated, these provisions cannot, however, be considered to conflict, given that they simply constitute two distinct sets of obligations, even if one should be more stringent than the other. As a result, a state that has failed to take a certain action by a given point in time may be in violation of the NPT, but not the TPNW. This would constitute no more of a conflict than conduct that is prohibited under the TPNW and not addressed under the NPT (such as prohibition of use under Article 1(d)).

Thus, by setting more explicit and sometimes higher standards, while stipulating safeguards provisions binding upon all parties rather than particular categories, and defining distinct timing requirements, the TPNW does differ from the NPT. Yet, all differences between the NPT and TPNW safeguards regimes considered, none of them give rise to concerns in terms of a *conflict*. Instead, the TPNW imposes in some respects new or more stringent, but not incompatible safeguards obligations.

7. NPT, Article VI (disarmament) in light of various TPNW provisions, particularly prohibition and elimination under Articles 1 and 4

The discrepancy between the disarmament provision contained in NPT, Article VI and both the comprehensive prohibitions of TPNW, Article 1 and elimination provisions under TPNW, Article 4 may be considered to constitute a significant component of the *raison d'être* of the TPNW. While the NPT contains an obligation to negotiate, the relevant terms of the TPNW are less equivocal. Though NPT, Article VI does envisage the negotiation of a *treaty*, the provision is without prejudice to the question of whether the TPNW is, in fact *that treaty*. As a result, understanding what exactly Article VI requires and contrasting it with the content of the TPNW may contribute to analysing the compatibility of the treaties.

The (authoritative but albeit non-binding) interpretation by the ICJ in its Nuclear Weapons Advisory Opinion has shed light on two aspects of particular note. First, that Article VI contains an obligation to achieve a “precise result” rather than conduct.²⁴² Second, that such result is of a distinct nature, namely “nuclear disarmament in all

240. Giorgou, E. (2018), *supra* note 9.

241. See *supra* note 48.

242. Nuclear Weapons Advisory Opinion, *supra* note 1, p. 34, para. 99 “[...] The legal import of that obligation goes beyond that of a mere obligation of conduct; the obligation involved here is an obligation to achieve a precise result – nuclear disarmament in all its aspects – by adopting a particular course of conduct, namely, the pursuit of negotiations on the matter in good faith.”

its aspects”²⁴³ as opposed to a mere component of a general and distant demilitarisation objective. NPT, preambular paragraph 11 reinforces this interpretation, linking “elimination of ... nuclear weapons” to “a Treaty on general and complete disarmament”, the former arguably denoting the subject matter and the latter the type of treaty.²⁴⁴ Considering that both the Biological and Chemical Weapons Conventions employ such language (“general and complete disarmament”) as well, a treaty on nuclear disarmament would seem to complement these treaties of the “general and complete” disarmament type.²⁴⁵ Preambular paragraphs 8 through 11 are sometimes referenced in this regard as well, citing, *inter alia*, co-operation towards nuclear disarmament.²⁴⁶

In addition, two instances of subsequent conduct of the parties relevant to the provision are of particular interest.²⁴⁷ One relates to the 1995 Principles and Objectives on the implementation of Article VI adopted in the context of the NPT Review and Extension Conference.²⁴⁸ They are contained in a “[d]ecision” citing, under a “principle and objective” titled “[n]uclear disarmament”, measures “important” to the “full realization and effective implementation of article VI”. One such measure is “[t]he determined pursuit by the nuclear-weapon States of systematic and progressive efforts to reduce nuclear weapons globally, with the ultimate goal of eliminating those weapons, and by all States of general and complete disarmament under strict and effective international control”, thus reinforcing an understanding that implementing Article VI requires efforts with the goal of complete nuclear disarmament. The other instance is the document titled “Thirteen Steps” for the implementation of Article VI adopted at the 2000 NPT Review Conference, which explicitly references the 1995 Principles and Objectives.²⁴⁹ These include in Step 6 “[a]n unequivocal undertaking by the nuclear-weapon states to accomplish the total elimination of their nuclear arsenals leading to nuclear disarmament to which all states parties are committed under Article VI.”²⁵⁰ Additionally, pertaining specifically to NWS, Step 9 references the “implementation of agreements pursuant to Article VI”, “[c]oncrete agreed measures to further reduce the operational status of nuclear weapons systems” and “the engagement as soon as appropriate of all the nuclear-weapon states in the process leading to the total elimination of their nuclear weapons.”²⁵¹ Finally, Step 13 envisages improving verification capabilities with respect to “nuclear disarmament agreements for the achievement and maintenance of a nuclear-weapon-free world.” As a result, read together, the cited steps indicate that implementation of Article VI involves the total elimination of nuclear weapons under an international agreement.

243. *Ibid.*, para. 105: “[...] There exists an obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control.”

244. Burroughs, J. (2007), *Nuclear Disorder or Cooperative Security?*, Lawyer’s Committee on Nuclear Policy, New York, p. 30.

245. *Ibid.*, pp. 30-31.

246. For instance, the Final Document of the 2010 NPT Review Conference, similar to earlier Conference documents, cites paragraphs 8 through 12 together with Article VI in reviewing the operation of the Treaty (see *supra* note 48).

247. On the question of whether or not this conduct represents subsequent agreement or practice establishing it pursuant to VCLT, Article 31(3)(a) or (b), see *infra* notes 252 *et seq.*

248. 1995 Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Decision 2 (NPT/CONF.1995/32 (Part I), Annex) 20 May 1995.

249. 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Final Document (NPT/CONF.2000/28 (Parts I and II)), 20 May 2000.

250. *Ibid.*

251. *Ibid.* One further step of particular interest as regards TPNW, Article 4: “5. The principle of irreversibility to apply to nuclear disarmament, nuclear and other related arms control and reduction measures”.

Thus, when Article VI NPT is read together with its preambular paragraph 12, the Advisory Opinion of the ICJ and subsequent conduct of the parties at the 1995 and 2000 Review Conferences, it appears entirely plausible to interpret the provision as envisaging a treaty such as the TPNW, which seeks to achieve universal (Article 12) prohibition (Article 1) and elimination (Article 4) of nuclear weapons. Therefore, the content of Article VI NPT does not conflict with the TPNW.

8. NPT, Article VI in conjunction with Article VIII(3) (disarmament measures at Review Conferences) in light of the substance of meetings under TPNW, Article 8(1)

Both the NPT (Articles VI and VIII(3)) and TPNW (Article 8(1)) stipulate the possibility of taking decisions with a view to disarmament measures at gatherings. Therefore, the same subject matter may be considered to be governed by the two treaties. Given the overlap of subject matter, it appears worth considering whether the provisions of the treaties and decisions taken on their basis may give rise to conflicts.

Specifically, both NPT, Article VI and TPNW, Article 8 envisage that the respective parties undertake further measures pertaining to nuclear disarmament. This circumstance itself, does not, however, give rise to any conflict. If, in the context of such meetings, states parties to the TPNW were to take a decision that conflicted with the NPT, it would be that decision but not the TPNW itself that interfered. Considering the degree of overlap between various instruments related to (the testing of) nuclear weapons or such related to disarmament, there are myriad opportunities for interaction that does not inhibit the contemporaneity of instruments under the law of treaties. As a result, a decision taken at a review conference or other meeting might be required to be measured by two yardsticks: both that of the NPT and the TPNW. Any conflict between a relevant decision and one of the treaties would, however, not impact the compatibility of the two instruments as such.

9. NPT, Article V (peaceful nuclear explosions) and various provisions of the TPNW, including use under Article 1(d)

In the broadest sense, NPT, Article V stipulates an obligation of all parties to make the benefits of peaceful nuclear explosions available to NNWS. Taken at face value, such a provision might appear entirely irreconcilable with the TPNW, not least by virtue of Article 1(b) prohibiting the transfer and (d) prohibiting the use of any nuclear explosive device.

At present, it is unlikely that any reasonable party to the NPT would dispute the factual obsolescence of NPT, Article V. Yet, there are two considerations that may merit revisiting the issue. For one, there may be a need to explain, in strictly legal terms, what exactly the status of NPT, Article V is so as to assure that any concerns of engaging in conflicting treaty relations be put to rest. For another, it has not yet been verified whether it would be legally impossible for any NNWS to invoke its rights under Article V at any future date, regardless of the wide agreement on the present irrelevance of the provision.

Despite elaborations above on its insignificance in light of equivocal wording and the lack of any pertinent benefits having yet materialised,²⁵² it may be the Article most

252. *Ibid.*, *et seq.* At the 1995 Review and Extension Conference, the parties came to the following understanding:

The Conference records that the potential benefits of the peaceful applications of nuclear explosions envisaged in article V of the Treaty have not materialized. In this context, the Conference notes that the potential benefits of the peaceful applications of nuclear explosions have not been demonstrated and that serious concerns have been expressed as to the environmental consequences that could result from the release of radioactivity from such applications and on the risk of

deserving of careful reasoning in terms of compatibility. The widespread consensus on the lack of importance of the obligation should not substitute a convincing explanation why exactly, under the rules of treaty law, the provision does not conflict with the TPNW. There are three principal considerations that may provide grounds for doubting the triviality of the matter.

First, Article V might still be considered to constitute a legally binding provision under the NPT. The Treaty has not been formally amended so as to omit the provision. If an NNWS decided that it did desire to enjoy what it considered the benefit of a peaceful nuclear explosion, demanding that international observation and procedures be set up to that end and convincingly dissuaded all other concerns which might be raised under the terms of the Treaty, could it then invoke the international responsibility of each party failing to take “appropriate measures”? Second, evolutive interpretation is a double-edged sword. While history has shown that until now, “potential benefits” may be understood as having proven to currently represent “none”, it is conceivable that at a future date, an actual benefit of peaceful nuclear explosions will be developed or discovered. One such suggestion has been advanced in the context of diverting potentially hazardous near-Earth objects or deflecting comets towards Mars for the purpose of promoting the development of the atmosphere on the planet and facilitating subsequent colonisation.²⁵³ However far removed any such possibility may appear now, as long as Article V remains in force, with the advent of a new peaceful nuclear explosion application, the provision could possibly regain relevance. Third, and perhaps most importantly in relation to the TPNW, a treaty that would render “taking appropriate measures to ensure that [...] potential benefits [of peaceful nuclear explosion are] made available” impermissible, could arguably be considered to represent a genuine conflict. Given that Article V is, *de facto*, relevant as an obligation of NWS, but, *de jure*, binds “[e]ach Party” to the NPT, every such potential party to the TPNW could be concerned that it would be engaging in conflicting treaty obligations.

Most recently, at the 2010 NPT Review Conference, the parties affirmed that Article V is “to be interpreted in the light of the Comprehensive Nuclear-Test-Ban Treaty”.²⁵⁴ Attributing any specific consequence to this statement requires both an interpretation of its content and appreciation of the legal value of an NPT Review

possible proliferation of nuclear weapons. Furthermore, no requests for services related to the peaceful applications of nuclear explosions have been received by IAEA since the Treaty entered into force. The Conference further notes that no State party has an active programme for the peaceful application of nuclear explosions.

Report of Main Committee III, Treaty on the Non-proliferation of Nuclear Weapons Review and Extension Conference, 5 May 1995, NPT/CONF.1995/MC.III/1, Sec. I, para. 2.

253. See also National Aeronautics and Space Administration (2007), “Near-Earth Object Survey and Deflection Analysis of Alternatives: Report to Congress”, available at https://cneos.jpl.nasa.gov/doc/neo_report2007.html (accessed 10 Dec. 2018); Phillips, T. (2014), “Colliding Atmospheres: Mars vs Comet Siding Spring”, https://science.nasa.gov/science-news/science-at-nasa/2014/12aug_marscomet (accessed 10 Dec. 2018).

254. Footnote omitted (containing a reference of unclear significance to UNGA Res 50/45, concerning the work of the International Law Commission) (NPT/CONF.2010/50 (Vol. I), 18 June 2010, Final Document Vol. I, Part I, para. 78). The same affirmation (lacking a reference to the pertinent UNGA Resolution) is also contained in earlier documents, such as the 2000 NPT Review Conference Final Document (2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Final Document (NPT/CONF.2000/28 (Parts I and II)), 20 May 2000). See *supra* note 252 for the factually more detailed but legally even less conclusive observations of the parties at the 1995 Review and Extension Conference.

Conference final document. CTBT, Article I(1)²⁵⁵ stipulates an obligation not to conduct nuclear tests or “any other nuclear explosion”, while paragraph (2) prohibits any participation therein. One might therefore be tempted to simply conclude that the parties to the NPT have agreed that (participation in) a peaceful nuclear explosion is prohibited and Article V inoperable as a result. There are a number of reasons to doubt such an interpretation. For one, it is unclear which meaning a general reference to a treaty that is not in force should unfold. In particular, should any possible effect of the reference rest in abeyance until such time as the CTBT enters into force.²⁵⁶ For another, it may be questioned whether the statement should be understood as simply citing a particular instance of a rule of interpretation whereby treaties shall be interpreted “in light” of agreements in force between the parties.²⁵⁷ Whether or not this is the case, one might ask whether the statement is then meant to unfold effects for non-signatories or consenting states to the CTBT (whether prior to or upon its entry into force). If the parties at the Review Conference had meant to incorporate the prohibitive rules contained in the CTBT regardless of the status of that agreement and the question of which NPT states were parties to it, would it then not have been more appropriate to clearly state that the parties considered that NPT, Article V should be interpreted in light of a prohibition to conduct nuclear explosions or participate therein? Even if the relevant affirmation were equated with such a prohibition, its effect upon the binding nature of NPT, Article V would need to be determined.

One possibility, would be to consider Review Conference documents as constituting subsequent agreement (or practice establishing it) pursuant to VCLT, Article 31(3)(a) and (b).²⁵⁸ The term “agreement” in the context of “subsequent agreement” does not refer to treaties.²⁵⁹ In its original commentary on the VCLT provision, the International Law Commission clarified that subsequent agreement may constitute authentic, i.e. binding, interpretation.²⁶⁰

Subsequent practice, on the other hand, is tied to an agreement and may thus be described as “objective evidence of understanding”.²⁶¹ Not all parties to a treaty must participate in such practice.²⁶² The VCLT reference to “the Parties” does refer to all parties, meaning, however, that it is “not participation [but] imputable agreement” which is required.²⁶³ Conversely, where decisions are adopted without concurrence of all parties they “cannot be regarded as subsequent agreement to an interpretation [of a treaty Article] nor as subsequent practice establishing an agreement of the parties regarding the interpretation of the Treaty”.²⁶⁴

255. Comprehensive Nuclear-Test-Ban Treaty (1996) (not in force), available at: www.ctbto.org/fileadmin/content/treaty/treaty_text.pdf (accessed 20 Dec. 2018) (CTBT).

256. Though signatories and states that have consented to the Treaty would be obliged not to frustrate its object and purpose prior to entry into force pursuant to VCLT, Article 18, which may well coincide with the terms at hand.

257. VCLT, Article 31(3)(c).

258. *Ibid.* Joyner refers to these documents as “subsequent interpretative agreements”, citing VCLT, Article 31(3)(a) (Joyner, D.H. (2013), *supra* note 30, p. 101).

259. Gardiner, R.K. (2015), *supra* note 69, pp. 244-245 referring to *Kasikili/Sedudu Island (Botswana v. Namibia)*, *Judgment*, ICJ Reports 1999, p. 1045.

260. *Ibid.*, p. 244 citing the Commentary of the ILC on the VCLT (International Law Commission (1966), *Yearbook of the ILC*, Vol. II, p. 222, para. 15).

261. Gardiner, R.K. (2015), *supra* note 69, p. 253.

262. Gardiner, R.K. (2015), *supra* note 68, p. 265 citing the *Case Concerning the Temple of Preah Vihear (Cambodia v. Thailand)*, *Merits, Judgment*, ICJ Reports 1962, p. 6, paras 58-70.

263. Commentary of the ILC on the VCLT, *supra* note 260.

264. *Whaling in the Antarctic (Australia v Japan: New Zealand intervening)*, *Judgment*, ICJ Reports 2013, p. 226, para. 83.

The recent report of the International Law Commission on Subsequent Agreement and Practice, prepared by Special Rapporteur Professor Georg Nolte, has referenced the opinion of commentators on NPT review specifically²⁶⁵ and decisions of conferences of states parties in general²⁶⁶ as “being capable of embodying” subsequent agreement, which although “not legally binding” may constitute “authoritative interpretation”.²⁶⁷ Nolte cites four particular considerations that must be taken into account when determining whether such conference documents constitute subsequent agreement, namely i) specificity; and ii) clarity “of the terms chosen in the light of the text ... of the decision as a whole”; iii) its object and purpose; and iv) the way in which it is applied.²⁶⁸ Though the relevant NPT Review Conference quote on NPT, Article V lacks, as illustrated, specificity and clarity, relevant decisions are, as cited, considered authoritative. Their object and purpose lies in “assuring that the purposes of the ... treaty are being realised”.²⁶⁹ Though the parties to the NPT may well attribute a certain significance to these decisions, it is unclear how far they are applied as decisions reflecting interpretations or mere declarations of intent. It thus might be concluded that there are both elements weighing in favour and such against, deeming the reference at hand a reflection of subsequent agreement.

One further approach to Article V would be to consider whether, with the lapse of time, the operation of the Article has been discontinued by tacit agreement, i.e. *desuetude*, or it has become obsolete due to a drastic change of circumstances since the conclusion of the Treaty.²⁷⁰ *Desuetudo* may be difficult to establish due to the nature of Article V. Whereas “repeated incompatible practices of all parties” may provide the requisite evidence of tacit agreement,²⁷¹ the absence of any practices in the case at hand, whether compatible or incompatible, may not suffice to give rise to the level of certainty required to determine that a treaty rule has been modified without a single party having explicitly made such a claim. By a similar token, it would seem premature to consider that a customary prohibition of nuclear explosions constitutes an instance of *desuetudo* similarly having modified the Treaty. If NPT, Article V were a customary rule, it may well be considered obsolete due to the fact that the “object to which [it] relates” has “disappeared” (benefits of peaceful nuclear explosions) or the rule itself has become “senseless” (performing peaceful nuclear explosions).²⁷² Yet, as a treaty rule, Article V may generally only be subject to the grounds of modification and termination detailed within the provisions of the VCLT. These permit *desuetudo* only so far as Article 54(b)²⁷³ pertains to the termination of an entire treaty rather than an individual provision and do not include obsolescence. It

265. Citing, *inter alia*, the previous edition of Joyner, D.H. (2013), *supra* note 30 (Joyner, D.H. (2011), *Interpreting the Nuclear Non-Proliferation Treaty*, Oxford University Press, Oxford, p. 83).

266. Citing Carnahan, B.M. (1987), “Treaty Review Conferences”, *American Journal of International Law*, Vol. 81, No. 1, p. 229.

267. For the Draft Conclusions on Subsequent Agreement and Subsequent Practice, with Commentaries, prepared by Special Rapporteur of the International Law Commission, Professor Georg Nolte, see International Law Commission (2018), *Report of the International Law Commission: Seventieth Session, UNGA Official Records, Seventy-third Session, Supp. No. 10 (A/73/10)*, p. 86. Coppen shares the view that NPT Review Conference documents may be “illustrative of subsequent agreement and practice” (Coppen, T. (2015), *supra* note 30, p. 147).

268. *Ibid.*, International Law Commission (2018), p. 89.

269. NPT, Article VIII(3) illustrates the purpose of reviewing the operation of the Treaty.

270. Wouters, J. and S. Verhoeven (2008), “Desuetudo”, in R. Wolfrum (ed.), *Max Planck Encyclopedia of Public International Law* (Online Edition), Oxford Public International Law, available at: <https://opil.ouplaw.com/abstract/10.1093/law:epil/9780199231690/law-9780199231690-e1027?rskey=DKhQsY&result=1&prd=EPIL> (accessed 6 June 2019).

271. *Ibid.*

272. *Ibid.*

273. VCLT, Article 54(b).

would be possible for a customary rule to derogate Article V, but as illustrated, it is likely premature to advance such a claim, especially in light of the pending entry into force of the CTBT. As a concluding remark, it might also be noted that neither *desuetudo* nor obsolescence, especially based upon grounds outside the VCLT, would satisfy the requirements of legal certainty in treaty relations.

When weighing considerations pertaining to subsequent agreement, *desuetudo* and obsolescence, one question that may arise is whether it is at all possible to *de facto* modify the provisions of a treaty without observing the procedure envisaged therefore (NPT, Article VIII(2) in the present case). In this context, it should be borne in mind that “parties to a treaty own the treaty”²⁷⁴ and may well modify it without observing the procedural requirements envisaged by it. One particular example of note is that pertaining to Article 27 of the UN Charter, describing the voting procedure of the Security Council. Though the amendment procedure envisaged by the Charter was not observed, the parties have successfully modified the express provisions of the Treaty by adopting the permanent member “veto” procedure.²⁷⁵

Finally, it is equally relevant to note that NPT, Article V does not require NWS to maintain their arsenals so that they may furnish NNWS with the benefits of peaceful nuclear explosions. An NPT NWS that has disarmed (Disarmed State or Newly Disarmed State) or becomes a party to the TPNW and disarms (Continuingly Armed State) would simply, if Article V NPT should still be considered operable, fulfil the obligation, the same way any NNWS would.

As a result, perhaps the most reliable conclusion would be to assert that the cited decisions of the parties taken at Review Conferences *permit one of several interpretations, whereby the parties have agreed that Article V has been rendered moot.*

V. Categorisation of prevailing concerns

The analysis performed within the previous sections has revealed that there are currently no known grounds to consider the invalidity,²⁷⁶ termination²⁷⁷ or

274. Crawford, J. (2013), “Subsequent Agreements and Practice from a Consensualist Perspective” in G. Nolte (ed.), *Treaties and Subsequent Practice*, Oxford University Press, Oxford, p. 31.

275. See *supra* note 68.

276. Indeed, no state has taken the requisite step of invoking it. With lack of consent (VCLT, Article 46), error (Article 48), fraud (Article 49), corruption (Article 50) and coercion (Article 51) being specific to an individual state, and conflict with a peremptory norm (Article 52) appearing equally unlikely, it would seem appropriate to eliminate invalidity from the present investigation.

277. Similarly, with regard to *termination* and the exception of the withdrawal of the DPRK pursuant to NPT, Article X (see *supra* note 70), no state has withdrawn from the Treaty. No instance of material breach (VCLT, Article 60), impossibility of performance (Article 61), fundamental change of circumstances (Article 62), severance of relations (Article 63) or emergence of a conflicting peremptory norm (Article 64) has been asserted. For the TPNW to terminate the NPT as a later treaty relating to the same subject matter (VCLT, Article 59), in addition to identity of parties, a pertinent intent, or alternately, incompatibility rendering simultaneous application impossible, would have to be established. Considering that the opposite of such intent is reflected within the TPNW (preambular paragraph 18), only incompatibility rendering simultaneous application impossible would come into question. Whether explicit or tacit, only a serious incompatibility or conflict may terminate an earlier treaty, “[i]t must result in the impossibility of applying both treaties – not just two provisions of the two treaties – at the same time” (Pauwelyn, J. (2003), *supra* note 19, p. 283). In any event, lack of requisite party identity permits the definitive ruling out of termination.

illegality²⁷⁸ of either Treaty. If individual provisions of the NPT were, in fact, *incompatible* with and related to the same subject matter as those of the TPNW, the latter would prevail pursuant to VCLT, Article 30(2). While the NPT does not govern its own compatibility with other agreements, TPNW, Article 18 asserts its prevalence. As a result, between mutual parties the TPNW would prevail. The same would apply even in the absence of any such determination, pursuant to VCLT, Article 30(4)(a) in conjunction with (3), i.e. the *lex posterior* rule. With respect to the principle *lex specialis derogat legi generali*, given that the treaties are successive and neither Treaty contracts out of general international law,²⁷⁹ individual provisions of the TPNW may, if at all, be considered *leges speciales* insofar as they simultaneously represent *leges posteriores* and thus reconfirm the cited result. Where a, although more specific, rule under the NPT would be incompatible with the TPNW, the latter would nevertheless prevail. This remains without prejudice to state responsibility, which may be triggered by a party to both treaties versus an exclusive NPT state resulting from the conclusion or application of the TPNW.²⁸⁰

Despite the prevalence of the TPNW in the event of incompatibility with individual provisions of the NPT and before asserting such circumstance in relation to individual provisions, it is important to note that potential conflicts are best investigated in the awareness of a general presumption against their existence.²⁸¹ Rebutting this presumption requires explicit language and evidence to that end, the burden of which is borne by the state asserting the presence of a conflict.²⁸² Moreover, “[w]hen faced with two possible interpretations, [that] which harmonises [...] ought to be preferred”.²⁸³ Article 31(3)(c) of the VCLT mandates an interpretation “tak[ing] into account, together with the context ... [a]ny relevant rules of international law applicable in the relations between the parties”.²⁸⁴ An interpreter should assume that parties need not reproduce their existing obligations in treaties, having implicitly referred to them instead.²⁸⁵ Where such referral is explicit, little room for doubt

278. In terms of “illegality”, there is no explicit prohibition within the NPT that would render the TPNW itself illegal, and the latter constitutes neither a modification (VCLT, Article 41) nor suspension (VCLT, Article 58) of the NPT.

279. Pauwelyn, J. (2003), *supra* note 19, p. 409.

280. VCLT, Article 30(5).

281. Pauwelyn, J. (2003), *supra* note 19, p. 240, citing, *inter alia*: Jenks, W. (1953), “Conflict of Law-Making Treaties” in *British Yearbook of International Law*, Vol. 30, p. 427 (“[i]t seems reasonable to start from a general presumption against conflict”); Akehurst, M. (1974-5), “The Hierarchy of the Sources of International Law” (1974-5), *British Yearbook of International Law*, Vol. 47, p. 275 (“just as there is a presumption against the establishment of new customary rules which conflict with pre-existing customary rules, so there is a presumption against the replacement of customary rules by treaties and vice versa”) and the WTO panel report *Indonesia – Certain Measures Affecting the Automobile Industry, complaints by the European Communities (WT/DS54), the United States (WT/DS59) and Japan (WT/DS64)*, panel report adopted on 23 July 1998, para. 14.28 (“in public international law there is a presumption against conflict”).

282. *Ibid.*, p. 240.

283. *Ibid.*, p. 241, citing the Right of Passage case: “[i]t is a rule of interpretation that a text emanating from a Government must, in principle, be interpreted as producing and as intended to produce effects in accordance with existing law and not in violation of it.” (*Case Concerning Right of Passage over Indian Territory (Portugal v. India) (Preliminary Objections), Judgment, ICJ Reports 1957*, p. 142).

284. VCLT, Article 31(3)(c).

285. Pauwelyn, J. (2003), *supra* note 19, p. 240, citing Srenson: “Le texte est considéré comme partie du système global du droit international et l’interprétation se propose de le mettre en harmonie avec la réglementation générale de celui-ci. La présomption sur laquelle se base cette méthode d’interprétation est que les contractants, en rédigeant le traité, sont partis de certaines données qu’il n’était pas besoin de reproduire dans le texte, et auxquelles ils se sont référés tacitement.” [The text is considered a component of the

remains. As a result, with incompatibility less than clearly established, it would appear prudent to first take every effort to render a harmonising interpretation.

In light of the analysis performed, NPT, Article V, stipulating rights and obligations pertaining to peaceful nuclear explosions, appears to constitute the only provision of the Treaty that may conflict with the TPNW, particularly the prohibition of use under Article 1(d). Pursuant to one interpretation, NPT, Article V has been rendered obsolete by subsequent agreement of the parties. Any state party to both treaties might be presumed to subscribe to that or a similar *harmonising interpretation*.

VI. Conclusion

Resting upon its three pillars, the NPT has withstood the test of time during mounting dissatisfaction over lacking disarmament progress. Itself envisaging a treaty that would eliminate nuclear weapons, the present analysis has sought to determine whether the TPNW is that, necessarily compatible, agreement. This investigation concludes that the TPNW in no way imposes upon peaceful use while adding remediation, complements non-proliferation with reinforced prohibition and sets out to fulfil the promise of elimination that disarmament holds.

Rather than being incompatible, or merely weakening the NPT, the TPNW may in fact revitalise it by incorporating three components that have been suggested²⁸⁶ as necessary to that end: i) complementing Article VI; ii) integrating non-NPT states parties; and iii) institutionalising the elimination of nuclear weapons. In this sense, assenting parties are not engaging in conflicting treaty relations but complying with and even implementing their obligations.

One recurring *motif* throughout the exploration of suggested and potential conflicts between the treaties has been the insight that these largely pertain not to what the NPT stipulates but what it has left out. The questions of whether the outbreak of armed conflict enables transfer of control, ultimate acts of nuclear self-defence are invariably unimpeachable, permissibility of sharing is implied, or manufacturing assistance may be lent between armed states: all these are matters that have been highly contentious in light of the alleged silence of the NPT, but none of them are rooted in rights conferred by its terms.

The absence of a prohibition cannot be equated with the presence of a right. Banning possession thus may face only facts but no rules with which it could interfere. The same holds true with respect to overlapping decisions that may be taken at the respective review conferences or meetings of states parties. Though safeguards provisions under the ban treaty differ in standards and deadlines from those under the NPT, they supplement and in no way contradict the established system.

In one respect, the terms of the treaties seem difficult to reconcile. Despite the consensus that these currently do not exist, benefits of peaceful nuclear explosions as envisioned by the NPT are legally rendered impossible under the TPNW. One interpretation of the NPT, taking into account as subsequent agreement the decisions of the parties upon review of the Treaty, renders the treaties compatible. A survey of

global system of international law, and interpretation is intended to harmonise it with the latter's general rules. This method of interpretation is based upon the presumption that the contracting parties, when drafting the treaty, built upon certain facts that they did not need to reproduce in the text and to which they have tacitly referred.] (Srenson, M. (1946), *Les Sources du Droit International* [The Sources of International Law], E. Munksgaard, Copenhagen, pp. 226-227).

286. Burroughs, J. (2007), *supra* note 244, p. 33.

applicable conflict rules has concluded that parties may be presumed to subscribe to such harmonising interpretation.

The TPNW ventures far beyond the limits of the NPT, stipulating wider, but never conflicting obligations. Future states parties to both agreements, especially Continuingly Armed States and Sharing States should fear that conduct which was hitherto legally permitted or ambiguous, may well breach the prohibitions of the ban treaty. But not, by virtue of a conflict with the NPT.

From Waste Confidence to Continued Storage: Legal theories supporting the US NRC's licensing of nuclear facilities without a repository

by Andrew P. Averbach*

In *New York v. Nuclear Regulatory Commission* (New York 2012),¹ the US Court of Appeals for the District of Columbia (DC) Circuit vacated the 2010 update to what was commonly known as the US Nuclear Regulatory Commission's (NRC or Agency) "Waste Confidence Decision". The Waste Confidence Decision was premised upon the NRC's professed confidence that spent nuclear fuel could and eventually would be disposed of in an underground repository and that spent fuel could be stored safely and without significant environmental consequence until that time. For decades, the decision had provided legal support for the Agency's issuance and renewal of licences for power reactors to operate, even as the process for licensing and constructing a repository in the United States became delayed and ultimately stalled (as it remains today). The court ruled in *New York 2012* that the NRC's continued reliance upon its Waste Confidence Decision to support these licensing decisions was inconsistent with the US National Environmental Policy Act (NEPA), which requires US federal agencies to consider the full panoply of the environmental impacts of certain "major federal actions" (including decisions to licence nuclear facilities).² The court required the Agency to further develop its analysis of the impacts of storing spent fuel for an extended period of time and to address the possibility of a repository not becoming available.

In the wake of the decision in *New York 2012*, the NRC suspended making final decisions on applications for reactor licences and spent fuel storage facilities until it performed an analysis that addressed the infirmities that had been identified by the DC Circuit. The Agency's analysis resulted in the preparation and publication in 2014 of a Generic Environmental Impact Statement (GEIS)³ describing the impacts of spent fuel storage across a variety of scenarios for repository availability, including one in which no repository is ever constructed. Concurrently, the NRC adopted a regulation, known as the NRC's "Continued Storage Rule", providing that for purposes of NEPA, the impacts identified in the GEIS constitute the post-operation fuel-storage-related impacts that can be reasonably expected to occur as a consequence of the issuance of a licence to operate a reactor or spent fuel storage facility anywhere in the

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1. 681 F.3d 471 (DC Cir. 2012).
2. National Environmental Policy Act of 1969, as amended (NEPA), Pub. L. 91-190, 42 USC 4321-4347.
3. NRC (2014), *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel*, NUREG-2157, NRC, Washington, DC.

United States.⁴ The Commission also issued an adjudicatory decision in 2015 affirming the NRC's authority to issue licences under the US Atomic Energy Act (AEA), which requires licensees to demonstrate that they can operate proposed facilities in a manner consistent with the public health and safety and common defence and security, even in the absence of meaningful progress towards repository construction.⁵

The NRC's resolution of the legal issues arising under NEPA – through its preparation of a GEIS and its adoption of the Continued Storage Rule – and the AEA – through the issuance of an adjudicatory decision – cleared the way for the Agency to resume final reactor and spent fuel storage licensing decisions after the ruling in *New York 2012*. Since August 2014, the NRC has issued eight new and renewed licences for power reactors and spent fuel storage installations that rely on the analysis contained in the GEIS. And the Agency's approach to resolving the NEPA deficiencies identified in *New York 2012* was upheld by the US Court of Appeals for the District of Columbia Circuit in a second *New York v. NRC* case (*New York 2016*).⁶

This article examines the history of the NRC's Waste Confidence Decision, the Agency's efforts to cure the legal deficiencies that were identified in the decision in *New York 2012* and the legal challenges that were raised both in court and before the NRC to the Agency's resumption of reactor licensing following its adoption of the Continued Storage Rule.

I. NRC's Waste Confidence Decision

The first US commercial nuclear power reactor began operating in 1958. It was originally assumed that the waste generated as a result of such operations – specifically, so-called spent nuclear fuel – would be cooled in spent fuel pools and shipped offsite for reprocessing. However, reliance upon reprocessing as a solution to the waste issue faded over time, and reprocessing has largely been abandoned in the United States as a viable alternative.

In 1976, as concern mounted that no viable solution to the waste problem was on the horizon, the Natural Resources Defense Council (NRDC), a US non-governmental environmental group, filed a petition requesting that the NRC conduct a “rulemaking” – one of the primary avenues through which US federal agencies formulate policy – to determine whether spent fuel “can be generated in nuclear power reactors and subsequently disposed of without undue risk to the public health and safety”.⁷ NRDC asserted that, without this determination, the Agency should refrain from making final decisions on pending or future requests for operating licences. The NRC denied NRDC's petition and found that, as a matter of statutory interpretation, the AEA did not require it to make the finding concerning disposal feasibility that NRDC requested as a prerequisite to reactor licensing.⁸

In denying the petition, the NRC acknowledged that it had certain obligations under the AEA with respect to spent fuel storage at the time of a reactor licensing decision, but that applicants need not have a developed plan for spent fuel disposal.⁹ Specifically,

4. 10 *Code of Federal Regulations* (CFR) 51.23.

5. *DTE Electric Co. (Fermi Nuclear Power Plant, Unit 3)*, CLI-15-4, 81 NRC 221 (26 Feb. 2015); Pub. L. No. 83-703, 68 Stat. 919 (original text of the 1954 Act). The AEA, as amended, is codified at 42 USC 2011–2021, 2022–2286i, 2296a–2297h-13.

6. 824 F.3d 1012 (DC Cir. 2016).

7. Natural Resources Defense Council, Inc.; Filing of Petition for Rulemaking, 42 *Federal Register* (Fed. Reg.) 2730 (13 Jan. 1977).

8. Natural Resources Defense Council, Inc.; Denial of Petition for Rulemaking, 42 Fed. Reg. 34391 (5 July 1977).

9. *Ibid.*, p. 34391.

the NRC explained that at the time a licence is issued, the Agency must “be assured that the wastes generated by licensed power reactors can be safely handled and stored as they are generated”.¹⁰ And as part of the reactor licensing process, the NRC noted, an applicant must submit information to allow the Agency to conclude that “the design provides for safe methods for interim storage of spent nuclear fuel” pending a plan for final disposition.¹¹ Given the AEA’s textual focus during the licensing process on the safety of licensed operations, however, the Commission determined that the statute (combined with the US Congress’s awareness over time that a solution to the waste problem had still not been developed) did not require the Agency to make, as a precondition to licensing, an express determination that spent fuel generated during operation could be disposed of safely.¹²

The denial of NRDC’s petition also included a separate section containing “policy considerations”. In that discussion, the Agency stated that, independent of what it is legally empowered to do under the AEA, it would not continue to license reactors if it “did not have reasonable confidence that [spent fuel] can and will in due course be disposed of safely”. The Agency explained that its “implicit” finding that methods of safe permanent disposition were available could be “readily distinguished” from the type of safety findings that the Agency is called upon to make during the course of reactor licensing under the AEA and that any finding in this regard “would not have to be a definitive conclusion that permanent disposal of high-level wastes can be accomplished safely at the present time”.¹³

NRDC appealed the Agency’s denial of its petition, but the US Court of Appeals for the Second Circuit affirmed the NRC’s decision and endorsed the Agency’s conclusion that the AEA does not, as a prerequisite to licensing, require a finding of reasonable assurance that “highly hazardous and long-lived radioactive materials can be disposed of safely”.¹⁴ The court concluded that by seeking to require an express finding concerning safe disposal prior to licensing, NRDC had “simply read [...] too much into the [AEA]”.¹⁵

In addition to recognising that the text of the AEA does not mandate a specific finding concerning the safety of spent fuel disposal, the court relied on the US Congress’s decades-long tacit approval of nuclear power plant (NPP) licensing even in the absence of a plan for disposal. The court explained that if NRDC’s view of the AEA were correct, it would be “incredible that [the NRC and its predecessor Agency] would have been violating the AEA for almost twenty years with no criticism or statutory amendment by Congress, which has been kept well informed of [disposal] developments”.¹⁶ Accordingly, the court determined that it was “fair to read this history as a [d]e facto acquiescence in and ratification of the Commission’s licensing procedure by Congress”.¹⁷

The court did not rest its decision solely on the legislative history of the AEA or on tacit congressional approval of reactor licensing absent safety findings for a repository. “[I]f there were any doubt over the intent of Congress” not to require a safety finding on spent fuel disposal, the court explained, it was “persuaded that the

10. *Ibid.*

11. *Ibid.*

12. *Ibid.*, pp. 34391-93.

13. *Ibid.*, p. 34393.

14. *Natural Resources Defense Council, Inc. v. NRC*, 582 F.2d 166, 168 (2d Cir. 1978).

15. *Ibid.*, p. 171.

16. *Ibid.*

17. *Ibid.*, pp. 171-72.

matter was laid to rest by enactment of the Energy Reorganization Act of 1974” (ERA).¹⁸ The court noted that in the ERA,

Congress [had] expressly recognized and impliedly approved NRC’s regulatory scheme and practice under which the safety of interim storage of [spent fuel] at commercial nuclear power reactor sites has been determined separately from the safety of ... permanent storage facilities which have not, as yet, been established.¹⁹

Although NRDC’s arguments did not change the NRC’s licensing practice, it did not take long for the issue of spent fuel storage and disposal to return to the courts. In *Minnesota v. NRC*, two groups of petitioners filed suit in the Court of Appeals for the DC Circuit challenging the NRC’s approval of amendments to two NPP operating licences to allow for the use of higher-density spent-fuel-storage racks in the reactors’ spent fuel pools, asserting that the NRC could not grant the amendments without assurance that the wastes generated by the plants could be safely disposed of.²⁰

The petitioners’ arguments in *Minnesota v. NRC* garnered the court’s attention. The court observed that the Second Circuit had recently ruled in the 1978 NRDC case that “Congress did not intend in enacting the Atomic Energy Act to require a demonstration that nuclear wastes could safely be disposed of before licensing of nuclear plants was permitted”, and it did not expressly disagree with that result.²¹ But, referring to the language in the policy statement accompanying the NRC’s denial of the petition for rulemaking filed by the NRDC, the court expressed concern that the “reasonable confidence” conclusion contained in the NRC’s denial of the NRDC’s rulemaking petition was not supported by “the kind of comprehensive inquiry into ... disposal solutions that would be required to give content to a ‘generic’ determination”.²² Accordingly, the court directed the NRC to determine:

whether there is reasonable assurance that an off-site storage solution will be available by [the end of the licence term of the reactor licences at issue, namely 2007 and 2009], and if not, whether there is reasonable assurance that the fuel can be stored safely at the sites beyond those dates.²³

The court’s decision in the *Minnesota* case led to what the NRC termed its “Waste Confidence” proceeding, a rulemaking that generically assessed the environmental and safety implications of continued storage. This rulemaking culminated in a series of findings, known as the “Waste Confidence Decision”, concerning, first, whether high-level radioactive waste “can be safely disposed of” and “when such disposal or off-site storage will be available”; and second, “whether radioactive wastes can be safely stored on-site past the expiration of existing facility licences until off-site disposal or storage is available”.²⁴ The Agency’s analysis contained five formal findings:

18. *Ibid.*, p. 174.

19. *Ibid.*; see 42 USC 5801-5891.

20. *Minnesota v. NRC*, 602 F.2d 412 (DC Cir. 1979).

21. *Ibid.*, p. 417.

22. *Ibid.*

23. *Ibid.*, p. 418. “Reasonable assurance” has long been the safety standard employed by NRC in licensing under the AEA. See, e.g., *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 US 519, 527 n.5 (1978); 10 CFR 50.57(a)(3) (requiring the NRC to find, in approving an operating licence, that “[t]here is reasonable assurance ... that the activities authorized by the operating license can be conducted without endangering the health and safety of the public”).

24. *Storage and Disposal of Nuclear Waste; Notice of Proposed Rulemaking*, 44 Fed. Reg. 61372, 61373 (25 Oct. 1979).

(1) The Commission finds reasonable assurance that safe disposal of high-level waste and spent fuel in a mined geologic repository is technically feasible.

(2) The Commission finds reasonable assurance that one or more mined geologic repositories for commercial high-level waste and spent fuel will be available by the years 2007-2009 and that sufficient repository capacity will be available within 30 years beyond the expiration of any reactor operating license to dispose of existing commercial high-level waste and spent fuel originating in such reactor and generated up to that time.

(3) The Commission finds reasonable assurance that high-level waste and spent fuel will be managed in a safe manner until sufficient repository capacity is available to assure the safe disposal of all high-level waste and spent fuel.

(4) The Commission finds reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the expiration of that reactor's operating license at that reactor's spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations.

(5) The Commission finds reasonable assurance that safe independent onsite or offsite spent fuel storage will be made available if such storage capacity is needed.²⁵

The findings were accompanied by a new regulation, 10 CFR 51.23, that applied the findings of no significant environmental impact to each applicable licensing proceeding and obviated the need for further NEPA analysis related to post-operation spent fuel storage in individual licensing proceedings.²⁶

While the NRC was engaged in its Waste Confidence rulemaking, the US Congress set about finding a solution to the nuclear waste problem. Its efforts led to passage of the Nuclear Waste Policy Act of 1982 (NWPAct), which established the US federal government's policy to dispose of high-level radioactive waste in one or more deep geologic repositories, which were to be funded by a surcharge on the generation of electricity at nuclear facilities.²⁷ In 1987, Congress designated Yucca Mountain in the state of Nevada as the single site for further study, and it subsequently designated that site for the development of a geologic repository.²⁸

Despite the intent expressed during the enactment of the NWPAct that a repository would commence operations in 1998, it soon became apparent that a repository (though not necessarily a federal interim storage facility) would be delayed. It also became apparent during the same time frame that many reactor licensees that received their licences during the 1960s and 1970s would be seeking to renew their licences. Accordingly, in 1990, the NRC revisited its Waste Confidence Decision and

25. Waste Confidence Decision, 49 Fed. Reg. 34658, 34659-60 (31 Aug. 1984).

26. See Requirements for Licensee Actions Regarding the Disposition of Spent Fuel Upon Expiration of Reactor Operating Licenses; Final Rule, 44 Fed. Reg. 34688, 34694 (31 Aug. 1984). The rule did not address the environmental impacts of storage during the life of each reactor.

27. 42 USC 10131, 10222. The Act authorised the US Department of Energy to enter into contracts with the generators of spent nuclear fuel providing for the Department to begin spent fuel acceptance commencing no later than 31 January 1998. *Ibid.* As a consequence of the delay in the development of a repository (for which a still-pending application was ultimately submitted in 2008), the US government has been deemed to be in breach of its contractual obligations and has paid and continues to pay damages to spent fuel generators for the cost of constructing and maintaining additional facilities to store spent fuel until a repository becomes available. See generally *Carolina Power & Light Co. v. United States*, 573 F.3d 1271 (Fed. Cir. 2009).

28. See 42 USC 10135, 10172.

updated the findings to reflect a new expected date for a repository to become available (“the first quarter of the twenty-first century”) and to include a 30-year licence renewal term in its analysis (i.e. to expand its determination concerning how long spent fuel could be stored on the site of a power reactor both safely and without environmental impact so as to include not just a single term of reactor operation, but a 30-year renewed term as well).²⁹

In 2010, with progress on a repository still delayed (as it remains today), the NRC determined that the “first quarter of the twenty-first century” prediction for repository availability contained in its 1990 update might not be accurate. Accordingly, the NRC issued another update that removed the anticipated date for repository availability altogether (explaining instead that a repository would be available “when necessary”) and expanded the time frame for safe and environmental-impact-free storage from 30 to 60 years after the end of the reactor’s licence term.³⁰

This update renewed the fears of those concerned about licensing plants without an operational spent fuel disposal programme. In 2010, four US states (Massachusetts, New Jersey, New York and Vermont), an Indian Tribe and a group of environmental organisations filed suit before the US Court of Appeals for the DC Circuit challenging the update to the Waste Confidence Decision. Calling attention to the political, legal and technical challenges that had been encountered in the efforts to license and construct a repository, these petitioners asserted that the NRC lacked a basis upon which to conclude that a repository would be available “when necessary”. They further asserted that certain aspects of the Agency’s conclusions concerning the storage of fuel pending repository availability were insufficient because, among other things, they had inadequately assessed the potential for spent fuel pool leakage and fires.

In 2012, the DC Circuit issued its decision in the first New York case, agreeing in substantial part with the challengers’ assertions. The court expressed doubt that the storage of fuel onsite in cases was, as the NRC characterised it, merely “temporary”, and it suggested that the Agency “apparently has no long-term plan other than hoping for a geologic repository”.³¹ The court vacated the NRC’s 2010 Waste Confidence update and found that the Agency had not satisfied its obligations under NEPA with respect to three issues: 1) the Agency did not consider the environmental impacts of a repository never becoming available; 2) the analysis of spent fuel pool leaks relied solely on past events and therefore was not forward-looking; and 3) the Agency had not sufficiently considered the consequences of spent fuel pool fires, notwithstanding the low risk that they would occur. In so doing, the court stressed that to satisfy its obligations under NEPA when licensing a reactor, the NRC was required to identify the reasonably foreseeable impacts that would be caused by licensed activity, including what the court perceived to be the non-remote possibilities that a repository would not be constructed or that a fire might occur in a reactor fuel pool, and that there might be leaks from fuel pools of a type that the Agency had failed to consider.³²

II. Development of the Continued Storage Rule and GEIS

In response to the court’s 2012 New York decision, the NRC considered revising the analysis underlying its Waste Confidence Decision and continuing to use the “findings” format developed in the Waste Confidence proceedings. The NRC

29. Waste Confidence Decision Review, 55 Fed. Reg. 38474 (18 Sept. 1990).

30. Waste Confidence Decision Update, 75 Fed. Reg. 81037 (23 Dec. 2010). The 60-year period corresponds to the maximum amount of time in which NRC licensees are permitted to decommission their facilities following licensed operation. See 10 CFR 50.82.

31. 681 F.3d 471, 474, 479 (DC Cir. 2012)

32. *Ibid.*, pp. 479-83.

recognised, however, both that the findings format was neither imposed by the court in *Minnesota v. NRC* nor used elsewhere, and that some of the language employed in the findings, particularly insofar as it adopted the AEA's "reasonable assurance" language, might have become confusing. Accordingly, the NRC concluded that a traditional and comprehensive NEPA analysis – in the form of an environmental impact statement (EIS) – would be a more effective vehicle for identifying the environmental impacts of continued storage.³³ Additionally, the Agency determined that employing an EIS to identify the impacts of continued storage would allow it to follow both the format used for similar analyses in licensing NPPs and the generic format used for analysis of environmental impacts in licence renewal proceedings.³⁴

Having chosen a new approach, the Agency embarked upon a two-year process to analyse the environmental impacts of continued storage and address several specific concerns identified by the court. The NRC published a proposed rule and draft GEIS in September 2013 and invited comments from the public.³⁵ As part of this effort, the NRC duly considered and, as appropriate, responded to over 1 000 unique written comment submissions as well as comments conveyed during 13 public meetings, held near NPPs across the United States. The final GEIS was issued in August 2014, along with a new Continued Storage Rule codified at 10 CFR 51.23. The rule makes clear that the analysis in the GEIS represents the Agency's determination, on a generic basis, of the post-operation fuel-storage impacts that are reasonably likely to result from a decision to issue a new or renewed licence from a power reactor anywhere in the US.³⁶ By design, the GEIS is to be used as one portion of the broader environmental analysis – the analysis pertaining to the impacts of storing spent fuel after the licensed life of a reactor – that must be undertaken each time the NRC issues a power reactor licence (including a reactor operating licence, a reactor combined licence, an early site permit or an independent spent fuel storage installation licence).

The GEIS includes discussions of the impacts of at-reactor and away-from-reactor storage, supporting appendices and responses to comments. The impacts to 17 separate resource areas, as well as impacts to these resources caused by accidents and acts of terrorism, are discussed in detail.³⁷ The NRC concluded that the impacts of continued storage, both direct and indirect, "will not vary significantly across sites, despite variations in site-specific characteristics", rendering a generic approach

33. As a general matter, NEPA requires US agencies undertaking "major federal actions" (whether on their own behalf or, as in the case of the NRC, when it issues a permit or licence to an applicant), to identify the reasonably foreseeable environmental impacts that are likely to result from a proposed action. 42 USC 4332. This process serves the dual purpose of ensuring that environmental considerations are taken into account as the Agency makes its decision and of fostering communication with the affected public concerning contemplated action. See generally *Robertson v. Methow Valley Citizens Council*, 490 US 332, 348-51 (1989). Notably, NEPA does not require an Agency to refrain from a particular action if environmental impacts are likely to result; it merely requires the Agency, as part of its decision-making process, to identify these impacts and to discuss ways in which adverse impacts might reasonably be mitigated. See *ibid.*

34. See License Renewal of Nuclear Power Plants; Generic Environmental Impact Statement and Standard Review Plans for Environmental Reviews, 78 Fed. Reg. 37325 (20 June 2013); 10 CFR Part 51, Subpart A, Appendix B.

35. Waste Confidence – Continued Storage of Spent Nuclear Fuel; Proposed Rule, 78 Fed. Reg. 56776 (13 Sept. 2013).

36. Continued Storage of Spent Nuclear Fuel; Final Rule, 79 Fed. Reg. 56238, 56263 (19 Sept. 2014).

37. The areas considered include land use, socioeconomics, environmental justice, climate and air quality, geology and soils, water resources (surface water and groundwater), ecological resources (terrestrial and aquatic), noise, aesthetics, waste management, transportation, and public and occupational health. NRC (2014), *supra* note 3, pp. xxxiv-xxxv.

appropriate.³⁸ The GEIS thus generically characterises impacts as small, moderate or large (and in some cases as a range), and it provides supporting explanation for each conclusion.³⁹

The identification of certain impacts, including the impacts of accidents, is informed by both the potential consequences and probability of the underlying events.⁴⁰ For example, the NRC specifically determined that the likely impacts of a fire in a spent fuel pool were small because, although the consequences could be “significant and destabilizing”, the probability of such an event is “extremely remote”.⁴¹

The Agency’s decision not to further update the “findings” of the Waste Confidence Decision enabled it to retire its historic practice of trying to predict the time frame for availability of a repository. Thus, instead of specifying its “confidence” in a specific date when a repository will become available, the GEIS analyses various repository-availability scenarios, including the possibility that a repository never becomes available.⁴² The GEIS analyses impacts for three postulated time frames: short-term, long-term and indefinite storage. The short-term time frame considers 60 years beyond the reactor’s licence term (including 2 20-year renewal terms, for a total of 80 years of operation); the long-term timeframe considers an additional 100 years; and the indefinite timeframe assumes that no repository becomes available.⁴³ The latter two scenarios assume that after the expiration of the short-term timeframe (during which fuel would be removed from spent fuel pools and placed into dry casks), reactor operators will be able to replace the casks using a dry transfer system and that this process would be repeated, as necessary, at 100-year intervals until the spent fuel is ultimately disposed of.⁴⁴ The NRC found repository availability

38. 79 Fed. Reg. at 56242.

39. For most resource areas, the impacts are designated as small. The GEIS indicates, however, that in certain scenarios, the impacts of continued storage caused by at-reactor storage may be “small to large” with respect to historic and cultural resources and may be “small to moderate” with respect to the generation of nonradioactive waste. NRC (2014), *supra* note 3, pp. xlvii-xlviii. For away-from-reactor storage, the GEIS also identifies several additional resource areas where the resources may be greater than small. *Ibid.*, p. lix. The same is true with respect to the GEIS’s evaluation of “cumulative impacts”, i.e. the effects of continued storage upon resource areas when added to the effects on those resources of other activities occurring within the same geographic areas. See *ibid.*, p. lx-lxi.

40. *Ibid.*, p. xxxiii.

41. *Ibid.*, Appendix F. Appendix F contains a description of the possible sequences of events that might occur in the event of a zirconium fire, including the exposure of the surrounding population and land, and estimates the number of early fatalities (within 10 miles, or approximately 16 kilometres) and latent fatalities (within 10 miles, or approximately 16 kilometres and 500 miles, or approximately 805 kilometres) that might result in the event that a fire occurred. These estimates are based on conservative (i.e. erring on the side of conditions that would result in greater consequences) assumptions. *Ibid.*, p. F-5.

42. *Ibid.*, p. xxx.

43. *Ibid.*, pp. xxx-xxxi. These scenarios govern the analysis to be applied on a going-forward basis each time the Agency issues a reactor licensing decision. Thus, for a new reactor licensing decision made in 2019 that utilises the GEIS, the short-term period would last from 2095 to 2159 (because it would begin in 80 years (after a 40-year term and 2 20-year renewals) and would end after another 60 years); the long-term period would begin in 2159 and end 100 years later; and the indefinite period would begin after the conclusion of the long-term period, i.e. in 2259. See *ibid.*, pp. 1-17.

44. *Ibid.*, p. xxxi. The GEIS describes the various dry transfer systems – i.e. systems that would enable the retrieval of fuel from dry casks for inspection or repackaging without a spent fuel pool – that have been evaluated in the United States over the last several decades. It notes that the NRC has previously concluded that the concept has not been tested through the licensing process but nonetheless “has merit”. *Ibid.*, pp. 2-20 to 2-24.

before the end of the short-term period to be “the most likely” scenario, though “not certain”, and it found the indefinite-timeframe scenario to be “highly unlikely”.⁴⁵

III. Legal challenges to the NRC’s current approach

A. Challenge under the National Environmental Policy Act

Publication of the GEIS in 2014 enabled the NRC to resume making final licensing decisions for reactor and spent-fuel-storage installation applications. A group of petitioners largely resembling the group that had prevailed in New York 2012, however, went back to the DC Circuit to challenge the NRC’s new framework, asserting that the Continued Storage Rule violated NEPA. In this case, known as New York 2016, the petitioners contended that, among other things, the impacts of continued storage could not be analysed generically; that the Agency failed to consider alternatives to spent fuel storage or to evaluate mitigation; and that the Agency made improper assumptions in support of its analysis. The petitioners specifically challenged the NRC’s assumptions that dry cask transfer systems will be available to replace existing systems (given that this technology does not currently exist), and they asserted that the NRC failed to provide sufficiently detailed analysis of the consequences of a failure to maintain “institutional controls” (i.e. the loss of governmental oversight) over such casks during a time span that could conceivably last tens or hundreds of thousands of years and in which civilisation and society as we know it today might not continue to exist.⁴⁶

The DC Circuit disagreed with each of the petitioners’ assertions.⁴⁷ The court first rejected the petitioners’ argument that the NRC’s promulgation of the Continued Storage Rule constituted a licensing decision requiring consideration of alternatives to plant licensing, including not licensing plants at all. Instead, the court agreed with the NRC’s argument that the impacts identified in the GEIS serve only as “input[s] for future site-specific reactor licensing”, such that alternatives to licensing are properly considered in connection in individual licensing proceedings. The court similarly ruled that “because mitigation is equally relevant during the licensed life of a reactor as it is during decommissioning, the NRC can defer consideration of such measures to site-specific review”. To this end, the court warned the Agency that it “take[s] the NRC at its word” that issues pertaining to alternatives and mitigation will be addressed each time a licence is issued that relies on the environmental analysis contained in the GEIS.⁴⁸

The court next declined the suggestion, advanced by New York and the states that joined its petition, that the generic analysis set forth in the GEIS is insufficient because it fails to employ conservative bounding assumptions in connection with its analysis of fires and leaks.⁴⁹ This argument relied in large part on site-specific variability

45. *Ibid.*, p. xxx.

46. In this regard, petitioners relied heavily on a NEPA analysis prepared by the US Department of Energy in connection with its application to construct a repository at Yucca Mountain, in which the Department of Energy estimated that, if no action were undertaken with respect to spent fuel stored at reactor sites, 1 000 latent cancer deaths were likely to take place over a 10 000-year period due to the entry of radionuclides into the accessible environment, with potentially even higher fatality rates in the years thereafter. US Department of Energy (2008), *Final Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, DOE/EIS-0250F-S1, DOE, Washington, DC, p. S-51.

47. New York 2016, 824 F.3d 1012 (DC Cir. 2016).

48. *Ibid.*, pp. 1017-18.

49. *Ibid.*, pp. 1019-20.

among plants (such as the population concentration near the Indian Point plant in New York and the particular susceptibility of the California coastline to seismic risk). The court accepted the Agency's conclusion that generic analysis was still possible, given the bounding nature of the NRC's analysis.⁵⁰ The court recognised that, even if the analysis in the GEIS is not bounding in the strictest sense, the Agency still properly reached a generic determination with respect to these issues because its analysis was "thorough and comprehensive" and identified impacts that are essentially common to all plants.⁵¹

In so doing, it accepted the NRC's arguments that its waiver and rulemaking processes⁵² ensure the ability to raise site-specific considerations or other information that would warrant departure in appropriate circumstances from the impacts identified in the GEIS and codified by the Continued Storage Rule. With respect to the last point, the court emphasised that it expected the NRC to give "due consideration" to waiver requests, the denial of which would be subject to judicial review.⁵³

Finally, the court rejected the petitioners' challenges to some of the assumptions upon which the impacts identified in the GEIS were based. Relying on the Agency's technical expertise and noting that its technical conclusions were entitled to deference, the court found reasonable the Agency's assumptions that spent fuel would be removed from spent fuel pools within 60 years and placed into dry storage; that dry casks would be replaced every 100 years (even if dry cask transfer technology is not presently available); and that institutional controls would be maintained.⁵⁴ The court specifically noted that assuming the maintenance of institutional controls facilitates the assessment of the impacts of continued storage and that, in any event, the Agency recognised in the GEIS that the loss of such controls would have "catastrophic" impacts akin to, though not necessarily quantitatively the same as, those that had been previously identified by the US Department of Energy.⁵⁵ And ultimately the court concluded that while there is "political discord surrounding the [the US's] evolving nuclear energy policy", concerns about the NRC's authority to continue issuing licences in the absence of a repository "should be directed to Congress" and not the courts.⁵⁶

B. Challenge under the Atomic Energy Act

In addition to participating in the legal challenge to the Continued Storage Rule in New York 2016, several environmental groups also responded to the Agency's actions by reasserting their challenge (previously raised and rejected in the 1978 NRDC decision) to the Agency's ability to continue to license plants under the AEA in the absence of findings concerning the safe storage of nuclear waste in a repository. These organisations raised these challenges before the Commission in several then-pending licensing proceedings. The AEA-based argument they raised, however, fared no better than the NEPA-based challenge that they filed in court. The Commission adhered to its position concerning the scope of the AEA, ruling that

at no time have we, Congress, or the courts articulated the view that the Atomic Energy Act requires a "finding" or "predictive safety findings" regarding the disposal of spent fuel in a repository as a prerequisite to issuing a nuclear

50. *Ibid.*, p. 1020.

51. *Ibid.*

52. 10 CFR 2.335(b), 2.802(e).

53. New York 2016, 824 F.3d at 1019-20, 1021-22.

54. *Ibid.*, p. 1023.

55. *Ibid.*, pp. 1022-23.

56. *Ibid.*, p. 1023.

reactor license. We see no reason to alter our long-standing interpretation of the Atomic Energy Act.⁵⁷

The Commission's decision largely recounted and endorsed the analysis of the AEA set forth in the Second Circuit's decision in the NRDC case. Echoing the view expressed in 1978, the Commission reiterated that Congress could have determined, had it desired, to strip the NRC of licensing authority in light of the lack of progress on a repository. It further observed that the years since 1978 had afforded numerous additional opportunities for Congressional action, and that Congress had nonetheless determined not to alter the status quo.⁵⁸

The Commission also provided additional context for the language contained in the "policy statement" it issued in 1978, concluding that it continued to adhere to the view that a repository was technically feasible:

When considered within the context of our denial of the petition for rulemaking, it is clear that the statement at issue was nothing more than what it purported to be: a statement of our policy regarding the licensing of nuclear power plants and our confidence in the availability of a disposal solution.⁵⁹

And the Commission explained that the delays in repository progress were attributable to political, rather than technical, issues:

[A]s the technical agency entrusted by Congress to make determinations of this sort, we have concluded – without qualification – that a geologic repository is technically feasible. As we acknowledged in the Continued Storage GEIS, the uncertainty in spent fuel disposal lies not with the technical feasibility of long-term storage and disposal, but with the political and societal factors that continue to delay the construction of a repository. We recognized this uncertainty in the Continued Storage GEIS by analyzing the possibility that a repository will never become available.⁶⁰

The Commission further noted that its determination concerning the feasibility of a safe permanent disposal programme was derived from numerous sources, both in the United States and internationally, and was based on both research and concrete examples of disposal technology proving effective:

Our analysis in the Continued Storage GEIS builds on decades of experience and multiple rulemaking proceedings. Specifically, our conclusion finds support in ongoing research in the United States and abroad, along with the ability to characterize and quantitatively assess the capabilities of geologic and engineered barriers, experience gained from the Staff's review of the Department of Energy's construction authorization application for a repository at Yucca Mountain, disposal activities at the Waste Isolation Pilot Plant, and continued progress toward a repository in other countries. Indeed, contrary to the situation that accompanied the issuance of the initial Waste Confidence Decision, our regulatory framework now includes specific standards and

57. DTE Electric Co. (Fermi Nuclear Power Plant, Unit 3), CLI-15-4, 81 NRC 221, 232 (26 Feb. 2015). Originally, the environmental group petitioners in New York 2016 notified the DC Circuit that they planned to raise the arguments raised in the DTE Electric adjudication as part of their challenge to the Continued Storage Rule. However, they opted not to raise these arguments in their briefs, and the issue was not pursued further in court.

58. *Ibid.*, p. 234.

59. *Ibid.*, p. 235.

60. *Ibid.*, p. 237.

requirements for licensing the storage of spent fuel and, in the case of Yucca Mountain, standards for licensing a repository.⁶¹

Finally, the Commission explained that it had both the legal tools and the expertise to ensure that spent fuel can be stored safely, even in the scenario (which it acknowledged as a possibility) that no repository becomes available. In so doing, it emphasised three important points. First, it stressed its ability to adapt its regulatory processes:

[O]ur regulatory process is dynamic: we continue to revise and refine our regulatory regime as our technical knowledge and experience grows. Thus, we rely both upon our ability to ensure that licensees conform to existing regulations and upon our comprehensive regulatory scheme that takes into account the length of time during which, and the conditions under which, the storage of spent fuel will occur.... We expect that our regulatory process will not be static and will continue to evolve in the future.⁶²

Second, it recognised its responsibility to ensure safety regardless of progress towards a repository:

Disposal in a deep geologic repository remains the option that Congress has selected for addressing the problem of spent nuclear fuel, and we have neither a mandate nor a reason to question this determination. For the reasons stated in the Continued Storage GEIS, we believe that a geologic repository is technically feasible and that, with sufficient political and societal commitment, a repository can become available within 25–35 years. But we have no crystal ball. We recognize, as we did in 1977, that the hazards associated with spent fuel could become acute at some distant time. We also recognize, as we must, that our statutory mission only confers upon us the authority to license, and not to construct, a permanent repository. Thus, our statutory obligation to ensure the adequate protection of public health and safety encompasses an ongoing responsibility to regulate the continued storage of spent fuel, with or without a repository. Our long history with these issues (including our ability to adapt our regulatory processes based upon changing circumstances) continues to support our conclusion that safe, permanent disposal of spent nuclear fuel is technically feasible and that spent fuel can be safely stored until a repository is available, or indefinitely should such storage become necessary.⁶³

And, third, it reaffirmed its view that continuing to license NPPs even in the absence of repository progress was consistent with the intent of the US Congress:

Congress has entrusted this agency to ensure adequate protection of public health and safety by granting us the authority to condition licenses and to enforce our regulations. In our view, licensing production and utilization facilities now and relying upon our overall regulatory regime to address both ongoing safe storage and the construction of a repository in the future does not constitute an abdication of our statutory obligations. Rather, we understand these actions to be precisely what Congress intended when it both authorized the NRC to issue licenses for nuclear power plants and granted the agency broad regulatory and enforcement authority to protect the public health and safety and common defense and security.⁶⁴

61. *Ibid.*, p. 238.

62. *Ibid.*, p. 241.

63. *Ibid.*, pp. 241-42.

64. *Ibid.*, p. 242.

C. Conclusion

Although there has been some progress in recent years towards one or more consolidated interim storage facilities in the United States, uncertainty remains over the construction of a repository for the permanent disposal of spent fuel.⁶⁵ Nonetheless, both the NRC and the courts have adhered to the view that given that an underground repository remains technically feasible, there is no impediment under US law to issuing new and renewed licences to facilities that will generate or store spent nuclear fuel. Although reasonable people might dispute whether, as a matter of a policy, it is wise to continue to issue new licences while political obstacles to a repository remain, the DC Circuit's conclusion in *New York* 2016 and the NRC's decision in the *DTE Electric* adjudication indicate that any cessation of reactor licensing in the United States due to the current lack of a disposal facility must come through legislation rather than through legal challenge.

65. Two applications for proposed consolidated interim storage facilities are currently pending before the NRC. Holtec International (Holtec) has requested, by letter dated 30 March 2017 (as supplemented), authorisation to construct and operate the HI-STORE Consolidated Interim Storage Facility, in Lea County, New Mexico. Holtec International's HI-STORE Consolidated Interim Storage Facility for Interim Storage of Spent Nuclear Fuel, 83 Fed. Reg. 32919 (16 July 2018). In addition, Interim Storage Partners, a joint venture between Waste Control Specialists, LLC (WCS) and Orano CIS, LLC, has requested, by letters dated 8 June 2018 and 19 July 2018, that NRC staff resume review of a licence application for the WCS Consolidated Interim Storage Facility in Andrews County in the US state of Texas. The previous applicant, WCS, had asked the NRC in 2017 to temporarily suspend all safety and environmental review activities. Interim Storage Partner's Waste Control Specialists Consolidated Interim Storage Facility, 83 Fed. Reg. 44070 (29 Aug. 2018).

New framework for radiation protection legislation in Germany

by Goli-Schabnam Akbarian*

I. Sources of radiation protection legislation

The entry into force of a new Radiation Protection Act,¹ along with a revised Radiation Protection Ordinance,² on 31 December 2018 marked the start of a new legal regime for radiation protection in Germany. Formerly, radiation protection was primarily regulated through ordinances on the basis of the German Atomic Energy Act,³ namely through the Radiation Protection Ordinance of 20 July 2001 and the X-ray Ordinance in the version promulgated on 30 April 2003. Radiation protection was originally included within the Atomic Energy Act because at the time of the Act's entry into force in 1960, radiation protection was primarily an issue for nuclear industries. For this reason, the Atomic Energy Act authorised the protection of workers and members of the public at an ordinance level, rather than at the act level.

The focus on protection of workers and members of the public was in line with the 1959 Treaty Establishing the European Atomic Energy Community (EAEC Treaty).⁴ According to its Article 2, the "Community shall (...) establish uniform safety standards to protect the health of workers and of the general public and ensure that they are applied". According to its Article 30, "Basic standards shall be laid down within the Community for the protection of the health of workers and the general public against the dangers arising from ionising radiations". "Basic standards" are, according to this Article, "(a) maximum permissible doses compatible with adequate safety; (b) maximum permissible level of exposure and contamination; (c) the fundamental principles governing the health surveillance of workers".

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1. *Gesetz zum Schutz vor der schädlichen Wirkung ionisierender Strahlung (Strahlenschutzgesetz – StrlSchG)* [Act to protect against the harmful effects of ionising radiation (Radiation Protection Act – StrlSchG)] of 27 June 2017, *Bundesgesetzblatt [Federal Law Gazette]* (BGBl.) I, p. 1966.
2. *Verordnung zum Schutz vor der schädlichen Wirkung ionisierender Strahlung (Strahlenschutzverordnung – StrlSchV)* [Ordinance to protect against the harmful effects of ionising radiation (Radiation Protection Ordinance – StrlSchV)] of 29 November 2018, BGBl. I, p. 2034.
3. *Gesetz über die friedliche Verwendung der Kernenergie und den Schutz gegen ihre Gefahren (Atomgesetz)* [Act on the Peaceful Utilisation of Atomic Energy and the Protection against its Hazards (Atomic Energy Act)] of 23 December 1959, as amended and promulgated on 15 July 1985, BGBl. I, p. 1565, as amended.
4. Treaty Establishing the European Atomic Energy Community (1957), 298 UNTS 167, entered into force 1 Jan. 1958 (consolidated version *Official Journal of the European Union* (OJ) C 203 (7 June 2016)).

However, this somewhat narrow understanding has been extended due to case law by the Court of Justice of the European Union (CJEU). In 1991, the European Parliament brought an action for annulment of Council Regulation (Euratom) 3954/87 of 22 December 1987.⁵ The Directive was based on Article 31 of the EAEC Treaty. The European Parliament was of the opinion:

that Article 30 *et seq.* of the EAEC Treaty, on the one hand, do not relate to so-called “secondary” radiation, that is, radiation emanating from contaminated products, but, on the other hand, concern only the protection of persons directly involved in the nuclear industry.⁶

The Court did not follow this restrictive interpretation and responded as follows:

There is no support in the relevant legislation for that restrictive interpretation, which cannot therefore be accepted. The indications are rather that the purpose of the articles referred to is to ensure the consistent and effective protection of the health of the general public against the dangers arising from ionising radiations, whatever their source and whatever the categories of persons exposed to such radiations.⁷

The Court has confirmed its position in the following years by the repeated statement “that the provisions of Chapter 3 of Title II of the EAEC Treaty are to be interpreted broadly in order to give them practical effect”.⁸

In 1997, the Council adopted Directive 97/43/Euratom of 30 June 1997.⁹ The directive addresses medical exposure, an issue that the EAEC Treaty does not mention explicitly. However, given the Court’s broad interpretation cited above, it is clear that the provisions of Directive 97/43/Euratom are considered to be “Basic Standards”.

II. Motivation for a new framework

The opportunity to draw up new legislation was offered by the obligation to implement Council Directive 2013/59/Euratom of 5 December 2013.¹⁰ The Basic Safety Standards Directive addresses the recommendations of the International Commission on Radiological Protection (ICRP) contained in ICRP Publication 103¹¹ and formulates them as European legal provisions. The Basic Safety Standards Directive thus follows

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5. Council Regulation (Euratom) 3954/87 of 22 December 1987 laying down maximum permitted levels of radioactive contamination of foodstuffs and of feedingstuffs following a nuclear accident or any other case of radiological emergency, OJ L 371 (30 Dec. 1987), p. 11.
 6. Judgment of 4 October 1991, *Parliament v. Council*, C-70/88, EU:C:1991:373, para. 13.
 7. Judgment of 4 October 1991, *Parliament v. Council*, C-70/88, EU:C:1991:373, para. 14, confirmed by Judgment of 27 October 2009, *ČEZ*, C-115/08, EU:C:2009:660, para. 112.
 8. Judgment of 12 February 2015, *Parliament v Council*, C-48/14, EU:C:2015:91, para. 35; see also Judgment of 10 December 2002, *Commission v Council*, C-29/99, EU:C:2002:734, para. 78, and Judgment of 27 October 2009, *ČEZ*, C115/08, EU:C:2009:660, para. 100.
 9. Directive 97/43/Euratom of 30 June 1997 on health protection of individuals against the dangers of ionising radiation in relation to medical exposure, and repealing Directive 84/466/Euratom, OJ L 180 (9 Jul. 1997), p. 22.
 10. 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 Jan. 2014) (Basic Safety Standards Directive), p. 1.
 11. Valentin, J. (ed.) (2007), *The 2007 Recommendations of the International Commission on Radiological Protection*, Publication 103, *Annals of the ICRP*, Vol 37, Nos. 2-4, Elsevier.

the approach based on exposure situations introduced in ICRP Publication 103, distinguishing between planned, existing and emergency exposure situations.¹²

In addition to the “classical” area of practices where human activity deliberately leads to exposure (therefore a practice belongs to the category of planned exposure situation), the Basic Safety Standards Directive focuses on situations where the exposure already exists and a decision about its control has to be taken. If immediate action is required, an emergency exposure situation is in place, otherwise it is an existing exposure situation. An example for an existing exposure situation is radon, a radioactive gas that is formed by the radioactive decay of the small amounts of uranium that occur naturally in all rocks and soils and that can accumulate in indoor spaces and in workplaces. Other examples include gamma radiation emitted from building materials or contaminated sites.

In summary, radiation protection concerns far more areas than just nuclear safety or nuclear waste management. Therefore, with the scope of radiation protection legislation steadily growing over the years, and the most recent considerable extension set out in the Basic Safety Standards Directive, a formal legal basis, separate from the Atomic Energy Act, needed to be created. The Radiation Protection Act implements a mandate laid down in the German government’s coalition agreement of the 18th legislative period (2013-2017), which strives to modernise radiation protection legislation and adapt the basic structure of radiological emergency preparedness to tackle accidents at nuclear installations in light of the lessons learnt in Fukushima.

III. Structure and content of the new legislation

1. Radiation Protection Act

The Radiation Protection Act follows the Basic Safety Standards Directive’s approach based on planned, existing and emergency exposure situations. The approach used to date of distinguishing between practices and work activities is discontinued. The Radiation Protection Act contains, *inter alia*, the following provisions:

- general principles of radiation protection (justification, optimisation and dose limitation);
- definitions;
- dose limits for occupational and public exposure;
- reference levels (relevant for existing and emergency exposure situations);
- licensing and registration procedures;
- operational organisation of radiation protection (responsibilities and tasks of the radiation protection executive and radiation protection supervisor);
- provisions on emergency preparedness and response;

12. Cf. Council Directive 2013/59/Euratom of 5 December 2013, para. 7:

The provisions of this Directive should follow the situation based approach introduced by ICRP Publication 103 and distinguish between existing, planned and emergency exposure situations. Taking into account this new framework, this Directive should cover all exposure situations and all categories of exposure, namely occupational, public and medical exposures.

By adopting this situation-based approach, the Basic Safety Standards Directive has abandoned the distinction introduced by Directive 96/29/Euratom between practices, work activities – including those involving natural radiation sources – and interventions.

- provisions on indoor exposure to radon and radon in workplaces, on gamma radiation from building materials as well as on contaminated sites.

In contrast to this, the Atomic Energy Act focuses, roughly speaking, on issues concerning:

- nuclear safety;
- practices concerning nuclear fuel, including transport;
- the disposal of radioactive waste;
- liability and financial security.

Some of its provisions continue to apply in the field of radiation protection (see *infra*).

2. Radiation Protection Ordinance

Radiation protection legislation is an area of law that is prone to a high level of detail. The German government's coalition agreement of the current 19th legislative period therefore provides that with a view to improve the protection of health against exposure due to ionising radiation, the details of the Radiation Protection Act have to be specified at the ordinance level. The Radiation Protection Act reflects this in numerous authorisations to issue ordinances. Specific radiation protection requirements are therefore addressed in the new Radiation Protection Ordinance that also entered into force on 31 December 2018. The requirements include, *inter alia*:

- specific requirements on radiological surveillance;
- occupational exposure, including medical monitoring;
- safety and security of radiation sources;
- protection of the public and of the environment;
- exposure of persons for medical and non-medical purposes;
- exemption and clearance levels;
- requirements and conditions for clearance;
- conditions for dose assessment, reporting and information requirements.

3. Connection between radiation protection and atomic energy law

Despite the separation, the Atomic Energy Act remains connected with radiation protection law. First, the clearance levels laid down in the Radiation Protection Ordinance apply to the nuclear energy sector, including the dismantling of nuclear power plants. Also, the exemption levels that determine, *inter alia*, whether a practice involving radioactive substances needs a licence apply in the context of the Atomic Energy Act. Finally, the operator of a nuclear power plant or of a nuclear waste facility or whose practice requires, for other reasons, a licence under the Atomic Energy Act (e.g. transport of nuclear fuel), has to comply with the applicable requirements of the Radiation Protection Act. These include, for example, the provisions on the protection of workers or dose limits for occupational or public exposure.

On the other hand, the Radiation Protection Act stipulates that certain provisions of the Atomic Energy Act remain applicable, since in the past they have proven effective and suitable. These provisions concern the:

- verification of the reliability of individuals to ensure protection against misappropriation or release of radioactive material;

- liability;
- financial security;
- the requirements to subject the use of a licence to certain conditions and government supervision.

IV. Outline of innovations

The following points highlight some of the new features envisaged for each exposure situation.

1. *Planned exposure situations*

As outlined above, planned exposure situations formed the core of German radiation protection legislation in the past. The provisions governing practices under the former Radiation Protection Ordinance and the former X-ray Ordinance correspond largely to the provisions set out in Part 2 of the Radiation Protection Act, subject to amendments due to the requirements under the Basic Safety Standards Directive or due to implementation-related experience.

a. *Impact of altered exemption levels on handling licences*

In accordance with the requirements outlined in Annex VII to the Basic Safety Standards Directive, certain exemption levels have been lowered. However, exemption levels for total activity will remain unchanged. Lowering exemption levels should only minimally effect the issuance of handling licences as they are generally issued in connection with exemption levels for total activity. In spite of this, Section 197(4) of the Radiation Protection Act envisages a transitional provision for practices that previously did not require handling licences, but which now require one due to the lowering of exemption levels. Pursuant to this provision, licence applications must be submitted by 31 December 2019.

b. *Transport of radioactive materials*

In accordance with Article 2 of the Basic Safety Standards Directive, the transport of radioactive material is considered a planned exposure situation. Thus, the articles in the Basic Safety Standards Directive concerning planned exposure situations apply. This includes the provisions on protection against occupational exposure and public exposure.

Many of these provisions were not applicable under former radiation protection legislation, but this was changed under the new Radiation Protection Act. Now any undertaking that needs a transport licence under Section 27 of the Radiation Protection Act must ensure compliance with the protective provisions relevant for transport. This includes fulfilment of the obligation to set up organisational radiation protection requirements and to appoint the appropriate number of radiation protection supervisors with the requisite qualifications in radiation protection (see the licensing requirements in Section 29(1)(3) of the Radiation Protection Act). In the context of transport, the function of the radiation protection supervisor can be assumed by dangerous goods advisers appointed under the Dangerous Goods Transportation Act,¹³ provided they possess the requisite qualifications in radiation protection.

As the possession of the requisite qualifications in radiation protection is a new requirement, the transitional provision in Section 204 of the Radiation Protection Act

13. Gesetz über die Beförderung gefährlicher Güter (Gefahrgutbeförderungsgesetz – GGBefG) [Act on the Transportation of Dangerous Goods (Dangerous Goods Transportation Act – GGBefG)] of 6 August 1975, BGBl. I, p. 2121, as amended.

stipulates that proof of the requisite qualifications in radiation protection is to be provided by 31 December 2021. This is of particular relevance for holders of a transport licence acquired under the former radiation protection law where such a requirement did not exist. Section 204 of the Radiation Protection Act stipulates that a licence for transport granted before 31 December 2018 shall continue to apply as a licence pursuant to Section 29 of the Radiation Protection Act if evidence of the required qualifications in radiation protection is presented to the competent authority before the above-mentioned date.

c. *Dose limits*

Dose limits are determined for occupational exposure and public exposure. Dose limits are not envisaged for medical exposure of patients as exposure is deliberate and directly benefits patients for diagnostic or therapeutic purposes. Limits could reduce the effectiveness of the diagnosis or therapy and thus do more harm than good.¹⁴

▪ aa. *Dose limits for occupational exposure*

Compared to the former radiation protection law, the dose limits for occupational exposure have remained the same (see Sections 77 and 78 of the Radiation Protection Act). Thus, the dose limit for the working life dose of 400 millisieverts (mSv) per calendar year has also been maintained. However, there is one exception: the limit on the equivalent dose for the lens of the eye for individuals subject to occupational exposure has been reduced from 150 mSv per calendar year to 20 mSv per calendar year, thus transposing the provision stipulated in Article 9(3) of the Basic Safety Standards Directive. The decision to lower the dose limit is based on new scientific findings, which were analysed, in particular, by the ICRP.

▪ bb. *Dose limits for public exposure*

For individual members of the public, the limit for the sum of effective doses is 1 mSv per calendar year for exposure from practices requiring registration or licensing and other practices listed under Section 80(1) of the Radiation Protection Act. Under the former radiation protection law, the dose limit of 1 mSv per calendar year was assigned to one practice. This has been changed under the new legislation; the limit value of 1 mSv per calendar year now relates to the sum of the practices listed under Section 80(1) of the Radiation Protection Act. The amended provision serves to implement Article 12(1) and (2) of the Basic Safety Standards Directive.

Ascertaining exposures from the sum of all registered or licensed practices to comply with the dose limit for public exposure may well present a challenge. The German Commission on Radiological Protection has therefore adopted a Recommendation¹⁵ as to how the effective doses of members of the public should be estimated. Furthermore, a future, general administrative provision on further assumptions to be made and on the calculation methods to be applied for the determination of the exposure will give further guidance.

14. Compare Valentin, J. (ed.) (2007), *supra* note 11, number 323.

15. Strahlenschutzkommission [German Commission on Radiological Protection] (2015), *Umsetzung des Dosisgrenzwertes für Einzelpersonen der Bevölkerung für die Summe der Expositionen aus allen zugelassenen Tätigkeiten: Empfehlung der Strahlenschutzkommission* [Implementation of the Dose Limit for Members of the Public for the Sum of Exposures from all Authorised Practices: Recommendation by the German Commission on Radiological Protection], Adopted at the 274th meeting of the German Commission on Radiological Protection on 19 and 20 February 2015, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

d. Dose constraints

On the basis of ICRP Recommendation 103, the Basic Safety Standards Directive provides for dose constraints. They serve as a tool for optimising a practice. Accordingly, the Basic Safety Standards Directive defines dose constraint as “a constraint set as a prospective upper bound of individual doses, used to define the range of options considered in the process of optimization for a given radiation source in a planned exposure situation” (Section 4(22) of the Directive). The intention is thus not to exceed this upper bound and to reduce doses to levels as low as reasonably achievable.

Both the Basic Safety Standards Directive and the new German radiation protection legislation do not require the use of dose constraints. Rather, Section 72 of the Radiation Protection Ordinance obliges an undertaking to assess whether dose constraints should be established. In the case of outside workers, an undertaking must perform this assessment in co-operation with the undertaking of the external facility. Section 72 also provides that dose constraints should be set as part of the planning of operational radiation protection, if the activities performed are connected with exposures that require the allocation of the exposed person to category A¹⁶ and the protection measures are not already optimised by other radiation protection planning measures. These provisions are in line with Article 6(1) of the Basic Safety Standards Directive, which requires member states to “ensure that, *where appropriate*, dose constraints are established for the purpose of prospective optimisation of protection [...]” (emphasis added).

In summary, both the European and the German legislator have provided for a smooth introduction of this new optimisation tool. Where radiation protection has been organised in such a way that optimisation is fully in place, the setting of dose constraints may not be needed.

2. Existing exposure situations

Prior to the transposition of the Basic Safety Standards Directive, German radiation protection law addressed certain situations that are now categorised as existing exposure situations. Thus, the former Radiation Protection Ordinance set out certain rules for the protection of workers at specified workplaces involving radon, e.g. mines or water procurement facilities. As to the remediation of contaminated sites on the territory of the former German Democratic Republic (GDR), including the decommissioning and remediation of plant facilities and operating establishments for uranium mining, the former radiation protection law of the GDR continued to apply. As to the remediation of other contaminated sites, the Federal Soil Protection Act was applicable.

The following existing exposure situations are regulated in Part 4 of the Radiation Protection Act:

- protection against radon in indoor spaces and workplaces;
- contaminated areas (radioactive contaminated sites and contaminated areas following an emergency);
- protection against radioactivity in building materials; and

16. Category A persons are those who have occupational exposure due to activities that may result in an effective dose of more than 6 mSv or an organ equivalent dose exceeding 15 mSv for the ocular lens or an organ equivalent dose exceeding 150 mSv for local skin, hands, forearms, feet or ankles per calendar year (see Section 71 of the Radiation Protection Ordinance).

- existing exposure situations arising from an emergency and other existing exposure situations (e.g. contaminated goods in supermarkets).
- a. Characteristics

An existing exposure situation differs from a planned exposure situation because it has not been deliberately planned. In a planned exposure situation, exposure is intentionally caused by a practice and the dose received can be calculated in advance. In contrast to this, existing – and emergency – exposure situations are characterised by exposures that have been found and must be dealt with. Such exposures cannot be managed in the same manner as in planned exposure situations. Therefore, the radiation protection principles as well as certain tools used in planned exposure situations do not apply in the same manner in existing exposure situations whose control may – depending on the type and degree of the situation – require more flexible solutions.

The Basic Safety Standards Directive reflects this with regard to the principle of justification and dose limitation by stipulating in Article 5(a) and (c) as follows:

- (a) Justification: Decisions introducing a practice shall be justified in the sense that such decisions shall be taken with the intent to ensure that the individual or societal benefit resulting from the practice outweighs the health detriment that it may cause. Decisions introducing or altering an exposure pathway for existing and emergency exposure situations shall be justified in the sense that they should do more good than harm.
- (c) Dose limitation: In planned exposure situations, the sum of doses to an individual shall not exceed the dose limits laid down for occupational exposure or public exposure. Dose limits shall not apply to medical exposures.
- b. Reference levels

Instead of dose limits, ICRP Publication 103 has introduced the new instrument of reference levels for existing and emergency exposure situations. Reference levels are an instrument intended to implement the principle of optimisation. A reference level is not a dose limit. A dose limit means a value that shall not be exceeded for an individual. By contrast, a reference level is defined in the first sentence of Section 5(29) of the Radiation Protection Act as “in an existing exposure situation or in an emergency exposure situation, the specified level used as a benchmark to review the appropriateness of measures” (compare this with the definition contained in Article 4(84) of the Basic Safety Standards Directive). This definition reflects the philosophy expressed in ICRP Publication 103, number 228:

The chosen value for a constraint or a reference level will depend upon the circumstances of the exposure under consideration. It must also be realised that neither dose and risk constraints nor reference levels represent a demarcation between “safe” and “dangerous” or reflect a step change in the associated health risk for individuals.

- c. Radon

The purpose of a reference level is demonstrated very clearly with regard to radon. Section 124(1) of the Radiation Protection Act specifies a reference level for indoor annual radon concentration in air of 300 becquerel per cubic metre. The same reference level is specified in Section 126 for annual radon activity concentration in air in workplaces. Both reference levels serve to implement the corresponding provisions set out in Article 54(1) and Article 74(1) of the Basic Safety Standards Directive.

The reference levels are of relevance for the identification of areas with increased radon potential. According to Section 121(1) of the Radiation Protection Act, the

competent authority is obliged to identify areas in which it is expected that the average annual radon activity concentration in the air will exceed the above-mentioned reference levels in a significant number of buildings with indoor spaces or workplaces. These areas must be identified before 31 December 2020.

In radon prone areas, special protective measures have to be taken in order to prevent or significantly impede the entry of radon in new buildings. These measures include, e.g. the use of diffusion-resistant, convection inhibiting materials or constructions. The measures are not mandatory for existing buildings. Rather, for these types of buildings, information and education campaigns aim to induce owners to take protective measures on a voluntary basis. Also in view of this aim, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the competent authorities of the German federal states encourage identification of indoor spaces in which reference levels are exceeded and recommend technical or other means to reduce radon exposure (Section 125(2) of the Radiation Protection Act).

Furthermore, in radon prone areas radon concentrations must be measured in all workplaces located on the ground floor and basement level of buildings (see Section 127 of the Radiation Protection Act). If the radon activity concentration in the air at a workplace exceeds the reference level pursuant to Section 126 of the Radiation Protection Act, the party responsible for the workplace shall take action without delay to reduce the radon activity concentration in the air.

3. *Emergency exposure situations*

Emergency exposure situations are the third type of exposure situation addressed by the Basic Safety Standards Directive and transposed in Part 3 of the Radiation Protection Act. Article 97 of the Directive obliges member states to establish an emergency management system that ensures emergency preparedness and emergency response. This obligation is taken into account in the Radiation Protection Act essentially by means of the three elements outlined below.

▪ a. *Emergency plans*

In the framework of emergency preparedness, the federal government and the federal states shall prepare emergency response plans outlining the planned adequate responses in the event of an emergency on the basis of specific reference scenarios (Sections 97 to 100 of the Radiation Protection Act). The federal government shall prepare a general emergency response plan that will be supplemented with special ministry-specific emergency response plans. The federal states shall also prepare general and special emergency response plans that will supplement the general and special emergency response plans of the federal government.

▪ b. *Interlinking approach*

The authorities that, within their area of responsibility, perform emergency response tasks in the course of their everyday business in the implementation of federal laws also retain this responsibility and competence in the case of radiological emergencies. Those authorities will additionally apply the emergency response plans and the ordinances prescribed in Sections 94 to 96 of the Radiation Protection Act. For such decisions, emergency response plans are to be observed, as well as the radiological situation, and account taken of other relevant circumstances of the respective emergency.

▪ c. *Radiological situation report / federal radiological situation centre*

For supra-regional and regional emergencies, it is important for all authorities to have a uniform radiological situation report for the evaluation of radiological situations (Section 108 of the Radiation Protection Act). For supra-regional emergencies, the

radiological situation report shall be drawn up by the radiological situation centre to be set up by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. For regional emergencies, the radiological situation report shall generally be drawn up by the federal state concerned. The other tasks performed by the radiological situation centre are listed under Section 106 of the Radiation Protection Act.

V. Conclusion

This study provides an overview of selected topics addressed in the new radiation protection law. German radiation protection legislation has now been given its own comprehensive, formal foundation, thus confirming the importance of this area of law.

Case Law

Belgium

Raad van State [Council of State], 24 May 2018, nr. 241.575

In the case brought before the Belgian Council of State, the claimant, Greenpeace Belgium, contested the legality of an authorisation for the transport of spent fuel delivered by the regulator, the Federal Agency for Nuclear Control (FANC).

The claimant's first argument was based on the Euratom Basic Safety Standards Directive¹ and the transposition of the principle of justification. The claimant argued that in order for the regulator to deliver an authorisation for a transport there always has to be a verification of the principle of justification, which is to be based on a justification study. The Council of State clarified that there only has to be a justification study if the scope of the authorisation concerns an act that is considered a new type of practice and not for a demand to authorise a practice that was already considered as justified in the past.

For the second argument, the claimant raised an issue related to the ALARA principle in the Euratom Basic Safety Standards Directive. The Council of State stated that the application of the ALARA principle was correct in the specific case. The scope of the authorisation was a specific isotope, in a specifically designed package that guarantees constant compliance with the values and correlations provided in the Belgian Royal Decree of 20 July 2001 (related to the protection of people and the environment from radiation hazards). The evaluation of the ALARA principle does not oblige the regulator to evaluate possible alternatives for the transport.

France

Cherbourg high court (Tribunal de grande instance), 16 October 2018, No. 18-00061

In 2016, the Australian Nuclear Science and Technology Organisation (ANSTO) and AREVA NC (now ORANO CYCLE) signed a trade agreement on the reprocessing of spent fuel from an ANSTO research reactor. France and Australia agreed on the organisation of this reprocessing in a 23 November 2017 bilateral agreement that was published in the *Journal Officiel* [Official Journal] by decree on 6 July 2018.²

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. *Décret n° 2018-586 du 6 juillet 2018 portant publication de l'accord entre le Gouvernement de la République française et le Gouvernement de l'Australie relatif au retraitement en France d'éléments combustibles nucléaires irradiés australiens, signé à Canberra le 23 novembre 2017* [Decree No. 2018-586 of 6 July 2018 on the publication of the agreement between the Government of the French Republic and the Government of Australia on the reprocessing in France of irradiated nuclear fuel elements from Australia, signed in Canberra on 23 November 2017], *Journal officiel de la République Française* [Official Journal of the French Republic] (JORF), 8 July 2018, text no. 10.

In September 2018, Greenpeace France asked ORANO CYCLE to view the contract signed between ORANO CYCLE and ANSTO. When this request was denied, Greenpeace France brought an action for summary judgement at the Cherbourg High Court (*Tribunal de grande instance*) to receive the various contracts signed within the framework of the trade agreement. Greenpeace France wanted access to these documents in order to assess the legality of the radioactive waste transport operations under Article L. 542-2 of the French Environmental Code, which prohibits the disposal in France of radioactive waste originating from a foreign country or from the processing of foreign spent fuel and foreign radioactive waste.

The judge dismissed all of Greenpeace France's claims. After reiterating the definitions governing the storage of radioactive materials and waste and the disposal of radioactive waste, the judge specified that:

while the disposal of radioactive waste originating from a foreign country remains prohibited, it is nevertheless possible to introduce and store in France radioactive waste and spent fuel originating from a foreign country for treatment or reprocessing, provided that the said storage does not exceed a date established by inter-governmental agreements, on the grounds that, contrary to the provisions of the legislation applicable previously, storage is no longer subject to the technical time frames imposed by reprocessing.

Japan

Decision by the Hiroshima High Court on appeal regarding the operation of the Ikata nuclear power plant

On 25 September 2018, the Hiroshima High Court (hereinafter referred to as "Hiroshima HC") overturned an earlier decision of the Hiroshima HC, where the HC issued a preliminary injunction to halt operations of the Ikata nuclear power plant (NPP). The Hiroshima HC's September 2018 decision on appeal allowed the restart of the Ikata NPP.

Although the earlier Hiroshima HC decision was overturned on appeal, two points should be noted regarding this decision. First, civil lawsuits have been increasing in number in Japan since the Fukushima Daiichi NPP accident. One main reason for the increase in civil lawsuits is that plaintiffs are choosing civil actions over administrative actions because of the difference in subject matter. A wide range of issues can be targeted in civil lawsuits in Japan, including the risk of worker exposure, fuel transport and so on, for courts' examination. As a result, the Japanese legal system allows for the suspension of NPP operation in civil lawsuits, even if such operation conforms to the nuclear regulations. In administrative lawsuits, on the other hand, courts can only consider the illegality of the authorisation decision. Thus, the scope of examination in an administrative action is more limited when compared with civil actions.

Second, the traditional framework for decisions in civil lawsuits prior to the Fukushima accident had been adopted based on a Supreme Court decision in an administrative lawsuit seeking to cancel permission for the construction of reactors at the Ikata NPP, with a few exceptions.³ However, while there were judicial rulings that adopted the traditional framework for decisions after the Fukushima accident, the courts harboured doubts about the content of regulatory standards set by the regulatory body. The courts pointed out the nuclear installation improvements

3. Supreme Court decision of 29 October 1992, Minsyu, Vol. 46, No. 7, p. 1174 (Ikata Supreme Court decision). A provisional translation of this decision is available on the Supreme Court website at: www.courts.go.jp/app/hanrei_en/detail?id=1399 (accessed 2 Apr. 2019).

needed for safety reasons. There were also judicial rulings that used this reasoning as a basis for their decisions. The Hiroshima HC's decision on the Ikata NPP case is the latest judicial ruling upholding a preliminary injunction to halt NPP operations. This decision is also the first preliminary injunction to adopt the determination of the Nuclear Regulation Authority (NRA) regarding the dangers presented by volcanic events as its basis.

The key to the decisions in this series of cases was how the courts evaluated the NRA's determination regarding the risks associated with volcanic events. First, under the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors (hereinafter referred to as "the Act"), which was amended after the Fukushima accident, the NRA created the Volcanic Effects Assessment Guide (hereinafter referred to as "the Volcano Guide") to serve as a regulatory standard for volcanic activity. The interpretation of the Volcano Guide was an issue in each of the three decisions. As provided in the Volcano Guide, NPP locations are evaluated as follows:

- 1) In case future volcano activity is foreseeable within a 160 km radius (geographical region) of the NPP, the NRA should determine whether the possibility of volcanic activity is sufficiently negligible during the period of NPP operation (in principle, 40 years).
- 2) If the NRA could not determine that the possibility of volcanic activity noted in point (1) was sufficiently negligible, the NRA must estimate the likely scale of any eruption during the period of NPP operation (in principle, 40 years).
- 3) If the scale of any eruption as noted in point (2) could not be estimated, the largest scale of eruption that the volcano in question has experienced is to be assumed. The NRA should then evaluate whether the possibility was sufficiently small that the facility would not be able to withstand the volcanic event (pyroclastic flow).
- 4) If it would not be possible to conclude that the possibility of the pyroclastic flow reaching the NPP as described in point (3) is sufficiently small, the siting of the NPP (in this particular area) will be deemed inappropriate, and the NPP would not be permitted to be operated at this site.

The Hiroshima District Court decision (30 March 2017)

The plaintiff in this case is a local opposition group who sought a preliminary injunction against operations at the Ikata NPP. On 30 March 2017, the Hiroshima District Court (hereinafter referred to as "Hiroshima DC") ruled against the plaintiffs and denied their petitions. In the Hiroshima DC decision, it was determined that the assumption contained in the Volcano Guide was unreasonable, because it stated that the timing and scale of any volcanic eruption could be accurately predicted a considerable time beforehand. Further, the Act aims to ensure safety assuming a natural disaster of a reasonably predicted scale based on the latest knowledge. Thus, with regard to "catastrophic eruptions", unless it is determined that there is no reasonable possibility of occurrence, the NRA's determinations would be consistent with the Act's purpose even if the site is deemed appropriate. Such reasonable grounds are not indicated in this case; therefore, the Hiroshima DC concluded that the NRA's determination was rational and held that the location of the Ikata NPP in relation to the volcano was not inappropriate.

The Hiroshima HC decision (13 December 2017)

The plaintiffs immediately appealed the Hiroshima DC decision. Following the trial on appeal, the Hiroshima HC issued a decision approving the injunction on 13 December 2017, suspending operation of the Ikata NPP. The Hiroshima HC decided that there was not enough evidence to support the judgement that the possibility of the volcanic activity in question was sufficiently small during the period of operation

of the NPP. However, the Hiroshima HC did conclude that, apart from this issue, the Volcano Guide was consistent with international standards and affirmed that its content was rational.

The Hiroshima HC stated that current scientific knowledge could not find the possibility of volcanic activity and thus the court was not able to judge under point 1), and that it could not determine the likely scale of an eruption under point 2). Therefore, the Hiroshima HC assumed the largest past eruption under point 3) and evaluated whether the possibility of the pyroclastic flow reaching the facility was sufficiently small. Then, the Hiroshima HC determined that the siting of the NPP was inappropriate because such an evaluation was impossible to carry out based on submitted arguments and premises.

The Hiroshima HC further stated that it would be unacceptable to change the Volcano Guide's framework for considering natural disasters. Incidentally, the court cast doubt that the NRA had to assume extremely low frequency events such as "catastrophic eruptions".

The Hiroshima HC appeal decision (25 September 2018)

Thereafter, the defendant, Shikoku Electric Power Co., petitioned the Hiroshima HC with an objection to the temporary restraining order, resulting in an appeal hearing held on 25 September 2018. The Hiroshima HC decision was overturned, and the plaintiff's complaint was dismissed. Like the initial Hiroshima DC decision, the Hiroshima HC noted on appeal that the Volcano Guide was based on the premise that the timing and extent of any eruption of the volcano in question could be predicted with considerable accuracy and a considerable time in advance. It concluded that this premise was not realistic. Then, the court determined that the best assumption of the risk for a huge volcanic eruption should be based on social common sense. This social common sense means that the risk of such extremely low frequency events like "catastrophic eruptions" is not regarded as a problem by the general public here in Japan. Applying these general theories to this case, the Hiroshima HC found that the NRA's determination was not contrary to the purpose of the Act. Therefore, as no reasonable grounds were found for the possibility of "catastrophic eruptions" in this case, the Hiroshima HC concluded on appeal that the NRA's determination was rational and held that the location of the Ikata NPP in relation to the volcano was not inappropriate.

United States

Cooper v. Tokyo Electric Power Company, Imamura v. General Electric Company, and other US lawsuits related to the TEPCO Fukushima Daiichi NPP accident

Since the last report on two lawsuits then pending in US federal courts related to the 2011 TEPCO Fukushima Daiichi NPP accident,⁴ there have been more developments that now involve five actions brought in US District Courts in California, the District of Columbia and Massachusetts. These lawsuits were initiated even though Japan's nuclear liability law channels liability for nuclear damage exclusively to nuclear operators and provides for unlimited liability. They have been allowed to proceed because the United States and Japan were not both parties to the Convention on Supplementary Compensation for Nuclear Damage⁵ at the time of the Fukushima NPP accident. The CSC and other international nuclear liability conventions provide that

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4. NEA (2017), "Cooper v. Tokyo Electric Power Company, No. 15-56426 (9th Cir. 2017)", *Nuclear Law Bulletin*, No. 99, OECD, Paris, pp. 73-74.
 5. Convention on Supplementary Compensation for Nuclear Damage (1997), IAEA Doc. INFCIRC/567, 36 ILM 1473, entered into force 15 Apr. 2015 (CSC).

jurisdiction over nuclear damage actions lies only with courts of the contracting party within whose territory the nuclear incident occurred.

As previously reported, the first US lawsuit was filed in 2012 in the US District Court in San Diego, California.⁶ Plaintiffs are US Navy service members (or those claiming through them) who were deployed off the Japanese coast as part of the US effort to provide earthquake relief, named Operation Tomodachi. The District Court in June 2015 denied TEPCO's motion to dismiss the complaint under the doctrine of international comity or *forum non conveniens*, but certified issues to the US Court of Appeals for the Ninth Circuit.⁷ On interlocutory appeal, the Government of Japan filed an *amicus* brief expressing Japan's interest in centralising claims in Japan. In an *amicus* brief specifically requested by the Ninth Circuit Court of Appeals, the US Government argued that "the district court did not err in allowing Plaintiffs' claims to proceed for the time being" and "that allowing Plaintiffs' lawsuit to continue in the United States is consistent with US efforts to promote the [CSC]." On 22 June 2017, the Court of Appeals affirmed the District Court's denial of TEPCO's motion to dismiss the Cooper lawsuit, holding that the provision in Article XIII of the CSC for exclusive jurisdiction in courts of the incident country did not strip US courts of jurisdiction over claims arising out of nuclear incidents that occurred prior to the CSC's entry into force on 15 April 2015.⁸ The Court of Appeals further held that the District Court did not abuse its discretion when it did not dismiss the lawsuit on grounds of *forum non conveniens* or international comity, even though it recognised that Japanese courts would provide an adequate alternative forum and that approximately 2.4 million Fukushima claims had been resolved in Japan with total payments then equivalent to more than USD 58 billion (now over USD 78 billion).

On 18 August 2017, counsel for the Cooper plaintiffs filed another lawsuit in the same court that they sought to have consolidated with the existing action.⁹ The new Bartel lawsuit identified an additional 157 individuals who claimed to have been injured (for a combined total of 396 individuals). On 5 January 2018, *Bartel v. TEPCO* ("Bartel I") was dismissed on jurisdictional grounds, following a hearing on the motions of TEPCO and General Electric. The court found that there was no specific personal jurisdiction over TEPCO in California and that the Bartel I plaintiffs had not alleged that there is general jurisdiction over TEPCO in California. As to General Electric, the court found that there was no subject matter jurisdiction because the Bartel I plaintiffs did not provide information in their complaint about the citizenship of plaintiffs necessary to show complete diversity required under the federal diversity jurisdiction statute. The District Court's order granted the motions without prejudice. Rather than filing an amended complaint or appealing, counsel for the plaintiffs, on 14 March 2018, filed another action in San Diego with 55 new plaintiffs ("Bartel II").¹⁰

The Cooper plaintiffs filed a separate lawsuit in the US District Court for the District of Columbia on 14 March 2018 (the same day the substantially similar Bartel II complaint was filed in the District Court in San Diego).¹¹ On 25 March 2019, the District Court issued an order continuing its stay of this lawsuit previously stipulated by the parties until resolution of appellate proceedings for Cooper and Bartel II, with a joint status report due 14 days after the appellate resolution.

6. *Cooper et al. v. Tokyo Electric Power Company, Inc. et al.*, No. 12CV3032 JLS-WMO (SD Calif., San Diego Div.).

7. 166 F. Supp. 3d 1103 (SD Cal. 2015).

8. 860 F.3d 1193 (9th Cir. 2017).

9. *Bartel et al. v. Tokyo Electric Power Company, Inc. et al.*, No. 17CV1671 DMS KSC (SD Calif., San Diego Div.).

10. No. 18-CV-537 JLS (JLB) (SD Calif., San Diego Div.).

11. *Holland et al. v. Tokyo Electric Power Company, Inc. et al.*, No. 18cv000573 (DDC).

On 13 September 2018, another lawsuit was filed in the Southern District of California on behalf of four US civilians working in Japan at the time of the Fukushima NPP accident.¹² On 28 March 2019, the District Court issued an order staying the proceedings until the conclusion of the appellate proceedings in Cooper and Bartel II.

On 4 March 2019, the District Court in San Diego dismissed both the Cooper and Bartel II lawsuits on various grounds, including that Japanese law should apply. Plaintiffs on 8 March 2019 appealed the District Court's dismissal order in the Cooper lawsuit to the US Court of Appeals for Ninth Circuit.¹³ Appellants' opening brief in Cooper was due 24 June 2019. Appellees' answering brief in Cooper was due 24 July 2019. Plaintiffs on 14 April 2019, appealed the District's Court's dismissal order in the Bartel II lawsuit to the US Court of Appeals for Ninth Circuit (No. 19-55442 (9th Cir.)). Appellants' opening brief in Bartel II was due 25 July 2019. Appellees' answering brief in Bartel II is due 26 August 2019.

Another Fukushima NPP accident supplier-related lawsuit was filed in the US District Court for the District of Massachusetts in Boston on 17 November 2017.¹⁴ The named plaintiffs are Japanese property owners, businesses and other commercial enterprises who brought this class action on behalf of more than 150 000 Japanese residents and hundreds of Japanese businesses who are alleged to have suffered property and other economic injury and damages as a result of Fukushima NPP accident. Defendants are General Electric and "Does 1-100" to be named later. The complaint contains several counts alleging negligence, strict liability and violations of various articles of the Civil Code of Japan by the defendants. Plaintiffs are seeking unspecified amounts of monetary and punitive damages. On 6 March 2018, General Electric moved to dismiss the Imamura lawsuit with prejudice, based on lack of subject matter jurisdiction, *forum non conveniens* and failure to state a claim. Among other points, General Electric said that deference by the Ninth Circuit Court of Appeals to the US Government's *amicus* brief in the Cooper v. TEPCO interlocutory appeal "was unwarranted," i.e. that the exclusive jurisdiction provision of the CSC (Article XIII) should apply. On 17 December 2018, the District Court held a hearing on General Electric's dismissal motion and requested the parties to file translations of the Japanese Fukushima NPP accident claims guidelines and information about the amount of monetary judgements in Japan. Such information was submitted on 26 February 2019. On 18 March 2019, General Electric informed the Boston Court of the San Diego Court's orders dismissing the Cooper and Bartel II lawsuits as well as the Japanese Supreme Court's 23 January 2019 decision upholding the constitutionality of channelling of liability to operator. On 8 April 2019, the Boston Court dismissed the Imamura lawsuit only on the grounds of *forum non conveniens*.

These US lawsuits can be expected to remain unresolved for some time: the Court of Appeals for the Ninth Circuit needs to rule again on the Cooper lawsuit, which could lift the stays in the Holland lawsuit in Washington and the Park lawsuit in San Diego. And a notice of appeal in the Imamura lawsuit was filed before the US Court of Appeals for the First Circuit on 1 May (Docket No. 19-1457 (1st Cir.)). Appellants' opening brief was due 1 July 2019. Appellee's answering brief is due within 30 days of Appellants' brief.

Litigants engage in forum shopping when they think they can get more favourable outcome in another court, especially in the event of nuclear damage due to a nuclear incident occurring at a nuclear installation, which has transboundary damage with

12. Park et al. v. Tokyo Electric Power Company, Inc. and General Electric Company, No. 18cv2121(SD Calif., San Diego Div.).

13. No. 19-55295 (9th Cir.).

14. Imamura et al. v. General Electric Company and "Does 1-100", No. 1:17cv12278-FDS (D Mass.).

respect to states not in treaty relations. Plaintiffs tend to favour US courts, especially given the lower nuclear liability limits of other countries, the more generous attitudes of US juries, the potential availability of punitive damages, liberal discovery, contingency fees, large damage awards, etc. Additionally, non-governmental entities typically make attractive targets for plaintiffs' lawyers, because, for example, they can be subject to jury trials (where the Federal Tort Claims Act does not allow jury trials when the claim is against the US Government), have fewer defences against executions of judgements, lack sovereign immunity, etc. The still pending US lawsuits confirm what can occur when there are not treaty relations providing for a single competent court in the territory where the nuclear incident occurred.

State of Nevada v. US Nuclear Regulatory Commission and David A. Wright, No. 18-1232 (unpublished) (DC Cir. 2019)

The state of Nevada filed a petition for review challenging a decision by Commissioner David Wright of the US Nuclear Regulatory Commission (NRC) not to recuse himself from the licensing proceeding for a proposed nuclear waste repository at Yucca Mountain, Nevada. Prior to his appointment as a member of the Commission, Commissioner Wright had been a Commissioner on the state of South Carolina Public Service Commission. Commissioner Wright had also supported the National Association of Regulatory Utility Commissioners (NARUC) when it intervened in the Yucca Mountain adjudicatory proceeding before the NRC and argued that the US Department of Energy could not withdraw its licence application. The state of Nevada cited several statements made by Commissioner Wright related to that proceeding, including statements expressing the view that the process for evaluating Yucca Mountain as a repository site should be completed, as evidence that he could not be an unbiased judge in the proceeding.

The NRC moved to dismiss Nevada's petition before the DC Circuit, arguing that: 1) the petition did not satisfy the limited waiver of sovereign immunity in the Nuclear Waste Policy Act; 2) Nevada had not raised its claims as a petition for mandamus, which would have been proper under the circumstances, instead of a petition for review; and 3) the case was not "ripe" for review because the adjudicatory proceeding remains suspended and the construction permit application might never be granted.

The Court issued an unpublished *per curiam* opinion that granted the NRC's motion to dismiss on the third ground noted above. The Court ruled that the case was not ripe for review because it "rests upon contingent future events that may not occur as anticipated, or indeed may not occur at all[,]" citing an earlier decision in a similar case involving former Chairman Allison Macfarlane in 2014.

National legislative and regulatory activities

France

Liability and compensation

Decree No. 2018-1027 of 23 November 2018 publishing the decision on the exclusion of small quantities of nuclear substances outside a nuclear installation from application of the Convention on Third Party Liability in the Field of Nuclear Energy (text in Annex), adopted by the Steering Committee of the Nuclear Energy Agency in Paris on 3 November 2016¹

In accordance with Article 1(b) of the Paris Convention,² the Steering Committee for Nuclear Energy of the OECD Nuclear Energy Agency (NEA) may, if in its view the small extent of the risks involved so warrants, decide to exclude any nuclear installation, nuclear fuel or nuclear substances from the application of the Paris Convention.

This is notably the case, further to the decision of the NEA Steering Committee of 18 October 2007, for small quantities of nuclear substances outside a nuclear installation, which are excluded from the scope of application of the Paris Convention, provided that they fulfil certain conditions.³ In order to take into consideration the revision of certain international regulations on the safe transport of radioactive material, the NEA Steering Committee updated the criteria for exclusion by a decision dated 3-4 November 2016,⁴ which replaces the decision of 18 October 2007, henceforth abrogated.

Decree No. 2018-1027 of 23 November 2018 publishes this decision, thereby incorporating it into French domestic law and guaranteeing its enforceability.

Germany

Food irradiation

New version of the Food Irradiation Ordinance

A new consolidated version of the “Ordinance on the Treatment of Foodstuffs with Electronic-, Gamma-, and X-Rays, Neutron- or Ultraviolet-Radiation (Food Irradiation

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1. *Journal officiel “Lois et Décrets”* [Official Journal of Laws and Decrees] (J.O.L. et D.), 25 Nov. 2018, text no. 6.
 2. Convention on Third Party Liability in the Field of Nuclear Energy of 29th July 1960, as amended by the Additional Protocol of 28th January 1964 and by the Protocol of 15th November 1982 (1960), 1519 UNTS 329 (Paris Convention).
 3. Draft Decision on the Exclusion of Small Quantities of Nuclear Substances from the Application of the Paris Convention on Third Party Liability in the Field of Nuclear Energy, NEA/NE(2007)8, 21 Sept. 2007; Summary of Decisions Taken at the 115th Session of the Steering Committee for Nuclear Energy, NEA/SUM/DEC(2007)2, 25 Oct. 2007.
 4. Decision on the Exclusion of Small Quantities of Nuclear Substances outside a Nuclear Installation from the Application of the Convention on Third Party Liability in the Field of Nuclear Energy, NEA/NE(2016)8/FINAL, 16 Jan. 2017.

Ordinance)” was published on 15 February 2019 in the *Federal Gazette*.⁵ By the new version of the Food Irradiation Ordinance the following two Directives will be implemented into German law:

- Directive 1999/2/EC of the European Parliament and of the Council of 22 February 1999 on the approximation of the laws of the Member States concerning foods and food ingredients treated with ionising radiation⁶ and
- Directive 1999/3/EC of the European Parliament and of the Council of 22 February 1999 on the establishment of a Community list of foods and food ingredients treated with ionising radiation.⁷

The amendment retroactively entered into force on 13 July 2017.

Nuclear trade (including non-proliferation)

Amendments to the Foreign Trade Ordinance

The 13th Ordinance to amend the Foreign Trade Ordinance⁸ of 27 February 2019⁹ amends Articles 74, 76 and 77 of the Ordinance as last amended on 19 December 2018.¹⁰ The minor amendments entered into force on 7 March 2019.

Transport of radioactive materials

Amendments to the transport of dangerous goods ordinances

The following Ordinances on the transport of dangerous goods were amended:

- the Ordinance on the transport of dangerous goods by road, railways and internal waters of 30 March 2017¹¹ was amended by Article 1 of an Ordinance of 20 February 2019;¹²
- the Ordinance on the transport of dangerous goods by seagoing vessels of 7 December 2017¹³ as last amended 2018;¹⁴
- a new version of the Ordinance on the exception from regulations on the transport of dangerous goods (Dangerous Goods Exception Ordinance) of 11 March 2019.¹⁵

5. *Bundesgesetzblatt* [Federal Law Gazette] (BGBl.) 2019 I, p. 116. For more information on earlier versions of the Ordinance, please see NEA (1992), “Amendments to the Meat Hygiene Ordinance (1991)”, *Nuclear Law Bulletin* (NLB), No. 49, OECD, Paris, p. 53; NEA (1993), “Foodstuffs and Consumer Goods Act (1992)”, NLB 52, OECD, Paris, p. 54; NEA (2001), “Ordinance on the Treatment of Foodstuffs with Radiation (2000)”, NLB 67, OECD, Paris, pp. 35-36; NEA (2007) “Amendment to the Ordinance on the Treatment of Foodstuffs with Radiation (2006)”, NLB 79, OECD, Paris, pp. 62-63.

6. *Official Journal of the European Union* (OJ), L 66 (13 Mar. 1999), p. 16.

7. *Ibid.*, p. 24.

8. For more information on the Foreign Trade Ordinance, please see NEA (2016), “Amendments to the Foreign Trade Act and the Foreign Trade Ordinance (2015)”, NLB 98, OECD, Paris, pp. 69-70.

9. *Bundesanzeiger* [Federal Gazette] AT 6 March 2019 V1.

10. *Bundesanzeiger* AT 28 December 2018 V1.

11. BGBl. 2017 I, p. 711.

12. BGBl. 2019 I, p. 124.

13. BGBl. 2017 I, p. 3862.

14. BGBl. 2018 I, p. 131.

15. BGBl. 2019 I, p. 229.

The amendments, partly retroactively, came into force on 1 January, on 28 February and on 18 March 2019, respectively.

Greece

Nuclear safety and radiological protection (including nuclear emergency planning)

Transposition of the Euratom Basic Safety Standards

The Greek Radiation Protection Regulations have been amended in order to comply with the Euratom Basic Safety Standards Directive,¹⁶ as well as to take into account the findings of international peer reviews (for example the International Atomic Energy Agency's (IAEA) International Regulatory Review Service (IRRS) missions to Greece in 2012 and 2017) of the national regulatory framework and the regulatory experience gained in the last 20 years. The new Radiation Protection Regulations consist of:

- a presidential decree (PD), which is the main legislative document providing the regulatory framework for conducting activities related to ionising radiation;
- three ministerial decisions dealing with the notification and authorisation procedures, the assignment of responsibilities for the implementation of strategies for the management of existing exposure situations and the establishment of the national action plan addressing long-term risks from radon exposures;
- Greek Atomic Energy Commission (EEAE) decisions that are mostly technical rules to control or regulate specific tasks and activities; and
- regulatory guidance, which is a set of recommendations designed to assist persons and organisations in complying with the legal requirements.

The PD, entitled “Adaptation of the 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/(EE L13/17.1.2014) – Establishment of radiation protection regulations” was published in the Official Government Gazette on 20 November 2018. The PD puts emphasis on the:

- graded approach of regulatory control based on risk assessment;
- regulatory control requirements, including the regulatory body, inspections and enforcement;
- clear allocation of responsibilities regarding radiation protection, including the prime responsibility of the undertaking for the practices applied;
- preparedness and response related to emergency exposure;
- protection from natural radiation sources and environmental issues in general;

16. 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 Jan. 2014) (Euratom Basic Safety Standards Directive).

- importance of education, training and information for all the persons involved in the radiation protection system; and
- reduction of the eye lens dose limit for the exposed workers from 150 mSv to 20 mSv.

The provisions of the PD came into force on 6 February 2018, subject to transitional arrangements.

The ministerial decision entitled “Procedures for the regulatory control of practices of ionizing radiation – approval and recognition of services and experts” has been promulgated in the *Official Government Gazette* in April 2019. It is the main secondary legislation issued upon the publication of the previously mentioned PD on the adoption of the Euratom Basic Safety Standards Directive. The ministerial decision defines:

- the procedures and the necessary information and supporting documents for the notification and authorisation of practices subject to regulatory control for the purposes of radiation protection based on the graded approach;
- the practices for which registration or licensing is required;
- other types of practices for which registration or licensing is required (such as the employment of outside workers and the transport of radioactive material.);
- the arrangements for the a) approval of radiation protection experts, medical physics experts and occupational health services; b) authorisation of dosimetry services; and c) recognition of the radiation protection officers.

Lithuania

Nuclear safety and radiological protection (including nuclear emergency planning)

Transposition of the Euratom Basic Safety Standards¹⁷

Lithuania continued its efforts to transpose the Euratom Basic Safety Standards by adopting the following new Nuclear Safety Requirements and orders:

- New Nuclear Safety Requirements BSR-1.9.8-2018 “Rules of Procedure for Preparation of Radiation Protection Officer Job Description and Radiation Protection Office Statute”¹⁸ were adopted by the head of State Nuclear Power Safety Inspectorate (VATESI) in order to set clear requirements for the content of the Radiation Protection Officer Job Description and Radiation Protection Office Statute and set their basic functions.
- Order No. 22.3-263, 5 Nov. 2018, “List of Types of Justified Activities with the Sources of Ionising Radiation in the Nuclear Energy Area” was approved in 2018 by the head of VATESI in order to establish the list of types of justified activities in the nuclear energy area. New types of practices that are not listed but that will result in exposure to ionising radiation in the nuclear energy area shall be justified by an undertaking before approval by VATESI.

17. *Ibid.*

18. Order No. 22.3-309 (12 Dec. 2018) of the Head of State Nuclear Power Safety Inspectorate “On the approval of Nuclear Safety Requirements BSR-1.9.8-2018 ‘Rules of Procedure for Preparation of Radiation Protection Officer Job Description and Radiation Protection Office Statute’”, available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/f9db1f70fe0c11e8a969c20aa4d38bd4.

- Nuclear Safety Requirements BSR-1.9.5-2018 “Assessment of justification of activities with the sources of ionising radiation in the nuclear energy area” were adopted by the head of VATESI to set the requirements for information and documentation to be presented to VATESI in order to justify the practices not included in the “List of Types of Justified Activities with the Sources of Ionising Radiation in the Nuclear Energy Area” and establish the procedure of justification of this practice.
- Nuclear Safety Requirements BSR 1.9.6-2018 “Recognition of Radiation Protection Expert for Activities with Sources of Ionising Radiation in Nuclear Energy Area and Duties of Undertakings carrying out Aforementioned Activities to Consult with Radiation Protection Expert” were adopted by the head of VATESI in order to set the duty for undertakings to seek advice from a radiation protection expert as well as to set basic functions and responsibilities of the radiation protection expert to consult with undertakings. Additionally, the Requirements establish the procedure for VATESI to recognise the competence of a radiation protection expert.
- Nuclear Safety Requirements BSR-1.9.7-2018 “Rules of Procedure for Recognition of Dosimetry Services of Nuclear facilities” were adopted by the head of VATESI in order to establish the procedure for VATESI to recognise the competence of the dosimetry service, including the requirements for the information and documentation presented for the recognition of this service and requirements for the quality management system for the dosimetry service as well as requirements for assessing the accuracy of measurements to evaluate the occupational exposure.

Nuclear Safety Requirements for commissioning of nuclear facilities

New Nuclear Safety Requirements¹⁹ for commissioning of all types of nuclear facilities were adopted by the head of VATESI in order to streamline the regulation. The main goal of the Nuclear Safety Requirements was to streamline provisions on commissioning to gather them in one document. The Nuclear Safety Requirements include:

- content of the commissioning programme and requirements for its implementation;
- organisation and management of commissioning of nuclear facilities;
- requirements for commissioning tests;
- requirements for verification of operation procedures, including emergency preparedness, during implementation of commissioning programme;
- requirements for commissioning tests and commissioning programme reports.

The new Nuclear Safety Requirements come into force on 1 May 2019.

19. Order No. 22.3-295 (4 Dec. 2018) of the Head of State Nuclear Power Safety Inspectorate “On the approval of Nuclear Safety Requirements BSR-1.8.5-2018 ‘Commissioning of Nuclear Facility’”, available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/a78e2dd0f79911e880d0fe0db08fac89.

Revision of Nuclear Safety Requirements for decommissioning

VATESI reviewed and adopted a new version of Nuclear Safety Requirements BSR-1.5.1-2019 “Decommissioning of Nuclear Facilities”.²⁰ The goal of the amendment was to update national requirements for decommissioning based on international practice and national experience of the dismantling and decontaminations projects at the Ignalina nuclear power plant. The main updates include:

- an update of several definitions and the approval of two new definitions – “brown field” and “green field” – that are possible end states of the decommissioning process;
- more detailed requirements for assessing decommissioning safety;
- an update of the contents of the final decommissioning plan and safety analysis report;
- the establishment of new requirements for the demolition of buildings during decommissioning that are on the site of a nuclear facility and that are not used in operation and not needed anymore. Nuclear Safety Requirements BSR-1.8.2-2015 “Categories of Modifications of Nuclear Facility and Procedure of performing the Modifications” was amended²¹ to include procedures for the modification of the aforementioned buildings.

The aforementioned amendments come into force on 1 May 2019.

Slovak Republic

General legislation, regulations and instruments

Drafting of new Atomic Act

The drafting of the new Atomic Act (“new Act”) has continued after it was interrupted in 2016 by activities related to transposing the European Union *acquis communautaire* (the cumulative body of EU legislation and the case law of the European Court of Justice). The initial meeting of the working group was held on 18 June 2018. Since then, the Schedule and Basic Principles of the new Act were approved by the management of the National Regulatory Authority of the Slovak Republic (NRA SR). According to the Schedule, it is foreseen that the consultation process with respective subjects and institutions will start in May 2019 and will be finalised in May 2020 by submission of the new Act for the approval of the Government of the Slovak Republic. Upon its positive opinion, the new Act will be submitted to the National Council of the Slovak Republic (Slovak Parliament) for the final approval. The new Act should come into force on 1 January 2021.

20. Order No. 22.3-19 (24 Jan. 2019) of the Head of State Nuclear Power Safety Inspectorate on the amendment of Order No. 22.3-216, 30 Nov. 2015, of the Head of State Nuclear Power Safety Inspectorate “On the approval of Nuclear safety requirements BSR-1.5.1-2015 ‘Decommissioning of Nuclear Facilities’”, available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/1f7dcee01fae11e9875cdc20105dd260.

21. Order No. 22.3-17 (23 Jan. 2019) of the Head of State Nuclear Power Safety Inspectorate on the amendment of Order No. 22.3-99 (7 Oct. 2011) of the Head of State Nuclear Power Safety Inspectorate “On the Approval of Nuclear Safety Requirements BSR-1.8.2-2015 ‘Categories of Modifications of Nuclear Facility and Procedure of Performing the Modifications’”, available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/803f3fb01f0f11e9875cdc20105dd260.

The main principles of the prepared new Act are focused on:

- the follow-up in transposition works and implementation of obligations stemming from international agreements and developments in the field;
- ensuring the compatibility and linkage with other acts (e.g. Cyber-Security Act, e-Government Act, Act Against Bureaucracy, Act on Civil Service);
- the alignment with IAEA and Western European Nuclear Regulators Association (WENRA) standards and definitions and the outcomes from the IRRS mission held in 2015;
- the adjustment of NRA SR competencies and reflection on activities in relation to experiences gained from the practical application of the Atomic Act;
- the relationship with the environmental impact assessment (EIA) process governed by the separate act; and
- the review of definitions.

Bilateral meetings with Polish and Czech regulatory authorities

There are no major developments in the international contractual base of the NRA SR in the respective period. Two bilateral activities were undertaken by the NRA SR resulting from ongoing bilateral relations. The first was a bilateral meeting between the Slovak and the Polish regulatory authorities held in Mojmirovce, Slovak Republic from 24 to 25 October 2018. The meeting was organised by the NRA SR and led by its Chairwoman, Ms Marta Žiaková. The Polish delegation was led by the Vice-President of the Polish National Atomic Energy Agency, Ms Ewa Paluch. The participants exchanged information on the current development of activities undertaken by their institutions, about the state of play of the nuclear programmes and the developments in the legal regulation of nuclear energy in their countries, as well as on the international activities of partner organisations, with the focus on the EU and the Visegrad Group (V4) area (the Czech Republic, Hungary, Poland and the Slovak Republic). The next meeting will be held in Poland in 2019.

A bilateral meeting between the Slovak and the Czech regulatory authorities was held in Prague, Czech Republic from 4 to 5 March 2019. The Czech Delegation was led by the Chairwoman of the State Office for Nuclear Security, Ms Dana Drabova, and the Slovak Delegation was led by the Chairwoman of the NRA SR, Ms Marta Žiaková. Participants exchanged their information on current developments, activities undertaken by both authorities, emerging issues and legislation in the field of nuclear energy as well as on their international activities. The next meeting will be held in the Slovak Republic in 2020.

Nuclear safety and radiological protection (including nuclear emergency planning)

Decree on the regular, comprehensive and systematic evaluation of the nuclear safety of nuclear equipment

Decree 71/2019 Coll. amending and supplementing Decree No. 33/2012 Coll. on the regular, comprehensive and systematic evaluation of the nuclear safety of nuclear equipment was published in the Collection of Laws of the Slovak Republic and it entered into force on 15 March 2019. A draft of this Decree was the subject of an approval procedure on 12 November 2018 by the Standing Working Commission on technical legal provisions of the Legislative Council of the Government of the Slovak Republic. Subsequently, this draft was forwarded to a commenting phase according

to Directive 2015/1535²² and made available within the Technical Regulation Information System (TRIS) database until 15 February 2019. After the finalisation of the notification procedure the decree was submitted for publication.

Spain

Nuclear safety and radiological protection (including nuclear emergency planning)

*Royal Decree 1400/2018, of 23 November, approving the Regulation on Nuclear Safety in Nuclear Facilities*²³

Royal Decree 1400/2018, of 23 November, approving the Regulation on Nuclear Safety in Nuclear Facilities²⁴ has incorporated into Spanish legislation the provisions of the 2014 Amended Safety Directive.²⁵ According to Article 4.1.b of this directive, member states shall establish and maintain a national legislative, regulatory and organisational framework for the nuclear safety of nuclear facilities, contemplated in the national nuclear safety requirements that cover all the phases of the life cycle of nuclear installations.

In Spain, the Nuclear Energy Act or Law 25/1964, of 29 April, constitutes the legal framework establishing the basic principles and requirements for the nuclear safety of these facilities, while Law 15/1980, of 22 April, creating the Nuclear Safety Council (CSN), establishes this body as the only competent authority in this area in Spain. The CSN has been developing and regulating the nuclear safety of nuclear facilities through different binding Instructions. The existence of this legal framework, along with the regulatory framework constituted by the Regulation on Nuclear and Radioactive Facilities, approved by Royal Decree 1836/1999, of 3 December, ensured that, at the time, the transposition of 2009 Safety Directive,²⁶ which is now amended in significant aspects by the 2014 Amended Safety Directive, was not necessary.

Although the Spanish regulatory framework, to a large extent, already includes the different requirements of the 2014 Amended Safety Directive, there was no specific regulatory standard on nuclear safety. There has been, however, regulation in the form of Royal Decrees in other areas of the sector, such as:

- radiological protection (by means of the Regulation on the Protection of Health against Ionising Radiation, approved by Royal Decree 783/2001, of 6 July);
- management of radioactive waste (Royal Decree 102/2014, of 21 February, on the Safe Management of Spent Fuel and Radioactive Waste);
- physical protection (approved by Royal Decree 1308/2011, of 26 September, on the Physical Protection of Nuclear Facilities and Materials and Radioactive

22. Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services (codification), OJ L 241 (17 Sept. 2015).

23. An unofficial translation of the Royal Decree can be found online at: www.csn.es/documents/10182/1369702/Royal%20Decree%201400-2018,%20of%20the%2023rd%20of%20November,%20approving%20the%20Regulation%20on%20Nuclear%20safety%20in%20nuclear%20facilities.

24. *Official State Gazette* of 24 November 2018, No. 284, Sec. I, p. 114601.

25. Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations, OJ L 219 (25 July 2014) (2014 Amended Safety Directive).

26. Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations, OJ L 172 (2 July 2009) (2009 Safety Directive).

Sources) and the licensing processes of said facilities (the aforementioned Royal Decree 1836/1999, of 3 December).

Moreover, some aspects of the 2014 Amended Safety Directive not provided for in the Spanish regulatory framework have been identified. It was determined that these were necessary to transpose, incorporating these aspects as well as several other procedures other than the CSN Instructions, and thus obtaining a unified text with the range of a Royal Decree.

Royal Decree 1400/2018 establishes the basic requirements of nuclear safety applicable to nuclear facilities throughout their life cycle, in order to:

- prevent accidents and, should an accident occur, mitigate its consequences;
- avoid, either by physical impossibility or by being extremely unlikely with a high degree of confidence:
 - early radioactive releases requiring off-site emergency measures without sufficient time for their implementation; and
 - large radioactive releases requiring protective measures for the population that cannot be limited in time or area.

The Regulation is applicable to existing or planned nuclear installations in Spain within the scope of the Directive, which includes nuclear power plants and their individualised storage facilities (ISFs), the centralised storage facility (CSF) and the Juzbado Fuel Element Factory. The facilities for the disposal of spent fuel or radioactive waste are excluded from its scope of application.

Royal Decree 1400/2018 establishes in Article 5 the prime and non-delegable responsibility of the licence holder for the nuclear safety of its installation. It also includes in Article 6 a safety objective that states, *inter alia*, that the location, design, construction, commissioning, operation and dismantling of these facilities must aim to prevent accidents and, in the event that they occur, mitigate their consequences. In order to ensure the achievement of this safety objective, the licence holders are required to apply the so-called “defence-in-depth principle”, incorporating multiple levels of protection to face a possible failure (Articles 11 and 16). Likewise, the licence holder is obliged to perform an evaluation of the installation (location, design and operation) to determine that an adequate level of nuclear safety has been achieved and that the installation complies with the safety objective (Article 12).

Furthermore, the licence holder, under the supervision of the CSN, must carry out a periodic safety review (PSR) to re-evaluate, systematically and periodically, at least once every ten years, the nuclear safety of the facility, in order to obtain an overall assessment of its behaviour, through the systematic analysis of all aspects of nuclear safety and radiological protection (Article 13). As a result of the PSR, the licence holder must introduce nuclear safety improvements in the facility.

Other aspects addressed by the regulation are the establishment of a management system aimed at nuclear safety, reinforcement of safety culture, reinforcement of the necessary structures and means for on-site emergency management and co-ordination for external management, availability of adequate financial and human resources, qualification of staff and subcontracted personnel, training, and an emphasis on early notification of events and transparency (Article 7 et al.).

Switzerland

Nuclear safety and radiological protection (including nuclear emergency planning)

Several amendments to the Nuclear Energy Ordinance (NEO) and other ordinances entered into force on 1 February 2019. Since the regulations on accident analyses in these ordinances lacked precision, the Swiss Federal Council has set out the wording unambiguously. It is now in line with the intention of the Federal Council in the original legislation, the practice applied by the Swiss Federal Nuclear Safety Inspectorate (ENSI) for many years and international requirements. Only the wording has been specified; effectively, there are no changes to current practice with regard to accident analyses. In addition to these clarifications, the Federal Council also issued new regulations for the decay storage of low-level radioactive waste from the decommissioning of nuclear power plants. The various amendments are presented in detail below.

Nuclear Energy Ordinance

Article 2 of the NEO has been amended by adding a Section 1bis that states that facilities that are located outside of nuclear facilities, and which are used for decay storage (in French “*stockage pour décroissance*” and in German: “*Abklinglagerung*”) in the meaning of Article 117 of the Radiological Protection Ordinance, are not considered as nuclear facilities. Facilities for decay storage serve for the disposal of low-level radioactive waste, which gets radiological free release or can be recycled at the latest after 30 years.

The amendments to Articles 8 and 44 of the NEO note that accident analysis is regulated in both the legislation on Nuclear Energy as well as in the legislation on Radiological Protection, but that the two pieces of legislation are compatible. The aim of the amendments was to clarify whether for an incident such as an earthquake that takes place, statistically speaking, every 10 000 years (frequency of 10^{-4} per year), the dose limit for radioactive impact on humans of 1 or of 100 millisievert (msv) is applicable. The wording of NEO, Article 8 on deterministic accident analysis and of NEO, Article 44 about the provisional taking-out-of-service of nuclear power plants as well as the wording of two ordinances of the Département fédéral de l’environnement, des transports, de l’énergie et de la communication [Federal Department of the Environment, Transport, Energy and Communications] (DETEC) have been specified in the way to unmistakably reproduce the meaning that the Swiss Federal Council had intended from the beginning, on which ENSI based its practice and that is in line with international standards.

The new rules for proof that the plant design can overcome failures ask for a differentiation between incidents caused by natural events and other incidents. Following the new wording of Article 8, Section 4 on the design of a nuclear facility states that failures originating within the plant (Section 2) and failures not caused by natural events originating outside the plant (Section 3) have to be ordered by frequency according to Article 123(2) of the Radiological Protection Ordinance. It has to be proved that in the case of a failure, the dose limits of Article 123(2) of the Radiological Protection Ordinance are observed.

The new Section 4bis of Article 4 prescribes that for the design of a nuclear facility two kinds of failures caused by natural events have to be taken into account: a natural event with an expected frequency of 10^{-3} per year and a natural event with an expected frequency of 10^{-4} per year. The basis for the design are thus two separate, single frequencies that are prescribed exactly by the Ordinance. For failures with the expected frequency of 1 every 1 000 years (10^{-3} per year), the dose resulting from a single such event for members of the public must not be greater than 1 mSv and for failures with the expected frequency of 1 every 10 000 years (10^{-4} per year) not greater than 100 mSv.

Article 8(5) has new wording as well, which states that the licence holder must prove by probabilistic analysis that there is sufficient protection in the case of an incident beyond design basis. The additional technical, organisational and administrative measures in the sense of Article 7(d) can be taken into account.

Article 44 regulates the criteria for provisional taking out of service and the backfitting of nuclear reactors. In addition to some changes in the text without material importance, Article 44(1)(a) has been amended with the provision that the holder of the operating licence must provisionally take a nuclear reactor out of service and backfit it when accident analyses show that core cooling in the event of a failure within the design basis can no longer be ensured and as a consequence the resulting dose exceeds 100 mSv. Following the new wording of Section 2 for failures not caused by natural events, an expected frequency of more than 10^{-6} per year and for failures caused by natural events an expected frequency of 10^{-4} per year have to be applied.

Article 51a now expressly regulates what kind of radioactive waste is not subject to the disposal obligation in Article 31 of the Nuclear Energy Act but remains nevertheless subject to the scope of the Nuclear Energy Act. This is the case of nuclear waste that is discharged to the environment (Article 111 to 116 of the Radiological Protection Ordinance) or that is treated in decay storage (Article 117 of the Radiological Protection Ordinance).

Article 55 fixes the responsibility for authorisations and consents for the handling of radioactive waste, which in principle belongs to the Swiss Federal Office of Energy (SFOE). The new Section 2 reserves ENSI's responsibility of following the also new Article 11(2)(f) of the Radiological Protection Ordinance. ENSI thereby becomes the granting authority for all activities related to the decay storage (see *infra* the commentary on the amendments of the Radiological Protection Ordinance).

Ordinance of the DETEC on the Methodology and Boundary Conditions for the Evaluation of the Criteria for the Provisional Taking-out-of-Service of Nuclear Power Plants (TooSO)

In the context of the amendments to the NEO, the TooSO was revised and restructured. With regard to substantive changes, the applicability of the TooSO has been expanded under the revision of Article 1. Before the change, the TooSO was applicable only for taking out of service due to design errors or ageing-related deviations from the safety-related technical design.

Ordinance of the DETEC on Hazard Assumptions and Evaluation of Protection Measures against Accidents in Nuclear Installations (HaO)

In the context of the amendments to the NEO, the HaO also has been amended. The aim of the changes of the HaO have essentially been to take over the amendments of NEO, Article 8.

Radiological Protection Ordinance (RPO)

In the context of the amendments to the NEO, there have also been amendments to the RPO. The new Article 9(j) states that the decay storage of nuclear waste from nuclear facilities that are located outside of nuclear facilities requires a radiation protection licence. The new Article 11(2)(f) states that ENSI becomes the granting authority for the radiation protection licence for the decay storage of radioactive waste of nuclear facilities and all activities related to it. In consequence, ENSI is the granting authority for licences based on both the nuclear energy legislation and radiological protection legislation for decay storage and to all activities related to it. It grants the approval for the transport of nuclear waste from the nuclear plant to the decay storage facility and the licence for the operation of the decay storage facility, and it confirms the clearance measurement.

As in the general rule, ENSI's responsibility over the nuclear power plant includes not only the control with regard to the nuclear energy legislation but also with regard to the radiological protection legislation (see Article 184(3)). In the field of decay storage, ENSI only grants separate radiological protection licences for the transport of nuclear waste from the nuclear power plant to the decay storage facility. The new Article 117(5) appoints ENSI to define the technical requirements for decay storage facilities and the activities related to the decay storage. The new Article 184(3)(d) states that ENSI is the supervisory authority for the decay storage of nuclear waste and for all activities related to it.

*Comprehensive revision of the Ordinance on Protection of the Population in the Vicinity of Nuclear Installations in the Case of an Emergency (Emergency Preparedness Ordinance – OPU)*²⁷

The Ordinance on Protection of the Population in the Vicinity of Nuclear Installations in the Case of an Emergency (Emergency Preparedness Ordinance – OPU) came into force on 1 January 2019. It regulates the provisions for emergency preparedness in the event of accidents occurring at Swiss nuclear power plants during which the release of large quantities of radioactive materials cannot be ruled out.

On 4 May 2011, in the wake of the nuclear disaster at the Fukushima Daiichi nuclear power plant, the Federal Council created the IDA NOMEX interdepartmental working group. The working group was convened to review whether the existing legislative and organisational measures in the area of emergency preparedness measures needed adapting, and if so how, especially with regard to emergency preparedness for the areas surrounding nuclear installations. The main points of the revision are:

- **Strengthening of planning assumptions:** the reference scenarios describe potential events and their consequences. Concerning emergency preparedness, the reference scenarios are used to set out strict rules on the preparation and strengthening of measures enabling the optimal management of an incident. Henceforth, the reference scenario based on a failure resulting in significant core damage, containment building failure, and the unfiltered release of a non-negligible amount of radioactive materials is applied (this is reference scenario A4). This scenario corresponds to a Level 7 event on the International Nuclear and Radiological Event Scale (INES), which is the highest classification on the international scale of safety significance developed by the IAEA. During a Level 7 event, emergency preparedness measures may be required in regions situated well outside emergency protection zone 2 (radius of 20 km around the installation). Accordingly, measures would be necessary in the rest of Switzerland (zone 3 until now) and more actors should be involved in emergency preparedness measures.

The comprehensive revision of the OPU specifies and, where necessary, supplements the obligations for cantons, some of which are located within protection zones 1 (radius of 3 to 5 km around the installation) and 2, thereby meeting the increasingly demanding requirements that are applicable within

27. For more information on the revision of the Emergency Preparedness Ordinance, see DETEC/OFEN (2017), *Révision complète de l'ordonnance sur la protection d'urgence (OPU) Rapport explicatif* [Comprehensive Revision of the Emergency Preparedness Ordinance: Explanatory Report], available at: www.admin.ch/ch/f/gg/pc/documents/2867/OPU_Rapport-expl_fr.pdf. See also, Département fédéral de la défense, de la protection de la population et des sports (DDPS), Office fédéral de la protection de la population OFPP (2015), *Concept de protection d'urgence en cas d'accident dans une centrale nucléaire en Suisse* [Emergency preparedness concept in the event of an accident at a nuclear power plant in Switzerland], available at: www.newsd.admin.ch/newsd/message/attachments/40199.pdf.

the framework of existing organisations. As a result, cantons, regions and communes are given duties within the rest of Switzerland.

- **Regulations governing evacuation:** the comprehensive revision of the OPU attaches greater weight to large-scale evacuation. The cantons containing some communes within protection zones 1 and 2, as well as the cantons in the rest of Switzerland, need to be involved. In particular, the latter have to guarantee the evacuation of the population exposed to danger along with the provision of accommodation and assistance to evacuees.
- **Changes in terminology:** the current “zones” have been renamed “emergency preparedness zones”. “Zone 3” (the rest of Switzerland) no longer exists under this nomenclature. Moreover, the term “planning zones” has been introduced. In the event of an incident, specific preparedness measures are ordered for these zones.

Radioactive waste management

Sectoral Plan for Deep Geological Repositories, third stage

- **General**

The search for suitable repository sites is regulated in the Sectoral Plan for Deep Geological Repositories.²⁸ The search is carried out in three stages in which the selection of geological siting areas is gradually narrowed down. At the end of each stage, the Federal Council decides on the next steps in the process. The SFOE bears the overall responsibility for the procedure, in which the protection of people and the environment is the top priority. The regional participation established within the sectoral plan enables the participation of the cantons, communes and neighbouring states (Germany) at an early stage in the process.

- **Stage 2**

In Stage 2, the task of the National Cooperative for the Disposal of Radioactive Waste (Nagra) was to propose at least two geological siting areas per type of repository (for high-level radioactive waste (HLW) and low- and intermediate-level radioactive waste (L/ILW)). Nagra proposed Jura Ost and Zürich Nordost as geological siting areas in which one repository for each category or a single repository for both categories would be feasible. Following its detailed study, the Swiss Federal Nuclear Safety Inspectorate came to the conclusion that, in addition to the two proposed geological siting areas, Nördlich Lägern should also be examined more closely. This view was also shared by the Federal Nuclear Safety Commission. Following a public consultation, Stage 2 was concluded on the basis of the decision by the Federal Council (end of 2018). In Stage 2, in addition to narrowing down the selection, Nagra is working closely together with the proposed siting regions in order to identify and designate potential sites for placement of the surface facilities.²⁹

- **Stage 3**

Stage 3 is the last stage in the Sectoral Plan for Deep Geological Repositories. During this stage, the remaining sites will be studied in detail and compared to each other. Nagra will use this as a basis on which to submit general licence applications for the construction of the deep geological repositories, most likely at the end of 2024. After a

28. For more information on the Sectoral Plan for Deep Geological Repositories see SFOE (n.d), “Deep Geological Repository’ sectoral plan (SDGR)”, www.uvek-gis.admin.ch/BFE/storymaps/EA_SachplanGeologischeTiefenlager/?lang=en (accessed 12 Apr. 2019).

29. For more information on the Stage 2 process, see NEA (2018), “Sectoral plan for deep geological repositories and Stage 2 consultation”, NLB, No. 100, OECD, Paris, pp. 102-103.

review by the relevant Federal authorities and upon completion of a consultation procedure, the Federal Council will be able to award the appropriate general licences and designate the siting location for the deep geological repositories. It will submit the rulings on the general licences to Parliament for approval. The decision on the approval of the general licences, which is expected in around 2030, is subject to a referendum.

After the award of the general licence, substructure geological analyses will be performed in the siting locations (construction of a rock laboratory). These investigations will provide important information for the construction of the repository. The next step is to apply for a construction licence and then an operating licence. Based on the current plan, the commissioning of a repository for L/ILW could take place as of 2050 and a repository for HLW as of 2060.

It is customary in the course of infrastructure projects such as deep geological repositories to involve all the relevant parties. This principle also applies to the aforementioned sectoral plan. Accordingly, regional conferences (RC) were put in place in Stage 2. Organised in associations, they will continue to represent the interests of the different siting regions in Stage 3 and draw up opinions, questions and requests. Their members represent the interests of the communes, planning associations, organisations and the population. In particular, the RCs will pay close attention to the realisation of the surface infrastructures and address issues related to regional development and security. Regional participation takes place with the support and under the aegis of the SFOE. The siting cantons are also involved, as are the other federal authorities such as ENSI and Nagra.

- Geological investigations

Geological investigations aim to further knowledge of the substructure in potential locations for a deep geological repository. The Nuclear Energy Act states that a licence is required from DETEC to carry out such investigations. Such boreholes provide more accurate information on the rock strata in the area of the potential repository, so that a profile of the geological situation can be drawn up with regard to all types of repository possible at the location (L/ILW, HLW and combined repositories). Quaternary boreholes also require a licence. These bore down to a lesser depth than exploratory boreholes and are used to obtain field data on matters relating to long-term geological evolution.

The SFOE is responsible for the licensing procedure in conjunction with the federal agencies and cantons concerned. A licensing procedure is conducted for each bore site. The application to bore is published at the beginning of each procedure and can be downloaded from this website. Persons affected by boreholes may appeal to the SFOE against the planned measures.³⁰

Nagra submitted 23 applications for boreholes in the potential siting areas with the SFOE: 8 for Jura Ost, 8 for Zürich Nordost and 7 for Nördlich Lägern. Public consultations were launched for all of the applications. They resulted in 472 objections for Jura Ost, 99 for Zürich Nordost and 132 for Nördlich Lägern.

30. For more information related to the licensing of the bore sites, see SFOE (2018), "Global investigations", www.bfe.admin.ch/bfe/en/home/supply/nuclear-energy/radioactive-waste/geological-investigations.html (accessed 12 Apr. 2019).

United States

General legislation, regulations and instruments

Nuclear Energy Innovation and Modernization Act

On 14 January 2019, the President signed into law the Nuclear Energy Innovation and Modernization Act (NEIMA),³¹ a statute that affects the US Nuclear Regulatory Commission (NRC) in a variety of ways. One of the most prominent sections of the new law requires the NRC to enhance its licensing process for commercial advanced nuclear reactors.³² First, working within the scope of the NRC's existing regulations, the NRC must provide for staged licensing and develop risk-informed, performance-based licensing evaluation techniques for commercial advanced nuclear reactors. Second, the NRC must undertake a rulemaking, to be completed by the end of 2027, to establish a technology neutral regulatory framework for optional use by commercial advanced nuclear reactor applicants.

The law also addresses research and test reactor licensing. Specifically, it requires the NRC to develop strategies and guidance for predictable, efficient and timely licensing reviews for research and test reactors and to apply a new cost recovery-percentage standard to distinguish between commercial facilities and non-commercial facilities.³³ Under the new cost-recovery standard, the NRC could issue a non-commercial licence for a reactor useful for research and development that also engages in commercial activities so long as the licensee recovers no more than 75% of its annual owning and operating costs through its commercial activities, with no more than 50% coming through sales of energy.³⁴

In addition, the law will require the NRC to adjust its approach to determining the fees it charges for its regulatory work. Although the NRC is not directly funded through fees – like most agencies in the US Government, the NRC receives appropriations each year from the US Treasury pursuant to appropriations laws enacted by the US Congress – the NRC has been required by law to charge fees to its licensees, applicants and others to whom it provides services, with those fees then being used to reimburse the US Treasury for a substantial portion of the NRC's budget.³⁵ The new law continues this basic approach, with certain adjustments, most of which will take effect in October 2020.³⁶

The law also addresses certain other budgetary and administrative matters involving the NRC, including requiring the NRC to develop performance metrics and milestone schedules for NRC activities being undertaken at the request of licensees or applicants and reporting certain delays to the NRC's Commission and to the US Congress, and requiring the NRC to train its staff and hire experts, as necessary, to support the licensing process improvement initiatives discussed above.³⁷ Finally, the law requires the NRC to develop and submit to the US Congress a number of reports on a variety of topics, including: 1) the commercial advanced nuclear reactor and research and test reactor licensing process improvement initiatives required by the law; 2) baffle-former bolt guidance; 3) evacuations in the event of emergencies;

31. Pub. L. No. 115-439, 132 Stat. __ (2019).

32. See *ibid.*, Sec. 103.

33. *Ibid.*, Sec. 103(a)(3), 106.

34. *Ibid.*, Sec. 106(b)(2) (amending the Atomic Energy Act of 1954, Sec. 104c. (42 USC 2134(c))).

35. See Omnibus Budget Reconciliation Act of 1990, Sec. 6101 (42 United States Code (USC) 2214).

36. Pub. L. No. 115-439, Sec. 102(b), 132 Stat. __ (2019); see also *ibid.*, Sec. 202 (requiring the NRC to complete a voluntary pilot initiative related to uranium recovery licensing fees).

37. *Ibid.*, Sec. 102(c).

4) accident tolerant fuel; 5) best practices for local community advisory boards associated with nuclear power reactor decommissioning; 6) the NRC's response to a study on reprisal and chilling effect at the NRC; and 7) improving the efficiency and transparency of, and examining a potential new fee approach for, uranium recovery licensing reviews.³⁸

Nuclear Energy Innovation Capabilities Act of 2017

On 28 September 2018, the President signed into law the Nuclear Energy Innovation Capabilities Act of 2017.³⁹ The law is directed primarily at the US Department of Energy (DOE), which has responsibility within the US Government for, among other things, promotion of commercial nuclear technologies, but the law does include certain provisions that address the NRC. One such provision requires the NRC to enter into a memorandum of understanding with the DOE that would address interactions between the two agencies regarding technical expertise, modelling and facilities related to advanced reactors.⁴⁰ The law also authorises the DOE and the NRC to enter into a memorandum of understanding relating to the National Reactor Innovation Center – a DOE programme authorised by the law for enabling the testing and demonstration of reactor concepts that would be proposed and funded, at least in part, by the private sector – to facilitate sharing of technical expertise and knowledge between the two agencies through a variety of means.⁴¹ The law additionally confirms that the NRC would remain responsible for licensing DOE reactors for commercial demonstration purposes as specified in pre-existing law (specifically, Section 202 of the Energy Reorganization Act of 1974 (42 USC 5842)).⁴²

As to the law's provisions directed more exclusively towards the DOE, they include, among other things, a requirement that the DOE assess the mission need for, as well as plan for and construct, a versatile reactor-based fast neutron source, with a goal of commencing operations by the end of 2025, and a requirement that the DOE execute a programme that would use high-performance computation modelling and simulation techniques to enhance US capabilities for developing new reactor technologies.⁴³

Radioactive waste management

Consolidated Interim Storage Facility applications pending before the NRC

The NRC is currently reviewing two applications to construct and operate a Consolidated Interim Storage Facility (CISF). The applicants, Interim Storage Partners/Waste Control Specialists (ISP) and Holtec International Inc. (Holtec), are requesting to store spent nuclear fuel in Andrews County, in the state of Texas, and Lea County, in the state of New Mexico, respectively.⁴⁴ The requested 10 *Code of Federal Regulations* Part 72 licences would authorise possession and storage of spent nuclear fuel for 40 years.

Several organisations have filed intervention petitions and requests for hearing on these applications, raising a variety of environmental, safety and legal contentions.

38. *Ibid.*, Sec. 103(b)-(e), 104-105, 107-109, 201-202.

39. Pub. L. No. 115-248, 132 Stat. __ (2018).

40. *Ibid.*, Sec. 2(h).

41. *Ibid.*

42. *Ibid.*

43. *Ibid.*, Sec. 2(e)(2), 2(g).

44. More information on the applications is available at NRC (2018), "Interim Storage Partners", www.nrc.gov/waste/spent-fuel-storage/cis/waste-control-specialist.html (accessed 3 Apr. 2019) and NRC (2018), "Holtec International – HI-STORE CISF", www.nrc.gov/waste/spent-fuel-storage/cis/holtec-international.html (accessed 3 Apr. 2019).

An Atomic Safety and Licensing Board (ASLB) has been established for each proceeding. Oral argument on standing and contention admissibility in the Holtec proceeding was held on 23-24 January 2019.⁴⁵

45. More information on the proceedings is available on the NRC's Electronic Hearing Docket at: <https://adams.nrc.gov/ehd/>.

Intergovernmental organisation activity

European Atomic Energy Community

Institutional issues and regulatory proposals

Communication on a more efficient and democratic decision-making in EU energy and climate policy¹

On 9 April 2019, the European Commission adopted a Communication to the European Parliament, the European Council and the Council of the European Union (EU) on “A more efficient and democratic decision-making in EU energy and climate policy”. The Communication acknowledges that nuclear power is a reality in today’s European energy mix and that half of the EU member states use nuclear energy for their power generation, representing 27% of the EU’s electricity generation. Moreover, it recognises that the Euratom Treaty² provides the most advanced legal framework in the world in the areas of nuclear safety, waste management or radiological protection. The Communication further states that there is, however, a recognised concern that the Euratom Treaty needs to evolve in line with a more united, stronger and democratic EU.

In this context, a central aspect is the democratic accountability of Euratom and in particular the involvement of the European Parliament and national parliaments. While the Treaty of Lisbon³ extended the ordinary legislative procedure to nearly all policy areas where the European Parliament previously only had a consultative role, under most provisions of the Treaty regarding the adoption of legal acts the European Parliament is only consulted. Therefore, it may be useful to explore how to enhance the role of the European Parliament to improve the democratic legitimacy of decision-making under Euratom.

An additional area where the Euratom Treaty does not reflect improvements in terms of transparency and democratisation achieved in the successive reforms of the EU Treaties is with regard to the role of national parliaments, whereby it may be useful to explore whether their role can be reinforced further.

The Commission should also take initiatives to increase the involvement of civil society in nuclear policy making and raise EU-wide interest in relevant fora. On some nuclear matters, the availability of information can be understandably limited, especially in the field of nuclear security. While this is a legitimate concern, issues such as nuclear safety, the management of radioactive waste and emergency planning deserve to continue to be debated as openly as possible in line with existing rules.

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1. Communication to the European Parliament, the European Council and the Council of the EU on “A more efficient and democratic decision making in EU energy and climate policy”, COM(2019) 177 final, 9 Apr. 2019, available at: <http://ec.europa.eu/transparency/regdoc/rep/1/2019/EN/COM-2019-177-F1-EN-MAIN-PART-1.PDF>.
 2. Treaty Establishing the European Atomic Energy Community (1957), 298 UNTS 167, entered into force 1 Jan. 1958 (Euratom Treaty) (consolidated version *Official Journal of the European Union* (OJ) C 203 (7 June 2016)).
 3. Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon, 13 December 2007, OJ C 306 (17 Dec. 2007), entered into force 1 Dec. 2009.

These issues are central to citizens' concerns. The first step is rigorous implementation of recently agreed legislation. In the area of responsible and safe management of spent fuel and radioactive waste, it is of utmost importance that member states continue to develop comprehensive plans for the management of nuclear waste and implement these plans. When cross-border impact is at stake, cross-border consultations between member states should be promoted, as well as stronger involvement of the European Nuclear Safety Regulators Group (ENSREG). The collective ability of the EU and member states to respond to nuclear accidents should be reinforced, in particular to clarify financial responsibility and ensure adequate financing in this respect.

The Communication notes that a change of the Euratom Treaty to extend the use of the ordinary legislative procedure needs to be part of a broader process of treaty reform using the ordinary treaty revision procedure under Article 48 Treaty on European Union⁴ and may be seen in the longer-term, post-2025 perspective. However, the Communication further states that in the months to come the European Commission will establish a high-level group of experts whose task will be to assess and report to the Commission on the state of play of the Euratom Treaty with a view to considering how, on the basis of the current Treaty, its democratic accountability could be improved.

Published studies

*Study for the European Parliament PETI Committee: "Cross-border nuclear safety, liability and cooperation in the European Union"*⁵

The study issued the following set of recommendations:

1. Consideration could be given to creating an independent EU agency with specific powers to regulate in the nuclear sector.
2. More precise EU rules should be designed concerning the siting, construction and operation of nuclear power plants. These should go beyond the currently applicable standards and be legally binding.
3. The EU should acquire powers to directly inspect and monitor compliance with nuclear safety rules by the nuclear power plants within each member state.
4. Specific rules concerning the risk-based inspections should be worked out, mandating how and when safety inspections at nuclear facilities should take place.
5. To the extent that no other interests are harmed by this (to be assessed by the independent EU agency) nuclear safety inspection reports should be made available to the public.
6. The EU should undertake a harmonisation initiative regarding nuclear liability and insurance for nuclear accidents, while providing for unlimited liability; a limitation of the duty to seek financial cover for an insurable amount; an additional state guarantee as a reinsurer of last resort.

4. Treaty on European Union, OJ C 191 (29 July 1992), entered into force 1 Nov. 1993 (consolidated version OJ C 202/13 (7 June 2016)).

5. Faur, M.G. and K. Kindju (2019), *Study for the PETI committee: Cross-border nuclear safety, liability and cooperation in the European Union*, European Union, Brussels, available at: [www.europarl.europa.eu/RegData/etudes/STUD/2019/608860/IPOL_STU\(2019\)608860_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2019/608860/IPOL_STU(2019)608860_EN.pdf).

7. The EU nuclear liability harmonisation initiative should either be autonomous or consist in the promotion of a fundamental revision of the international legal framework.
8. Further EU legally binding rules should be adopted concerning the siting, construction and operation of nuclear power plants at the EU level.
9. Judicial co-operation in civil matters with respect to nuclear liability should also be harmonised.
10. Measures should be taken to work out scenarios under which compensation to victims of a nuclear accident will be provided, whereby adequate compensation should be provided via a fast and low-cost procedure.

*European Study on Medical, Industrial and Research Applications of Nuclear and Radiation Technology*⁶

On 11 February 2019, the Euratom Commission's Directorate-General for Energy published a *European Study on Medical, Industrial and Research Applications of Nuclear and Radiation Technology*. According to the study, since their discovery over a century ago, ionising radiation (IR) technologies have become key tools to explore matter and biological building blocks. One of the most important discoveries of the 20th century, namely the structure of DNA, was the result of analysing its X-ray diffraction pattern. Over the years, health has become one of the most important non-energy applications to use IR, including imaging and therapy. IR is also used in many industrial domains, ranging from sterilisation and disinfection to security-control systems, and from non-destructive testing to environmental applications. Nanotechnologies, nanoelectronics, photonics, advanced materials, biotechnologies and advanced manufacturing also use IR tools. Not only do these technologies generate high revenues by themselves, they also generate highly skilled innovation-oriented jobs, confer added value to products and services in which they are embedded and prompt other technological developments. Europe hosts a substantial infrastructure of facilities dedicated to fundamental or applied IR research, a broad network of advanced universities and research centres, as well as world-class industrial corporations and innovative SMEs competing at the global level. Such assets should be sustained and developed, alongside its most promising applications, while ensuring the highest level of safety and radiological protection. This study provides up-to-date information on the non-power applications of nuclear and radiation technology in the EU with the view of identifying their key societal benefits and development perspectives. The study proposes a series of actions in this area aimed at contributing to European citizens' health and to the European economy, competitiveness, jobs and growth.

6. NucAdvisor/Technopolis Group (2018), *European Study on Medical, Industrial and Research Applications of Nuclear and Radiation Technology*, Final Report – EC-01-08-D-30/07/2018, available at: https://publications.europa.eu/en/publication-detail/-/publication/6ae3e9cd-2e7a-11e9-8d04-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=null&WT.ria_f=3608&WT.ria_ev=search.

International Atomic Energy Agency

Nuclear safety

Organizational Meeting for the Eighth Review Meeting of Contracting Parties to the Convention on Nuclear Safety

The Agency hosted the “Organizational Meeting for the Eighth Review Meeting of Contracting Parties to the Convention on Nuclear Safety”⁷ at the IAEA’s Headquarters in Vienna on 17 October 2018. At the meeting, a number of preparatory decisions related to the conduct of the upcoming review meeting were taken and agreed upon by consensus.

Contracting parties in particular, elected the officers for the Eighth Review Meeting, to be held from 23 March to 3 April 2020, and decided on the establishment and composition of seven country groups. The meeting, following up on the decision of the Seventh Review Meeting to continue to hold topical sessions during future review meetings, decided to recommend “ageing management” and “safety culture” for consideration as topics for these sessions. Contracting parties further agreed to invite the OECD Nuclear Energy Agency (NEA) and the World Association of Nuclear Operators (WANO) to attend as observers, the opening and final plenary sessions of the Eighth Review Meeting.

Officers’ Turnover Meeting

The Officers’ Turnover Meeting was held in Vienna on 19 March 2019 where the officers of the CNS Seventh Review Meeting shared with the officers elected for the CNS Eighth Review Meeting their experience and feedback on the preparation and conduct of the previous review meetings. At the meeting, incoming and outgoing officers discussed the review meeting process in detail, including key documents, in order to ensure the transfer of knowledge on the CNS, its processes and the role of the officers.

Nuclear security

Convention on the Physical Protection of Nuclear Material and its Amendment

The fourth “Technical Meeting of the Representatives of States Parties to the Convention on the Physical Protection of Nuclear Material (CPPNM)⁸ and the CPPNM Amendment”⁹ was held in December 2018 at the IAEA’s Headquarters in Vienna and was attended by around 60 participants. The representatives discussed, *inter alia*, the role of the Points of Contacts designated under the CPPNM, as well as the communications pursuant to Article 14.1 of the CPPNM and its Amendment on the laws and regulations giving effect to these instruments.

An Informal Meeting of the Parties to the A/CPPNM was held on 10 and 11 December 2018 in Vienna. The purpose of the meeting was to discuss the preparations for the 2021 Conference of the Parties to the A/CPPNM to “review the implementation of the [amended] Convention and its adequacy as concerns the preamble, the whole of the operative part and the annexes in the light of the then prevailing situation”, as foreseen in Article 16.1 of the A/CPPNM. Around 50 parties to the A/CPPNM as well as some parties to the CPPNM attended the meeting. The

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7. Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, 1963 UNTS 293, entered into force 24 October 1996 (CNS).
 8. Convention on the Physical Protection of Nuclear Material, (1980), IAEA Doc. INFCIRC/274 Rev. 1, 1456 UNTS 125, entered into force 8 February 1987 (CPPNM).
 9. 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 (A/CPPNM).

participants also discussed and agreed on a “Provisional Roadmap Towards the 2021 Conference of the Parties to the Amendment to the CPPNM”.

The IAEA continued to promote universal adherence to the Amendment to the CPPNM, including through three regional workshops held for Southeast Asia, for French-speaking Africa and for Russian-speaking states.

International Conference on the Security of Radioactive Material

The Agency organised the “International Conference on the Security of Radioactive Material: The Way Forward for Prevention and Detection”, in Vienna in December 2018. The conference, attended by some 550 participants from over 100 member states and co-chaired by Italy and Senegal, featured 6 main panel sessions and 28 specialised technical sessions. Topics addressed included international co-operation, communication, sustainability of national nuclear security regimes, state experiences in prevention and detection, the roles and initiatives of international organisations, securing nuclear material during its full life cycle and the detection of radioactive material involved in criminal and unauthorised acts.

Nuclear liability

The Secretariat continued to assist member states, upon request, in their efforts to adhere to the relevant nuclear liability instruments.

Workshops on civil liability for nuclear damage

A Regional Workshop on Civil Liability for Nuclear Damage for European States hosted by the government of Romania was held in Bucharest, Romania, in April 2019 and was attended by 74 participants from 25 member states. The Secretariat also conducted a joint mission with the International Expert Group on Nuclear Liability (INLEX) to Sudan in November 2018.

International Expert Group on Nuclear Liability (INLEX)

At its 19th regular meeting held in Vienna, Austria, in May 2019, INLEX finalised its discussions on issues concerning transportable nuclear power plants (TNPPs) and reached conclusions on several other issues. As regards TNPPs, INLEX reiterated its conclusions from previous meetings that a TNPP in a fixed position (that is, in the case of a floating reactor, anchored to the seabed or the shore, and attached to the shore by power lines) would fall under the definition of “nuclear installation” and therefore be covered by the nuclear liability regime, and that, in case of transport of a factory-fuelled reactor, the TNPP would also be covered by the nuclear liability conventions just as any other transport of nuclear material. INLEX, however, noted that these conclusions could not apply in circumstances where the reactor was used for the propulsion of the vessel.

INLEX then discussed the issue of factory-fuelled reactors transported and deployed in a host state either not party to a nuclear liability convention or not party to the same convention as the sending state and where no unloading of fuel from the vessel occurs before the operation of the TNPP in the state of destination. It was noted in this respect that the language used in the nuclear liability conventions is ill-suited to cover this situation as, in fact, under the nuclear liability conventions, the sending operator is liable until the nuclear material has been unloaded from the means of transport by which it has arrived in the territory of a non-contracting state: if interpreted literally, this would entail that the sending operator would remain liable indefinitely, irrespective of whether the TNPP would thereafter be operated by another operator in the state of destination. INLEX therefore recommended that the Vienna Convention and the Convention on Supplementary Compensation for Nuclear Damage be interpreted to mean that in such a case the sending operator would cease to be liable when the TNPP is taken charge of by the authorised person in the state of destination.

INLEX added in this respect that, at some future point of time when the original sending operator took responsibility for the TNPP in order to return it to the sending state, that operator would again assume liability, and INLEX decided that the potential further complications that may arise if the TNPP were to be deployed in a third state prior to its return to the state of origin need not be discussed at this stage. With these additional conclusions, INLEX considered the issues concerning TNPPs as closed.

With respect to liability issues concerning cyber-attacks, INLEX concluded that, assuming the attack triggered a nuclear incident, there was no basis for treating a cyber-attack differently from other acts of terrorism. On this basis, INLEX reaffirmed that like other acts of terrorism, a cyber-attack would not exonerate the operator from nuclear liability, unless that cyber-attack amounted to “an act of armed conflict, hostilities, civil war or insurrection” and then only if the nuclear incident was “directly due” to such an act. It was noted in this context that the burden of proof would lie with the operator claiming such an exoneration before the competent court and that third-party liability insurance contracts generally do not contain an exoneration for cyber-attacks.

With respect to the issue of jurisdiction under the Joint Protocol, INLEX reaffirmed that in the case of a nuclear incident involving the transport of nuclear material between operators whose installations are situated in states party to different nuclear liability conventions but both party to the Joint Protocol, jurisdiction lies with the courts of the incident state (including, in the case of a party to the 1997 Vienna Convention or, in the future, to the Paris Convention as amended by the 2004 Protocol, where the incident occurs within the area of its exclusive economic zone).

Finally, INLEX discussed the differing amounts of compensation available under the various nuclear liability conventions and concluded that the higher liability amounts established by a state party to the 1997 Protocol to Amend the Vienna Convention is to be distributed without discrimination to victims in states party to the original 1963 Vienna Convention. INLEX also discussed issues that may arise if one or more states party to the Paris Convention and to the Brussels Supplementary Convention, as they will be revised by protocols adopted in 2004, decided to join the CSC, in particular as regards the definition of damage and the interaction between different supplementary compensation funds.

Legislative assistance

The Agency continued to provide legislative assistance to its member states to support the development of adequate national legal frameworks and to promote adherence to the relevant international legal instruments. Specific bilateral legislative assistance was provided to several member states through written comments and advice on drafting national nuclear legislation. Assistance in gaining more broadly a better understanding of the relevant international legal instruments was also provided to member states through awareness missions and workshops conducted in member states. In addition, the Agency continued to organise regional and training events in nuclear law, such as the 9th session of the Nuclear Law Institute (NLI), which was attended by 61 participants from member states, and the Regional Workshop on Nuclear Law conducted in Santiago, Chile, for member states of Latin America and the Caribbean.

OECD Nuclear Energy Agency

NEA Nuclear Education, Skills and Technology Framework (NEST) Agreement enters into force

Nuclear skills and education is an increasingly important challenge for NEA member countries, all of whom need to have a new generation of highly-qualified scientists

and engineers to ensure the continued safe and efficient use of nuclear technologies for a wide range of industrial, scientific and medical purposes. The NEA has therefore developed the NEA Nuclear Education, Skills and Technology (NEST) Framework, which officially entered into force on 15 February 2019. In partnership with 15 organisations from 10 member countries, NEST aims to nurture the next generation of nuclear experts who can provide the knowledge and leadership needed by the NEA membership in the years to come.

The first NEST Management Board meeting was held on 28 March 2019 with 29 participants from the 10 countries and 15 organisations that are signatories of the NEST Framework Agreement. During this meeting, the NEST Management Board elected Dr Andreas Pautz of Switzerland as its Chair and discussed and established guidelines for the implementation of the Framework and the first steps towards the development of four NEST projects and activities. These projects cover a wide range of nuclear technologies, from robotics in decommissioning proposed by Japan, small modular reactors proposed by Canada and the United States, hydrogen risk in safety assessment proposed by Switzerland and radioactive waste management with a focus on graphite proposed by Russia. The NEST Management Board wishes to enlarge the NEST Framework by welcoming additional project proposals, countries and organisations.

2019 International Nuclear Law Essentials (INLE)

The eighth session of the NEA International Nuclear Law Essentials (INLE) course was held on 18-22 February 2019 in Paris, France, bringing together a diverse group of 49 professionals from 22 NEA member and non-member countries. During the one-week programme, the participants learnt about the international nuclear law framework and major issues affecting the peaceful uses of nuclear energy. A total of 18 lecturers from the NEA, the International Atomic Energy Agency (IAEA), nuclear regulatory authorities and the private sector gave lectures on topics related to nuclear safety, security, non-proliferation and liability.

News briefs

First topical peer review on managing the ageing of nuclear installations

The European Commission welcomed the publication by the European Nuclear Safety Regulators Group (ENSREG) of the report¹ and country findings² of the first topical peer review (TPR) under the 2014 Amended Safety Directive.³ The Commission, whose duty is to monitor the implementation of the 2014 Amended Safety Directive, initiated the exercise in close co-operation with ENSREG, following and supporting it all the way. Such a review will hereafter take place every six years, as required by the Directive. In total, 19 countries (16 European Union countries, plus Norway, Ukraine and Switzerland) participated in the peer review. The added value of the exercise is that it is based on comprehensive factual expertise built up by the regulators.

The review highlights that ageing management programmes, based on the International Atomic Energy Agency (IAEA) safety standards and Western European Nuclear Regulators Association (WENRA) reference levels, are in place for all nuclear power plants. While the review did not identify any major deficiencies in European approaches to regulate and implement ageing management programmes for nuclear power plants, it highlighted wide differences in national approaches. The report lists as many as 19 areas in which each country should reach an “expected level of performance” defined in the report to ensure a consistent and acceptable management of ageing throughout Europe. Ageing management programmes for research reactors, on the other hand, are neither regulated nor implemented systematically and comprehensively and therefore require further attention from both regulators and licensees.

The Commission calls on national authorities to develop action plans, as stipulated by the 2014 Amended Safety Directive, to ensure the timely implementation of all measures, and the Commission expresses its willingness to support and participate in the review of their implementation. These plans should address the results of the self-assessments and respond to the country specific findings. According to the decision taken by ENSREG on 4 October 2018, these national action plans should be published in September 2019 and will be analysed by ENSREG. The Commission will continue to follow and support the process.

2019 Fourth International Workshop on the Indemnification of Damage in the Event of a Nuclear Accident

After two successful workshops on the Indemnification of Damage in the Event of a Nuclear Accident organised in France in November 2001 and in the Slovak Republic in

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1. ENSREG (2018), *1st Topical Peer Review “Ageing Management”*, available at: www.ensreg.eu/sites/default/files/attachments/hlg_p2018-37_160_1st_topical_peer_review_report_2.pdf.
 2. ENSREG (2018), *1st Topical Peer Review “Ageing Management” Country specific findings*, available at: www.ensreg.eu/sites/default/files/attachments/hlg_p2018-37_161_1st_tpr_country_findings.pdf.
 3. Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations, *Official Journal of the European Union* (OJ) L 219 (25 July 2014) (2014 Amended Safety Directive).

May 2005, the Nuclear Energy Agency (NEA) organised the 3rd International Workshop on the Indemnification of Damage in the Event of a Nuclear Accident in co-operation with the Nuclear Regulatory Authority of the Slovak Republic in October 2017. This workshop assessed the practical implementation of currently applicable international nuclear liability conventions in conjunction with, among others, non-convention states' regimes, assuming all modernised international instruments have come into force. Over 170 participants from 33 NEA member and non-member countries attended the workshop. The programme and discussions followed a specific scenario (a nuclear incident occurring at a nuclear installation which would cause transboundary damage) and the sessions were prepared based on responses to a tailored questionnaire gathered by the NEA from 27 NEA member and non-member countries. For more information about the previous workshops, as well as the associated publications, please see: www.oecd-nea.org/law/nuclear-liability-pubs-workshops-symposia.html.

The 4th International Workshop on the Indemnification of Damage in the Event of a Nuclear Accident will be held from 8-10 October 2019 in Lisbon, Portugal. This workshop will be a unique opportunity to continue exploring the practical application of the international nuclear liability instruments and the potential consequences, including with regard to non-convention states, of a nuclear incident occurring at a nuclear installation. It will address, in much more detail, topics identified by the workshop participants for further discussion, for example the determination of the nuclear damage to be compensated and transboundary claims handling.

Second NEA International Radiological Protection School (IRPS)

In 2018, the NEA created the International Radiological Protection School (IRPS), in co-operation with the Centre for Radiation Protection Research (CRPR) of Stockholm University and with the support of the Swedish Radiation Safety Authority (SSM). The first IRPS session took place from 20 to 24 August 2018 at Stockholm University. It was attended by 41 participants from 24 countries, selected on the basis of their education, experience and potential as future radiological protection (RP) leaders.

The next session of the IRPS will take place from 18 to 22 August 2019 at Stockholm University. The five-day training provides mid-career RP experts with an understanding of the “spirit” of the RP system. International experts will present the nuances, history and between-the-lines meaning of international guidance and working experience, which will allow tomorrow's RP leaders to appropriately apply the RP system to address current and future radiological circumstances.

Recent publications

Nuclear Law in Motion, Proceedings of the AIDN / INLA Regional Conference 2017 in Bonn (2019) by Ulrike Feldmann, Christian Raetzke and Marc Ruttloff (eds.)

For the 15th time, the German Branch of the Association Internationale du Droit Nucléaire/International Nuclear Law Association (AIDN/INLA) held its biannual conference, this time taking place in Bonn (28-29 September 2017), the ancient residence of the Electors of Cologne and the capital of the Federal Republic of Germany from 1949 to 1999. The conference was chaired by the President of the German Branch of AIDN/INLA, Christian Raetzke, who also edited this volume together with Marc Ruttloff, Vice-President of the German Branch and Ulrike Feldmann, Board Member of the German Branch as well of the AIDN/INLA itself.

The conference programme focused on pressing issues both under discussion in Germany as well as internationally, namely on responsibility and liability in nuclear waste management, nuclear third party liability in the transport of nuclear material, legal issues in radiological protection (especially the revised Euratom Basic Safety Standards and waste disposal) and finally on some current developments in German and international law showing that nuclear law continues to be “in motion”.

The first session was mainly devoted to content, questions under constitutional law and regulatory issues concerning the German Act on the Reorganisation of Responsibility in Nuclear Waste Management. This Act came into force on 16 July 2017 and only applies to nuclear power plants. It is a package containing a number of individual acts with respect to the responsibility for waste management, as well as the financing of shut-down and dismantling of nuclear power plants and the disposal of radioactive waste. The third and last presentation in this session concentrated on economic analysis, state aid in the nuclear industry, as well as lessons learnt from the Hinkley Point example for the reorganisation of responsibility in nuclear waste management in Germany.

The second session covered current problems of liability for transport of nuclear substances, giving an additional meaning to the conference title “nuclear law in motion”. Whereas one presentation was devoted to issues of transport liability in general where the international patchwork continues to be of concern to operators, transporters and insurers, another one delved deeply into the territorial application of the Paris Convention in case of transport of nuclear substances to and from a non-convention state. In a third contribution, contractual considerations were given to the marine transport of nuclear substances.

The third session focused on a key element of nuclear law, that is to say the law of radiation protection starting with a presentation of the new German Act on Radiation Protection. This act, promulgated in July 2017, implements the revised Euratom Basic Safety Standards on Radiation Protection into national law. The next presentation explained the growing difficulties in depositing radioactive substances released from regulatory control in Germany. The third paper concentrated on the issue of low dose radiation health effects being scrutinised under the multidisciplinary European project “MELODI”, which is also the central topic of the report *Deriving Organ Doses and their Uncertainty for Epidemiological Studies* by the National Council on Radiation Protection and Measurements (United States).

The fourth and last session highlighted current developments in international nuclear law, namely the nuclear law in the United States under President Trump, as well as the legal implications of “Brexitom” from the perspective of the United Kingdom.

The majority of the papers, namely those not dealing with specific German legislation, are in English. Therefore, the volume should be useful to the international community of nuclear law experts. The proceedings of the conference include papers and discussion reports by: Markus Ludwigs, Christian Müller-Dehn, Jostein Kristensen and Anton Burger, Torsten Gierke, Achim Jansen-Tersteegen and Christian Raetzke, Mehboob Vadiya, Kaan Kuzeyli, Justin Franken, Goli-Schabnam Akbarian, Brigitte Röller, Mark Callis Sanders and Charlotta E. Sanders, Sidonie Royer-Maucotel, Jay Kraemer, Ian Salter and Ian Truman, and Łukasz Młynarkiewicz.

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