

“ATOMIC LAW” OR “NUCLEAR LAW”? AN ACADEMIC DISCUSSION REVISITED

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The terms “atomic law” and “nuclear law” are regularly being (to a certain part as synonyms) used in both scientific and popular literature to refer to a body of legal norms, governing peaceful uses of nuclear energy and ionizing radiation, as provided by sources of international law (“international atomic law,” or “international nuclear law”), national legislation and a complex body of unbinding norms (soft law). Further, several other variations of these terms are also regularly used (such as “atomic energy law,” “nuclear energy law,” “international nuclear law,” “law of the atomic/nuclear energy,” etc.). This contribution aims to identify the origins of this terminological labyrinth and to deal with the perception of these terms in the legal scholarship. Further, this contribution deals with the recent perception of these terms in the legal science of major States, using nuclear energy for peaceful purposes. This article aims to clarify the existing terminology, which is to large extent being used in the literature without an appropriate explanation. The author pleads for a consequent use of the term “nuclear law” (droit nucléaire, yadernoe pravo, Nuklearrecht, derecho nuclear, diritto nucleare) and presents arguments for such conclusion.

Keywords: nuclear law; atomic law; nuclear energy law; atomic energy law; international nuclear law; international atomic law; law of nuclear energy.

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Introduction

Nuclear energy and ionizing radiation currently find various peaceful uses in industry, medicine, agriculture, archaeology and many other areas of human

activity. Nuclear energy has been used for electricity production since the late 1950s. Further, nuclear energy has been also used as a means of marine propulsion (nuclear icebreakers in the Arctic) as well as for desalination, though that process is very costly. The uses of ionizing radiation are today crucial for many branches of medicine (radiopharmacology, radiotherapy, radiosurgery, etc.), industry (radioluminescence, smoke detectors, etc.), archaeology (dating minerals and rocks) and in many other areas. Also, several States are using nuclear energy for military (defense) purposes.

From the legal perspective, the peaceful uses of nuclear energy and ionizing radiation are currently governed by a vigorous legal framework, established by binding instruments of international law, adopted under auspices of the International Atomic Energy Agency (thereinafter “the IAEA”), the Organisation for Economic Co-operation and Development (thereinafter “the OECD”) and to a certain extent the International Maritime Organisation (thereinafter “the IMO”). The instruments of international law cover the issues of early notification¹ and mutual assistance² in a case of a nuclear accident or radiological emergency, nuclear safety,³ nuclear liability (established both under the auspices of the OECD,⁴ IAEA⁵ and IMO⁶) and nuclear security⁷ as well as the issues of radioactive waste management.⁸ These instruments

¹ Convention on Early Notification of a Nuclear Accident (adopted 26 September 1986, entered into force 27 October 1985), INFCIRC/335 (CENAC).

² Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (adopted 26 September 1986, entered into force 26 February 1987), INFCIRC/336 (CACNARE).

³ Convention on Nuclear Safety (adopted 17 June 1994, entered into force 24 October 1996), INFCIRC/449 (CNS).

⁴ Convention on Third Party Liability in the Field of Nuclear Energy (adopted 29 July 1960), as amended by the Additional Protocol of 1964 (adopted 28 January 1964, entered into force 1 April 1968) and by the Protocol of 1982 (adopted 16 November 1982, entered into force 7 October 1988), commonly referred to as the Paris Convention (PC) and the Protocol to Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960 as Amended by the Additional Protocol of 28 January 1964 and by the Protocol of 16 November 1982 (adopted 12 February 2004, not yet in force).

⁵ Vienna Convention on Civil Liability for Nuclear Damage (adopted 21 May 1963, entered into force 12 November 1977), INFCIRC/500 (VC); Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (adopted 21 September 1988, entered into force 27 April 1992), INFCIRC/402 (JP); Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage (adopted 12 September 1997, entered into force 4 October 2003), INFCIRC/566 (VP) and the Convention of Supplementary Compensation of Nuclear Damage (adopted 12 September 1997, entered into force 15 April 2015), INFCIRC/567 (CSC).

⁶ Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material (adopted 17 December 1971, entered into force 15 July 1975).

⁷ Convention on the Physical Protection of Nuclear Material (adopted 26 October 1979, entered into force 8 February 1987), INFCIRC/274 (CPPNM) and the Amendment to the Convention on the Physical Protection of Nuclear Material (adopted 8 July 2005, entered into force 8 May 2016), INFCIRC/274/Rev.1/Mod.1 (ACPPNM).

⁸ Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (adopted 5 September 1997, entered into force 18 June 2001), INFCIRC/546 (JCSSF).

of international law are currently binding for a majority of States operating nuclear installations for electricity production within their territory.⁹

It is matter of fact that these fail to represent self-executing international conventions and thus require inclusion in the legal norms of national legislation.¹⁰ Further, there are many areas that have yet to be governed by *any* international instruments and are exclusively subject to national legislation of the concerned States.

Consequently, such legislation represents the core requirement for legal frameworks applicable in this area.¹¹ Additionally, there is a robust structure of unbinding instruments (*soft law, para-droit*)¹² that provide commonly accepted practices and technological standards in this field. Certain authors argue that the decision-making practice of the competent regulatory authorities also represents (at least to some extent) a source of law in this field.¹³

In the legal scholarship, the body of legal norms governing peaceful uses of nuclear energy and ionizing radiation has been *promiscue* referred to as “atomic law” (*droit atomique, Atomrecht, diritto atomico, atomnoe pravo*) and “nuclear law” (*droit nucléaire, Nuklearrecht, diritto nucleare, yadernoe pravo*).¹⁴ Further, several

⁹ There are currently 157 Contracting Parties to the CPPNM, 121 Contracting Parties to CENAC, 118 Contracting parties to the ACPNM, 116 Contracting Parties to the CACNARE, 85 Contracting Parties to the CNS, 79 Contracting Parties to the JCSSF, 40 Contracting Parties to the VC, 28 Contracting Parties to the JP, 13 Contracting Parties to the VP, 16 Contracting Parties to the PC and 10 Contracting Parties to the CSC.

¹⁰ This is, to a large extent, the case of radiological protection, which is however subject to vigorous regulation under the law of the European Atomic Energy Community (Euratom).

¹¹ The degree of codification of these legal norms varies within different States. Some jurisdictions opted for a codified framework, with one central piece of legislation (a code of nuclear law) serving as general base of all activities in the area of the peaceful uses of nuclear energy and ionizing radiation. Currently, this is the case of Germany, Switzerland, Finland and the Czech Republic. Based on particular historical and institutional circumstances, other jurisdictions fail to follow this concept and regulate this area by a body of independent acts. This is currently the case in the United States, United Kingdom and Russian Federation.

¹² This is in particular the case of the “Codes of Conduct,” “Nuclear Safety Standards” and “Safety Fundamentals,” published by the IAEA.

¹³ Yannick Martiquet, *L'autonomie du droit nucléaire: Contribution à l'étude de la nature et des caractères d'un droit nouveau* 410 (Nîmes: Université de Nîmes, 2015).

¹⁴ From the publications of the last decade, see *Балюк Г.І. Ядерне право України [Galina I. Balyuk, Ukrainian Nuclear Law]* (Kyiv: Taras Shevchenko National University of Kyiv, 2010); Helen Cook, *The Law of Nuclear Energy* (London: Sweet & Maxwell, 2013); *Фатьянов А.А. Основы правового регулирования в сфере использования атомной энергии (ядерное право) [Alexey A. Fatyanov, Fundamentals of Legal Regulation in Uses of Atomic Energy (Nuclear Law)]* (Moscow: MEPhI, 2011); *Грищенко А.И. Ядерное право России [Anatoly I. Grishchenko, Russian Nuclear Law]* (Moscow: Yurist, 2017); *Июйрыш А.И. Концепция атомного права [Abram I. Iouyrsh, The Conception of Atomic Law]* (Moscow: Yuniti-Dana, 2008); *Никифоров Н.В. Ядерное право: системный комментарий к нормативной базе [Nikita V. Nikiforov, Nuclear Law: Systematic Commentary to the Legal Framework]* (Moscow: Rosatom, 2011); *Internationales und europäisches Atomrecht: Die militärische und friedliche Nutzung der Atomenergie aus Sicht des Völker- und Europarechts* (K. Odendahl (ed.), Berlin: Duncker & Humblot, 2013); *Droit nucléaire: Le contentieux du nucléaire* (J.-M. Pontier & E. Roux (eds.), Marseille:

additional variations also appear in the literature, such as “atomic/nuclear energy law,” “international atomic/nuclear law,” “law of atomic/nuclear energy,”¹⁵ etc.

As a matter of fact, both the terms “atomic law” and “nuclear law” lack any definition in the binding instruments of international law. Consequently, these terms have to a large extent been the result of legal scholarship that developed since the late 1950s¹⁶ when referring to a certain body of the corresponding legal norms. At the same time, this terminology has only rarely¹⁷ become subject to a detailed academic scrutiny and proper clarification. This paper primary aims to address this gap in the legal scholarship. Having said this, I also aim to clarify the legal terminology used in the field of peaceful uses of nuclear energy and radiation, which is largely being used in the literature without any appropriate explanation. This paper argues that there have been certain developments in the use of both the terms “atomic law” and “nuclear law” during the past decades in the legal scholarship. Further, this contribution deals with the recent perception of these terms in the legal science of major States, when using nuclear energy for peaceful purposes. Thus, the author pleads for the consequent sole use of the term “nuclear law” and presents his arguments for such a conclusion.

1. “Atomic Law” or “Nuclear Law”? The Debate Revisited

1.1. “Atomic Law” or “Atomic Energy Law”?

The outset of the first nuclear installations for electricity production in the 1950s¹⁸ triggered their first legislative initiatives, which initially established a legal framework

Presses Universitaires d'Aix-Marseille, 2011); Проблемы и тенденции правового регулирования в области использования атомной энергии [*Problems and Tendencies of Legal Regulation in the Area of Use of Atomic Energy*] (V.V. Romanova (ed.), Moscow: Yurist, 2017); Wolf-Georg Schärf, *Europäisches Atomrecht: Recht der Nuklearenergie* (2nd ed., Berlin: De Gruyter, 2012); Stephen Tromans, *Nuclear Law: The Law Applying to Nuclear Installations and Radioactive Substances in Its Historic Context* (2nd ed., Oxford: Hart Publishing, 2010), etc. This overview of the recently published works manifests the fact, the area of peaceful uses of nuclear energy and ionizing radiation is being subject of wide attention by both academicians and practitioners in various jurisdictions.

¹⁵ Also the “European atomic law” or the “European nuclear law” in order to refer to the legal norms established by the legal framework of the European Union and the European Atomic Energy Community (Euratom).

¹⁶ Vanda Lamm, *The Utilization of Nuclear Energy and International Law* 19 (Budapest: Akadémiai Kiadó, 1984).

¹⁷ Among recent publications, see, in particular, Грищенко А.И. О Концепции ядерного права России // Правовой энергетический форум. 2014. № 4. С. 19–20 [Anatoly I. Grishchenko, *On the Concept of Nuclear Law of Russia*, 4 Energy Law Forum 19, 19–20 (2014)] and Jean-Marie Pontier, *Le droit du nucléaire, droit à penser*, 30 L'Actualité juridique. Droit administratif 1680, 1680–1688 (2015).

¹⁸ On 27 June 1954, the world's first grid-connected nuclear power plant to generate electricity (albeit at small scale) commenced operations at the Institute of Physics and Power Engineering in Soviet Obninsk. The world's first full scale power plant, Calder Hall in the Great Britain, commenced its operation on 17 October 1956.

for the peaceful uses of nuclear energy and ionizing radiation.¹⁹ Basically, two different approaches were followed in the legislations of the concerned States.

In the first variant, the emerging legal problems were settled primarily by modifying or complementing certain earlier pieces of legislation in accordance with its new requirements.²⁰ The second solution consisted of settling questions of the peaceful uses of nuclear energy and ionizing radiation by establishing special, complex legal codes. The States adopting²¹ these codes referred either to the “atom”²² or to “atomic energy” in their title (“Atomic Energy Act,” “Atomic Energy Control Act,” “Atomic Act,” “Atomgesetz,” etc.).

Consequently, these terms also found use in the designation of regulatory authorities competent in this field.²³ At the international level, the United Nations Atomic Energy Commission (UNAEC) was established in 1946 as a subsidiary organ of the General Assembly to study in detail those questions raised by the peaceful uses of nuclear energy and ionizing radiation. Further, in 1957, three major international organizations were established in the field of nuclear energy, each of which was destined to have key roles in further developments: the International Atomic Energy Agency, the European Atomic Energy Community and the European Nuclear Energy Agency.²⁴

The peculiar character of these newly established branches of industry, as well as the nature of risks arising from the peaceful uses of nuclear energy and the consequent specific nature of certain institutes provided in newly enacted legislation triggered the

¹⁹ New Zealand was the first State to enact corresponding legislation in 1945. It was followed by France (Ordonnance n° 45-2563 du 18 octobre 1945), the United States (U.S. Atomic Energy Act of 1946), Canada (Atomic Energy Control Act of 1946), Japan (Atomic Energy Basic Law of 1955), the Federal Republic of Germany (Atomgesetz of 1959), Switzerland (Gesetz über die friedliche Verwendung der Kernenergie und den Schutz gegen ihre Gefahren (Atomgesetz) of 1959), the United Kingdom (Nuclear Installations Act of 1959) and Italy (Legge 31 dicembre 1962, n. 1860, relativo agli Impiego pacifico dell'energia nucleare).

²⁰ In the 1950s and 1960s, this solution was characteristic for the legislation in France, Belgium, Norway and Austria. This was also the situation in the Soviet Union, where the matter was addressed basically by “departmental” regulations, rather than by acts of higher rank.

²¹ This was the case of the Federal Republic of Germany, Switzerland, Sweden, the United Kingdom, Japan and Canada.

²² It is perhaps useful to remind, that the word “atom” (from Greek ἄτομον, *atomon*, i.e. “uncuttable,” “indivisible”) was coined by the Greek philosopher Leucippus and his pupil Democritus. They proposed that all matter was composed of small indivisible particles called “atoms.” The work of Democritus only survives in secondhanded reports, some of which are unreliable or conflicting. Much of the best evidence of Democritus’ theory of atomism is reported by Aristotle in his discussions of Democritus and Plato’s contrasting views on the types of indivisibles composing the natural world.

²³ This was the case of the Commissariat à l’énergie atomique (established in France in 1945), the Atomic Energy Commission (established in the United States in 1946), the Atomic Energy Authority (established in the United Kingdom in 1954), etc.

²⁴ The European Nuclear Energy Agency (ENEA) bears the name Nuclear Energy Agency (NEA) since 1972, after Japan became its Member State. Currently, it is a specialised agency of the OECD.

attention of legal scholarship. According to Hans Kruse,²⁵ the first organization to use the term “atomic energy law” was the American Bar Association, when in September 1953 it set up a Special Committee on Atomic Energy Law. Consequently, the terms “atomic law” (*droit atomique, Atomrecht, diritto atomico*) and “atomic energy law” (*droit de l'énergie atomique, Atomenergierecht, diritto dell'energia atomica*) became used quite regularly in the legal literature published in the United States and Western Europe in the 1950s and 1960s.²⁶ It is a fact that both terms were, to a large extent, used synonymously to refer to these newly established legal frameworks. They covered, in particular, the issues of the permitting and operation of nuclear installations, as well as radiological protection in medicine, nuclear research and the issues of nuclear liability.

Consequently, these issues of terminology triggered the attention of German legal scholars. From a theoretical point of view, they criticized the use of the term “atomic law” (*Atomrecht*). In this respect, Hans Kruse²⁷ and Rudolf Fleck²⁸ argued that the *object* of legal regulation is the energy arising therefrom and used the *atomic energy* rather than the atom itself. Therefore, they preferred the consequent use of the term “atomic energy law” (*Atomenergierecht*). In their understanding, only this term was capable of addressing *all* aspects of peaceful uses in this area: production of electric energy, naval propulsion and various applications of ionizing radiation in medicine, etc. Further, Hans Fischerhof also argued²⁹ in favor of the consequent use of the term “atomic energy law” and condemned the term “nuclear law” with very similar arguments. It is a fact that this line of terminological argumentation was followed by many Western European authors in subsequent decades.³⁰ It is important to note, that this terminological clarification

²⁵ Hans Kruse, *Legal Aspects of the Peaceful Utilization of Atomic Energy* 10 (Berlin: Neue Wirtschafts-Briefe, 1960).

²⁶ See Georg Erler & Hans Kruse, *Deutsches Atomenergierecht* (Göttingen: O. Schwartz, 1957); Georg Erler, *Die Rechtsentwicklung der internationalen Zusammenarbeit im Atombereich* (Göttingen: O. Schwartz, 1963); Pierre Julian, *Le statut juridique de l'énergie atomique: utilisations pacifiques* (Lyon: Institut de droit comparé, 1958); Eberhard Lühe, *Atomenergierecht in Westeuropa, USA und Kanada* (Göttingen: O. Schwartz, 1958); Henry Puget, *Aspects du droit de l'énergie atomique. T. 1, 2* (Paris: Centre français de droit comparé, 1965–1967); Berthold Moser, *Probleme und Grenzen der Atomgesetzgebung* (Vienna: Springer, 1968); J. Renault, *Problèmes juridiques de l'utilisation pacifique de l'énergie atomique*, 9(1) *Revue de droit international et de droit comparé* 88 (1957), etc. The terminology was also reflected in the titles of scientific periodicals (e.g., “Atomic Energy Law Journal,” “Cahiers du droit de l'énergie atomique”). A periodic publication entitled “Internationale Bibliographie des Atomenergierichts” was published by the Institute for International Law at the University of Göttingen from 1960 to 1988.

²⁷ Hans Kruse, *Atomenergie als Rechtsbegriff* in *Festschrift zum 70. Geburtstag von Paul Gieseke* 351, 352 (Karlsruhe: C.F. Müller, 1958).

²⁸ Rudolf Fleck, *Aspekte zur Systematik des Rechts der friedlichen Verwendung der Kernenergie*, 46 *Neue juristische Wochenschrift* 381, 382–383 (1962).

²⁹ Hans Fischerhof, *Zur Terminologie des Atomenergierichts*, 46 *Neue juristische Wochenschrift* 2095, 2096–2097 (1962).

³⁰ See Ulrich Nehring, *Strafnormen im Atomenergierecht: eine rechtsvergleichende Untersuchung* (Göttingen: Universität Göttingen, 1965); Heribert Rausch, *Schweizerisches Atomenergierecht* (Zürich: Schulthess,

was not autotelic. Taking the independent *object* of this newly established regulation into regard, Georg Erler,³¹ Hans Fischerhof,³² Hans Kruse³³ and Werner Boulanger³⁴ argued that “atomic energy law” represents (in similar fashion as the newly established space law and environmental law) a special, independent branch of law.³⁵

The above-mentioned process of the establishment of new legislation and the emerging legal scholarship in this area had been carefully reflected in the Soviet legal science.³⁶ This reflection was twofold:

Sergey A. Malinin refused³⁷ the idea of “atomic energy law” as an independent branch of law. In criticizing the German scholars, he pointed out that their views regarding an independent “atomic energy law” were erroneous,

... trying almost forcibly to unify, on one hand, the national laws of different – both socialist and capitalist – States concerning the use of atomic energy and, on the other hand, such norms that relate to international relations and, i.e. two separate legal systems.³⁸

Having said this, Malinin argued for using the terms “atomic law” (*atomnoe pravo*) and “international atomic law” (*mezhdunarodnoe atomnoe pravo*). These terms

1980); Volkmar Goetz et al., *Studien zum internationalen Wirtschaftsrecht und Atomenergierecht* (Cologne: Carl Heymanns, 1982); *Neues Atomenergierecht – Internationale und nationale Entwicklungen* (N. Pelzer (ed.), Baden Baden: Nomos, 1995); Norbert Pelzer, *Brennpunkte des Atomenergierichts* (Baden Baden: Nomos, 2002), etc.

³¹ Georg Erler, *Atomenergierecht in Handwörterbuch der Sozialwissenschaften. Bd. 12* 523, 525 (E. von Beckerath et al. (eds.), Stuttgart; Tübingen; Göttingen: Gustav Fischer; Mohr Siebeck, 1965).

³² Fischerhof 1962, at 2096.

³³ Kruse 1960, at 10–11, 83.

³⁴ Werner Boulanger, *The Development of Nuclear Law in Nuclear Law for a Developing World* 55–56 (Vienna: IAEA, 1966). Here, the author used the term “nuclear law,” which is however understood as a synonym to the “atomic energy law.”

³⁵ During the last two decades, the issue was again reopened in the French and Russian legal scholarship. This was in particular in the dissertation entitled “L’invention d’un système juridique: nucléaire et droit,” defended by Anne-Sophie Millet-Devalle at the University of Nice in 1991. In the Russian Federation, the topic was addressed in the dissertation of Vladimir P. Parkhitko, defended at the Lomonosov Moscow State University in 2000. Most recently, Yannick Martiquet reopened this issue in his outstanding dissertation, defended at the University of Nîmes in 2015 (Martiquet 2015, at 23–36).

³⁶ To certain extent, these reflections were mutual, and the status of the Soviet legal framework occasionally attracted attention of Western authors. See, e.g., Donald D. Barry, *Political and Legal Aspects of the Development and Use of Nuclear Power in the USSR and Eastern Europe in Law and Economic Development in the Soviet Union* 159, 167–168 (P.B. Maggs et al. (eds.), Boulder: Westview Press, 1982).

³⁷ Малинин С.А. Мирное использование атомной энергии. Международно-правовые вопросы [Sergey A. Malinin, *Peaceful Uses of Atomic Energy. International Legal Issues*] 3 (Moscow: International Relations, 1971).

³⁸ *Id.*

were intended just to technically refer to certain legal norms that govern the field of peaceful uses of nuclear energy and ionizing radiation, but belong to various branches of law. Consequently, he preferred the term “atomic law” over either “atomic energy law,” or “nuclear law,” as being a “commonly accepted” technical term, without any systematic aspirations.³⁹ To certain extent, this position was shared by Abram I. Ioırysh, who defined⁴⁰ “atomic law” as “a body of legal norms that regulate issues arising by uses of atomic energy.” In this respect, he argued, that “atomic law” is composed of legal norms belonging to administrative, civil and criminal law. At the same time, he understood “atomic law” as an emerging legal discipline, very similar to space, aviation and maritime law.⁴¹

These terminological and systematic arguments not only influenced subsequent legal scholarship in the Soviet Union,⁴² but those in the States of the former Eastern bloc as well. The term “atomic law” has been widely accepted in these States to refer to the corresponding body of legal norms.⁴³ The doctrine concerning the place of “atomic law” in the legal framework had also been reflected in the legal scholarship of the former Eastern bloc. As was noted by Vanda Lamm,⁴⁴

... the idea of an independent nuclear law has not taken root in the socialist literature of international law. (...) Seen from the viewpoint of practice, it may be necessary to treat together certain norms of municipal and international and, consequently, to mark them with a common label. Theoretically, however, the idea of either independent atomic law or international atomic law is difficult to accept, and even any sort of complex atomic law may be in place only from the practical point of view.

Contemporary Soviet legal scholarship also reflected the developments towards complex legal codes in Western Europe. In their monograph on “Soviet Atomic Law,”⁴⁵

³⁹ Malinin 1971, at 157.

⁴⁰ Иоıрыш А.И. Атом и право [Abram I. Ioırysh, *Atom and the Law*] 26 (Moscow: International Relations, 1969).

⁴¹ *Id.* at 27.

⁴² See, e.g., Иоıрыш А.И. Правовые проблемы мирного использования атомной энергии [Abram I. Ioırysh, *Legal Problems of Peaceful Uses of Atomic Energy*] (Moscow: Nauka, 1979); Международное атомное право [*International Atomic Law*] (A.I. Ioırysh et al. (eds.), Moscow: Nauka, 1987); Иоıрыш А.И., Чопорняк А.Б. Атомное законодательство капиталистических стран [Abram I. Ioırysh & Alexey V. Chopornyak, *Atomic Legislation of Capitalistic Countries*] (Moscow: Nauka, 1990); Ioırysh 2008, etc.

⁴³ This was the case of Czechoslovakia (*atomové právo*), Poland (*prawo atomowe*), etc. Consequently, the codes governing the peaceful uses of nuclear energy and ionizing radiation in the Czech Republic, Slovak Republic and Poland still bear the title “Atomic Act,” rather than “Atomic Energy Act.”

⁴⁴ Lamm 1984, at 24 and 27.

⁴⁵ Советское атомное право [*Soviet Atomic Law*] (P.N. Burgasov et al. (eds.), Moscow: Nauka, 1986).

which was published just few months before the nuclear accident in Chernobyl, Pyotr N. Burgasov, Abram I. Ioyrysh and Andranik M. Petrosyants noted that the contemporary framework “has an uncoordinated character and many gaps,” that “the majority of important questions are still not regulated” and that “norms of a general character reflecting the specifics of the atomic energy are still absent.”⁴⁶ The authors⁴⁷ stressed that the applicable legislation in the field of peaceful uses of nuclear energy and ionizing radiation was mostly composed from “departmental” norms, while the legal norms of higher rank were absent in principle.

Consequently, they urged the executive to commence work toward a legal code regulating the peaceful use of nuclear energy and ionizing radiation in a comprehensive way. Further, they argued that such a step would lay the foundation of a new Soviet nuclear legislation.⁴⁸ This appeal was reflected both abroad⁴⁹ and in the Soviet Union, beginning the complex projects of drafting new legislation. This process was completed by adopting new legislation in the Russian Federation in 1995.⁵⁰

1.2. The Emergence of “Nuclear Law”

The term “nuclear”⁵¹ has been used as a *synonym* for “atomic” since the 1950s. It is a fact that one of the three international organizations in the field of peaceful uses of nuclear energy and ionizing radiation was labelled the European Nuclear Energy Agency. Further, the first international conventions adopted in this field opted for the use of the term “nuclear” in their provisions, rather than “atomic.” This was the case of the PC⁵² and of the VC⁵³ in the 1960s.

⁴⁶ *Soviet Atomic Law*, *supra* note 45, at 19.

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ Donald D. Barry, *A Law on Atomic Energy: Preliminary Observations in The Impact of Perestroika on Soviet Law* 197, 197–204 (A.J. Schmidt (ed.), Dordrecht; Boston; London: Martinus Nijhoff, 1990).

⁵⁰ Федеральный закон от 21 ноября 1995 г. № 170-ФЗ «Об использовании атомной энергии», Собрание законодательства РФ, 1995, № 48, ст. 4552 [Federal Law No. 170 of 21 November 1995. On the Use of Atomic Energy, Legislation Bulletin of the Russian Federation, 1995, No. 48, Art. 4552].

⁵¹ Also, on this place, an etymological exposé can be useful. The word “nucleus” is from the Latin word *nuclula*, a diminutive of *nux* (“nut”), meaning the *kernel* (i.e., the “small nut”) inside a watery type of fruit (like a peach). A general sense of the word in the English language as a “central part or thing, about which others cluster” is from 1762. Michael Faraday used the term in 1844 to refer to the “central point of an atom.” The modern atomic meaning was proposed by Ernest Rutherford in 1912. See “Nucleus” in Online Etymology Dictionary (Sep. 5, 2018), available at <https://www.etymonline.com/word/nucleus>.

⁵² The PC was adopted under the auspices of the European Nuclear Energy Agency to establish a regional liability framework in the Western Europe. Consequently, it was later ratified by Belgium, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Turkey and the United Kingdom.

⁵³ The VC was adopted under the auspices of the IAEA in order to establish a liability regime applicable worldwide. However, at the time of its entry into force (1977), it had only eight Contracting Parties

Given the fact, both conventions in principle required further reception into the national legal framework, the terminology was consequently reflected in the legislation of the concerned contracting parties. This terminology was reasserted by the CPPNM in 1979, introducing the terms “nuclear material,” “international nuclear transport” and establishing foundations of “nuclear criminal law” (*Nuklearstrafrecht*).⁵⁴

Subsequently, this tendency in international law was confirmed in the terminology of international instruments adopted after the nuclear accident in Chernobyl (1986) in the area of early notification (CENAC), mutual assistance in a case of a nuclear accident or radiological emergency (CANCARE), nuclear liability (JC, VP and CSC), nuclear safety (CNS) and the issues of radioactive waste management (JCSSF). These conventions introduced definitions of the terms “nuclear accident,” “nuclear safety” and “nuclear installation” into international law and consequently reasserted the term “nuclear” instead of the rather archaic “atomic.” The post-Chernobyl conventions, adopted under the auspices of the IAEA, in principle became accepted by majority of the developed States using nuclear power to produce electric energy, providing a certain degree of harmonization worldwide.

These developments⁵⁵ were reflected by using the term “nuclear law” (*droit nucléaire, Nuklearrecht, diritto nucleare, derecho nuclear*). Despite the different meaning of the terms “atom” and “nucleus,” the term “nuclear law” since the 1960s has been used in legal scholarship as a synonym to the “atomic law.”⁵⁶ While originally less

(Argentina, Bolivia, Cameron, Cuba, Egypt, Federal Socialistic Republic of Yugoslavia, Philippines and Trinidad and Tobago). While the Soviet Union participated (together with the Byelorussian Soviet Socialist Republic) at the diplomatic conference adopting this convention, it strictly opposed the principles provided by the newly established liability regime (in particular the principle of channelling of liability to the operator, rather to the State). Consequently, neither of the States of the former Eastern bloc (with the salient exception of the above-mentioned Yugoslavia) acceded to this convention until the early 1990s. They did so only after the collapse of the Soviet Union: Hungary in 1989, Poland in 1990, Lithuania and Romania in 1992, Armenia in 1993, Bulgaria, Czech Republic and Estonia in 1994, Latvia and Slovakia in 1995, Ukraine in 1996 and the Russian Federation in 2005.

⁵⁴ See Miguel Sousa Ferro, *Criminal Nuclear Law: International Obligations and Their Implementation in the EU*, 2(2) *International Journal of Nuclear Law* 120, 120–140 (2008).

⁵⁵ On this place, a terminological remark is to be made. The international conventions mentioned above have regularly used the term “nuclear” to refer to particular, and to some extent different technologies. E.g., the term “nuclear installation” in the PC does cover neither fusion reactors, nor low risk facilities (e.g., mining and milling facilities), nuclear powered vessels, etc. Neither of the conventions do cover installations operated for military (defence) purposes. However, the term “nuclear law” aims to cover legal norms regulating all uses of nuclear energy and ionizing radiation, notwithstanding their relation to the existing international instruments.

⁵⁶ See Enrique Zaldívar, *Cuestiones legales originadas por el uso de la energía nuclear: con especial enfoque a su impacto en América Latina* (Buenos Aires: El Ateneo, 1960); *Il diritto dell'energia nucleare* (Milano: Centro di documentazione e studi sulle Comunità europee, 1961); G. Belli, *La nouvelle législation nucléaire italienne* (Paris: PUF, 1964); José L. Maffei Fuenzalida, *La energía nuclear ante el derecho* (Santiago: Editorial Jurídica de Chile, 1963); Klaus Schnyder, *Le droit nucléaire suisse* (Paris: Ed. Pédone, 1964), etc. It is interesting to note, that to some extent, this terminology was reflected also in the Soviet legal scholarship. See Пархутько В.П. Международное ядерное право [Vsevolod P. Parkhitko, *International Nuclear Law*] (Moscow: Znanie, 1972).

frequented, the term “nuclear law” became more used after the European Nuclear Energy Agency established its own periodical, the Nuclear Law Bulletin (*Bulletin de droit nucléaire*), in 1968.⁵⁷ In its first decades, even on pages of this journal, the terms “atomic law” and “nuclear law” were used interchangeably.⁵⁸

However gradually, the journal contributed greatly to the general acceptance of the term “nuclear law” in legal scholarship.⁵⁹ Further, the International Nuclear Law Association (*Association internationale de droit nucléaire*) was established in 1973 as an international learned society, aimed at the promotion and pursuit of studies and knowledge of legal issues related to the peaceful utilization of nuclear energy.⁶⁰ In 2000, the Nuclear Energy Agency renamed its *Group of Governmental Experts* to *Nuclear Law Committee*.⁶¹ The European Atomic Energy Community (Euratom) also contributed to these developments by referring to the term “nuclear” in its legislation governing, in particular, the issues of nuclear safeguards,⁶² nuclear safety,⁶³ shipment of spent fuel⁶⁴ and radioactive waste management.⁶⁵

⁵⁷ The journal has been published since then by the OECD in both English and French versions. The Nuclear Law Bulletin has aimed to cover legal aspects of following areas: (i) environmental protection, (ii) food irradiation, (iii) international co-operation, (iv) liability and compensation, (v) licensing and regulatory infrastructure, (vi) nuclear installations, (vii) nuclear safety and radiological protection, including emergency planning, (viii) nuclear security, (ix) nuclear trade, including non-proliferation, (x) nuclear-powered ships, (xi) radioactive materials, (xii) radioactive waste management, (xiii) transport of radioactive materials. This list represents an early consensus on the scope of the special body of legal norms, which were to be referred to as “nuclear law.”

⁵⁸ See José M. López Olaciregui, *Civil Liability and Nuclear Law*, 3(5) Nuclear Law Bulletin 27 (1970); Josef K. Pfaffelhuber, *New Trends in Atomic Law*, 10 Nuclear Law Bulletin 43 (1972), etc.

⁵⁹ Norbert Pelzer, *The Nuclear Law Bulletin: Source of Informing On, and Instrument of Developing, Nuclear Law. Hommage à un journal juridique*, 100 Nuclear Law Bulletin 30, 30–33 (2018).

⁶⁰ The international congresses of the Association, called regularly “Nuclear Inter Jura,” have been organised bi-annually since 1973 and are considered among the most important events in the legal scholarship in this particular field. Since the first bi-annual congress was held in Karlsruhe in September 1973, the proceedings of presented papers have provided valuable sources of knowledge concerning the problems of contemporary nuclear law. Since 1973, altogether twenty-two congresses were held thus far. Also, the regional groups of the Association (in particular the Argentinian, French, German and Indian) also contributed to the acceptance of the term “nuclear law” in the scholarship of these particular countries.

⁶¹ Julia Schwartz, *The Nuclear Law Committee – A Historical Perspective in Anniversary of the Nuclear Law Committee: Past, Present and Future of the Nuclear Law Committee* 4, 6 (Paris: OECD, 2006) (Sep. 10, 2018), also available at <https://www.oecd-nea.org/law/colloquium/schwartz.pdf>.

⁶² Commission Regulation (Euratom) No. 302/2005 of 8 February 2005 on the application of Euratom safeguards, 2005 O.J. (L 54) 1.

⁶³ Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations, 2009 O.J. (L 172) 18.

⁶⁴ Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel, 2006 O.J. (L 337) 21.

⁶⁵ Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, 2011 O.J. (L 199) 48.

Consequently, since the 1970s, the term “nuclear law” began to be increasingly used in literature⁶⁶ to refer to the same body of legal norms as previously termed “atomic law” or “atomic energy law.” Several variations of the term, such as “nuclear energy law” or “international nuclear law” have also been used interchangeably.⁶⁷

Most recently, the term appears to be widely recognized when dealing comprehensively with the legal framework governing peaceful uses of nuclear energy and ionizing radiation. This is the case of the works published recently by Stephen Tromans⁶⁸, Galina I. Balyuk,⁶⁹ Alexey A. Fatyanov,⁷⁰ Helen Cook⁷¹ and Anatoly I. Grishchenko.⁷² The leading teaching scheme in this area, organized jointly by the University of Montpellier and the OECD, also bears the name International School of Nuclear Law. Further, courses on “nuclear law” are regularly taught in countries with distinctive nuclear industries, such as the United Kingdom, the Russian Federation, the Czech Republic, etc.

1.3. A Treatise for “Nuclear Law”

To a large extent, a general acceptance of the term “nuclear law” was the result of the “Handbook on Nuclear Law,” published by the IAEA in 2003.⁷³ Here, the term was defined as a

body of special legal norms created to regulate the conduct of legal or natural persons engaged in activities related to fissionable materials, ionizing radiation and exposure to natural sources of radiation.⁷⁴

⁶⁶ See Jean Hebert, *Das französische Kernenergie recht* (Göttingen: Universität Göttingen, 1974); *Droit nucléaire et droit océanique* (Paris: Economica, 1977); *Droit nucléaire* (M. Pascal (ed.), Paris: Eyrolles, 1979); Jorge Martinez Favini, *Madurez del Derecho Nuclear (Notas Introdutorias)*, 1(1) *Revista Jurídica de Buenos Aires* 20, 20–28 (1985); H.J. van Zwam, *Kernenergie recht: een beschrijving van het internationale en nationale kernenergie recht, welke vooral is toegespitst op de voor ondernemingen belangrijke bepalingen en op de samenhang van de diverse nationale en internationale regelingen* (Arnhem: Gouda Quint, 1985); Jean-Marie Rainaud, *Le droit nucléaire* (Paris: PUF, 1994); Henri Pac, *Droit et politiques nucléaires* (Paris: PUF, 1994); Juan M. Ayllón Díaz-González, *Derecho nuclear* (Granada: Editorial Comares, 1999); Fabrizio Nocera, *The Legal Regime of Nuclear Energy: A Comprehensive Guide to International and European Union Law* (Antwerp: Intersentia, 2005); Olivier Guézou & Stéphane Manson, *Droit public et nucléaire* (Bruxelles: Bruylant, 2013).

⁶⁷ E.g., *Nuclear Energy Law After Chernobyl* (P. Cameron et al. (eds.), London: Graham & Trotman, 1988).

⁶⁸ Tromans 2010, at 37–38.

⁶⁹ Balyuk 2010, at 10–12.

⁷⁰ Fatyanov 2011, at 2–8.

⁷¹ Cook 2013, at 3–7. Here, the author uses the terms “nuclear energy law” and “nuclear law” as synonyms.

⁷² Grishchenko 2017, at 11–16. Here, in the chapter entitled “Nuclear Law: Subject, Method and Basic Principles,” the author argues that “nuclear law” constitutes a special area of energy law.

⁷³ Carlton Stoiber et al., *Handbook on Nuclear Law* (Vienna: IAEA, 2003).

⁷⁴ *Id.* at 4.

Consequently, “nuclear law” covers both areas governed by existing international conventions and areas, which have not been regulated by the international instruments so far.

Further, the authors argue, that this definition comprises four key elements: (1) as a body of special legal norms, nuclear law is recognized as a part of general national legislation, while at the same time comprising different rules required by the special nature of the technology; (2) the element of regulation incorporates the risk-benefit approach that is central to managing activities that present both hazards and advantages for social and economic development; (3) as with all legal regimes, the special legal norms relate to the conduct of legal persons, including commercial, academic, scientific and governmental entities, as well as of individuals; (4) the fourth element focuses on radioactivity (produced through the use of fissionable material or ionizing radiation) as the defining feature justifying a special legal regime.⁷⁵ It is a fact that this definition of “nuclear law” has been widely accepted in the legal scholarship⁷⁶ and, consequently, obtained an authoritative status. Under this understanding, the term “nuclear law” covers in in principle following areas of legal relations:

- 1) radiation protection;
- 2) nuclear and radiation safety;
- 3) nuclear liability and coverage;
- 4) physical protection;
- 5) non-proliferation and nuclear safeguards.

Despite being the most recently frequently used, a terminology justification of the term “nuclear law” has only been very occasionally subject to academic treatise. In principle, it seems, that the authors prefer this term as it is more *en vogue*. A rare exemption is found in an article published by Anatoly I. Grishchenko.⁷⁷ Here he observes the terminological shift from “atomic law” toward “nuclear law” during the last decades, stating that

as the science and technology advances enabling us to obtain more powerful energy as a result of chain reactions of heavy nucleus fission and thermonuclear fusion of light nuclei, scientists tended to change their opinions as to the name of this branch.⁷⁸

Further, he argues:

⁷⁵ Stoiber et al. 2003, at 4.

⁷⁶ Cook 2013, at 7; Grishchenko 2017, at 10; Martiquet 2015, at 13–14; Schärf 2012, at 5–7. Curiously enough, the last of the here cited authors deals with the definition of “nuclear law” in the very beginning of his monograph, which is entitled “European Atomic Law.”

⁷⁷ Grishchenko 2014, at 19–20.

⁷⁸ *Id.*

Is it not better to use the term “nuclear” instead of “atomic,” and would it not be a more modern practice? This question has both technical and historical aspects. If we consider it scientifically, ionizing radiation is connected to the reactions in the nuclei of atomic particles. Accordingly, the term “nuclear” seems to be more precise and modern.⁷⁹

I agree with this terminological justification. All relations (both peaceful and military⁸⁰) that are regulated by “nuclear law” have their origin in the atomic *nucleus*, rather than in the atom. At the same time, the term “nuclear law” seems also to be more appropriate, than the term “nuclear energy law,” which – *stricto sensu* – does only⁸¹ address legal issues arising by using atomic *nucleus* for the production of electric energy. However, the term “nuclear law” is broader one, it does not cover only the area of nuclear power industry, but also other uses of ionizing radiation (in medicine, research, archaeology, etc.). In this respect, Jean-Marie Pontier proposed⁸² the use of a term “le droit du nucléaire” in French literature, which, however, has not been accepted widely so far.

Finally, the term “nuclear law” also covers prospective developments of this legislation in the future – in particular those addressing challenges arising from the need to manage radioactive waste and spent fuel, as well as prospective developments in nuclear fission, nuclear marine propulsion and in new types of nuclear technologies such as small nuclear reactors.

Conclusion

In both the popular and scientific literature, the terms “atomic law” and “nuclear law” (“atomic energy law” and “nuclear energy law” respectively) are used to a large extent as *synonyms*. They refer to the same body of legal norms governing peaceful uses of nuclear energy and ionizing radiation. Having explored the origin and subsequent developments of both terms, we can conclude that the terms “atomic law,” “atomic energy law” and “international atomic law” were the result of an early stage of development. These terms followed a certain line of legal argument that was not wrong *per se*. It is matter of fact that also traditional branches of law are

⁷⁹ Grishchenko 2014, at 19–20.

⁸⁰ It is matter of fact that literature has only occasionally dealt with the legal framework, applicable to military (defense) nuclear installations. A rare exemption can be found in Emmanuelle Racinet, *Le droit nucléaire de la défense* (Paris: Ministère de la Défense, 2002).

⁸¹ Consequently, one can doubt whether the term “nuclear energy law” also covers the issues arising from orphan sources, from uses of radioisotopes in nuclear medicine, from applications of radioiodine ablation in radiation therapy, etc.

⁸² Pontier 2015, at 1680–1688.

being called by different terms.⁸³ This is a practice, which is to a large extent familiar to a wide legal community and does not need any further explanation. However, one can argue that the casual use of *two* different terms to refer to the *same* body of legal norms in such specialized field has no justification and can merely lead to misunderstandings or, worse yet, confusion.

In this respect, there are persuasive arguments for the consequent use of the term “nuclear law” (*droit nucléaire, yadernoe pravo, Nuklearrecht, diritto nucleare, derecho nuclear*) to refer to the above-mentioned body of legal norms:

The international instruments adopted by the States to regulate this field use the term “nuclear” to define specific installations, situations, materials, etc. To some extent, this terminology supports the use of the term “nuclear law” to refer to the corresponding legal framework, rather than “atomic law.” Also, the major international organizations in this field recognized the use of the term “nuclear law,” rather than those more previously frequented terms “atomic law,” or “atomic energy law.” Finally, the term “nuclear law” has consequently been accepted in the legal scholarship of major States more recently using nuclear energy and ionizing radiation. Consequently, a consistent use of the term “nuclear law” (“international nuclear law” respectively) would certainly contribute to clarity of terminology, at least in the legal scholarship that deals with the above-mentioned topics.

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⁸³ See the parallel use of the terms “Zivilrecht,” “Privatrecht” and “Bürgerliches Recht” in Germany, “commercial law,” “trade law” and “business law” in the United Kingdom, etc.

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