

NUCLEAR INSURANCE POOLS WORLDWIDE: THE ROLE IN THE NUCLEAR LAW

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Abstract

In the second part of the 20th century it became clear to insurers that any nuclear accident has catastrophic potential. The characteristics of the nuclear risks made the coverage unattractive to individual insurers. The insurance industry was challenged to create structural and legal mechanisms, in order to be able to deal with the new hazard. The most important mechanism is the insurance pool which has contributed to the insurance industry remaining an essential part of the development of the nuclear industry and the nuclear third party liability regime. Today, the insurance market, through the insurance pools, is involved in the parallel creation of legislation and insurance policies in the two most important types of nuclear insurance:

- Insurance of physical damage or first party liability that will provide coverage for all the operator's assets on the nuclear facility. This damage consists of various types of actual damage and future damage or loss of income which results from the actual damage

- Nuclear third party liability policy or liability insurance covers all aspects of off-site nuclear damage suffered by people, businesses and other property not directly related to the nuclear site.

This paper aims to present the significance of the nuclear insurance pools in nuclear law and the provision of financial security in case of third party liability for the nuclear operator.

Keywords: *nuclear operator, third party liability, nuclear damage, insurance pool, financial security.*

The principle of compulsory financial security – legal presumption for the existence of nuclear insurance pools

Today, there are three basic international regimes for nuclear third party liability in force:

- Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960 (Paris Convention)¹; Coverage under the Paris Convention is extended by the Supplementary Convention on Third Party Liability in the Field of Nuclear Energy of 31 January 1963 ("the Brussels Supplementary Convention")².

- Convention on Civil Liability for Nuclear Damage of 1963 (Vienna Convention)³.

- Convention on Supplementary Compensation for Nuclear Damage of 1997 ("the CSC")⁴

These international regimes have set five basic principles that underlie the special nuclear third party liability and compensation regimes at both national and international levels: strict liability, exclusive liability (legal channeling), compulsory financial security, liability limits in amount and liability limits in time.⁵ The third party liability of the nuclear operator is strict, which means that he is liable regardless his fault or negligence. The damage may have resulted from any kind of guilt that can be found with the nuclear operator but there is no need (in legal sense) to proof that. This base of liability was adopted due to the need to assure a greater protection for the public. "*In return for an onerous obligation of absolute and strict liability, nuclear site operators received a temporal and financial limit to their liability that enabled them to approach the conventional private market to transfer the risks inherent in the total but limited liability obligation placed upon them*"⁶

¹ Available at https://www.oecd-nea.org/law/nlparis_conv.html on 16.04.2017.

² Available at <https://www.oecd-nea.org/law/brussels-supplementary-convention.html> on 16.04.2017.

³ Available at <https://www.iaea.org/sites/default/files/infcirc500.pdf> on 16.04.2017.

⁴ Pursuant to Article XX.1, the CSC entered into force on 15 April 2015. The date was the ninetieth day following the date on which Japan signed and delivered the instrument of acceptance of the CSC, meaning at least 5 States with a minimum of 400 000 units of installed nuclear capacity deposited an instrument referred to in Article XVII.

⁵ See Schwartz, Julia A., *Liability and Compensation for a Third Party Resulting from a Nuclear Incident*, International Nuclear Law: History, Evolution and Outlook, 2010, OECD, pp. 307-355.

⁶ Tetley M. *Revised Paris and Vienna Nuclear Liability Conventions- Challenges for insurers*, Nuclear Law Bulletin, 2006, pp. 27–39, pp. 27.

According to the principle of compulsory financial security the nuclear operator is required to secure finances to cover the nuclear liability. Traditionally this is provided by the private insurance market, although there are other known financial instruments that can be used to achieve this goal, such as bank guarantee, operator pooling system, or self - insurance. The minimum amount of protection required is set by national laws, which often depend on international treaty obligations. Over time the amount of this mandatory protection has increased, partially adjusting for inflation and partially allowing for an increased burden of responsibility to be passed on to nuclear operators. In most countries contractors and suppliers to the nuclear operator have exclusions clauses or "hold harmless" agreements that steer liability back to the operator.⁷

In the following table presents the obligation (in amount) of the nuclear operator under the international nuclear liability regime - liability amount imposed by the conventions:⁸

Convention	Minimum amount	Maximum amount
1. Paris Convention	5 million SDRs ⁹ /EUR 5.9 million/ USD 7.2 million.	15 million SDRs/ EUR 17.8 million / USD 21.6 million
2. Vienna Convention	5 million US dollars (USD) ¹⁰	None

⁷Reitisma S., Tetley M. *Insurance of nuclear risks* in OECD/NEA (ed) *International Nuclear Law: History, Evolution and Outlook*, 10th Anniversary of the International School for Nuclear Law, Paris, 2010, pp. 387-412, pp.397.

⁸Data according to Schwartz J., *International Nuclear Third Party Liability Law: The Response to Chernobyl*, International Nuclear Law in the Post- Chernobyl Period, A Jointed report by OECD/NEA and IAEA,2006, pp.37-73, str. 42, available at <https://www.oecd-nea.org/law/chernobyl/> on 17.04.2017 and Schwartz J., *Nuclear Risks, Are they Insurable? Are they insured?* Nuclear Risk and Public Decision – Making Scientific Conference, OECD, 2011.

⁹The Special Drawing Right is a unit of account defined by the International Monetary Fund (IMF) based upon the US dollar, the Euro, the Japanese Yen and the Pound Sterling. The IMF Treasury Department exchange rate between the SDR and the EUR on 31 March 2006 was SDR 1= EUR 1.19 and between the SDR and the USD on that same date was SDR 1=USD 1.44. All SDR-EUR/USD conversions in this paper are based on these exchange rates. 15 million SDRs is approximately EUR 17.8 million or USD 21.6 million.

¹⁰This amount is defined by reference to its value in gold on 29 April 1963. That value is USD 35 per one troy ounce of fine gold. The liability amount is generally considered to have a value of approximately USD 50 million today.

3. Protocol to amend the Vienna Convention	300 million SDRs	None
4. Brussels Supplementary Convention	700 million EUR	15 million SDRs
5. Convention on Supplementary Compensation	300 million SDRs	None

The private insurance market includes nuclear insurance pools, captive insurance companies,¹¹ mutual insurance companies, financial markets and traditional insurer/reinsurer market. For example there is only one mutual insurance company¹² within Europe that provides nuclear third-party liability cover in addition to the commercial cover offered by the pools for operators of nuclear power plants. This is the European Liability Insurance for the Nuclear Industry (ELINI) established in 2002. The capacity provided by ELINI is independent of that provided by the various nuclear pools. ELINI's current portfolio is based on nuclear liability risks covered, in accordance with the decision of the Member¹³, with the existing Pools and any other markets as coinsurer, reinsurer or leader with the exception in those countries where a 100 % policy is taken out by the Member. The prices of the insurance coverages are in accordance with the Member's own rating tables so that Members of Mutual will derive immediate benefit from reduced contributions.¹⁴

Interest of this paper is only the insurance pools and their role in nuclear law and providing compulsory financial security for the nuclear operator, and their features will be presented as follows.

¹¹ They belong to an industrial or commercial company whose primary business is not insurance.

¹² Quéré A., Challenges facing the insurance industry since the modernization of the international nuclear third party liability regime, Nuclear Law Bulletin No. 94/Vol. 2014/2, NEA No. 7183, OECD, 2014, pp. 77-104, str. 84-86.

¹³ The present Members of ELINI include nuclear facilities in Belgium, Canada, Czech Republic, Finland, France, Germany, Great-Britain, Hungary, Italy, Slovak Republic, South Africa, Spain, Sweden, Switzerland and the Netherlands. The purpose of ELINI is to provide insurance capacity for nuclear liability risks to its Members.

¹⁴ For more information about the work of ELINI see the official web page <http://www.elini.net/about/>, available on 19.04.2017.

Definition and basic principles of nuclear insurance pools

A pool is essentially a group of insurance companies jointly participating, up to a fixed proportion, in the insurance of a particular risk or class of business. It is a mechanism commonly employed where the risks in question are few in number, or requires a capacity beyond the means of the individual members even if arranged on a traditional co-insurance basis, or which presents some particularly hazardous aspect which would render acceptance by conventional methods difficult if not impossible.¹⁵

There are few basic principles of nuclear insurance pools activities:

- All risks accepted are covered by net retention of individual pool members (insurance capacity). The risks may not be further individually reinsured;
- Reinsurance is arranged among pools and is therefore transparent and maximally protected against unknown accumulation of risks;
- Reinsurance among pools is direct (without using any intermediaries); therefore the cost of reinsurance is minimal.¹⁶
- Cost efficiency at a national and international level

Although we named the fundamental principles, common to nuclear insurance pools worldwide (26 insurance pools)¹⁷ we must keep in mind that these pools operate on the basis of differing constitutions and procedures reflecting the various legal, economic and market conditions and practices in their domestic territory. They also differ as to the subject of the insurance, and in this matter we can conclude that most of them exclude the insurance of radioisotopes or nuclides which are used for industrial, agricultural and medical purpose.¹⁸ On the other hand, all pools insure the nuclear power

¹⁵<https://www.nuclearpools.com/about-us>, available data on 15.04.2017

¹⁶See <https://www.nuclearpool.cz/en/historie/>, <https://www.nuclearpools.com/about-us>, and Syban's Statute available on www.syban.be, available on 15.04.2017.

¹⁷The list that we were able to make for this research shows 26 insurance pools according to a geographical presentation of nuclear pooling system available at <http://www.poolamx.com.mx/docsENG/nuclear-pools.html> on 17.04.2017 and research of the official web pages of nuclear insurance pools. The list is part of this paper and it is given at the end of the paper.

¹⁸The China Nuclear Insurance Pool, for example is one of the few pools in the world which insures operators of medical and industrial radioactive sources official data available on <http://eng.chinare.com.cn/zhzjteng/505881/505896/index.html> on 17.04.2017.

stations and most pools insure other installations of the nuclear fuel cycle and nuclear transport.¹⁹

Another difference is that some nuclear international pools operate only as a domestic pool insuring only nuclear risks (for nuclear liability and physical damage) located within territorial limits (such as the Bulgarian National Insurance Pool and the Nuclear Insurance Association of Canada²⁰) while others insure nuclear risks on an international level. At the national level, even in the cases where foreign insurance companies are members of the national pool, "*...national pools directly insure only the operators that are located in their countries and not the operators that are located in other countries...Such situation may be questionable according competition law requirements whereas the possible competition between the insurance pools might be restricted. Of course such argument is often denied referring to the situation that insurance pools do not have a goal to restrict competition rather to provide sufficient compensation system.*"²¹

What follows is another difference between insurance pools, the types of policies created by insurance pools in order to insure the nuclear operators' third party liability.

Types of policies

This is a list of the four liability policies offered by the American Nuclear Insurers which are designed to satisfy the requirements of the federal Price-Anderson Act which established a framework for handling potential liability claims that could arise in the event of a nuclear incident.

1. Facility Form Policy: This policy provides primary financial protection and is purchased by commercial nuclear power plant operators and several other nuclear facilities.

¹⁹Conclusions based on presentation on Insurance of Nuclear risks in Workshop, IEA, December, 2013, available at <https://www.oecd-nea.org/ndd/workshops/nuclearcomp/presentations/documents/1.SebastianRitsma-OECD-NEALiabilityWorkshop-December2013.pdf> on 16.04.2017.

²⁰Official data available at <http://www.niac.biz/services.php> on 17.04.2017.

²¹Rimšaite L. *Nuclear Insurance Pools: Does the Horizontal Cooperation leads to the Market Foreclosure?* Journal of business Law and Ethics, Vol. 1 No.1, December 2013, pp. 16-26, pp.20.

2.Secondary Financial Protection (SFP) Policy: This policy is “following form” coverage for operators of nuclear power plants for a loss that exceeds the \$375 million limit of the Facility Form Policy.

3.Facility Worker Form Policy: This policy covers radiation tort claims of workers at nuclear facilities insured by ANI. This is an industry-wide program subject to a single shared industry aggregate limit of \$375 million.

4.Supplier’s and Transporter’s Policy: This policy is designed for companies providing products and services to operators of nuclear facilities.²²

An example of third party liability insurance policies that are currently offered is the Czech nuclear insurance pool, which includes the following:²³

a) Civil Liability Insurance of a Nuclear Installation Operator for nuclear damages incurred to third parties as a consequence of operation of a nuclear installation or from transportation of nuclear material ²⁴ This Insurance is designed for holders of a license for operation of a nuclear installation or of a license for any activity related for the use of a nuclear installation and holders of a license for transportation of nuclear material who are, in accordance with the Atomic Act, operators liable for nuclear damage on grounds of an international agreement (Vienna Convention on Civil Liability For Nuclear Damage) to which the Czech Republic is a party. This insurance is offered with accordance to General Insurance Conditions for Insuring Liability for Nuclear Damages JPO 97.

b) Insurance of operators of ionizing radiation sources (radionuclide emitters), which have no obligation to conclude a third party liability insurance contract for nuclear damage but who consider such an insurance as needed for securing their entrepreneurial activities (facultative insurance).

c) Insurance of general liability of operators of nuclear installations (insurance of non-nuclear - conventional damages).This insurance is only offered as a complement to insurances listed under a) and b) above.

d) Insurance of Directors and Officers Liability of a joint-stock company for a damage arising as a consequence of nuclear damage. This insurance is available only for these clients, which have concluded a valid

²² Data available on the official site of American Nuclear Insurers <http://www.amnucins.com/insurance/>, available on 15.04.2017.

²³Data available on the official site of the Czech nuclear insurance pool available at <https://www.nuclearpool.cz/en/pojisteni-odpovednosti/>, on 19.04.2017. This pool offers policies for first party liability or insurance for material damage but in order to safe place we didn’t present them.

²⁴ This is mandatory insurance - as required by Act no. 18/1997.

insurance cover for Directors and Officers of a joint-stock company for conventional (i.e. non-nuclear) damage.

e) Liability insurance of suppliers of products and services for nuclear installation operators

Nordic Nuclear Insurance is another example of nuclear insurance. This company offers three kinds of insurance for nuclear installations:

1. Material damage insurance covering damages to the plant itself and to radioactive material during transportation.

2. Business interruption insurance for nuclear power plants that covers the additional costs for replacing energy to customers due to an interruption of the production and loss of fixed cost and profit.

3. Third party liability insurances compulsory for the operator of a nuclear power plant. The insurance provides compensation for damages to third parties (humans and/or environment) as a result of a radiological accident. This insurance is also compulsory when transporting nuclear material such as nuclear fuel. The compulsory sum insured is SDR 300 million (about SEK 3.0 billion) in Sweden and SDR 600 million (about €680 million) in Finland.

The Swiss Nuclear Pool insures both material damage and third party liability. The third-party liability insurance is based on international conventions and underlying national laws. In Switzerland the relevant law is Kernenergiehaftpflichtgesetz (Federal Nuclear Energy Liability Act) or KHG. It comprises the principles of the Paris Convention on third-party liability in relation to nuclear energy. The Convention not only guarantees victims of a nuclear accident a minimum overall compensation amount, but is also protecting the interests of victims. In addition, under the Convention it is compulsory for the nuclear power plant operator to take out insurance or other financial protection against liability. In Switzerland this sum currently amounts to CHF 1.1 billion. Due to the importance placed on protecting victims, the operator is not granted a license to operate unless insurance or another form of financial protection has been taken out.²⁵

The Russian Nuclear pool offers the following policies²⁶:

1. nuclear third party liability insurance
2. transportation nuclear third party liability insurance
3. material damage insurance

Although they generally offer different types of policies they all cover these two types of insurance:

²⁵<https://nuklearpool.ch/en/legislation> 19.04.2017.

²⁶<http://www.ranipool.ru/eng/Association/Insregulations/>

- Insurance of physical damage or first party liability that will provide coverage for all the operator's assets on the nuclear facility. This damage may consist of various types of actual damage and/or future damage or loss of income which has resulted from the actual damage and

- nuclear third party liability policy or liability insurance which covers all aspects of off-site nuclear damage suffered by people, businesses and other property not directly related to the nuclear site.

Aside from these two types of insurance policies that have become standard among nuclear insurance pools, these pools also include "... *new covers for instance those protecting the balance sheet of nuclear operators in a general sense, or providing profit sharing elements, have recently been introduced. These new insurance products have rapidly been shared with and taken up by other pools via the international pooling mechanism, providing a most suitable forum for the interchange of information.*"²⁷

Challenges faced by nuclear insurance pools

The modernization of the conventions with the increase of the compensation amount, the wider definition of nuclear damage and an increase in compensation period has been a challenge for the nuclear insurance industry and the nuclear insurance pools. According to Pelzer the main points of concern of the insurance industry are the following²⁸:

- Cost of measures of reinstatement of impaired environment [Articles I(1)(k)(iv) VC, 1(a)(vii)(4) PC, I(f)(iv) CSC]²⁹;

- Loss of income deriving from an economic interest in any use or enjoyment of the environment [Articles [Articles I (k) (v) VC, I (f) (v) CSC)]; ...deriving from a direct economic interest... [Article 1(a)(vii)(5) PC];

- Costs of preventive measures [Articles I(1)(k)(vi) VC, 1(a)(vii)(6) PC, I(f)(vi) CSC];

- Coverage of nuclear damage caused by radioactive emissions within the permitted dose limits under normal operational conditions;

²⁷Reitsma S. Nuclear Insurance Pools: World – wide practice and Prospective, available online http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/31/051/31051428.pdf, last visited on 30.04.2017.

²⁸Pelzer, N., *International Pooling of operator's Funds: An Option to Increase the Amount of Financial Security to Cover Nuclear Liability?* Discussion Paper for the IAEA INLEX Group Meeting on 21-22 June 2007, Nuclear Law Bulletin, No. 79, NEA, 2007, Paris, pp.46-47.

²⁹The acronyms "VC", "PC" and "CSC" stand for Vienna Convention, Paris Convention and Convention on Supplementary Compensation.

- coverage of nuclear damage caused by a nuclear incident directly due to a grave natural disaster of an exceptional character;
- coverage of nuclear damage which becomes evident more than ten years after the nuclear incident occurred; that applies to claims for compensation of personal injury the period of prescription or extinction of which extends to 30 years from the date of the nuclear incident [Articles VI(a)(I) VC, 8(a)(I) PC; the CSC does not extend the period of personal injury to 30 years, Article 9(1)Annex to CSC];
- in a number of States, there might be difficulties to cover the minimum amounts of liability of SDR 300 million under Articles V VC, II(1)(a) CSC and in particular of EUR 700 million under Article 7(a) PC;
- Insurance industry finally expressed concern regarding the costs of claim handling in the case of a major nuclear accident where possibly many thousands of justified and unjustified claims have to be dealt with.

Concluding remarks

The development of the nuclear industry has been associated with the insurance industry from the start, due to the principle of compulsory financial security that must be provided by the nuclear operator under the international third party nuclear liability regime. In the past the insurance industry has answered successfully the challenge of insuring nuclear risk. This was achieved only by the creation of the nuclear insurance pools worldwide, as a mechanism that has the leading role in insuring nuclear third party liability. The insurance industry is known to be the proper and experienced partner in providing nuclear liability coverage. But, the revising process in the international third party liability regime has brought new challenges for nuclear insurance pools for many reasons. A higher liability limits are being set and although they can generally be insured, other difficulties are still unsolved. For example, it is difficult for the insurer to define, and to quantify for that matter, the cost of reinstating an impaired environment, as well as the loss of income from direct economic interest in use of the environment. These specific difficulties had made the nuclear insurance pools reluctant to offer insurance in circumstances where they have difficulties in setting a premium because the lack of experience and knowledge in the matter of these heads of damage. The question is: did the revised international third party liability regime mark the way for seeking new mechanism that will lead the way in providing financial security? Is the "polluter pays" principle going to develop and take over the role of nuclear insurance pools in the future or the nuclear insurance pools will be able to keep their place in nuclear law? Or, will the

nuclear insurance pools continue to accumulate as much capacity as possible in order to answer the demands of the nuclear industry.

Nuclear insurance pool	Country	Web site
1.Nuclear risk insurers Limited	UK	http://www.nuclear-risk.com/
2.Czech Nuclear Insurance Pool	Czech Republic	http://www.nuclearpool.cz/
3.Nordic Nuclear Insurers (The Finnish and Swedish Atomic Insurance Pools merged in 20020)	Finland and Sweden	https://atompool.org/en
4.Russian Nuclear Insurance Pool	Russian Federation	http://www.ranipool.ru/eng/
5.Swiss pool of the insurance of nuclear risks	Switzerland	https://nuklearpool.ch/de/ueber-uns
6.American Nuclear Insurance	US	http://www.amnucins.com/
7.Belgian Nuclear Insurance Pool	Belgium	http://www.syban.be/en/page/history
8.Slovak Nuclear Insurance Pool	Slovak Republic	http://www.nuclearpool.sk/
9.Assureatome	France	http://www.assuratome.fr/en/2-welcome-to-assuratome
10. Bulgarian National Nuclear Insurance Pool	Bulgaria	/
11. Nuclear Insurance Association of Canada	Canada	http://www.niac.biz/
12. The China Nuclear Insurance Pool	China	http://eng.chinare.com.cn/zhzteng/505881/505896/index.html
13. Croatian Nuclear insurance pool	Croatia	
14. Deutsche KernreaktorVersicherungsge meinschaft	Germany	
15. Nederlandse Pool voorVerzekering van Atoomrisico's	Netherlands	http://www.verzekeraar-pensioenfondsdan.nl/id-nederlandse_pool_voor_verzekering_van_atoomrisico_s_rijswijk/
16. Hungarian Atomic Pool	Hungary	
17. Japan Atomic Energy Insurance pool	Japan	
18. Pool AtómicoMexicano	Mexico	http://www.poolamx.com.mx/
19. Romania Pool for the Insurance of Atomic Risks	Romania	
20. Nuclear Insurance and Reinsurance Pool, Ljubljana	Slovenia	
21. The South African Pool for the Insurance of Nuclear Risks	South Africa	

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22. The Korea Atomic Energy Insurance Pool	South Korea	
23. Espanuclear	Spain	
24. The Ukrainian Nuclear Insurance Pool	Ukraine	http://www.atomforum.org.ua/eng/ukrnuuinpool4334
25. Consórcio Brasileiro de Riscos Nucleares – CBRN	Brazil	
26. Nuclear Energy Insurance Pool of the Republic of China	Taiwan	

Annexes: List of nuclear insurance pools worldwide

