TERRORISM AND NUCLEAR DAMAGE COVERAGE

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ABSTRACT

This paper deals with nuclear terrorism and the manner in which nuclear operators can insure themselves against it, based on the international nuclear liability conventions. It concludes that terrorism is currently not covered under the treaty exoneration provisions on 'war-like events' based on an analysis of the concept on 'terrorism' and travaux preparatoires. Consequently, operators remain liable for nuclear damage resulting from terrorist acts, for which mandatory insurance is applicable. Since nuclear insurance industry looks at excluding such insurance coverage from their policies in the near future, this article aims to suggest alternative means for insurance, in order to ensure adequate compensation for innocent victims.

1 INTRODUCTION

The September 11, 2001 attacks at the World Trade Center in New York City and the Pentagon in Washington, DC resulted in the largest loss in the history of insurance, inevitably leading to concerns about nuclear damage coverage, should future such assaults target a nuclear power plant or other nuclear installation. Following the attacks, some insurers signalled their intentions to exclude coverage for terrorism from their nuclear liability and property insurance policies beginning in 2002. Other insurers maintained coverage for terrorism, but established aggregate limits or sublimits and increased premiums. Highlighted by the September 11th events are questions about how to define “acts of terrorism” and the extent to which such are covered under the international nuclear liability conventions and various domestic nuclear liability laws. Of particular concern to insurers is the possibility of coordinated simultaneous attacks on multiple nuclear facilities. This paper provides a survey of the issues, and recommendations for future clarifications and coverage options.

2 “ACT OF TERRORISM” VERSUS “WAR-LIKE EVENT”

A threshold issue is how to define “acts of terrorism” and whether they can be distinguished from “acts of war” (or other war-like events) subject to existing exclusions in the nuclear liability conventions, domestic laws, and insurance policies. Within the framework of international law, an impressive expansion of positive law in the field of anti-terrorist legislation was developed during the twentieth century, mainly under the auspices of the United Nations. However, the problems surrounding the ambiguity of the definition of “terrorism” and the differences between “act of war” and “terrorist act” [or between “national liberation movement” and “terrorist organisation”] were not tackled. Terrorism is far from a new phenomenon, and there has been ample opportunity to modify the “war-like” exemptions under the international conventions on nuclear liability and insurance policies to include terrorist activities.

The concepts of “Act of Terrorism” and “War-like Event” are defined by a number of UN Resolutions and by the Resolutions adopted in response of the September 11th attacks. Lacking a unified definition of terrorism, such resolutions do not characterize terrorism as a “war-like” event, but either condemned terrorism and underline its international character and classification as a threat to international peace and security, while highlighting the obligation of the international community to cooperate in the elimination of

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international terrorism in all its forms and manifestations or, on the other hand, merely laid down the rights and obligations related to identifying, sponsoring and combating international terrorism.

Finally, a number of international treaties on terrorism have directly or indirectly foreseen potential terrorist attacks on buildings, facilities or platforms by means of aviation or maritime navigation. Clear definitions and delineation of the concept of "terrorism" are, however, absent in existing international instruments. Terrorism is not defined in terms of interstate or intra State conflicts, but more as civilian(s) acts versus (whether as goal or target) State public entities. It gives no basis for assimilating terrorism as "hostilities."

Finally, also the Convention on the Physical Protection of Nuclear Material of 1979 (which obliges States to combat unlawful taking and use of nuclear material within their territory or on board their ships or aircraft during international nuclear transport), unfortunately, also does not give a definition of terrorism. It does, however, contemplate the possibility of terrorist groups using nuclear material as a weapon to achieve their goals. As such, it might therefore provide a basis for the development of a future legal framework dealing with nuclear terrorist acts.

To conclude, the existing UN Conventions on terrorism do not define terrorism, but rather seek to outlaw specific forms of terrorist action (such as hijackings and bombings), and provide for rules on criminal sanctions and extradition. Lacking a unified definition of terrorism, even individual traditional definitions have some shortcomings. First of all, they generally focus on groups and group members, while excluding individual (non-group organized) activities. Another weakness is the criterion of violence in a traditional form; whereas with the current highly computerized and globalized world, computer "virus" sabotage might be thinkable (which, in case of nuclear facilities, could have serious consequences by penetrating vital computer software). Furthermore, current definitions of terrorism all incorporate the condition of politically motivated behavior, whereas such acts might also be perpetrated out of financial profit or religious and cultural motivation. It can be concluded that acts categorised as "terrorism" or "international terrorism" are those acts committed outside a situation of military hostilities or situations of war and violate human rights. However, some latitude is warranted in case such terrorists act on the basis of claimed sovereignty to be 'at war'. Movements of national liberation (which could be categorised under the heading of "hostilities" and "invasion") should be differentiated from terrorism in so far as the first seeks to implement the right of national self-determination.

The September 11th attacks took place in peacetime, and were not part of any recognised armed conflict, declared or otherwise. They are properly viewed, not as violations of the law of war, but as "crimes against humanity" (which are not dependent on an act being part of an armed conflict). They were also violations of US law and various international conventions on terrorism, and fell outside the category of national political or international war-like disturbances. Members of terrorist organizations are generally not members of armed forces but rather of non-state armed groups, may be hard to distinguish from civilians, and may indeed claim civilian status.

The clauses proposed by insurers should be viewed in the light of the above. For instance, British Nuclear Insurers (BNI) gave the International Atomic Energy Agency (IAEA) and the OECD Nuclear Energy Agency (NEA) a typical terrorism exclusion clause utilized by the Lloyd's market. It defines an "act of terrorism" as:

> *an act, including but not limited to the use of force or violence and/or the threat thereof, of any person or group(s) of persons, whether acting alone or on behalf of or in connection with any organisation(s) or government(s), committed for political, religious, ideological or similar purposes including the intention to influence any government and/or to put the public, or any section of the public in fear.*

A draft limitation of coverage for terrorist acts circulated by American Nuclear Insurers (ANI) on November 30th, 2001, provided:

the term "terrorist act" as used herein means a violent or otherwise hostile act or an act dangerous to human life, tangible or intangible property or infrastructure by any person or group, whether acting alone or on behalf of any organization or government, which causes damage to property or injury to persons, or represents a threat thereof and appears to be intended to (i) intimidate or coerce a civilian population; or (ii) disrupt any segment of an economy; or (iii) influence the policy of a government by intimidation or coercion; or (iv) affect the conduct of a government by mass destruction, assassination, kidnapping or hostage-taking.

It is clear that only through an extension of such an exemption clause on terrorism, and within the limits as set out in this section, can it be ensured that insurers escape coverage of the nuclear operator's liability. This is further confirmation of the interpretation that, without such explicit revision of the current insurance policy language, terrorism would fall outside the exoneration provision. However, under both the Paris Convention (PC) and the Vienna Convention (VC), the operator will still be liable and obliged to provide coverage for third-party liability in case of terrorist attacks. Unless those conventions are changed or an authoritative and generally accepted interpretation is adopted, terrorist attacks on nuclear power plants resulting in nuclear damage will trigger the strict liability of the operator. The following section will demonstrate this.

3 INTERNATIONAL NUCLEAR LIABILITY CONVENTIONS

Since the nuclear liability conventions generally set the international standard for nuclear liability coverage (as binding treaty obligations and/or as models for many national laws), we have examined in some detail the conventions' provisions on "war-like" acts to determine whether they were intended to exonerate operators from liability from acts of terrorism. In light of the importance of the issues addressed herein, we also analyzed the readily available *travaux préparatoires* of the Paris and Vienna Conventions to identify the purpose and intent of a treaty.

4.2 Paris Convention

The Paris Convention imposes strict liability upon the operator for nuclear damage resulting from an incident in its installation. According to the legal channelling principle, no person will be liable other than the operator. However, the Convention leaves in place liability of "any individual for damage caused by a nuclear incident for which the operator, by virtue of Article 3(a)(ii)(1) and (2) or Article 9, is not liable under the PC and which results from an act or omission of that individual done with intent to cause damage". Article 3(a)(ii)(1) and (2) refer to damage to the nuclear installation(s) itself and on-site property, whereas Article 9 refers to situations of *force majeure* which is, except if further confined by national law, limited to nuclear incidents *directly* due to "*an act of armed conflict, hostilities, civil war, insurrection* or, a *grave natural disaster of an exceptional character*". Therefore, in such cases, the operator is not liable, nor will its liability insurance coverage be triggered for compensating damage as a result of these events. However, this nuclear liability regime does not explicitly exclude the possibility that "another person" who acted with intent could be held liable for such damage. *Motif* No. 48 to the Paris Convention provides an authoritative interpretation of the exonerations, as follows:

The absolute liability of the operator is not subject to the classic exonerations such as force majeure, Acts of God or intervening acts of third persons, whether or not such acts were reasonably foreseeable and avoidable. Insofar as any precautions can be taken, those in charge of a nuclear installation are in a position to take them, whereas potential victims have no way of protecting themselves.
The only exonerations lie in the case of damage caused by a nuclear incident directly due to certain disturbances of an international character such as acts of armed conflict and hostilities, of a political nature such as civil war and insurrection, or grave natural disasters of an exceptional character, which are catastrophic and completely unforeseeable, on the grounds that all such matters are the responsibility of the nation as a whole. No other exonerations are permitted. The national legislation of the operator liable may, however, provide that he is to be liable even in the case of a grave natural disaster of an exceptional character [Article 9]. [...]
As has been pointed out (see paragraph 16), where the operator is exonerated, if the applicable law so provides an individual may be liable for damage caused by a nuclear incident resulting from that individual's act or omission done with intent to cause damage. [Emphasis added].

From a textual interpretation, it can be deduced that exonerations were permitted only on the grounds of an international war-like conflict (inter-States), internal politically motivated uprisings (intra-States), or major catastrophes originating in nature itself (geophysical), and in so far as the nuclear damage directly resulted from those exonerating incidents. Based on a literal interpretation of the text of the PC, it seems evident that a terrorist act, or terrorism in general, was not intended to be covered by the exoneration provision.

This is also likely considering the purpose of Article 6(c)(i)(1), *in fine*, which would cover only very limited situations under which an individual could be liable for his or her intentional conduct in case of war-like events, logically excluding natural disaster events. In such situations, it would be conceivable that an individual (such as the terrorist-millionaire Osama bin Laden) could be held liable for nuclear damage; and if not found, recover compensation by way of freezing his assets worldwide. It should be remembered that the right of recourse as referred to in Article 6(f) would be reserved for those situations for which the operator *would* be liable, but another individual (possibly an employee) would have caused the damage by his or her intentional conduct. This would thus be based on a teleological interpretation.

It is clear that Article 6(c)(i)(1) *juncto* Article 9 foresees the possibility where the operator is exonerated *ex* Article 9, but another person can be still liable for intentional conduct on the basis of Article 9. Since it is unlikely that such individual caused a natural disaster by his or her intentional conduct, the only possibility left is that he or she engaged in a "warlike" activity not of an international scale, *i.e.* an individual hostile act not of a political or national nature. The only possible option here is a terrorist activity, which could find its origin either inside or outside the State, but is not necessarily related to hostilities directed against the political nature of a State or a State *per se*. This could support the view that certain hostile acts done by individuals *in the course of an armed conflict* will fall within the exoneration. In December 1958, the Insurance Sub-Committee of the Joint Trade and Intra-European Payments Committee suggested with regard to Article 5 that the words "there shall be no liability" be replaced by the words "the operator shall not be liable." In an armed conflict, for example, there might be cases where the enemy would be held liable. There is no further evidence that this was or can be interpreted to extend to situations outside armed inter or intra-State conflicts.

The *travaux préparatoires* of both treaty articles as well as its *Exposé des Motifs* shed some light on what the *auctores intellectuales* meant to incorporate by their definition of exoneration of the operator's liability. It made clear that the exonerations enumerated were exhaustive and a maximum allowed, based on the fact that, insofar as any precaution can be taken, operators were in a better position to do so than potential victims. It would not allow an interpretation (directly or indirectly) that terrorist acts were either incorporated in the exoneration definition (under the extension of the meaning of the legal concept of "hostilities"), or were not "meant to be covered" by the related insurance obligation of the operator for its liability.

Furthermore, States can by legislation only restrict, but not expand, the scope of exonerations. Since individual acts were clearly not meant to be covered by Article 9, it would not only be against the purpose and object, but also the literal text of the Convention, to suggest that terrorist acts would be covered by the word "hostilities." The word "hostilities" replaced the original term "invasion", and was done so later by an Amending Protocol to the PC merely to align it with the terminology of the VC that originally also employed the term "invasion." The drafters of the text, however, saw no real difference in scope of the term invasion as compared to hostilities. It was merely considered to be wider in the sense that "invasion" suggests military troops/ships or aircraft on a foreign territory, whereas "hostilities" could take place with no actual physical presence in the foreign country.
From the above cannot only be deduced that all other individual acts of sabotage or terrorism perpetrated against a State will not exonerate the operator; but, moreover, that such interpretation was inferred from a Third Party Policy. Apparently, there seems no doubt or uncertainty at that time as to what liability risk insurers were obliged to cover under the PC. As stated, the term "hostilities" was only changed in 1964 with the Additional Protocol to the PC simply to align terminology with that of the VC, which, as we will see later, based that term on international legal concepts of other conventions (basically the Brussels Convention on Liability for Operators of Nuclear Ships).

It now appears that the PC contracting parties were not willing to give any consideration to an amendment addressing terrorism during their revision discussions. Thus, under the PC, the operator will remain strictly liable for acts of terrorism. If insurance is not available, operators could be called upon to provide other forms of financial protection or the installation State would have to provide the coverage. Finally, no further indications on a possible willingness to expand existing exonerations or interpret "hostilities" to include terrorism can be seen either. The PC revision process, concluded only in February 2002, clearly could have provided a perfect opportunity to deal with this problem. However, a final text of the revised PC was approved, and was signed in February 2004. Due to lack of necessity claimed by the Government representatives, the revised PC only deletes the exoneration in case of natural disasters (as does the revised Vienna Convention (VC)).

4.2 Vienna Convention

A similar conclusion can be drawn from the text and *travaux préparatoires* of the Vienna Convention. Article IV.3(a) of the current version of the 1963 VC provides:

> *No liability under this Convention shall attach to an operator for nuclear damage caused by a nuclear incident directly due to an act of armed conflict, hostilities, civil war or insurrection.*

With respect to natural disasters, however, the VC is even more restrictive, allowing exoneration only insofar as national law provides for this Article IV.3(b) reads:

> *Except in so far as the law of the Installation State may provide to the contrary, the operator shall not be liable for nuclear damage caused by a nuclear incident directly due to a grave natural disaster of an exceptional character.*

Besides these exonerations, Article IV.5 further exempts operator's liability in case of nuclear damage to the installation(s) itself, on-site property, or to means of transport. Like the PC, the VC provides for a limited recourse possibility of the operator. Article IV.7(a) provides that nothing in this Convention shall affect:

> *the liability of any individual for nuclear damage for which the operator, by virtue of paragraph 3 or 5 of this Article, is not liable under this Convention and which that individual caused by an act or omission done with intent to cause damage* [...].

For the recourse action, and possible conclusions drawn from it, the same reasoning can be applied as that related to the PC. Therefore, also with respect to the VC, a mere textual interpretation would not justify exemption of liability in case of a terrorist attack. This is further confirmed by the *travaux préparatoires* of the VC, which originally aimed at even restricting liability exemption in case of war-like events, in same manner as with respect to natural disasters while referring to"invasion" and not "hostilities". During later negotiations on the draft Convention, the text of this provision was finally revised, as it was felt that, only in case of natural disasters, national law could in view of the construction technology and insurance coverage available decide to no longer exempt the operator's liability in such cases, whereas "war-like" events remained to be a matter of the State entirely outside the responsibility of the operator.

The Article-by-Article comments further demonstrated that, as in the PC, national law could only restrict, but not extend, these limited exonerations. The negotiators thus all agreed that absolute liability of the operator was the main principle and that "paragraph 3 provided for exceptions to that principle and its scope should therefore be as narrow as possible".
As to the revision of the term "insurrection" into "hostilities", it seemed that this was due to reference to Article VIII of the Brussels Convention of Operators of Nuclear Ships, stating that similar language should be incorporated in the VC and in the general understanding that, in case of war-like acts against nuclear ships, "hostilities" would be a better concept than "invasion." The latter, while certainly meaning the same, however, would also anticipate war-like events potentially perpetrated on national territory of the State-flagged nuclear ship wherever its location.

Suppose, in light of more recent practice and increasing cases of terrorist attacks, somehow this limitation would have been felt to be too narrow, certainly the revision of the Vienna Convention of 1997 would have provided a perfect opportunity to look at this again. Indeed, the article on exemptions was discussed intensively, however, it was used to only further restrict the exoneration possibility, *i.e.,* the reference to natural disasters was deleted as exoneration. Article IV.3 of the 1997 VC was amended to read:

> *No liability under this Convention shall attach to an operator if he proves that the nuclear damage is directly due to an act of armed conflict, hostilities, civil war or insurrection.*

This seems entirely in line with the purpose and objective of the Vienna Convention and its *travaux préparatoires* that exemption to the principle of absolute liability and its scope should be as narrow as possible, and used to only further restrict the exoneration possibility. Similarly, the Convention on Supplementary Compensation addresses war-like acts only in its Annex (which applies to a State not a party to the VC or PC). 1997 CSC Annex Article 3.5(a) provides:

> *No liability shall attach to an operator for nuclear damage caused by a nuclear incident directly due to an act of armed conflict, hostilities, civil war or insurrection.*

From the above analysis of the Paris and Vienna Conventions can be concluded that there is no valid justification to interpret the exoneration for "hostilities" as to include "terrorist attacks", neither from a textual or teleological interpretation, from their *travaux préparatoires*, nor from the later revision process of these conventions (including the 1997 CSC).

4 NUCLEAR INSURANCE

4.1 Insurance of the nuclear risk

To understand how nuclear damage might be covered, one has to bear in mind the specific ways nuclear risks now are insured. Studies carried out in the 1950s and early 1960s indicated that the capacity of individual insurance companies was insufficient for covering nuclear risks. Similarly, there was no experience with covering these types of risks. To overcome these problems, nuclear insurance pools were created on a national basis. This means that, in a given country, several insurance companies have joined their forces in order to each cover a small part of the third-party liability of an operator. Those nuclear insurance pools are still effective today; they offer not only cover for the third party liability of the nuclear operator, but also for the property damage, worker's compensation, etc. As a consequence of the fact that the pools are organised on a national basis, a Belgian operator can only buy third- party nuclear liability insurance with the Belgian nuclear pool, a Dutch operator with the Dutch pool, etc.Every pool member declares each year for which amount it is willing or able to provide insurance coverage. The capacity of the pool is equal to the contributions of all its members.

4.2 Nuclear Insurers' Actions After September 11th

It is striking that after the events of September 11th, the reaction of the nuclear insurers on the market was somehow different from country to country. Some pools argued that, since they had their own reinsurance scheme (reinsuring each other instead of reinsuring on the common reinsurance market), they were more or less able to continue providing coverage, including the terrorism risk. Others adopted a different position. Since other authors at this conference will be describing the current insurance situations in their respective countries, we will provide only a brief overview.

To protect against terrorism claims, BNI in November 2001 quickly announced plans to issue Notices of Cancellation on nuclear policies "...to take effect from the next respective renewal dates unless the Nuclear Operators have, by that time, been exonerated from all liability consequent upon a terrorist attack of the nature of those experienced in September in the United States." BNI is one of the largest nuclear insurance

pools, which typically reinsure each other. Thus, its November 2001 notices to the IAEA and NEA indicated that nuclear insurance in some other countries might begin excluding or restricting terrorism coverage.

BNI indicated it would like to have the Vienna and Paris Conventions amended to specifically exclude terrorism from events causing nuclear damage for which the operator is liable. In addition to seeking a specific exoneration for terrorism, BNI asked the IAEA to provide some kind of binding interpretation that "hostilities" under Article IV.3 of the VC includes acts of "gross terrorism." That paragraph provides that no liability under the VC shall attach to an operator if the nuclear damage is directly due to "armed conflict, hostilities, civil war or insurrection." IAEA responded that it is merely a depository of the VC. The Vienna Agency spoke of "subsequent practice" as a source for interpreting treaties (under the separate Vienna Convention on the Law of Treaties); and, suggested that, if States simply adopted legislation exonerating operators for such damage (while agreeing the State would pay for it), such might eventually "create a practice reflecting an agreed interpretation". IAEA told BNI that amendment of the VC would be very time-consuming. Indeed, amendment of individual national laws would be a lengthy process, too. We note that the Government of Romania (a party to the Vienna Convention) in 2003 issued a decree that attempts to include acts of terrorism within the term "hostilities."

ANI (which provides nuclear liability insurance for all of the 104 operating US nuclear power plants, or almost one-quarter of the world's plants) took a different position: In November 2001, ANI decided not to exclude terrorism from its liability policy, but to impose an industry-wide aggregate limit of then US$200 million, effective January 1, 2002. ANI sent notices to its insureds indicating it would provide only US$200 million, regardless of the number of terrorist losses (but subject to reinstatement at ANI's discretion). In other words, for losses due to terrorism, ANI then would pay no more than US$200 million, regardless of the number of power plants or claims involved. This meant that, if one such terrorist related accident resulted in third-party liability claims of US$50 million, only US$150 would be available for the next accident, and so on. However, for power plants, the industry retrospective assessments under the Price-Anderson Act (which would provide over US$10 billion) presumably would be called upon to step down to cover the gap in insurance coverage, if there were more than one US$200 million loss due to terrorism. Thus, each power plant continued to have over US$10 billion of nuclear liability coverage for a loss due to terrorism. ANI recently has endorsed its nuclear third-party liability policies to remove the more recent US$300 million aggregate limit for acts of "international terrorism" in light of reinsurance from the US Government under the Terrorism Risk Insurance Act of 2002 (TRIA). Since TRIA covers only action committed by individual(s) on behalf of a "foreign person or foreign interest" to coerce the U.S. population or Government, acts of "domestic terrorism" still would be subject to the ANI aggregate limit.

Meanwhile, the reactions of the different players on the nuclear insurance market were different from country to country. Some of the players began working out self-insurance schemes covering only the nuclear terrorism risk; others tried to convince their national authorities to act as a reinsurer or guarantor. In Canada, for example, the Government is acting as reinsurer.

The fact that some nuclear insurers rushed to amend their policies as to terrorism indicates they feared they would have to pay in the event of a claim. Indeed, insurance law generally favors policyholders, unless there is a clear and unambiguous exclusion. A "bedrock insurance rule of construction" is the maxim *contra proferentem, i.e.* the burden is on the insurer (the profferer of the policy language) to show that coverage does not apply. This principle even has been incorporated in national insurance codes in jurisdictions such as, for example, China and Switzerland. It also was forcefully illustrated in the United States by the thousands of insurance coverage claims growing out of hazardous waste cleanups at Superfund sites.

5 CONCLUSIONS AND RECOMMENDATIONS

Our research has indicated that the existing exonerations for "war-like" events in the Paris and Vienna Conventions and the domestic laws we have examined were not intended to encompass acts of terrorism. Thus, the requests of some insurers that the term "hostilities" in the Conventions be interpreted to include acts of terrorism is not a viable option (notwithstanding Romania's attempt to do so). Since nuclear insurance policies written prior to September 11th do not include a clear and unambiguous exception for terrorism, the

most likely interpretation of existing policies (based on long-standing legal principles applicable to insurance) is that they cover terrorist acts (whether or not the insurers and the insureds calculated or imagined the magnitude of such at the time the policies were written).

A possibility would be to modify the limited exonerations currently in the PC, VC, CSC, and domestic laws to encompass terrorism. In that case, the operator would have no obligation to provide insurance or other financial security for terrorist acts (and presumably would place the burden on the State, which already would normally have inherent responsibility to protect its citizens against war-like and/or criminal acts). For those States party to the PC or VC, modifying domestic laws alone may be difficult, since the Conventions require their Members' laws to be in conformity with the Conventions. The PC Members clearly chose not to prolong their revision discussions by addressing terrorism, notwithstanding the strong requests of insurers. Reopening the VC or PC would be difficult and time-consuming. So, it will be quite difficult for the countries that are member of the PC or VC to change their domestic law concerning terrorism. If they would want to change the national nuclear liability provisions by accepting terrorism as an exoneration for the nuclear operator, the provisions of the Conventions would be violated. It is thus quite unlikely that nuclear civil liability principles will be changed. Theoretically, a country that is not member of the Conventions could do so more easily than member countries, but whether this would be politically acceptable remains to be seen. Therefore, the only solution for nuclear operators seems to be in trying to find additional cover for the terrorism risk, since they are liable for such under today's legal principles.

Insurers as for-profit commercial entities with limited capital and insuring capacity can cancel or restrict their nuclear damage coverage (as provided in their policies and with due notice). Nuclear insurers in most instances are not obligated to write a particular line or amount of coverage. Nuclear operators, nevertheless, remain liable under the general principles of their applicable nuclear liability regimes (international convention and/or domestic law). VC Article VII.1 provides the Installation State shall ensure the payment of claims by providing the necessary funds to the extent that the yield of insurance or other financial security is inadequate to satisfy such claims (but not in excess of the national liability limit). Similar provisions are found in Annex Article 5.1(a) of the 1997 CSC. A type of State responsibility was imported into the PC by the BSC, which obligates BSC Contracting Parties to contribute public funds (currently up to 300 million SDRs). This means that BSC member States will be liable for terrorist claims to the extent not covered by insurance. Some domestic laws also oblige the State to guarantee the operator's payment of its financial security obligations (sometimes subject to reimbursement).

If nuclear operators no longer can rely on insurance to cover the part of their potential liability arising from terrorism, they will have to provide some alternative form of financial security under the congruence principle *(e.g.,* a bond, letter of credit, or government indemnification). An important element for the sake of our analysis is the financial security requirement (so-called *congruence principle,* meaning that all liability should be covered). According to PC Article 10, for example, the operator is required to have and maintain insurance or other financial security. This mandatory financial security guarantees that the victim will be compensated for damage suffered (or, through the limitation of the available amounts, part thereof). Although the Convention clearly gives operators a choice as to the kind of financial security, operators historically have opted for insuring their liability. It is up to the national authorities to determine the nature and conditions of the insurance or other financial security that the operator needs to obtain. This does not mean that contracting parties to the Conventions are obliged to create a special body controlling the insurance market, but that they have to provide for sufficient control to ensure compliance with financial security provisions. Governments may be unwilling or unable to provide indemnities without legislative authority, so may have to seek law changes. Some governments already may have an obligation to guarantee the payment of an operator's liability for third-party nuclear damage.
In the US, the major airlines, with the support of the Bush Administration, agreed to create **their own insurance company (1)** to cover themselves against terrorist attacks. Under the plan, which the airlines approved 28 February 2002, the US Government would continue to provide subsidized coverage for especially large losses. Comparable solutions could be contemplated in the nuclear industry.

The most viable near-term alternative may be for nuclear operators that cannot obtain indemnities from their governments to accept **more limited insurance coverage (2a)** for damages resulting from terrorism than

they have had in the past (*e.g.,* with an aggregate limit), presumably with higher premiums. A **worldwide aggregate for terrorism (2b)** may be an option, particularly since a national aggregate would not have much advantage to insurers in a country with few nuclear plants. Alternatively, an operator could simply **self-insure (3)** for all terrorist claims, rather than accepting coverage with aggregate or other limits. This could take the form of a bond or letter of credit sufficient to satisfy the governmental authority that requires them to show financial responsibility as a license condition.

For the longer term, nuclear operators might utilize **an industry captive mutual insurance company (4).** Creating this on a worldwide basis would make the most sense. This would serve to spread the risk, particularly for States with nuclear programs too small to create an aggregate limit. An **Industry Credit Rating Plan (5)** similar to ANI's could be set up to refund unneeded premiums after some period of time.

Another alternative could be risk pooling by plant operators, *i.e.* a **risk sharing agreement (6)** that could provide higher amounts of nuclear damage coverage. A kind of pooling of nuclear operators already exists in the United States: Under the US Price-Anderson Act, a nuclear operator is obliged to have an individual liability coverage of equivalent to the amount of insurance available (now US$300 million); but, if the damage exceeds this amount, the nuclear operator must pay a retrospective premium of US$95.8 million per nuclear power plant. Thus, the total compensation available in the United States consists of two layers: first, the liability insurance of the individual nuclear operator; and, second, the collective layer of all licensed nuclear power plants.

A further alternative could be the creation of a so-called **damage fund (7)**, such as often proposed as a means for covering environmental liability. In fact, several types of funds can be distinguished: limitation fund, advance fund, guarantee fund and a fund replacing liability and insurance. The new mutual, pooling or damage fund arrangement eventually might provide coverage for nuclear liability risks in addition to terrorism. Such competition even could encourage existing nuclear insurers to re-enter the market for terrorism coverage and/or reduce their premiums. It could cover both third-party liability and on-site property risks, but would require the development of the ability to handle possible numerous claims (an expertise now found only in the existing nuclear insurance pools). Other proposals tend to solve the capacity problems of the insurance market by looking for alternative on the capital market. These so-called ART-Mechanisms (*Alternative Risk Transfer*) use insurance derivatives like swaps and options. One of these alternative mechanisms is the *Act of God Bonds* where the return payment of the investment highly depends on the realization of certain events (called catastrophic risks).

It is beyond the scope of this paper to discuss the advantages and disadvantages of each of the above alternatives into detail. It is important to have in mind that a great variety of mechanisms already exist and that negotiations have been going on, both in the conventional and nuclear insurance industry. It is quite unlikely that there will be one "miracle solution"; it seems more reasonable to assume that a combination will eventually be worked out and become effective.

In any case, it further would beneficial for there to be a more explicit and universally applicable definition of what constitutes "terrorism" in the context of nuclear damage coverage. For example, placing such a definition in insurance policies or other financial security documents would serve to reduce any ambiguity in the distinction between "acts of terrorism" and "war-like events." A functional definition of terrorism, for example, should include the following elements:

(i) The targeted or indiscriminate use of force, violence [not limited to physical violence, e.g., computer-system (virus) sabotage], or the threat thereof, outside the context of declared or implied armed interstate conflict;

(ii) The act creates or aims to create a public danger or a state of terror [especially involving inherent public fear of nuclear-related material], without any direct gain or benefit from the act by the perpetrators, other than influencing a government or other audience, and to serve ideological, social, philosophical, religious or other ends;

(iii) The relevant criminal offences cannot be characterized as state or state-sponsored offences [including "national liberation movements" or "resistance to foreign occupation"];

(iv) Description of direct and peripheral damage; and

(v) Description of what constitutes a single or multiple incident.

While it is unknown when or if such might occur, it would be preferable to act before any attack on a nuclear facility occurs anywhere in the world. This leaves little time for a solution to the issue of terrorism and nuclear damage coverage satisfactory to protect potential terrorist victims in the public and industry.