

Nuclear Insurance and the Pool System

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Nucleares

«The development of man-made installations for using atomic energy and the subsequent emergence of the Nuclear Energy Programme for peaceful purposes in the 1950s, presented insurers with two totally new risks and two independent but interrelated problems: the possible loss of control of a nuclear chain reaction and secondly the risk of radioactive contamination. Groups of insurance companies, set up by the world's principal insurance markets, were found to be the best alternative to traditional insurance methods. In general terms, they were intended to complement the non-nuclear activities of their members, fire insurance and public liability, by offering a similar range of cover to that available to the conventional industrial policyholder when, by virtue of nuclear exposure, no cover was forthcoming in the open market.»

Initial challenges

In the 1950s, the world insurance market faced two challenges: how to provide the **best cover** for the incipient nuclear industry and how to **protect the general public** without exposing the insurers' solvency margins as a result of claims arising from radioactive contamination.

The design of specific cover for the nuclear industry proved especially difficult because of:

- ▶ the absence of statistical knowledge or prior experience,
- ▶ the huge potential risk of damage from contamination, where notification of claims is usually subject to significant delays, and
- ▶ the need to have substantial cover capacity for a limited number of insured parties. In 2003 a little over 400 nuclear energy reactors were in operation in the entire world.

For obvious reasons, the traditional insurance mechanisms were inappropriate. Insurance markets throughout the world then formed consortia or pools covering the entire market, listing exclusion clauses in their non-pool insurance portfolios so as to take advantage of maximum capacity.

At present there are 25 insurance consortia, although it is still not possible to provide full insurance cover for a nuclear operator's exposure to risk.

Consortia for Nuclear Insurance

Reasons

a) Protection of the public – directing liability

The use of capacity by means of worldwide collaboration by insurers through consortia, has allowed governments to draw up **International Agreements** on nuclear public liability and

introduce **domestic legislation** secure in the knowledge that the obligations imposed on the nuclear operators can be covered by the insurance markets. From the outset, the consortia have maintained close links with governments and with the bodies responsible for the Agreements on Nuclear Liability (the IAEA in Vienna and the OECD for the Paris and Brussels Supplementary Agreements). The present proposals to amend these agreements and include much higher compensation limits within an expanded framework of cover, mean that this relationship is presently as important as when the agreements were originally drawn up, and the demands for additional capacity were equally significant.

The direction of all nuclear liability towards the operator of the plant has been reflected in **domestic legislation** on the public liability of the non-signatory countries to the agreements, whether it relates to legal or financial liability. Speedy compensation and provision of maximum capacity require the assurance that **only one insurance policy** be responsible for all the claims resulting from a nuclear accident, with the aim of avoiding a long, expensive investigation and possible legal action to establish who is finally liable for the damage.

b) Exclusion clauses relating to nuclear contamination

Certain risks imply such a potential for causing devastation that it is impossible to find cover in the private insurance market. Risks relating to a land war are a case in point, and another is radioactive contamination.



Consortia for Nuclear Insurance

Background

A consortium or pool consists, essentially, of a mechanism whereby a given number of insurers join forces to cover a stated risk or type of business. An insurance company is able to accept such a policy within clearly defined guidelines, on behalf of all the consortium members who have agreed to provide the insurance on a net retention basis. Each of them may act as the consortium's insurer and administrator, or the members may designate a third party to act as joint agent.

The Consortia for Nuclear Insurance were established by the world's leading insurance markets towards the middle and end of the decade of the 1950's, and they have continued developing in some markets up to the present day.

The reasons for their creation can be summarised as follows:

- ▶ The risk is potentially catastrophic due to of the unknown cumulative effects, which discourage most individual insurers who use normal reinsurance and retrocession contracts.
- ▶ The risks, because of their small number, are not sufficiently well spread to provide a balanced portfolio and do not justify setting up individual insurance departments in each company.
- ▶ The sums insured for Material Damage and the limits fixed for Public Liability have always been very high.
- ▶ The exchange of joint liability reinsurance contracts between domestic consortia provides access to worldwide insurance capacity for those domestic markets that wish to participate.

Basic principles

There are a number of basic principles which are common to all consortia operating throughout the world:

- ▶ They cover the entire market, making it easier for insurers to participate and giving them financial capacity, technical experience and qualified specialists to handle the business.
- ▶ All acceptances are based on the net retention of each member without resorting to the protection of individual reinsurance. Joint liability reinsurance is arranged with other nuclear consortia throughout the world. This transparency not only guarantees the maximum level of reinsurance security, but also imposes a well-defined limit on the participation of each member.
- ▶ Reinsurance exchanges between domestic markets are arranged without the involvement of intermediaries, and so expenses are kept to a minimum. Members of the consortia pay a proportion of the expenses amounting to about 7.5% instead of paying a reinsurance commission.

After almost 50 years' operation and an excellent security record, the nuclear industry enjoys as broad a level of insurance cover as any other large industry, and with rates as good as or better than those of other activities. It is a reflection of the confidence that insurers have in the consortia system, where the pure risk premium paid by the operators to the nuclear consortia is limited, practically, to the premium itself, given that only a tiny percentage is added to compensate for operational and administrative expenses.

Relationship between the consortium and the operator

The **contractual relationship** of each consortium with its clients operates in accordance with market practice and the preferences of the client and may be direct or through intermediaries, who in turn may be the insurance department of the operators or their insurance brokers or external agents who place the business on behalf of their clients.

Some consortia have **direct contact** with their clients and their policies are issued by the consortium in the name of their members, in the form of a coinsurance. Other consortia only act as agents **for their associated companies**, who issue the policies and sign contracts with the nuclear operators. In such cases, the business underwritten by these fronting companies is wholly reinsured by the consortium, who redistributes it to the participating associated companies, with joint liability retrocessions to consortia of foreign reinsurers.

As has been mentioned previously, however, the **reinsurance** is carried out directly amongst the ceding consortium, under the joint liability of its members and reinsurers.

The insurers, after taking legal advice, were aware at the end of the 1950s that the conditions of the policies then in force included, effectively, damage resulting from most cases of radioactive contamination. In the knowledge that said contamination could result in the overall limits of the policy being reached in all contracts within the affected area, they decided to protect their solvency by excluding radioactive contamination from those classes of insurance in which the risk was deemed to be non-insurable.

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It was, however, the potentially catastrophic exposure of the insurers' existing portfolios which motivated the exclusion. Even in the markets in which no nuclear consortia have been established, the insurance companies considered it appropriate to exclude radioactive contamination, irrespective of whether the affected countries have built nuclear power stations.

Present situation

The value of the assets of nuclear plants has been very high from the outset and is increasing through the constant development of additional security requirements. Although there is still insufficient capacity to provide full cover for the potential exposure to an operator's risk, the consortia have constantly tried to increase their support and especially in the

last five years they have managed to provide an increasingly dynamic source for the cost/effective capacity ratio relating to replacement values of power stations. At present, the consortia system can provide cover for material damage and public liability for a figure of approximately EUR 1,200 million.

The aforementioned total available capacity may be reduced substantially in line with the socioeconomic factors in each country and, more especially, as a result of assessment of the security level of the individual power stations in accordance with the requirements established by each consortium for its insurers.

Of the total number of operational reactors in the world, some 300 are insured through consortia. Furthermore, the consortia provide cover for plants that have been shut down and for other related risks, such as transport.

Confidence as a priority to ensure capacity

From the moment that the consortium system was established, a close and constructive international collaboration was created in order to study and assess the technical merits of the risks. It has always been agreed, however, that each individual consortium should develop its own specific insurance concepts which reflect existing practice in the conventional domestic markets. For their part, the reinsurance consortia have also supported them, although they do not necessarily agree with their own market practice.

As well as promoting numerous joint undertakings, individual bilateral contacts between consortia have proved important in advising insurance



industries of other countries on setting up their own consortia.

This flexible approach by the consortia has been possible because of the transparency of the system and the open exchange of information about developments in their markets, during their international gatherings.

Proportional cover for the international system of nuclear consortia

The Nuclear Consortia consider that their principal task is to provide cover for catastrophic risks relating to the nuclear fuel cycle, to obtain maximum capacity, dispersal and transparency of portfolios, as well as experience at a minimal cost. There is, however, no fully uniform approach, because the consortia have different **areas of operation**:

▲ In **Germany** only the nuclear reactors and the storage of used fuel are included within the compulsory scope of the Consortium.

▲ In **France** and **Spain** radioisotope risks that do not form part of the nuclear fuel cycle may be covered.

▲ In the **United States** cover is available for contractors' risks, even prior to the arrival of the nuclear material at the plant that is under construction, i.e. before any nuclear exposure.

If we ignore the preceding differences, which are inevitable in a free market, cover in existence internationally can be summarised as follows:

Property

▲ Material Damage

Cover is granted for nuclear plants in accordance with the conditions normally

used by the **industrial fire** sector in each market, namely fire, explosion, lightning and aircraft impact, as well as the extension for any damage to assets insured through uncontrolled reactivity and accidental contamination caused by radioactive materials. The current trend, inspired by the Anglo-Saxon market, is to draw up Comprehensive policies, a practice that has been adopted recently in Spain.

Cover for **natural risks** varies considerably in accordance with practice (and exposure, for example, to seismic movements) in the relevant market.

Political and **war** risks are always excluded.

On occasion the cost of removing accumulated contamination is covered in the course of the normal operation, to the extent that it may be necessary to allow for repairs to be carried out.

The plant is covered against **nuclear contamination** up to the insured value, as the cost of decontamination bears no relation to this figure and, at times, could exceed it.

When the amount of existing cover is less than the total value of the plant or power station, normally cover is granted for the total value, but an aggregate annual loss limit is applied based on the amount that may be placed. In the markets there are also different types of First Loss cover.

Cover may be for the «actual value» or, for plants with a long or at least undefined operational life, for total or partial value based on «new for old». This latter manner of compensation normally calls for the **rebuilding** of the insured plant; this requirement is unlikely in the event of seriously damaged nuclear power stations, and so the relevant clause

Worldwide reinsurance amongst consortia

Most of the consortia exchange their business on a **facultative basis**. Only two of them have established **quota share** reinsurance contracts as a basis for assignments to other consortia. With regard to facultative reinsurance, the consortia have developed «Set Rules for Exchanging Reinsurance amongst Consortia» in order to regulate the exchange of business, although they can be amended by bilateral agreements.

«Reinsurance Cover Notes» have also been developed as documentation for the individual risks which are ceded within the framework of the «Set Rules». Furthermore, there is an obligation for each consortium to submit a document entitled «Basis of Operations» in a certain format, in which are included the statutes of the consortium, the security for its members' cover, the list and percentage participations of its members and the set wording of the ceded insurance policies, with an additional English translation and an explanation of the terms used in its conditions and the Cover Notes. These documents are sent to all consortia with which insurance operations are transacted.

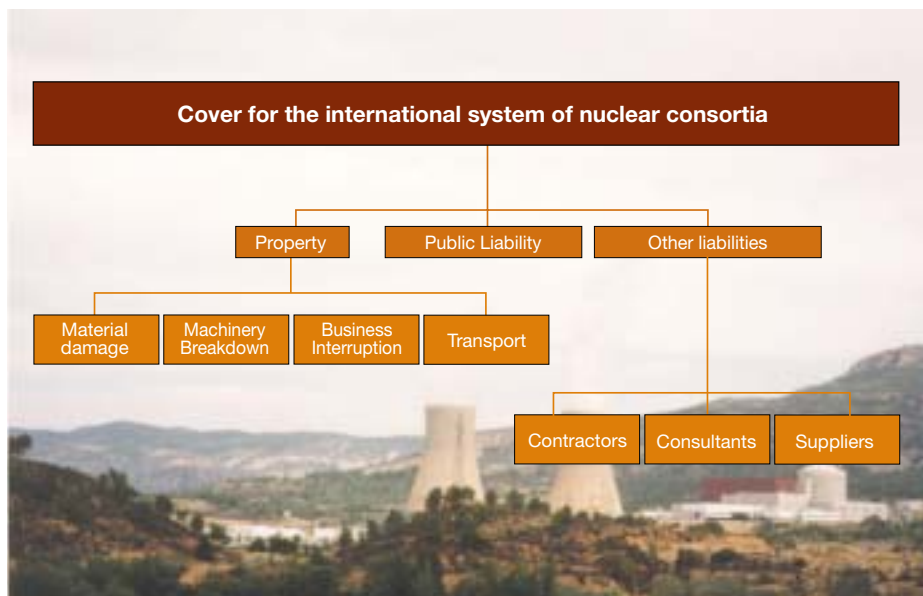
should be toned down to allow for the compensation to be reinvested in another, possibly non-nuclear, power station, in a different geographical region.

Special attention is paid to the cost of **removal of radioactive waste**. In some markets there is also some cover for the removal of an undamaged but useless power station after a major nuclear accident that has brought it to a conclusive standstill.

On account of the difficulty that may arise as a result of damage caused by nuclear risks and non-nuclear risks in the course of the same **accident**, the consortia refuse to offer cover that is restricted to nuclear risks or non-nuclear risks.

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The policy of the consortia may, however, become operative in **stages**; for example, in the first instance it may deal with cover for the fuel storage building and its contents when the fuel arrives, and then make it extend to the entire power station, when the reactor starts up or when it first goes critical. For the power station or the risks which are not assumed by the consortium, the Contractor's All Risks and Construction's All Risks that exist in the open market will



generally continue to provide cover until the normal expiry date. The exclusion clause in the reinsurance contract known as NMA 1975 attempts to take into account all these possible variations by excluding the nuclear power station from all ordinary reinsurance agreements.

▀ Machinery Breakdown

There is considerable divergence between the markets on this point. In the United States, for example, this risk is included in the cover for material damage in accordance with a type of Comprehensive policy with special stipulations for exemptions. In some consortia cover may be provided for the breakdown of machinery through a separate policy for the entire plant. Other consortia grant cover within the area of high radioactivity, leaving the remainder of the power station to the open market. There are also markets which cover the whole plant but to a limited degree, for example first loss, in the area of high radioactivity. The policies will include a list of the equipment to which machinery breakdown cover is applicable.

Clearly some types of accident may include both the breakdown of machinery and the risks included in the Material

Damage policy itself. In such cases, involving different markets, all the policies affected should provide temporary financing while the question of which part of the damage is to be assigned to each policy is clarified.

▀ Business Interruption (indirect losses, loss of profit)

The consortia offer little additional capacity for large power stations in this regard, and the tendency is to include such cover as a sub-limit, within the scope and global limits of the Material Damage policy. In Europe, this cover is available in the Belgian, British, Spanish, French and Swedish markets.

▀ Transport

Cover for material damage to nuclear equipment and material in transit is arranged in the marine market and other traditional markets, although the consortia are also used.

Public Liability

Cover provided is in accordance with the **special legislation** on liability that exists in each country (in many cases regulated by international agreements), with the State or, as is the case in the United



States and Germany, the nuclear industry itself insuring the cover in excess of that provided by the consortium, where there is liability for certain non-insurable risks.

Most consortia provide cover for a range of non-nuclear liabilities, whether or not they are related to a nuclear incident. The reasons for this practice are similar to those applicable to comprehensive cover, but because the compulsory cover for nuclear risks is imposed, as defined in the special legislation, the need to distinguish nuclear liability from the non-nuclear variety is not avoided and only a large consortium would not consider it necessary to include the «conventional» risks in its policies.

Normally there is no automatic reinstatement of the limits of the policy after an incident, or only partially. Spanish legislation provides for it and in the past the operators of the nuclear power stations underwrote it. At present it is only underwritten in Public Liability policies for Radioactive Plants.

It must be borne in mind that this system can only operate if nuclear risks are **excluded** from all the policies in the pertinent sectors (fire, home, public liability); otherwise the necessary cumulative control would be impossible. This is also applicable to the public liability policies issued to the suppliers of nuclear plants etc., who are protected in respect of public liability risks to third parties arising from nuclear risks by the

direction of the liability to the operator of the nuclear plant in question, whether by law or in accordance with the terms of the policy of Consortia Liability, and with regard to the liability for damage to the installation itself, by renouncing an appeal in accordance with the Material Damage policy or a liability exemption contract with the operator of the nuclear plant.

The Consortia also provide cover for liability arising from the transport of nuclear material in accordance with the legislation of the countries through which the nuclear material passes. In this way

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a shipment of nuclear fuel from Spain to Sweden by road should have cover of EUR 6 million in Spain, EUR 23 million in France, EUR 297 million in Belgium, etc.

Other liabilities

The contractors, suppliers and consultants, in certain circumstances may be liable for causing nuclear damage, according to the contract, as may the administrators of the

nuclear power stations. Some consortia will cover these risks, either on a contingency basis, or as an addition to the existing liability policies, in order to «buy back» the nuclear exclusion or even by assuming the entire liability risk from the insured party in question when, for example, their work relates exclusively to the nuclear industry. In every case, the risk should be assessed on its individual merits and a reply given in accordance with the circumstances and the prevailing view in the internal insurance market.

Conclusions

The **risks** that arise from civil use of nuclear energy are classified as incidents of **low frequency and high cost**. On the one hand, it requires a deployment of capacity from the insurance market that is greater than in any other field of activity, while, on the other, the risks themselves are few in number and make for an unbalanced portfolio with a scarce statistical database.

Throughout the world, nuclear risks generate a global premium amount that is disproportionately small in comparison with its political, sociological and economic importance and the magnitude of the risks assumed by the insurers. By forming net-line consortia the insurance industries have succeeded in accumulating the maximum available capacity for this type of business. The consortium system, therefore, operates to the benefit of the nuclear industry and, finally, of society in general. ■