



REPORT To

**DEPARTMENT OF ENERGY AND CLIMATE
CHANGE**

ON

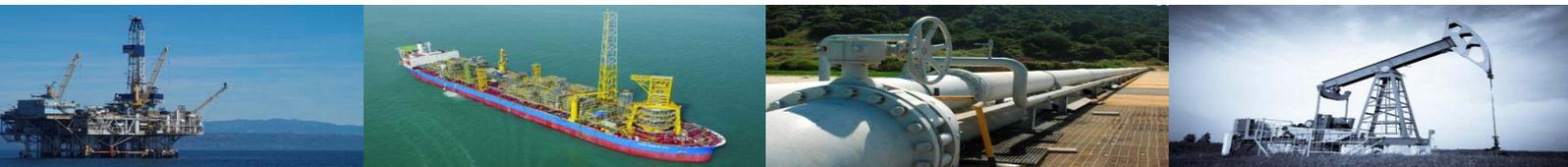
**STRUCTURE, AND PRICING OF SUGGESTED
SOLUTIONS TO GAPS ARISING FROM PARIS AND
BRUSSELS IMPLEMENTATION**

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INDECS Consulting Ltd, 52-54 Gracechurch Street, London EC3V 0EH

Tel: +44(0) 20 7397 4141 Fax: +44(0) 20 7397 4142

www.indecs.co.uk



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INTRODUCTION

INDECS' report of October 2011 on the commercial insurance implications of the implementation of the Paris and Brussels liability framework for the nuclear industry in the UK indicated that there will be a short term (next 2-3 years) insurance market failure applying to two specific areas:

- Liability for personal injury after 10 years up to 30 years, and
- Liability for damage caused by authorised discharges.

This problem is not confined to the UK, other Paris and Brussels countries face similar difficulties.

It is likely that Government will need to have a solution ready for a limited period (at the start of the regime) to provide selective cover for these particular liabilities or sectors of the industry where market failure has occurred.

This paper provides guidance on the options open to Government as to how Government might structure such a solution, and premium pricing mechanisms in order to achieve the following objectives;

- 1) Government should not be exposed directly to the operators or take on the administrative burden of the scheme, and in particular claims.
- 2) Pricing should attract commercial insurers to replace Government as long term providers of cover.
- 3) Government must be able to implement a managed exit strategy from providing the cover, in the quoted time frame, leaving the commercial market to take over.
- 4) The structure should be simple, easy to establish and to deconstruct.
- 5) The structure should be open to all sectors of the industry.
- 6) All sectors of the industry should eventually have a range of captive /mutual/pool/commercial options by means of which these liabilities may be funded and managed.
- 7) Where possible coverage should be structured so that capital need not be unnecessarily tied up.



SECTION ONE – STRUCTURING GOVERNMENT SUPPORT

The various structural options open to Government are discussed below with a clear INDECS recommendation as a summary.

I. Insurance Contract (directly with Operators)

An insurance contract directly with the Operators puts the Government in the same position as commercial insurers. Once Government takes the risk away from the Insurers / Operators, there is little incentive for the market to find an alternative solution. This would put Government into a direct commercial relationship with multiple Operators – requiring the management of multiple direct relationships and contracts.

In order to provide an insurance contract, it would be necessary for Government to put in place a structure to document and invoice insurances, and manage claims brought by the Insureds. This could be done via an insurance and claims management agreement with a third party administrator, but ultimately the decision as to whether a claim was payable would have to rest with Government.

As well as the risk of potential conflict with Operators, there would also be a significant hurdle in dovetailing the insurance provided by Insurers for the heads of claim they cover with that provided by Government. The risk of conflict between Government, Operators and insurers is high.

At this time, we cannot see any particular advantages for Government providing direct insurance coverage.

II. Reinsurance contract (with the insurers/pools ceding the risk to Government)

A reinsurance contract is a contract between the direct insurer (or pool/mutual/captive) - and another insurer(s). Essentially, it is a mechanism by one insurer to lay off risk(s) via reinsurance to limit the Insurer's exposure to a particular loss or series of losses.

Reinsurance contracts arise in a multitude of circumstances and structures. For example, they can cede specific elements of the insured risk, "packages" of similar risks, or a proportion of an insurers overall risk portfolio.

The advantage of the reinsurance structure is that the reinsurer is one removed from the direct relationship, leaving the insurer to manage the commercial relationship with the original Insured, including the detailed terms and conditions and claim management. Furthermore, most reinsurance contracts are on a "pay to be paid" basis – i.e. the insurer has to have a liability to pay the Insured and have paid the insured for the loss before having to settle a claim. For Government this actually may be the most appropriate mechanism to encourage Insurers to participate and eventually replace Government in the risks. The key driver is the reinsurance premium charge and whether this is at a level to encourage other markets to provide capacity and/or Operators to find alternative solutions.

Usually, the Insured will not have any particular knowledge of the relationship of an Insurer with its reinsurers. However, we believe that the structure and pricing of Government's participation will need to be transparent, and this transparency should assist in the development of alternative solutions by the commercial market and Operators.

It is our opinion, that a reinsurance style of contract is advantageous to Government, for the



following reasons:

- a) Government provides a standard contract to direct insurers/pools/mutual/captives.
- b) Removal from direct relationship with Operators.
- c) Government do not need to put in place direct claim management process with Operators.
- d) Reinsurance is on a “pay to be paid” basis.

III. A guarantee (such as bond or letter of credit)

A guarantee in the form of a bond or letter of credit could be structured to provide a similar contractual performance obligation as a reinsurance contract. Generally, a letter of credit would be seen as a guarantee to pay upon presentation by the holder (rather than on a “pay to be paid” basis) without the need to prove a financial loss.

The use of a guarantee is relatively unusual in an insurance context, usually because the treatment of a bond or letter of credit from an accounting perspective is different from an insurance or reinsurance contract.

Pricing of guarantees is notoriously difficult. There is no competitive “market” as such and these instruments are generally priced by the provider, with little price competition.

For these reasons we do not see guarantees as a workable or appropriate solution.

IV. Loan to Insurers

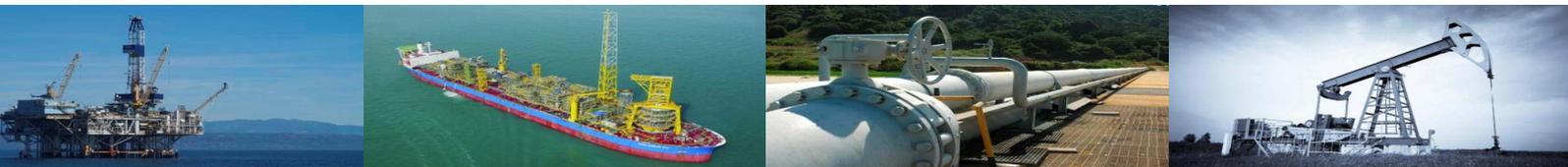
The concept is that a loan would be available to Insurers in the event of an insured loss, and that the repayment of the loan would be pre-agreed with an appropriate level of interest payable.

The concern regarding a loan is the same as for a guarantee, which is whether this is particularly interesting for Insurers in encouraging capital inflow and how it may be priced. The reluctance of Insurers to provide coverage is not a lack of capital, there is sufficient capital in the market, and therefore we do not believe that the provision of a loan would entice Insurers to provide the coverage.

INDECS’ Recommendation

Where non insurance organisations provide financial support to insurance products, experience has proven that direct interface with customers is inadvisable. Customers have high service expectations, there are statutory obligations and liabilities to consider, and liaison direct with customers is costly and risky to reputation generally.

INDECS’ recommendation therefore is that Government support is considered only as a reinsurance product to direct insurance providers, i.e. NRI, commercial insurance companies, plus ELINI and Operator captives where required. The justification of including ELINI and captives is that the reinsurance will be transacted at a robust market price (ref Section Two below) and these providers will need to decide whether the risk transfer to Government at the required price is better value for value for money than retaining the risk



SECTION TWO – PRICING THE RISK

A) MEASURING THE CREDIBLE EXPOSURE

Before we consider the mechanics of risk pricing it may be worth saying a little about how the risk exposure is assessed and measured. (It is once this has been done that pricing methodologies are applied.) For liability exposures such as the Personal Injury and Authorised Discharges there are in effect two levels of exposure;

1. The contractual exposure (which in this case for each Operator would be EU 700m on implementation per site)
2. The realistic credible worst case exposure (somewhat less than EU 700m in many cases).

The contractual exposure is the theoretical maximum exposure of the insurer and reinsurers, however depending on a variety of issues such as type of activity, location of risk, management quality, mitigation measures etc; it is rarely a credible scenario. Insureds and insurers have an interest in assessing credible scenarios in order to calculate the realistic value of the exposure at risk, and these estimates form the basis on which the pricing is derived.

Means of assessing potential liability exposures have become much more scientific over recent years. Brokers, insurers and actuaries employ risk engineers who can run sophisticated models to assess and analyse credible scenarios, and calculate potential liability claim amounts which may arise. For personal injury and authorised discharges for example, the scenarios attaching to a major power plant could be derived from a major incident, and exposure measured by concentric circles with diminishing impact and claim potential as claimants get further away. The aggregate value of claims in each circle can be actuarially assessed as a maximum estimate. For low level waste operators the assessment will inevitably be different; more gradual in nature and less incident driven, geared towards the specifics of that business.

Application of these scientific principles will also provide guidance on whether there is in effect a credible risk of multi-site liabilities, and how operators may comply with the Paris/Brussels requirements without having to pay unrealistically high prices for multi-site cover which may not be credibly necessary.

B) PRICING RISK IN COMMERCIAL INSURANCE MARKETS

Insurance risk pricing in modern markets is comprised of two components. These are generally utilised independently, but occasionally pricing can be an amalgam of both. They are:

- 1) The theoretical or technical price of the risk, and
- 2) The commercial price of the risk

Theoretical (technical) Pricing

a) Cost of Risk (CR)

Most insurance companies apply actuaries and statisticians in order to calculate the probability and cost of the risks they underwrite. Provided there is adequate history of losses and their values, and global spread, the actuaries are able to calculate a reasonably statistically accurate probability and cost of risk in a particular industry sector/geographical area. This is usually expressed as a percentage either of the amount of insurance bought by a customer (or the maximum credible loss ref. measuring the credible exposure above).



b) Cost of Capital (CC)

Under accounting and solvency rules, insurers need to allocate sufficient capital from their reserves in order to ensure that they are able to meet their contractual promises to their customers. In order to allocate capital they use basic Cost of Risk data however they also build in conservative contingencies in order to ensure that unforeseen events or combinations of events do not leave them overexposed. There is a value to the capital thus set aside, usually measured as the value that that capital could earn elsewhere.

c) Cost of Administration (CA)

Insurers have costs and expenses in reinsurance program(s), marketing, underwriting, investment management, claims handling and general management. These can form a significant part of an insurance company's Profit and Loss account, and therefore need to be included in the theoretical risk price.

The theoretical price of the risk is therefore $CR + CC + CA$ all expressed as a percentage of the overall exposure or amount insured. This is often referred to as the wholesale or technical price of the risk.

Commercial Pricing

Irrespective of the technical price of the risk, insurers operate in a competitive market where in most cases, supply exceeds demand and so there is pressure to offer insurance at a price below the technical price, often set at a level just below which a competitor may offer an equivalent product. Regulation and solvency rules continue to reduce differentiation of insurers on quality grounds, and so price becomes the main value differentiator. This means that insurance premium volatility continues to increase depending on customer procurement rules, insurer experience and market sentiment. In such an open and volatile marketplace, commercial pricing inevitably becomes emotionally driven and short term, and certainly over recent market cycles, well below technical pricing.

Other Pricing Mechanisms

- Where there is really large critical mass across a portfolio of risk (e.g. life and motor insurance) actuaries are able to calculate an accurate risk price based on statistical extrapolation of large volumes of historical data. Cost of capital and administration are less significant and pricing becomes the cost of risk plus a margin for profit (and low cost administration) only. *This would not be appropriate either for the risks envisaged here nor for the Nuclear industry which does not have equivalent critical mass of mass market insurance products.*
- Capital markets are often asked to shelter risks where they know the value at risk (e.g. the loss has occurred and has a value) and the only indeterminate factor is the time and date at which it may come due. In such cases the pricing is pure cost of capital plus profit (profit can be very high because in the capital markets there is general balance between supply and demand). *This is lending by another name and is not really effective risk transfer. It will lack credibility with the Operators as a pricing mechanism.*
- Mutual Pricing. Depending on the spread and make up of a mutual insurance association, risk pricing is set as the cost of risk for the pool plus the cost of administration of the mutual. Cost of capital is generally not priced in mutual set ups. Furthermore, the target is to break even over approximately 5 year cycle, with the ability to charge additional costs (premiums) to all participants in the event of "exceptional" loss cycle to achieve this target.



This model provides insufficient margin for uncertainty, reduces upfront costs (with an opportunity for retroactive charging), and would set the pricing too low to attract competition from the commercial insurers.

- **Excess Pricing:** Casualty insurance is typically structured in “layers” of cover, with different insurers providing blocks of cover building up a vertical tower of cover. The primary layer is key and pricing of this may be technically or commercially driven. However excess layers are priced very simply by giving discounts to reflect the higher attachment points, with the reducing probability of loss. For example if a primary layer is USD 25m, an excess layer of USD 25m in excess of USD 25m (providing USD 50m of cover) is priced as “primary price less 15%”. *This approach is commercially driven by the market and does not stand up in uncompetitive markets.*
- **Arbitrary (opportunistic) pricing:** Where capacity is short and demand is high, opportunistic insurers will quote prices which are neither technical nor commercial, and have no relationship with the probability of loss or exposure potential. Rates of 10% have been known to be quoted by opportunistic capital providers, to insureds desperate for cover. *Such pricing is arbitrary in nature and would be perceived poorly by all participants.*

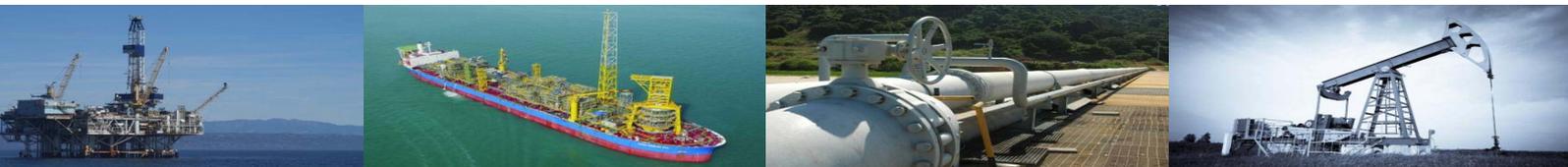
Pricing Recommendation

INDECS’ recommendation would be to utilise theoretical (technical) pricing as a basis for setting a price for the risks it will be reinsuring. Nevertheless, this must always be subject to the principle that in the (unlikely) event that the commercial price exceeds the technical price, then the commercial price will be applied. The reasons for this recommendation are as follows:

- Insurers will be naturally attracted to a product with a technical price floor. It builds in near certainty of a reasonable rate of return on capital, and a comfortable profit margin.
- A justified technical price should be “saleable” to the Operators, since the mechanism is transparent, and the principles follow reasonable economic logic.

In the unforeseen but possible event that the commercial price exceeds the technical price, a move to the commercial price is justified by the argument that failing to follow the commercial price (which will inevitably have been set by an open competitive market) would constitute an indirect subsidy.

We also recommend that whether reinsurance is provided on an annual or longer term basis, the ability of Government to re-price annually is clearly embedded to reflect shorter term market changes.



SUMMARY OF FINDINGS

Structure

INDECS' recommendation for Government to consider is to provide **reinsurance** of the anticipated two heads of cover under discussion:

- Liability for personal injury after 10 years up to 30 years, and
- Liability for damage caused by authorised discharges.

to all insurers participating in the market:

- NRI
- Commercial insurance companies
- ELINI
- Operator captives

Pricing

INDECS' recommendation would be to utilise technical pricing as a minimum (floor), as a basis for setting a price for the risks it will be underwriting. In the event that the commercial price exceeds the technical price, then the commercial price will be applied.

The actual mechanism for providing the capital to multiple providers needs to be considered – as not all providers will have equal market share.

Issues and Challenges

- Calculating the maximum estimated exposures across the two heads of damages for the whole industry in the UK will be required to assist in arriving at a pricing structure across the market as a whole. Such methodology may be applied to the other heads of damages so that Government may be able to value its potential exposure in excess of the Paris/Brussels limitation amounts (and times).
- The critical mass of the Nuclear industry in the UK is not sufficient to generate an accurate actuarial cost of risk. Discussions with and input from existing insurers, brokers and possibly actuaries will be required in order to establish an acceptable mechanism to establish a workable cost of risk.
- We assume Government has cost of capital measures which could be applied.
- Cost of administration should be an insurance industry norm which can be determined from published insurance company data.
- The insurance and reinsurance markets are open and transparent and so it will be quite straightforward to track the commercial price to monitor the fact that it remains below the technical price, or switch where it does not.

For and on Behalf of INDECS Consulting Ltd