



Insurance of large civil engineering projects

INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS

A Status Report

Fédération Internationale des Ingénieurs-Conseils
International Federation of Consulting Engineers
Internationale Vereinigung Beratender Ingenieure
Federación Internacional de Ingenieros Consultores



i n t r o d u c t i o n

This FIDIC publication, prepared by FIDIC's Risk Management Forum, comprises:

Section A

An update prepared by Griffiths & Armour in 2004 on behalf of the FIDIC Risk Management Forum

Section B

An update prepared by Griffiths & Armour in 1997 on behalf of the FIDIC Risk Management Committee, with a progress report on the implementation of the committee's recommendations

Section C

The Status Report issued by FIDIC's Project Insurance Steering Committee in 1981.

The 2004 update of Section A focuses on the widely held belief that the construction industry - and the construction insurance market - are adversely affected by insurers' reluctance to insure risks rather than liabilities. Insuring risk rather than liability will form a common thread of this update, together with commentary on the developments in the other key areas reviewed in the 1997 report.

The 1997 update of Section B outlines the 1997 position in relation to the six major points addressed in the 1981 status report. Section B1 summarizes the main points of the original publication and Section B2 examines subsequent progress.

The 1981 status report reviewed the existing procedures for complying with the insurance requirements of the FIDIC *Conditions of Contract (International) for Works of Civil Engineering Construction*, 3rd Edition, and indicating lines of action that might be taken to resolve some of the insurance problems for which examples were provided by many parties. Specifically, attention was focused on the position of the owner who may not always be sufficiently experienced to realise that one could be exposed to an uninsured loss of a catastrophic nature. The report's conclusion made recommendations for any changes that should be made to the Conditions of Contract

Since then, the FIDIC *Conditions of Contract for Works of Civil Engineering Construction* have been published in the 4th Edition (1987). In 1999, FIDIC recommended that these Conditions of Contract be replaced by the FIDIC *Conditions of Contract for Construction*, First Edition, 1999.

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A - Update 2004

The 2004 update focuses on the widely held belief that the construction industry - and the construction insurance market - are adversely affected by the insurers' reluctance to insure risks rather than liabilities. Insuring risk rather than liability will form a common thread of this update, together with commentary on the developments in the other key areas reviewed in the 1997 report.

Contents

- A1 A review of the 1981 and 1997 reports
- A2 Insuring project risk under a CAR policy
- A3 The problem of Consequential Loss
- A4 And the future?

A1 A review of the 1981 and 1997 reports

The original 1981 report reviewed FIDIC members' dissatisfaction with the gaps in insurance cover for large civil engineering projects. The report identified five main areas where change was needed.

The report was then updated in 1997, providing analysis of developments in both the construction and insurance markets.

Griffiths & Armour have been invited to review the reports on behalf of FIDIC's Risk Management Forum, and to update prior to their republication. Whilst coverage available in the Contractors All Risks (CAR) and Professional Indemnity (PI) insurance markets has not altered significantly since 1995, market capacity has reduced and premiums have increased.

This update will therefore adopt a different format from that of the 1997 report by focusing on the widely held belief that the construction industry - and the construction insurance market - are adversely affected by insurers' reluctance to insure risks rather than liabilities. The insuring of liabilities is an extraordinarily inefficient mechanism of risk transfer which, in addition to increasing premium levels, also

promotes defensive working attitudes and stifles innovation, both of which are damaging to the partnering concept.

Unlike the insurance market, the construction industry has evolved considerably over the same period. The concept of partnering has promoted change towards a more innovative culture and a shift away from a "blame" culture.

The insurance market needs to embrace these changes and take a holistic view of construction insurance rather than protecting the interests of individual parties to a contract.

The illogical economics of insuring liability is clearly expressed in Lord Woolf's interim report *Access to Justice* published in the UK, where the following comments were made:

"Professional Indemnity Insurers in construction cases generally consider that, of money paid out, more than 50% is accounted for by costs rather than compensation. A survey by consulting insurance brokers, Griffiths & Armour found the situation was worse than this overall impression: in fact £1 of construction-related compensation generated £5 of costs".

Contrast that with risk based Material Damage insurance where it is estimated each £5 of premium pays for around £4 of real compensation of loss.

Insuring risk rather than liability will form a common thread of this update, together with commentary on the developments of the other key areas reviewed in the 1997 report.

A3 Insuring project risk under a CAR policy

1 Design cover

Effective insurance of risk via a CAR policy requires the widest possible design cover available in the joint names of all contractors, sub-contractors and consultants.

The 1997 report reviewed the differences in design-related cover and noted that many CAR insurers were willing to provide the wider DE5 design wording. Unfortunately, whilst DE5 cover is still available, increasingly the market is reluctant to provide this cover with each risk being underwritten on its merits.

The market is demonstrating a preference towards the DE3 wording as this falls closest to what was the market wording and intention prior to the introduction of the DE wordings.

It is estimated that 90% of UK construction cases are on a DE3 basis, with 5 to 6% on a DE4 basis and 4% on a DE5 basis and there are indications in the UK construction market that DE5 cover may not be readily available in the future, and certainly not without increasing rates and excesses.

The majority of contracts on a DE5 basis are on single project covers. This is because insurers are more responsive to providing DE5 cover where full details of the risk are available as opposed to an annual policy covering all work.

As CAR insurers try to retract the amount of design cover available, any ambiguity regarding the interpretation of responsibility for design may lead to more protracted liability disputes. The risk of disputes promotes defensive working attitudes and an atmosphere of “innovate at your peril”. This is both counter productive to the progress of the construction industry and unsupportive of the partnering concept.

It should be pointed out that even the widest possible design cover under a CAR policy is not a total substitute for Professional Indemnity insurance which responds to claims arising out of liability for pure financial losses even in the absence of any physical damage, for example those caused by delays. One should, however, always seek a means of insuring where the policy is triggered directly by loss or damage caused by an insured risk and not by liability for that loss or damage.

2 A call for an all tier CAR policy including all contractors, sub-contractors and consultants

Recent UK case law (Co-operative Retail Services Ltd *versus* Taylor Young Partnership Limited and Others) highlighted the problems associated with claims for contribution from various parties to a

construction contract. In this case, the defendants were architects and engineers on a construction project. The works were badly damaged by fire and the defendants had been sued by the developer, who alleged that the fire was caused by their negligence. The defendants denied negligence, but said if they were to blame, the contractor and sub-contractor would be to blame as well.

In this case, the defendants were held to be unable to seek contribution from the contractor as under a joint-names CAR policy, one co-insured cannot be sued by another for losses for which they are both covered under the insurance policy.

This is likely to mean increasing liability claims against professional consultants in the knowledge that contribution cannot be sought from contractors.

In response to this case, Lord Bingham suggested that it would have been open to the consultants in the fire damage case to seek to be included as co-insured in the joint-names insurance.

Examples of joint-names Material Damage cover with subrogation rights waived against consultants have been available for some time in the Latent Defects Insurance (LDI) market. If waiver of subrogation rights is available in the LDI market, why have CAR insurers been reluctant to include consultants under a joint-names policy?

Insuring risk rather than liability also accords with the logic of distinguishing between the ability to give advice on technical aspects of risk, which generally lies with consultants, and the ability to manage and pay for financial risk which should, generally, remain the responsibility of the party who is expecting to own, use or take the profit from the project.

3 A move to owner controlled insurance

This final aspect raises the second key point of this update in that the owner, as the ultimate source of funding should want to see the greatest economy of premium cost, quality of insurance protection and project efficiency.

There has been a trend for the appointment of Project Management Companies who take responsibility for arranging the insurance in addition to

managing the project. This effectively means the insurance programme is owner controlled but the major contractors have more input into the programme at the initial stages.

Annual owner controlled programmes are available in the UK for smaller projects up to £25M. This helps develop the mind set towards owner controlled programmes on larger contracts.

The benefits of owner controlled programmes are becoming increasingly recognised and this should help the case for programmes that cover risk without the need to establish liability since owners will not wish to pay for cover arranged on a basis where the insurers may dispute the owner's own claim.

Some areas where an owner controlled programme can be of benefit are summarised in the table below.

4 Flaws in the CAR market

The events of September 11th, 2002, coupled with extreme losses on the world's stock markets, have had a significant impact on the insurance market.

Capacity problems are such that it may not be possible to provide adequate coverage and consequently "alternative" risk financing methods are becoming more frequent. To the extent that such risk financing involves loans rather than risk transfer the use of alternative risk financing may deter the development

Owner controlled programme benefits

Economy of premium	Quality of protection	Project efficiency
<p>1 Under an orthodox contractual procedure, with each party insuring their respective liabilities, there is a considerable aggregation of costs. Each insurer will incorporate a contingency premium in case other contractor's insurers do not meet any claims. There will be overlaps between policies.</p>	<p>1 The primary purpose of project insurance is to protect the interests of the owner. Owner controlled programmes allow the employer to have the ultimate choice of insurer(s). The recent demise of several insurers has highlighted the importance of financial security. The contractor may be price sensitive which is not in the interests of the employer.</p>	<p>1 Progress of a contract and costs are affected by the need to check insurances arranged by the contractors and sub-contractors. This is alleviated by an owner controlled programme. Similarly, the onus of relying on the solvency of other parties is removed.</p>
<p>2 The separate insurance cost of the participants reflects their claims experience and the costs therefore, may have little relevance to the true risk exposure on a specific project.</p>	<p>2 The onus of relying on the solvency of all named parties and these parties paying the premiums is removed.</p>	<p>2 Owner controlled programmes alleviate problems relating to establishing responsibility for loss.</p>
<p>3 The owner may also have risks and liabilities which cannot be passed on contractually and which should therefore be included within the insurance - existing structures on the site being an example.</p>	<p>3 An all tier owner controlled programme alleviates the need to co-ordinate the insurances arranged by all parties to avoid potential gaps.</p>	

of common coverage for the owner and the entire supply team.

Following September 11th, market attitudes to terrorism cover have changed. The catastrophic potential of this peril has resulted in many reinsurers being unable to provide terrorism cover.

With respect to the extensions of cover detailed in the 1997 report, these are still available within the market although each extension is now more stringently underwritten, requiring a full risk assessment before cover is provided.

A3 The problem of Consequential Loss

Subsequent to the 1997 report, the latest forms of FIDIC contracts exclude liability on the part of the contractor for “any indirect or consequential loss or damage which may be suffered by the (Employer)”. The Employer will therefore need to consider how such risks can be insured.

Liquidated Damages cover is extremely restrictive. In 2003, there was only one Lloyd’s market available to provide the cover at extremely high rates and deductible levels. This is due to the fact that only the Employer can predict the level of loss and the perils to be insured under JCT 22D may be wider than that available in the market. Also, as highlighted in the 1997 report, insurers fear “selection” against them and under the terms of the clause, losses need not be proven.

The insurance market is, however, more responsive to providing Advance Loss of Profits cover. This allows the Employer to predict the likely level of losses and allows the insurers to stipulate the insured and excluded perils.

Under an owner controlled contract works programme, the owner is then able to insure advanced loss of profits with the CAR insurer.

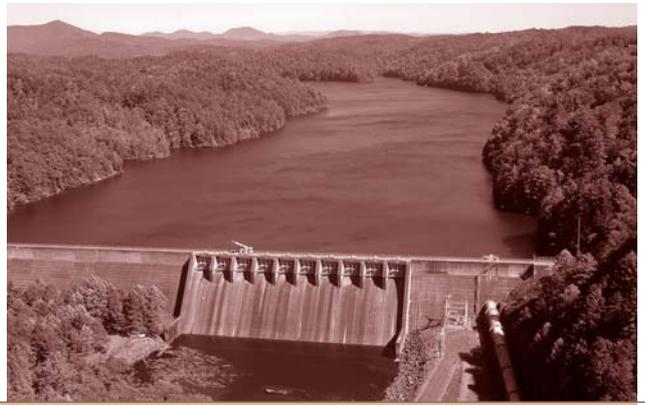
A4 And the future?

The immediate future is unlikely to offer very much innovation from the insurance market whilst it struggles with problems of capacity and seeks to rebuild adequate levels of profitability. However as profitability is seen to return so will capital capacity flow back into the insurance industry, and new insurance products shall then be easier to develop.

The construction industry should build a case, and the demand, for insurances covering project risk rather than the contractual liabilities associated with those risks.

As owner-controlled insurance arrangements become more widespread it is hoped that clients of the industry may themselves be persuaded of the superior certainty and economy of the insurance of risk on behalf of the owner and the entire supply team, particularly where a philosophy of partnering is adopted in bringing the supply team together.

The case for change should be made now, whilst the relatively high cost and limited availability of cover is in everyone’s mind, so that there can be a consensus for change as capacity flows back into the insurance market.



B - Update 1997

This update outlines the 1997 position in relation to the six major points addressed in the 1981 FIDIC status report *Insurance of large civil engineering projects*.

Contents

- B1 A summary of the original report
Summarises the main points of the original publication.
- B2 Status Report
Examines subsequent progress as outlined below.

In relation to each point we have examined the situation as it existed when the 1981 report was written and how that situation had been arrived at.

We have then recorded, briefly, the changes which the report hoped might be achieved.

We have compared the hoped for changes recorded in the section above with the current situation in the insurance market.

Where the changes in practice have not reflected the 1981 report we have set out, briefly, the reasons for the current situation being as it is in spite of the perceived needs of owners, contractors and designers and explaining the situation from the point of view of insurers and underwriters who have to provide insurance cover on large projects.

In outlining the current situation and the reasons for it we have pointed up the differences in practices in relation to small, medium to large and very large projects where this is appropriate.

B1 A summary of the original report

The FIDIC committee which reported in 1981 was appointed to discuss dissatisfaction with the gaps in insurance cover for large-scale engineering projects. Particular attention was focused on the position of the owner who may not always be sufficiently experienced to realise the uninsured losses being faced.

The position was reviewed in the light of the contract conditions which were in general use at the time, i.e., between owner and contractor - FIDIC *Conditions of Contract (International) for Works of Civil Engineering Construction*, Third Edition, March 1977, and between owners and engineer - FIDIC *IGRA Agreement for design and supervision of Construction of Works*, 1979.

The FIDIC IGRA agreement has been replaced by the FIDIC *Client-Consultant Model Services Agreement* (presently in its 3rd Edition, 1999).

The allocation of risks is summarized in the table as shown on page 70 of the 1981 report (see Appendices, page 40).

1 Dissatisfaction with the system in 1981

Problems with the current arrangements were identified as being in five main areas:

- 1 The contract between owner and contractor
 - 1 The Contract Works Clause specifically exempted the contractor for responsibility for damage “caused solely due to the engineer’s design of the Works”. Whilst this was not unreasonable, this clause resulted in problems and dispute as to whether or not damage was caused exclusively by the engineer’s design.
 - 2 Contract Works cover should be arranged on an “All Risks” basis - this was not always practicable or achievable in practice because of the restrictions of the insurance market and in particular because all insurance policies contain exclusions either express or implied.

- 3 The owner had the right to approve the policies arranged by the contractor on his behalf. This was a standard clause in any construction contract, but in practice the owner rarely had the experience to scrutinize the policies effectively.
 - 4 There was no maximum limit on the contractor's liabilities - theoretically they faced unlimited liability - and the very wide scope of the indemnities given by the contractor could not be fully matched by insurance.
 - 5 In many countries local legislation required that risk be insured with local insurers.
 - 6 Liquidated Damages: this clause was optional only and there was no corresponding clause requiring contractors to insure their liabilities under it.
- 2 The contract between owner and engineer
 - 1 The standard of care owed by the engineer to the owner was only that of reasonable skill, care and diligence in relation to the professional standards then pertaining thereby giving the engineer the possibility of a "state of the art" defence.
 - 2 The engineer was not a party to the contract between the owner and the contractor even though the contractor was dependent upon the engineer for carrying out the instructions of the owner.
 - 3 The insurance requirements stipulated for the engineer were far less onerous than those for the contractor, chiefly:
 - 1 The engineer needed only use "best endeavours" to maintain Professional Indemnity which was "reasonable", and
 - 2 The owner would indemnify the engineer for all claims which exceeded the agreed limit of the engineer's liability.
 - 3 The contractor's uninsured risks
 - 1 The Contract Works sum insured might not represent the full value at risk because of inadequate insurance capacity. This was a very rare occurrence, but was possible where:
 - a the project was located in an area prone to natural disaster, e.g. earthquake, cyclone, tidal wave;
 - b a major complex project was involved and the earlier contracts let absorbed most of the market capacity leaving a shortage of insurance capacity for later contracts;
 - c inadequate allowance was made for cost inflation over the course of a project.
- 2 Damage due to faulty workmanship and materials was excluded: however, this was a trade risk which it was generally acknowledged should remain uninsured.
 - 3 Damage due to faulty design was excluded, not merely damage resulting from "a cause solely due to the engineers design of the Works". The insurance exclusion was, therefore, wider than the "excluded risk". Depending on the precise Contract Works policy wording the contractor might end up responsible for the uninsured cost of repairing at least the faultily designed part if not the whole damage arising out of design error. There might also be a lengthy dispute whilst the parties argue as to whether or not design was the "sole" cause of the damage. Where only the faultily-designed part was excluded there could be arguments over what constituted the part excluded and what was resultant damage, and the contractor could be liable to pay for reinstatement regardless of the insurance position.
 - 4 The definition of "All Risks" cover available under a Contract Works policy was not as wide as that required by the FIDIC contract - for example, non-accidental damage was not normally covered.
 - 5 Third party liability claims could exceed the Limit of Indemnity under the Public Liability policy.
- 4 The owner's uninsured risks
 - 1 The "Excepted Risks" under the FIDIC contract, namely:
 - War risks
 - Riot, commotion or disorder
 - Use or occupation by the owner of any permanent works

- A cause solely due to the engineer's design of the works
- Radioactive contamination
- Sonic boom
- Forces of nature which could not reasonably be foreseen by the contractor.

In fact, some of these risks were insurable elsewhere - see Risk Table - but the contractor had no obligation to extend his insurance programme to cover insurable "Excepted Risks".

2 Defective design

In circumstances where:

- the design whilst incorrect was not "negligent";
- the engineer's liability was limited by the terms of his agreement, or
- the engineer's PI cover failed to operate or was exhausted and his own realizable assets were small in relation to the owner's loss

In all cases the owner was faced with the probability of irrecoverable costs.

3 Inadequate Contract Works insurance

In circumstances where:

- the policy failed to operate because of technical breach by the contractor; or
- the Limit of Indemnity was insufficient.

In both cases the contractor was still ultimately responsible for indemnifying the owner irrespective of the insurance position, but the owner ran the risk of not being indemnified, or at least of having to fund the project pending settlement of the claim.

- ### 4 Third party liability claims which were either:
- inevitable given the nature of the contract;
 - due to the negligence of the owner (although presumably these could be covered by the owner's liability insurance).

Financial losses as a result of delayed completion of the works - these could be substantial. Dependent upon circumstances these might be recoverable either from the contractor, engineer or under the Liquidated Damages clause where one was included. There was no requirement for insurance to cover these losses.

5 Uninsured risks of the consulting engineer

It might not be possible to obtain adequate PI cover because of:

- 1 Insufficient capacity in the PI market (at the time estimated to be US\$75 million maximum).
- 2 Cover might only be available on an aggregate basis, not for each and every claim.
- 3 Contractual liability exclusions.
- 4 Where cover was on an "occurrence basis" the Limit of Indemnity might prove inadequate in later years as eroded by inflation.
- 5 Where cover was on a "claims made basis" then the consulting engineer was reliant upon cover being renewed each year.
- 6 Did cover extend to include other professional, but non-engineering, advice proffered?

2 Evaluation of the system in 1981

1 Merits

The system's merits can best be summarized by the one word "familiarity", i.e.:

- 1 It had stood the test of time and was accepted by all parties including insurers.
- 2 Contractors, on whom the major responsibility for the care of the works rested, felt more comfortable if they also arranged the insurance, and liked to do so because they could use their bargaining power to negotiate the best deal and arrange cover most suitable for their own financial needs.
- 3 Owners liked it because most of the arrangements were made by the contractor and even when a claim was turned down, the contractor still paid up. Very rarely had the system resulted in a major uninsured loss.

1 Major disadvantages

- 1 Claims where defective design was a possible or contributory factor inevitably resulted in protracted dispute necessitating, *inter alia*, legal costs, the owner often having to fund interim payments, and delays in completion. In these circumstances the contractor and engineer frequently adopted defensive attitudes which prevented effective action being taken to minimize the loss.

- 2 It was becoming inappropriate in the light of the changing nature of projects:
- a An increasing number of large-scale projects could result in an increasing incidence of shortfall in insurance cover.
 - b Owners were demanding (and entitled to) a far greater say over the level of premiums and cover arranged on their behalf primarily because insurance costs on major projects represented an increasingly significant cost.
 - c Increasingly complex projects, e.g., phased hand-over, multi-contract and turnkey projects, etc., rendered the traditional structure of contracts and risk transfer obsolete.
 - d Ever more remote locations and new state of the art designs meant that underwriters were having to rate a risk with insufficient knowledge.
 - e Technology had increased the inherent design risk which would fall to be carried by the owner who might not be fully aware of this increasing risk.
 - f An increasing number of projects were located in developing and third-world countries, many of whom stipulated that insurance cover be arranged locally in markets unfamiliar with, and incapable of, dealing with such complex and large-scale risks.

3 The committee's proposed solution

- 1 The owner's interests should be protected by the appointment of a risk management adviser to provide expert guidance on the areas where the owner is vulnerable to losses and the options open to him for recovering such losses. Remuneration to be by fee, not commission.
- 2 The risk management adviser should seek to arrange an owner-controlled comprehensive project insurance programme under which the owner, engineers and all contractors would be joint-insurers.

3 The risk management adviser should assemble all the information on the design aspects of a project (assisted where necessary by an independent engineer) to provide insurers with sufficient data with which to assess the risk of design-related damage. Wherever possible insurers should be encouraged to quote terms to cover the design risks either with or (preferably) without subrogation rights against the engineer.

- 4 As the system evolved it was hoped that eventually all the owner's risks could be covered under two policies:
- Full design-related physical damage cover could be provided under the Contractors All Risks policy with full waiver of subrogation rights.
 - Comprehensive cover for financial losses arising out of insured damage.

The ultimate goal was a Project Works Policy covering not only physical damage on site, but also cost of rectification of defects even when not leading to physical damage; similar cover for loss of the insured's anticipated revenue; and for cover to continue for a reasonable period after hand-over.

Note:

The main speculative risks inherent with any development arising out of its siting, basic design and execution should not be insurable and remain the risk of the owner.

The alternative option envisaged was a comprehensive "Differences in Terms & Conditions" cover taken out by the owner specifically to fill the gaps: this was rightly regarded as an unsatisfactory and unwieldy approach, unsustainable in the long term.

4 Merits of the solution

- 1 Reduction in the areas of dispute.
- 2 The large capacity in the Contractors All Risks market would be available to enhance capacity in the far smaller Professional Indemnity market.
- 3 Speedy claims resolution minimising disruption and delays in construction programmes.

- 4 No duplication of cover.
- 5 Market capacity could be concentrated on one policy, not divided amongst several - essential for very large projects.

Implementation of the above recommendations was to be facilitated by:

- 1 Amending FIDIC contract conditions to give the owner the option of effecting a Project Insurance programme.
- 2 Lending institutions allowing fees in respect of a risk management adviser to be treated as project-related loans.
- 3 Omitting the word “solely” from the excepted risk covering design - this having the effect of transferring much of the design risk over to the owner, thereby impressing upon him the need for comprehensive design cover.

B2 The six major areas of concern expressed in the 1981 report

This section identifies the six major areas of concern expressed in the 1981 report and provides an update on, and explanation of, current insurance practice relating to those areas.

1 The owners dependence upon the contractor to maintain adequate insurance

1 The situation in 1981

Under FIDIC 1979, responsibility for arranging and maintaining Contractors All Risks insurance lay with the contractor.

Changes hoped for

A switch over to, or at very least the option of, owner-controlled insurance.

2 The situation in 1995

Options have been written into the contract conditions to allow for this possibility.

Owners can rely on the increasing experience and expertise of their own risk managers to monitor the contractor's insurance arrangements.

Insurance for a number of major projects has been handled by just one or two brokers acting for all parties, e.g.:

- Channel Tunnel - Sedgwick
- Hong Kong Airport Project - Gilman Swire Willis

Reason why

The fear then was that the interests of the owner were not adequately represented and that he was at the mercy of insurers and contractors.

However, contractor-controlled insurance is generally accepted as satisfactory:

- The contractors like it because they control costs, and levels of cover
- Many owners like it because the onus lies with the contractors and notwithstanding whether or

B - Update 1997

not cover is in force the contractor still has to indemnify the owner for all losses (other than by the Excepted Risks).

- For major projects owner-controlled insurance is now an accepted option.

2 The requirement that insurances be placed locally

1 The situation in 1981

A large number of countries, particularly within the developing and third world, only allowed Liability and Material Damage policies to be placed with local companies who, it was argued, lacked the experience, capacity and flexibility to underwrite major projects.

Changes hoped for

Complete deregulation.

2 The situation in 1995

With the exception of the European Union, where Freedom of Services applies, the trend world-wide is towards increasing regulation of insurance. In terms of coverage this does not represent a major obstacle as there are enough brokers, insurers and (most importantly) reinsurers with world-wide representation to assist local insurers in providing the appropriate coverage. In terms of capacity most of the larger risks are reinsured with no problems in London or elsewhere. Where the insistence upon locally-placed insurance can provide problems is:

- In price - reinsured risks are usually far more expensive - often because the local insurer demands a large commission.
- In security - many local insurers lack the financial security or claims handling expertise desired by owners/contractors. This problem can be overcome by a security policy available in the London market which pays claims in the event that the local insurer did not, or could not, pay up within an agreed timespan.

The other solution available to the contractor and owner is a "Difference in Cover" policy whereby the statutory minimum covers are purchased locally and top-up cover to the desired level is bought elsewhere.

Reason why

This is a political issue, not an insurance one, and for as long as insurance premiums remain a significant source of revenue for the host country then it is unlikely to improve.

3 Flaws in the Contractors' All Risks market

Note: includes problems of covering "consequential losses" - see Section 3.5 of the 1981 Report). Comments regarding cover for design are dealt with separately.

1 The situation in 1981

Capacity was generally regarded as being sufficient, but concern was expressed about:

- Availability of cover for certain natural perils in certain geographical areas.
- Inadequate provision for the effects of inflation on reinstatement costs and other consequential cost increases resulting from damage to the contract works.
- Non-availability of cover for certain perils, e.g. war, nuclear risks, etc.
- World-wide market capacity being insufficient for a major project.

Changes hoped for

Increased capacity
Wider cover

2 The situation in 1995

A number of major civil engineering projects have been successfully insured, e.g.:

- Canary Wharf - £2 billion
- Channel Tunnel - £8 billion (EML £500m)

Currently the biggest project is reckoned to be the Hong Kong Airport and world-wide capacity to be £40 billion.

Compare with the NatWest Tower project commenced in 1971 at a cost of £82m. Then it was insured by a panel of 30 insurers, it is reckoned now that the equivalent risk today would require only 6 insurers.

Regarding the excluded risks, there has been no change to this situation, indeed with the advent of the terrorism restrictions in the UK it has possibly worsened. However, these are primarily a political matter.

The 1981 report drew attention to the problem of Consequential Losses and additional costs which may flow from delayed completion of the works. The risks identified were summarized as “the owner’s loss of anticipated revenue and additional costs and loan charges incurred as a result of the Works suffering defect or damage”.

A variety of extensions of cover have been developed. These range from protection against increased costs of materials and labour affecting the subsequent stages of construction resulting from delay caused by an insured event, to a more general cover for “additional costs of construction”. Wordings available vary from time to time and from project to project, depending on the current state of competition in the insurance market.

A broad summary of what may be available is set out below for various types of loss.

- 1 Reinstatement of loss or damage/Additional costs of reinstatement

Cover available

Contract Works policy cover caters for cost of “reinstatement” which may entail substantial additional costs of labour, materials and plant, particularly where the method of construction needs to be altered to cope with the conditions following the loss.

For example, the cost to reinstate the Central Terminal Area at Heathrow Airport greatly exceeded the original cost of the relevant portion of the contract as it involves a complete redesign of the works, etc.

However, cover will be subject to limitations on the sum insured and the limit of liability needs to reflect the cost of reinstatement rather than the contract price.

- 2 Removal of debris

Cover available

A consequence of a loss is the costs incurred to remove debris or shore or prop up the works. This may include ground stabilisation costs (tunnels) and retrieval of debris from riverbeds (bridge collapses, etc.) whereby the cost of removal may be disproportionate to the value of the contract.

- 3 Removal of undamaged works to gain access for reinstatement of insured damage

Cover available

If, in order to rectify insured damage, it is necessary to damage other insured property, this will fall as a “repair cost” and be covered under the claim cost for the original loss or damage.

If no “insured damage” occurred, merely presence of defective property requires rectification, then this falls as a “trade risk” with no recovery under insurance available. There must be actual physical loss or damage.

- 4 Increased cost of construction of unbuilt portions

Cover available

Inflation Clause extension on Contract Works policy caters for inflationary increases. If a wider “additional costs of construction” cover is written without qualification this will pick up a potentially very wide area of costs following delay such as cost of redesigning unbuilt portions, costs of more expensive construction method. On widest wordings this could embrace “acceleration costs” (increasing number of employees or gangs, working 3 shifts per 24 hours rather than a single shift, etc.) and prolongation costs, etc. (cost of keeping contractor on site).

- 5 Owners increased financing costs

Cover available

Interest on Tied Capital or Additional Interest

policy - caters for bank/interest charges on servicing loans/capital invested in the project for period of delay following loss. Also loss of development profit.

6 Owners loss of Liquidated Damages

Cover available

Should site engineer grant an extension on the contract without requiring contractor to pay Liquidated Damages, etc., then employer may require contractor to effect a 22D type cover ("Employers Loss of Liquidated Damages"). However, a more correct indemnity would be achieved by the principal effecting a full Advance Profits cover. (See Section 6 below).

7 Contractors increased financing costs

Cover available

If not recoverable from the principal by a variations clause, etc., contractor may be able to purchase an Additional Interest cover to cater for additional bank charges, etc. Also requires protection against delay in obtaining payments and consequent loss of use of construction profit.

8 Contractors cost of idle plant / idle staff / disruption / supervision / extended Site establishment / retraining costs

Cover available

Following loss or damage, the contractor is able to recover from the insurer under Contract Works policy the cost of plant, etc., whilst reinstating the damaged works. For the period beyond that to reinstate the works, only cover that may be available for such prolongation costs may be picked up by the widest "Additional Cost of Construction" wordings (See 4 above), or an "Increased Cost of Working Cover" which may be available as an extension to a premises risk policy, but is generally restricted to "depot risks" excluding site risks.

9 Loss of anticipated revenue due to delay in completion

Cover available

Following loss or damage cover available either by a specific Advance Profits policy, or by extension to principal's annual Business Interruption policy.

10 Contract/project overrun costs

Cover available

Several years ago a facility was advertised at Lloyd's to insure against the cost of liabilities following project overrun. Cover is still available, but subject to a substantial excess and a risk management survey is a prerequisite.

4 Insufficient capital for the Professional Indemnity markets

1 The situation in 1981

Maximum capacity was reckoned to be \$75M and then on an aggregate basis only. Cover excluded liability under contract.

Changes hoped for

Cover to be available

- on a project basis where necessary as opposed to annually renewable
- on a claims-occurring basis to avoid owners reliance upon the engineers renewing cover especially after the end of a project
- with a limit of indemnity separately applicable to each and every claim.

2 The situation in 1995

- The maximum limit of indemnity available is now reckoned to be at least £50M whether on an aggregate basis or an "each and every claim" basis. An "each and every claim" basis of cover is not universally available - notably for US risks and for pollution risks.
- Cover on a project basis is available - single premium policies of at least six years do exist at Lloyd's and within the USA. However, they are

often subject to a three year review clause and a cancellation clause, thus reducing their effectiveness, and arrangements will need to be made to cover liabilities, including liability for personal injuries, which may subsist long after a single project cover has expired.

- Claims occurring wordings (and what is really needed is “claims caused” not “claims occurring”) are now effectively obsolete for Professional Indemnity policies - the trend within the insurance market generally is towards claims made wordings for a number of classes of liability business.
- Re contractual liabilities, the insurers are now willing to cover contractual liability to third parties with varying degrees of flexibility, however, penalty clauses, liquidated damages and fitness for purpose warranties are still excluded.

Reasons why

- The Professional Indemnity market is far smaller than the Contractors All Risks market and generates much less premium. Therefore, it simply does not have the capacity to absorb very large individual risks.
- Claims caused (or occurring) policies provide only the limit of indemnity available at the time of error; by the time the loss/claim comes to light this may have been seriously eroded by inflation.
- Insurers’ general experience of trying to fix a premium “now” for future interpretations of liability has been disastrous. The trend is, therefore, towards “claims made” cover for a variety of heavy liability risks.

5 Cover for design-related damage

1 The situation in 1981

Under the FIDIC 1979 conditions, contractors were only excused liability to repair design damage where such damage was solely due to the engineer’s design. Contractors All Risks policies themselves have never followed this exclusion preferring instead to exclude all design related damage, or, at best, all damage to the faultily designed part. Under the FIDIC *Client-Consultant Model Services Agreement* (the “White Book”) the engineer is only liable for negligent advice not necessarily faulty advice, thus giving him, inter alia, the possibility of a “state of the

art” defence. Also under the agreement the owner indemnifies the engineer for all losses exceeding the limit of indemnity under a Professional Indemnity policy.

The changes hoped for

Contractors All Risks policies to cover damage resulting from design defects except where that damage resulted solely from the engineer’s design; better still, Contractors All Risks policies to include the design risk in totality and to include the engineer as a named insurer under the policy. Underwriters to be encouraged and assisted in this by relying upon a technical audit prepared by an independent engineer.

2 The situation in 1995

Most Contractors All Risks policies now provide the wider design cover, i.e. they only exclude the faultily designed part itself. Indeed, some wider cover is now available (see below), but insurers still retain the right of subrogation against the engineer. However, in practice subrogation is rarely exercised because of the costs of litigation and the fact that rarely is blame apportioned 100% to the engineer. Insurers may also be influenced by the fact that the White Book, where used, limits subrogation rights to the engineer’s limit of indemnity. One insurer commented that pure design damage claims are very cheap and, therefore, not worth subrogating. Also there are commercial pressures from contractors on insurers not to subrogate against the design team thereby upsetting good relationships.

The state of the art defence is rarely successfully pleaded.

FIDIC’s revised contract conditions issued in 1987 now exempt the contractor from responsibility for “loss or damage to the extent that it is due to the design of the Works, other than any part of the design provided by the contractor and for which the contractor is responsible”. This has the effect of transferring the design risk away from the contractor to the owner except where the contractor is responsible for the design giving rise to loss or damage. The contractor is thereby relieved of potentially uninsurable risk except to the degree that he has caused a loss.

However, commercial pressures from contractors

and brokers are forcing insurers to cover more of the design risk. Away from the UK, some Contractors All Risks policies on major projects are now being written in the joint names of all interested parties (including designers) with a full waiver of subrogation rights.

When underwriting a CAR risk, increasing account is now being taken of the design team - either loading for known "avant garde" designers, or discounting for acknowledged experts in the field.

The use of technical audits has not found widespread acceptance yet - even when, as now, the Contractors All Risks policy provides an element of design cover. Problems are:

- Who is competent to advise, particularly on major projects where the best design teams globally are already being engaged?
- Impact on costs.
- On major civil engineering projects the detailed design is constantly being amended as the job proceeds, therefore, a technical audit prior to commencement of the work will inevitably be of little relevance.
- In comparison with the likely savings in claims payments, does a technical audit represent good value for money?
- Competition within the insurance market is such that contractors are likely to choose the insurer who does not insist upon the expense and inconvenience of a technical audit.

Experience of the use of "technical audit" in connection with Latent Defects Insurance may encourage insurers to make more use of technical auditors to review quality management on projects where they are involved as Contractors All Risks insurers.

Reason why

The Contractors All Risks and Professional Indemnity markets are very distinct - involving different underwriting skills, wordings (e.g. damaged based versus liability based), Government reporting regulations.

There is little realistic prospect of Contractors All Risks insurers ever including the whole Professional Indemnity risk - the CAR market is essentially a

Material Damage market, whereas many PI claims are not for financial losses arising out of damage, but for delay, or for cost overruns.

6 Contractors All Risks

Alternative Design Exclusion Wordings (DEW) in current use [DE Wordings (1995)]

1 Outright Defect Exclusion DE 1 (1995)

This policy excludes loss or, or damage to, the property insured due to defective design plan specification, materials, or workmanship.

1 Extended Defective Condition Exclusion DE 2 (1995)

This policy excludes loss of or damage to and the cost necessary to replace repair or rectify:

- a Property insured which is in a defective condition due to a defect in design plan specification materials or workmanship of such property insured or any part thereof.
- b Property insured which relies for its support or stability on (a) above.
- c Property insured lost or damaged to enable the replacement repair or rectification of property insured excluded by (a) and (b) above.

Exclusions (a) and (b) above shall not apply to other property insured which is free of the defective condition but is damaged in consequence thereof.

For the purpose of the policy and not merely this exclusion the property insured shall not be regarded as lost or damaged solely by virtue of the existence of any defect in design plan specification materials or workmanship in the property insured or any part thereof.

3 Limited Defective Condition Exclusion DE 3 (1995)

This policy excludes loss of or damage to and the cost necessary to replace repair or rectify:

- a Property insured which is in a defective condition due to a defect in design plan specification materials or workmanship of such property insured or any part thereof.
- b Property insured lost or damaged to enable the replacement repair or rectification of property

insured excluded by (a) above.

Exclusion (a) above shall not apply to other property insured which is free of the defective condition but is damaged in consequence thereof.

For the purpose of the policy and not merely this exclusion the property insured shall not be regarded as lost or damaged solely by virtue of the existence of any defect in design plan specification materials or workmanship in the property insured or any part thereof.

4 Defective Part Exclusion DE 4 (1995)

This policy excludes loss of or damage to and the cost necessary to replace repair or rectify:

- a Any component part or individual item of the property insured which is defective in design plan specification materials or workmanship.
- b Property insured lost or damaged to enable the replacement repair or rectification of property insured excluded by (a) above.

Exclusion (a) above shall not apply to other parts or items of the property insured which are free from defect but are damaged in consequence thereof.

For the purpose of the policy and not merely this exclusion the property insured shall not be regarded as lost or damaged solely by virtue of the existence of any defect in design plan specification materials or workmanship in the property insured or any part thereof.

5 Design Improvement Exclusion DE 5 (1995)

This policy excludes:

- a The cost necessary to replace repair or rectify any property insured which is defective in design plan specification materials or workmanship.
- b Loss or damage to the property insured caused to enable replacement repair or rectification of such defective property insured.

But should damage to the property insured which is free of such defective condition (other than damage as defined in (b) above) result from such a defect this exception shall be limited to the costs of additional work resulting from and the additional

costs of improvement to the original design plan specification materials or workmanship.

For the purpose of this exception the property insured shall not be regarded as lost or damaged solely by virtue of the existence of any defect in design plan specification materials or workmanship in the property insured or any part thereof.

7 The availability of Consequential Loss insurance

1 The situation in 1981

No facility then existed whereby the contractor could insure the revenue losses suffered by the owner in the event of delay in completion of the works. Otherwise compensation was only available to the owner if he could prove negligence against either the engineer or contractor - inevitably a time-consuming, costly and often unsuccessful process.

Changes hoped for

The introduction of an owner-arranged policy covering the financial losses as a result of physical loss or damage to the works covered under the Contract Works policy.

1 The situation in 1995

- FIDIC has not amended its contract conditions to allow this possibility, but this change is currently in hand.
- In the UK, JCT conditions were amended in 1986 to include the option of Liquidated Damages insurance - Clause 22D) (see below). This was in response to demands from owners for some form of Consequential Loss cover, however, take-up has been very limited - very few insurers offer it primarily because of fears of "selection" against them, that the level of Liquidated Damages are excessive and that under the terms of the clause losses need not be "proven".
- An alternative policy which has always been available is Advance Profits insurance which can be arranged directly by the owners as an extension of his existing conventional Consequential Loss policy. The problems which such a policy, however, are:
 - Assessing the financial loss especially for

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public sector, non fee-earning projects such as dams, highways, etc.

- The Consequential Losses can often be far higher than the Material Damage loss - insurers face exposure to enormous losses.

Amended JCT Conditions

Clause 22D - Insurance for Employer's Loss of Liquidated Damages

22D.1 Where it is stated in the Appendix that the insurance to which Clause 22D refers may be required by the Employer then The Contractor shall obtain a quotation for such insurance This quotation shall be for an insurance on an agreed value basis to be taken out and maintained by the Contractor until the date of Practical Completion and which will provide for payment to the Employer of a sum calculated by reference to Clause 22D.3 in the event of loss or damage to the Works, work executed, site materials, temporary buildings, plant and equipment for use in connection with and on or adjacent to the Works by any one or more of the Specified Perils and which loss or damage results in the Architect giving an extension of time

22D.2 The sum insured by the relevant policy shall be a sum calculated at the rate stated in the Appendix as liquidated and ascertained damages for the period of time stated in the Appendix.

22D.3 Payment in respect of this insurance shall be calculated at the rate referred to in Clause 22D.2. for the period of any extension of time finally given by the Architect or for the period of time stated in the Appendix.

22D.4 The amounts expended by the Contractor to take out and maintain the insurance shall be added to the Contract Sum.

- * The adoption of an agreed value is to avoid any dispute over the amount of the payment due under the insurance once the policy is issued. Insurers on receiving a proposal for the insurance to which Clause 22D refers will

normally reserve the right to be satisfied that the sum referred to Clause 22D.2 is not more than a genuine pre-estimate of the damages which the Employer considers, at the time he enters into the Contract, he will suffer as a result of any delay.

B3 Postscript

This update updates the 1981 report on the *Insurance of large civil engineering projects*. Since 1981, project procurement methods have developed and the emergence of Build-Own-Operate-Transfer (BOOT) and of public procurement under Private Finance Initiatives have radically extended the risks falling on the supply side of the construction industry. This paper has not sought to address those new and extended risks. They could form the subject matter of a further paper at a future date.



C - Report 1981

A status report *Insurance of large civil engineering projects* issued by the FIDIC Project Insurance Steering Committee in 1981.

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Preface

This “Status Report”, which is in fact the final report of FIDIC’s Project Insurance Steering Committee, has not been an easy task. That it finally appears in a coherent and comprehensive form is due almost exclusively to three individuals from the insurance world, who collectively were a special sub-committee to prepare the Report. These are Dr. Eric M. de Saventhem (Chair), Mr. Robert C. Steven, and Mr. J. Sprigg Duval.

Their assignment was given to them by the Steering Committee that I had the honour to chair, the other members of which (in addition to those named above) were Messrs. Gerald M. Beaumont and Kenneth N. Drobig, FIDIC, Messrs. Giuseppe Lodigiani and Iain L. Ross, European International Contractors, Mr. James M. Sprouse, from the Associated General Contractors of America, and Dr. David Sassoon, The World Bank.

Dr. Sassoon served on the Steering Committee until his resignation from the World Bank in 1980, and would also have been an active member of the special sub-committee had he continued. He deserves special mention because it was his earlier writings that first stimulated FIDIC to undertake the Project Insurance Seminar in London in 1978.

Although I have identified the organizations from which the members of the Steering Committee came, all members were selected and functioned as individuals, not as representatives of their organizations.

Furthermore, only the special sub-committee and I bear any responsibility for the contents of this Status Report. Other members of the Steering Committee may not necessarily agree with parts of the Report. However, I am grateful to all members for their assistance in the planning of the Report.

As Chairman of the Steering Committee and now also as President of FIDIC, I hope that Owners, Consulting Engineers, Construction Contractors, Financing Agencies and Insurance Advisors will find this report of value, in their considerations of insurance of civil engineering projects.

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C1 Introduction

- 1.1 In June 1977, the Executive Committee of the Federation Internationale des Ingénieurs-Conseils (FIDIC) requested Mr. Wilson V. Binger to form a non-standing Committee to organise discussion on the dissatisfaction felt with the gaps in insurance coverage for large scale civil engineering projects and if possible to offer solutions. This Committee became known as the FIDIC Project Insurance Steering Committee.
- 1.2 The Committee organised a two-day seminar in London in June 1978. Attendance was by invitation only and limited to just under 100 selected representatives from parties primarily involved in such projects. It thus included Owners, Lending Institutions, Consulting Engineers, Contractors, Loss Adjusters, Insurers and Insurance Brokers.
- 1.3 The various problems experienced in obtaining fully comprehensive insurance cover particularly with regard to design at reasonable premium costs were freely discussed during the seminar by small working parties and in plenary sessions. A detailed summary of the proceedings was subsequently published in *The Consulting Engineer*, August 1978. Copies of this summary and of some keynote papers are available to interested parties and may usefully be consulted in conjunction with this Report.
- 1.4 Following the seminar the Committee decided to issue a “Status Report” reviewing the existing procedures for complying with the insurance requirements of the FIDIC *Conditions of Contract (International) for Works of Civil Engineering Construction*, Third Edition, and indicating lines of action that might be taken to resolve some of the insurance problems for which examples were provided by many parties at the seminar. Specifically, attention has been focused on the position of the owner who may not always be sufficiently experienced to realise that he could be exposed to an uninsured loss of a catastrophic nature. Moreover, if the Committee considered any changes should be made to these Conditions of Contract, they were asked to make the appropriate recommendations.
- 1.5 Since the “Status Report” is essentially dealing with projects in which the civil engineering contract accounts for the major part of total costs, it does not concern itself with insurance aspects pertaining to the mechanical, electrical or process engineering elements of such projects. Nor does it discuss in detail the special situations arising in large composite projects where the FIDIC *Conditions of Contract (International) for Works of Civil Engineering Construction* apply to only a minor part of total outlay.
- 1.6 The views expressed in this report represent a general consensus and are not necessarily held by all members of the Steering Committee. Furthermore the views expressed are not necessarily endorsed by the organisations to which the Committee members belong.
- 1.7 Throughout this report, the Owner, Employer or Client is referred to as the “Owner”.

C2 Current Conditions of Contract

- 2.1 Introduction
 - 2.1.1 In this Report specific reference is made to Clauses 20 to 24, 47 and 65 of the FIDIC *Conditions of Contract (International) for Works of Civil Engineering Construction*, 3rd Edition March 1977 and to Clauses 2.3 to 2.5 of the FIDIC *IGRA Agreement (1979 D & S)* respectively (See Appendices 1 and 2).
 - 2.1.2 A schematic overview of the pattern of risk-allocation and transfer resulting from these Clauses is attached hereto in the form of a Liability and Insurance Table (Appendix 3).
- 2.2 FIDIC Conditions of Contract
 - 2.2.1 Under the Conditions of Contract Clause 20 the Contractor takes full responsibility for the care of the Works from commencement of the Project until a date stated in the Certificate of Completion. During this period

the Contractor must make good at his own expense any damage, loss or injury to the Works. Should such damage be caused by any of the “excepted risks” listed in paragraph (2) of Clause 20 then the Contractor must carry out repairs if so requested by the Engineer but at the expense of the owner. This responsibility is modified by the provision of Clause 65 in respect of risks specified in that Clause.

- 2.2.2 During the Period of Maintenance following Completion the Contractor must make good at his own expense defects, imperfections, shrinkages or other faults if in the opinion of the Engineer it is the responsibility of the Contractor.
- 2.2.3 It should be noted that one of the “excepted risks” listed in Clause 20 (2) is damage, loss or injury happening from a cause solely due to the Engineer’s design of the Works. This is a central issue from which many disputes arise in settling insurance claims within the contract period. This question is considered in greater detail in the later sections of the Report.
- 2.2.4 Clause 21 requires the Contractor to insure in the joint names of himself and the Owner against “all loss or damage from whatever cause arising, other than the excepted risks” (a) the Works and (b) Constructional Plant and other materials brought to Site by the Contractor. The Works must be insured “to the estimated current contract Value” of parts executed for the time being, whilst Constructional Plant and other materials must be insured for their replacement value.
- 2.2.5 Using his best endeavours to comply with the Contract the Contractor arranges an All Risk policy which will cover physical loss or damage to the Works and Plant. It is recognised by all parties having to deal with the FIDIC Conditions of Contract that there are practical limitations in complying fully with Clause 21.
- 2.2.6 A principal reason goes to the very root of insurance in that all insurance policies contain exclusions either expressed or implied and the difficulty of arranging insurance cover which will fully match the requirements of Clause 21 is at the heart of the disquiet expressed by many of those involved in the Construction industry.
- 2.2.7 Contractors Plant can be insured separately in compliance with the Contract, either on a project-by-project basis or under annual plant policies. Exposures during transit to the site can be insured by marine transit policies under various conditions. Problems can arise for the less experienced owner when he tries to evaluate the policies submitted to him by the Contractor for approval.
- 2.2.8 Clause 22 requires the Contractor to indemnify the owner against “all losses and claims in respect of injuries or damage to any person or material or physical damage to any property whatsoever ...arising from the execution and maintenance of the Works”. The exceptions to this indemnity, for which the owner indemnifies the Contractor, are listed in Clause 22 (1) (a) to (d).
- 2.2.9. Clause 23 requires the Contractor to insure the exposures resulting from Clause 22 and to include a provision for indemnification of the owner if he, the owner, should be held liable as a result of the activities of the Contractor.
- 2.2.10. In most contracts, the Owner will specify minimum amounts of indemnity to be provided under policies arranged in compliance with Clause 23. It should be noted, however, that the stipulation of such minimum limits of the insurance cover required does not affect the extent of the Contractor’s liability under Clause 22, which remains unlimited.
- 2.2.11. The first part of Clause 24 requires an indemnity from the Contractor to the Owner against claims made by the employees of the Contractor and the second part of Clause 24 requires the Contractor to insure such liability. The Contractor must also indemnify the owner against claims from employees of sub-contractors.
- 2.2.12. To comply with his insurance obligations under Clauses 23 and 24 the Contractor arranges a policy(ies)

specifically covering the Third Party and Employers Liability risks. In countries where Workmen's Compensation Acts apply, the resultant liabilities of the Contractor will be insured separately or discharged by payments to appropriate government bodies.

- 2.2.13. Because of the very wide scope of the indemnity to be provided by the Contractor under Clauses 22 and 24 there are difficulties in arranging fully matching insurance cover, for the same reasons as already referred to above.
- 2.2.14. Under Clause 47 (Liquidated Damages for Delay) the Owner may require the Contractor to be liable for substantial amounts as liquidated damages arising from delays in completing the Works. Insurance protection can be found by the Contractor for such liability arising from physical damage on site. However, as long as there is no contractual requirement to arrange such cover, Contractors will hesitate to allow for its cost in their pricing for fear of losing competitive edge.

2.3 FIDIC IGRA Agreement

- 2.3.1 The Consulting Engineer is not a party to the FIDIC Works Contract although the Contractor is dependent upon him for carrying out the instructions of the Owner. The Engineer may have a specifically worded contract or be retained on the basis of the FIDIC IGRA agreement.
- 2.3.2. It should be noted that in many countries the skill, care and diligence required from a Consulting Engineer is judged by the criterion of what is reasonable in accordance with recognised professional standards. By contrast the Contractor must in most countries and certainly under the terms of the FIDIC Works Contract provide a sound product complying with a detailed specification.
- 2.3.4. Compared with the Contractor, the Engineer's insurance requirements are relatively restricted as can be illustrated by reference to the *FIDIC IGRA Agreement* (1979 D & S), Clauses 2.3 and 2.4. This limits the Engineer's obligation to use his best endeavours to maintain at his own cost Professional Liability coverage which is "reasonable". The owner will indemnify and hold harmless the Engineer against any and all claims, expenses and costs in excess of a sum agreed between the Owner and the Engineer as being the limit of the latter's liability. In addition, unless agreed otherwise, the Engineer is required to take out, at the Owner's expense, Third Party Liability Insurance plus cover on equipment purchased by the Owner for use by the Engineer.

C3 Exposures remaining uninsured

3.1 Introduction

- 3.1.1 In order to identify the principal exposures for which the main parties involved in a Civil Engineering Construction project may not have insurance cover the positions of the Contractor, the Owner, and the Consulting Engineer are analysed in turn.

3.2 The Contractor

- 3.2.1 There are certain significant differences between the responsibilities - and the corresponding insurance requirements - imposed upon the Contractor under the FIDIC Conditions of Contract on the one hand, and the insurance cover currently available on a best efforts basis on the other hand. By way of illustrating this "short fall" the following may be cited.

3.2.2 Sums insured for Works and Contractors Plant and Equipment

As noted above, the sum to be insured in respect of the works is required to be at least equal to the

estimated current contract value of such part of the Works as has been executed at any one time. Materials destined for incorporation in the Works as well as Constructional Plant brought to the site by the Contractor must be covered up to their replacement value. There are several problems in complying with this requirement as far as the Works are concerned.

- a Generally speaking the capacity of the world insurance market will be sufficient to provide cover up to the full contract value of the Works. This is true even for multi-billion dollar projects since most insurers' acceptances are determined more by the figure representing the estimated "Maximum Probable Loss" (MPL) than to the "Total Contract Value" (TCV). The MPL figure usually represents a modest percentage of the TCV.
- b However, in zones subject to devastation by extreme natural phenomena such as earth-quake, cyclone, hurricane, tsunami, insurers must allow for the possibility that a single occurrence may destroy or severely damage very large parts of the Works right up to their substantial completion. For projects located in such zones the capacity available on the MPL basis may not be sufficient to provide cover up to the full contract value. Since such natural catastrophes will cause widespread damage insurers must also allow for their prior and ongoing engagements in policies covering other properties in the same zone.
- c As insurers' capacity will normally be absorbed on a "first-come-first-served" basis such capacity shortage may on complex projects cause acute problems to those Contractors whose contracts are signed some time after a previous major contract has been awarded.
- d In requiring Works executed to be insured up to "their estimated current contract value", FIDIC Conditions of Contract clearly seek to ensure that the indemnity payable by insurers will always cover the full cost of reinstating damaged or destroyed work. In the insurance policy the Works are insured for a specific figure - normally equal to the TCV as estimated at the time when the insurance is placed. There are policies which provide for regular updating of this insured value and there are different formulae in use for this exercise, but even where such provision is not inserted, price-escalation-related increases in the value of the Works over and above the original estimate are deemed to be accepted by insurers since the policy premium will eventually be recalculated on the actual contract price as finally agreed between Employer and Contractor when the job has been completed. Most claims, therefore, are in fact adjusted on the basis of the actual cost incurred by the Contractor for repairing or reinstating damaged or destroyed work, even when such cost is considerably higher than the cost of original construction. However, if Works nearing completion should be severely damaged, the Sum Insured may not be sufficient to cover the actual cost of reinstatement. This can be particularly the case in contracts where there is a high concentration of risk or where marked escalation of costs has occurred.

3.2.3 Faulty workmanship and materials

Under the contract the Contractor is responsible for making good faulty workmanship or defective or unsuitable material and for loss or damage resulting therefrom. Whilst cover is obtainable in respect of loss of or damage to other parts of the Works resulting from such defects in execution, few insurers will indemnify the Contractor for costs incurred in rectifying replacing or repairing the defectively executed parts themselves. The view is commonly taken that such costs ought to be borne by the Contractor since they represent a genuine trade risk.

3.2.4 Faulty design

The "excepted risks" specified in Clause 20 include "a cause solely due to the Engineer's design of the Works". Consequently, the Contractor is relieved both from responsibility for damage, loss or injury due to such a cause and from the obligation to arrange insurance in respect thereof. The problem confronting the

Contractor is that he has to show that the cause was solely due to the Engineer's design. Experience has shown that this may often be difficult or even impossible. Consulting Engineers will often argue that faulty execution of their design was at least a contributory cause of the damage, and unless such an allegation can be totally disproved, the Contractor loses all benefit from this exception and will be held responsible for repairing the damage at his own cost. To the extent that the Engineer's negligence was a contributory factor, the Contractor and his insurers may have a right of recourse against the Engineer.

The design exclusions found in most Contractors' All Risks policies are not couched in the same language as used in the FIDIC Conditions of Contract. There are two basic variants:

- i a wording which totally excludes all design-caused damage - or all damage caused by "faulty" design;
- ii a wording which excludes the faultily designed part itself, but restores cover for other (correctly designed) parts of the Works which suffer damage as a result of such faulty design.

In either case the cover does not equate to the Contractor's contractual liability. Therefore, if he cannot show that the excepted risk clause applies, the Contractor can be exposed to an uninsured loss. In the case of the second variant, there is often difficulty in determining what is the line between the faulty part itself and the resultant damage. This can lead to protracted argument.

Where the Engineer's design is found not to be the sole cause of damage, the Contractor has some protection - under variant (ii) above - with regard to what is called "resultant" damage. But since the FIDIC Contract does not make the distinction between the faultily designed part itself and the "resultant" damage to other parts of the work, the Contractor remains contractually obligated to repair at his own cost also the faultily designed part. To this extent his exposure remains uninsured under the present system.

3.2.5 Fortuity

Clause 21 of FIDIC requires that insurance be arranged "against all loss or damage from whatever cause arising, other than the excepted risks, for which he (the Contractor) is responsible under the terms of the contract". In many insurance policies the definition of the risks to which they shall apply is different from that used by FIDIC. But even when the definition in the Insurance Contract is identical to that used in the Works Contract, it may, in the context of the former, be interpreted differently. The legal situation normally is such that fortuity of an event is a necessary condition before insurers' liability under a property insurance becomes engaged. The element for fortuity thus becomes an implied condition and lack of fortuity can be invoked to deny liability resulting again in an uninsured exposure.

3.2.6 Third Party Limit of Indemnity

As earlier stated, Contracts usually specify a minimum limit up to which the Contractor is required to insure his liability to third parties (other than employees). Under both the Contract itself and at Common Law the Contractor's Liability is normally unlimited. With rare exceptions insurers will not provide Third Party Liability Cover for unlimited amounts although cover can be obtained for very high figures.

3.3 The Owner

3.3.1 The "Excepted Risks"

As mentioned in 3.2.3 above, under the FIDIC Conditions of Contract the Contractor is relieved of responsibility for loss of or damage to the Works caused by the "excepted risks". The Contractor is also relieved from any obligation to provide cover for these risks under his insurance programme. Consequently, unless the owner has himself arranged insurance to protect his interests in this respect he will find that in

the event of such a loss he must bear the cost of repair or reinstatement.

It is established that in respect of some of the excepted risks, insurance cover should be readily available and readers should here refer to the FIDIC Notes on Documents for Civil Engineering Contracts dated March, 1977. The relevant passages are attached hereto as Appendix 4.

3.3.2 Defective (or Faulty) Design

Although this is part of the “excepted risks” in as far as the Engineer’s design for the Works is concerned it deserves special treatment under the heading of the Owner’s uninsured exposures. The term “defective design” is used in preference to “faulty design” in order to embrace also those cases where a design was “correct” in terms of the state-of-the-art ruling at the time the design was made and where the knowledge of its being “faulty” is derived from subsequent developments leading to an improved state of the art. “Faulty” has a pejorative connotation in the sense that whoever made or provided the design was “at fault” in so doing.

It is a matter of experience that in the event of a major loss due to defective design of the Engineer, recovery under the Contractor’s Policy will at best be partial (as illustrated in Section 2.1 above). Settlement will often be delayed for long periods whilst disputes concerning applicable responsibilities are being sorted out.

Inasmuch as the Engineer’s design is found to be the cause of the damage, the Owner may expect to be able to recover costs of repair or reinstatement from the Engineer. However, the agreement under which the Engineer has been retained may specify certain limits for his liability with regard to such costs. Even if there is no such limit written into the agreement the amount claimed may exceed the level of Professional Indemnity cover carried or indeed obtainable by the Engineer, and other resources of the Engineer may be small compared to the costs the Owner might wish to recover.

Moreover before the owner can hope to make any recovery from the Engineer he will usually have to show not only that the damage is due to the Engineer’s design but also that the design was faulty in terms of the “state of the art”. In other words, the Owner will have to demonstrate that in drawing up the design in question, the Engineer has not exercised all reasonable skill, care and diligence in accordance with recognised professional standards. Professional Liability Insurance will not normally respond to the owner’s claim unless a “breach of duty” can be proved against the Engineer. As modern projects call for more and more innovative methods of design and use of new materials and techniques, the “state of the art” defence put up by the Engineer and his Professional Liability Insurers may often be found impossible to refute.

Section 7 of this Report which is headed “Possible Future Developments” will re-address this problem with a view to suggesting possible remedies.

3.3.3 Contractor’s Inadequate Insurance

In the event of the Contractor being responsible for repairing at his own cost loss of or damage to the works he may not have the resources to do so unless the cost is funded by insurers. Insurers may refuse to pay his claim if the Contractor is in breach of policy terms compliance with which is a condition precedent to Insurers’ Liability.

In the event that the alleged violation consists in the non-disclosure of a material fact by the Contractor to the Insurers, the latter may declare the policy to be void from inception. In such a case the Owner may well have to fund the cost of repair himself (with rights of recovery from the Contractor or his surety) unless the policy is so worded that non-disclosure of a material fact by the Contractor does not void the policy as far

as any other joint insured's rights and interests are concerned.

Even if the policy is worded in this manner and an issue of this kind is eventually resolved in the owner's favour, there will be need for interim funding by the Owner whilst arguments, arbitration or even court proceedings are in progress.

Another form of possible exposure has already been touched upon in 2.2 above. Where the indemnity payable by Insurers is inadequate to meet the cost of reinstatement, the owner may be forced to pay the difference himself if the Contractor's financial resources are insufficient to bear it.

3.3.4 Third Party Liability

As a result of commissioning the carrying out of the works the Owner remains exposed to certain claims from third parties for compensation in respect of injury, or damage they sustain, as a direct consequence of the execution of the works. Whilst the prime responsibility to indemnify the Owner in respect of such claims rests with the Contractor, Clause 22 of the FIDIC Conditions inter alia exempts the Contractor from such responsibility when injury or damage to persons or property

- i are the unavoidable result of the execution or maintenance of the works in accordance with the contract;
- ii result from any act or neglect of the Owner his agents, servants or other Contractors not being employed by the Contractor.

This limitation of the Contractor's responsibility for indemnifying the owner is reflected in the terms of the Contractor's Third Party Liability Insurance which would therefore not respond to claims of this nature even though the insurance is required to provide an indemnity to the Owner.

The Owner's exposure can be very serious if structures collapse because of faults in geological formations or because the Owner took other "calculated risks" in commissioning the Works. See also 5.2.2 and 7.8.

3.3.5 Consequential Losses

The extent to which the Owner is exposed to financial losses arising as a result of delayed completion of the Contract Works in consequence of loss or damage thereto occurring during the construction period is not always clear. The relevant clauses of the FIDIC Conditions of Contract can be open to differing interpretations and indeed the law according to which the Contract is to be interpreted will also have a bearing on the position. In particular it is not clear from Clause 44 of the FIDIC Conditions of Contract whether the Contractor is entitled to an extension of time for completion if delayed completion of the Contract Works occurs in consequence of loss or damage to the Contract Works during the construction period. If the Contractor is entitled to an extension of time, the Owner will not be entitled to recover financial loss suffered in consequence of the delay. If the Contractor is not entitled to an extension of time, then the Owner will be entitled to recover liquidated damages for delay under the provisions of Clause 47 but if the liquidated damages have not been agreed, he could be entitled to recover his actual financial loss. The insurances normally effected by Contractors do not provide the Owner with an indemnity against financial loss resulting from loss or damage to the Contract Works. The FIDIC Conditions of Contract do not stipulate that the Contractor should arrange to cover this exposure.

Delayed completion not only deprives the Owner of anticipated revenue but also saddles him with additional costs on the project itself, e.g. price adjustment under cost escalation clauses, and prolonged servicing of loans. Such items can be insurable if they directly arise from physical loss or damage to the Contract Works.

Where delay is due to the Engineer's negligence, either directly or through physical damage due to negligent design the Owner can attempt to recover these consequential losses from the Engineer. The proving of such negligence is likely to be very difficult indeed. Even if a claim is successful the indemnity under the Engineer's Professional Liability policy may fall far short of the amounts required (see below).

These two problems deserve particular attention, since the owner's loss due to delayed completion can quickly reach very substantial proportions.

3.4. The Consulting Engineer

3.4.1 It is more difficult to define the uninsured exposures of the Consulting Engineer as these depend upon the scope of the work he is performing and the terms of his appointment. Nevertheless, the insurance of his liability, particularly in respect of his design of the project, can pose considerable problems.

3.4.2 Design Liability

Insurance providing cover for the Engineers' Professional Liability - i.e. for liability to the Owner and to Third Parties arising from the exercise of his profession - is traditionally provided by a specialist market with restricted capacity. Until fairly recently, limits of indemnity in excess of US\$ 20 million were virtually unobtainable, especially for Engineers engaged in projects in foreign countries. Currently, a limit of US\$ 75 million is regarded as the maximum available from the international insurance market.

Professional Liability insurance is normally purchased by an Engineer under annual policies with the limit of indemnity "floating" over the whole spectrum of his activities. Insurers restrict indemnity in respect of any one occurrence and in the aggregate to all claims made under the policy during the policy year. Therefore, unless the indemnity is replenished following a claim, the indemnity available for claims from a specific project may be less than the policy limit due to the partial erosion of that limit by previous claims, pending or settled on the same or another project.

For large projects, Engineers can purchase Professional Liability cover which will remain in force throughout the period during which the Engineer is engaged on the project and which will provide ongoing protection for a number of years beyond completion. But under these policies, too, the total amount available will be subject to an aggregate limit.

The Engineer may have a contractual liability, which would not be covered under a normal Professional Liability policy, since this only indemnifies where a breach of professional duty can be proved. Hence, in respect of such contractual responsibilities, the Engineer will have an uninsured risk exposure.

The Engineer's liability for professionally negligent acts, errors or omissions does not cease with the completion of the Works nor even with the issuing of final Acceptance Certificates. Occasionally professional liability cover is provided on an "occurrence" basis and will respond to claims even after the policy has lapsed, provided the negligence was committed in a year whilst the policy was in force. But the indemnity will be limited to whatever amount was in force (and has not been exhausted by other claims) for that year.

Most Professional Liability policies today are written on a "claims made" form. They will respond to all claims made during the policy year regardless of the time when the negligence itself occurred. But apart from limited "discovery periods" they will not protect the Engineer once they have been allowed to lapse or renewal has been refused by insurers.

Up to the time of writing this report the insurance market has generally been reluctant to include the Engineer as an insured under the Works policy. Thus, as matters stand, the Engineer must look to his Professional Liability policy alone for cover.

3.4.3 Other Professional Liabilities

Although the Consulting Engineer would normally expect to be covered under his Professional Liability policy for any breach of duty, which could include monitoring of insurance and the advising on Works taken into use, he will have an uninsured exposure if he undertakes duties not strictly related to his profession such as legal and accounting advice. In this connection FIDIC's recent notice on professional liability is of particular interest - see Appendix 5.

C4 Evaluation of the present system

- 4.1 It is correct to say that the responsibilities and corresponding insurance requirements laid down by the FIDIC Clauses as reviewed in the preceding section (and by the basically similar Clauses in the First and Second Editions of the FIDIC Conditions of Contract) have served all interested parties well enough in a very large number of Contracts and over a considerable period of time.
- 4.2 Contractors in particular have found what might be called "the present system" to be on the whole beneficial. Having had certain responsibilities contractually placed upon them, it makes good business sense for the Contractor to arrange the appropriate insurance protection to cover them.
- 4.3 As regular buyers of insurance for major projects, Contractors have been able to build up sound business relationships with certain sections of the world insurance markets. Policy wordings have been refined over the years, thereby reducing certain areas of dispute and certain terms or underlying principles have been clarified in arbitration or in judicial proceedings. As FIDIC-governed contracts rarely lay down specific levels for self-insured deductibles, Contractors have had reasonable freedom to exercise their own judgement based on experience in this field.
- 4.4 Owners have also benefited from the present system, though less directly. Since premium costs are ultimately borne by the Owner as part of the Contract Price, savings may result where a Contractor has superior buying-power. Little demand has been made on the owner's manpower resources in connection with insurance. The failure of insurance to respond to a particular claim does not absolve the Contractor of any responsibility that he may have, under contract or otherwise. It should be recognised, however, that if there is no effective insurance protection, difficulties may arise for the Owner in recovering from the Contractor.
- 4.5 In Section 3 of this Report the various short-comings of the present procedure have been discussed. In practical terms they have rarely resulted in a major uninsured loss. However, claims for loss or damage where defective design is a possible or contributory factor have presented serious problems. As has been demonstrated earlier paragraphs, the position can be aggravated by the wording of the excepted risk relating to design and the limited cover normally given by the insurance market.
- 4.6 From this can arise conflict of interest situations which are potentially both disagreeable and damaging, particularly to the Owner during the period of construction. When the Works suffer serious damage, it is of paramount interest to the Owner that remedial works be undertaken immediately so as to minimise disruption of the construction programme. Where the damage is clearly due to a fortuitous external cause, e.g., flooding or landslide, the Contractor will forthwith mobilise the required resources since he knows that virtually all of his extra costs will be recoverable from the Contract Works insurers. But the situation can change radically when it becomes clear that defect in design or execution may be a major element. Both the Contractor and the Engineer, and their respective insurers, may then adopt defensive attitudes and be averse to any course of action which might prejudice their position. The ensuing deadlock can deprive the owner of the full cooperation of the Engineer and the Contractor just when he most depends on it to minimise the consequential losses which will inevitably ensue. In such a situation the Owner may not only have to fund from his own resources the costs of remedial work but may even find it the "lesser evil" to agree with the Contractor and the Engineer that he will not press them for reimbursement of such costs beyond the amounts eventually recovered from their respective Insurers.

Although such cases have fortunately been rare in the past, they serve to highlight the pressures which may be generated by the inadequacies of the "present system" in the area of defective design and/or execution of the Works, to the great detriment of the Owner.

C5 Factors affecting the traditional procedure

5.1. Introduction

- 5.1.1 In Section 4 of this Report it was stated that the "present system" for arranging insurance for construction projects had, on the whole, worked well. The areas of "shortfall" identified in Section 3 have, it is true, created problems, yet their adverse impact has in the past rarely been such as to justify a call for radically revamping the traditional procedures, even for the large-scale construction projects with which the FIDIC Project Insurance Seminar concerned itself and to which this Status Report refers. The question arises however, whether the admitted shortcomings of the present system may not, in the rapidly expanding area of such large-scale projects, predictably lead to a growing number of cases where shortfall in insurance cover has such serious consequences as to affect the availability of credits and to threaten financially weaker parties with economic extinction.
- 5.1.2 These shortfall problems have, in recent years, been aggravated by a gradual erosion of insurance premium rates for Contract Works policies. Many Insurers are incurring underwriting losses on this part of their portfolio, which has led to a more critical analysis of claims submitted. There is also the fact that in present-day and future large scale construction projects the values at risk are often in excess of US\$ 1,000 million and that the total insurance premiums generated by them represent correspondingly large amounts of money. Since they are ultimately a charge on the owner, there is a prima facie case for giving the owner a greater measure of control over this expenditure and the related terms of payment. Moreover the owner should be in the position of evaluating the various options of cover open to him particularly when very high premiums are involved.
- 5.1.3 Projects are continually becoming more complex, as evidenced by increasing demand for project management or coordination services. For composite or multi-site projects on which a number of Engineers and Contractors are engaged simultaneously but under separate contracts, the traditional patterns of risk-allocation and risk-management will not give the best results or may even be totally inappropriate. This becomes evident particularly when the work programme calls for phased hand-over, with work on other sections continuing nearby.

5.2 The Design Risk

- 5.2.1 The ever-increasing rate of technological progress and the availability of a wider range of materials has meant that new design methods and concepts are rapidly replacing proven existing methods. At the same time, the increasing scarcity of oil, minerals and other energy resources means that projects are being sited at locations, some of which may have been avoided hitherto because of greater difficulty of development, possible exposure to natural catastrophes, or lack of hydrologic and other relevant data. Proper assessment of hazards may therefore be more difficult.
- 5.2.2 It is appreciated that the Engineer will normally alert the owner when his designs involve a "calculated risk" either in terms of the "state of the art" or because of insufficient data. But it is by no means certain that the Owner will fully appreciate the effects of such a warning in terms of liability and insurance protection. Under the present system Owners have taken little direct interest in insurance, relying on the contractual pattern of risk-allocation and management. Owners may thus be unaware that in the changing technological setting of new large-scale projects this pattern will leave them unprotected in respect of very major exposures.

5.3 Changing commercial environment

5.3.1 Increasingly, substantial contracts are being let in Third World countries where there is legislation requiring all insurances to be placed locally, with the international insurance markets being involved only by way of reinsurance. The Contractor cannot then use his normal facilities and must rely on local insurers with limited experience of the problems which large-scale projects can pose. Moreover, in many such cases the Contractor will be dealing with insurance organisations whose legal concepts and commercial customs are not only foreign but alien to his own. Despite the use of FIDIC Contract Clauses and of insurance policy wordings current in the international market, this can give rise to confusion and disputes over the Contractor's responsibilities and his rights to be indemnified by insurers.

C6 An alternative approach

6.1. Introduction

6.1.1 In the instances addressed in the last Section, i.e. where Contracts are either very large, or complex, and contain an inherently high design risk, the traditional method whereby the Owner leaves the arranging of insurance to the Consulting Engineer and the Contractor can result in his not being as well protected as he might need or wish to be. Moreover he may not fully appreciate the risks that will remain to his account.

6.1.2 In such circumstances the Steering Committee advocates the appointment by the owner of a firm offering the requisite skills to provide comprehensive risk management advice.

6.1.3 The role of the Risk Management Adviser would be to ensure that the owner receives guidance on the areas where he is vulnerable to losses and the options open to him for insuring such losses. In addition, in consultation with the owner, the Risk Management Adviser would determine which risks the owner should, or is obliged, to retain for his own account, and which risks should be protected by insurance, or otherwise. The Committee feels that the need for this advice is very great with large and complex contracts.

6.2. Brief

6.2.1 The Risk Management Adviser's brief would be as follows:

- a Identification and analysis of risks.
- b Advice on economically viable methods of reducing or eliminating these risks as far as possible.
- c Review of insurance cover available for all remaining risks and of the probable cost thereof.
- d Recommendations for self-retention of certain risks (or parts thereof) by the Owner.
- e Recommendations for the transfer of risks to insurers.
- f Design of a comprehensive insurance programme.
- g Advice on the placing of this programme.

6.2.2 The Adviser should be remunerated by a fee rather than by commissions payable by Insurers, even if his brief is extended to include the placing of the insurance programme. It is felt by some that remuneration by commission might lead to conflict between the roles of Adviser and Insurance Broker.

6.3. Comprehensive Project Insurance

6.3.1 In most circumstances involving the type of projects under consideration, it could well be anticipated that the Adviser will recommend that an owner-controlled Comprehensive Project Insurance programme be adopted to eliminate some of the shortfalls that would make the traditional method inappropriate. FIDIC Clauses 21, 23 and 25 would therefore require to be amended. Appendix 4 of this Report offers an amended wording for these Clauses to cater for an Owner controlled approach to insurance.

- 6.3.2 Under such a programme, the Owner, the Engineers, and all the Contractors and Sub-Contractors involved would be joint insureds. The policy would be drafted so as to provide better protection for the Owner, without adversely affecting the Contractor's position. As seen in preceding Sections, one of the main areas of concern - for all parties, but particularly for the owner - is the risk of design-related physical loss or damage to the Works. To accomplish the tasks listed in (a) and (b) of his brief, the Adviser will assemble pertinent information also on relevant design aspects. He may retain an independent Consultant to help him in this task. The resulting risk survey report, together with all relevant data and details which are made available to the Adviser by the Owner and the Engineers, would provide insurers with a reasonable information base from which to assess the risk of design-related damage. Insurers may, in addition, wish for an independent expert to carry out an in-depth assessment and evaluation of certain aspects of project design, including proposed methods of construction and choice of materials (see 7.3.(c) below).
- 6.3.3 On the basis of the information assembled by the Adviser the Insurers should be in a position to take a view on the acceptability of extended cover for design risks. They may find such risks too heavy even for partial acceptance. Alternatively, the terms which they offer for covering such risks may be found too onerous by the Owner. At the very least, the information generated by the Adviser should enable Insurers to consider in a constructive manner to what extent and on what terms cover for all design-related physical damage to the Works could be granted within the framework of an Owner-Controlled Contract Works (i.e. Contractors' All Risks) Policy. This will then be incorporated into the insurance programme which the Adviser suggests to the Owner.

6.4 Advantages

- 6.4.1 The structuring of a Project Insurance programme organised by a Risk Management Adviser who has also addressed the specific exposures relating to design, should lead to the following advantages:
- a areas of potential dispute between Owner, Engineer, Contractor and Insurers are reduced by virtue of a better understanding of inherent risks and specifically by eliminating the distinction between:
 - the faultily designed part itself and "other parts of the Works damaged as a result thereof",
 - negligent and non-negligent defective design;
 - b the very great capacity of the Contractor's All Risk insurance market would at least partly become available for protecting the Owner's, Engineer's and Contractor's exposure relating to damage due to a defective design.
- 6.4.2 Insurers may not be willing to give such extended cover without retaining Rights of Recourse against the Engineer whenever the latter has been negligent. Such Recourse Rights can be reserved even when the Engineer is a joint insured under the Contract Works Policy. They should preferably be limited amount-wise to whatever ceiling is fixed in the FIDIC *IGRA Agreement* (1979 D & S) for the Engineer's liability in respect of the project. Recourse would be an issue between the Contract Works Insurers on the one hand and the Engineer and his Professional Liability Insurers on the other hand. It would not involve the owner and consequently, claims payments under the Contract Works Policy for physical damage due to defective design would not be held up whilst the question of negligence is being disputed. This would represent a further major improvement by comparison with the present system. Insurers may however view such an arrangement with concern since they would normally not wish to become involved in proving that one of the insured parties was negligent in the performance of his professional duty.
- 6.4.3. Two further advantages may be derived from a professionally structured Owner-controlled programme: by avoiding duplication of cover between policies taken out separately by a multiplicity of parties, an overall reduction of insurance costs should be obtainable. Where natural catastrophe threatens, the entire world market capacity would be harnessed to provide maximum cover for the joint benefit of those whose interests could be affected.

C7 Possible future development

- 7.1 In general terms most major innovations in cover provided by the insurance markets have been initiated by intermediaries who responded to or anticipated demands for insurance cover not yet catered for.
- 7.2 In the context of construction project insurance, the Committee sees the Risk Management Adviser as the catalyst in the process of identifying areas of exposure to which the insurance markets could respond more adequately, and of designing appropriate procedures including policy terms and conditions.
- 7.3 The initial objective must be to obtain full design-related physical damage cover under the Contract Works Policy. It may be unrealistic to expect the insurance market to respond immediately to this request. Progress towards this goal could evolve through the following stages:
- a Initially the Contract Works Policy would include the Consulting Engineer as an insured party but would still exclude design risks in the manner detailed in X above under variant 3.2.4ii.
 - b In a second phase the market would be asked to give full physical damage cover under the policy to the Owner alone in respect of loss or damage due to defective design, faulty workmanship or materials, but with Insurers retaining either full Rights of Recourse against the Engineer and/or the Contractor, or whenever negligence is being imputed.

This extended cover might be subject to particular conditions, e.g.:
 - high deductibles applying either overall or to certain of the more hazardous parts of the project
 - specific limits of indemnity per occurrence and in all under the policy.
 - c It is hoped that during this second phase the insurance market would acquire the necessary confidence to move one step further, i.e. to waive all Rights of Recourse against the Consulting Engineer and the Contractor. It may be that before doing so - even within the restrictions indicated in (b) above - Insurers would require the Risk Survey Report already established by the Adviser as part of his risk management function to be complemented by a report from an independent expert assessing the risks associated with design, method of construction and choice of material in greater depth from an underwriting point of view. The owner should be prepared to pay for the cost of such further assessment on the understanding that the expert's report is released to the owner and is available for negotiation with the world insurance markets when the owner's insurance programme is being placed.
- 7.4 At the same time, the cover available to the owner for loss of anticipated revenue should be explored more fully and an attempt should be made to obtain adequate protection at least for those losses which are due to physical loss or damage to the Works, indemnifiable under the Contract Works policy. Here again, in a first phase design-related physical damage might remain excluded altogether, or rights of recourse against the Engineer be retained.
- 7.5 The ultimate goal would - and indeed should - be a Project Works Policy covering, not only physical damage on site but also cost of rectification of defects even when not leading to physical damage. The Owner's cover for loss of anticipated revenue should ideally respond on the same comprehensive basis - either under a separate policy or as an extension of the Project Works Policy. Again ideally, these policies should continue to cover costs of rectifying defects (and indemnity for resultant loss of revenue) for a reasonable period even after hand-over or final acceptance.
- 7.6 Acting on behalf of Owners, Risk Management Advisers could aim to achieve substantially the same results by an alternative procedure. This would entail developing a positive response from Insurers to the Owner's need for additional protection over and above that which he obtains under the "present system" but without altering the latter. The main areas which such a separate insurance, which has been called "Owner's Difference in Conditions" (ODIC) policy by one writer, would seek to cover have been identified as follows:

- a The excepted risks which the Contractor is not required to insure, and for which it is possible to obtain some measure of cover, i.e.:
 - war risks on marine transits in certain circumstances
 - the owner's use or occupation of any part of the Works prior to completion
 - sonic booms
 - damage due to such operation of the forces of nature as an experienced Contractor could not foresee or reasonably make provision for or insure against.
 - b Claims which have been repudiated by the Contractor's "All Risks" insurers due to a breach of policy warranty or condition.
 - c Costs incurred by the owner, in excess of the Consulting Engineer's contractual liability or Professional Indemnity insurance limit of indemnity, in rectifying defects and damage as a result of faulty design.
 - d The owner's loss of anticipated revenue and additional costs and loan interest charges incurred as a result of the works suffering defect or damage.
 - e Costs incurred in the betterment of design following defect or damage.
 - f The cost of rectifying defects of material, workmanship or design during construction and for a specified period after completion. This cover would solely apply to any difference between the Contractor's and Consulting Engineer's contractual responsibility and the actual costs incurred by the owner.
 - g Damage resulting from the Owner's operation of parts of a project which have been taken over from the Contractor in advance of completion of the whole project.
- 7.7 The principal objective of these two alternative approaches is to provide the Owner with greater protection. At the same time the Contractor and the Engineer would also benefit, as areas of dispute are eliminated and insurance indemnities become payable on Proof of Loss rather than on Proof of Liability.
- 7.8 It must be recognised however that for certain basic questions concerning the siting, design and execution of the project the owner remains the ultimate arbiter. Where his decision involves the knowing acceptance of a high probability of physical damage to the project, the Owner should not expect the world insurance market to provide a complete indemnity. Instead the owner should allow for such risks in his own budget by establishing appropriate contingency funds.
- 7.9. At the time of writing this Report there are only isolated precedents for project insurance programmes organised by a Risk Management Adviser. There are no precedents at all for the ODIC cover. We do not think that this need deter Risk Management Advisers from seeking cover along either of these lines. Inasmuch as insurance techniques evolve in response to demand, present shortfalls of cover can best be overcome by creating a broadly based demand for more comprehensive protection. Insurers will respond positively as soon as they can see a reasonable "spread" for the new risks which they are asked to shoulder.
- 7.10 A market giving broader design cover will not develop if the few risks presented to it are all of an obviously hazardous nature. Underwriters must be allowed the opportunity of building up a portfolio of risks of varying exposures. It is therefore to be hoped that the appointment of Risk Management Advisers will materially assist in the development of this market.

C8 Conclusions

- 8.1 The committee is concerned at the wide range of situations in which one or more of the parties in a civil engineering project may not be adequately protected for their respective responsibilities or liabilities by insurance. Some of these situations have developed in the past and have led to disputes and to financial embarrassment. On future projects, these situations are likely to have even more serious consequences. There is an urgent need for reducing the areas of insurance shortfall.

- 8.2 To ensure better appreciation of and provision for the risks associated with the construction of major (and/or complex) civil engineering projects, the Committee recommends:
- that prior to finalisation of Tender Documents, Owners of such projects appoint duly qualified Risk Management Advisers
 - that Lending Institutions allow fees payable to Risk Management Advisers for initial and ongoing services to be financed from project-related loans
 - that a proviso be inserted in the FIDIC Contract Conditions which gives the owner the option of effecting a project insurance programme
 - that consideration be given to omitting the word “solely” from the excepted risk concerning design. Although it could not be claimed that this would remove all contention, it should reduce the possibility. In doing so, however, one would reduce the responsibility of the Contractor and increase the exposure to the Owner. This underlines the need for broader provision of cover, particularly for the owner’s design exposure. At the same time Contractors’ contractual liability for damage to works will then more closely equate with the Contract Works insurance cover that they are able to purchase.
- 8.3 The Committee recognise that the insurance industry has traditionally given a constructive response to requests for extended or new forms of coverage whenever there was a reasonable expectation that sufficient demand for such covers would develop over time at adequate premium levels.
- 8.4 It is recommended that all parties concerned and in particular Risk Management Advisers and Insurance Brokers impress upon the insurance market the need for a broader and more flexible approach in the future especially with regard to design cover.
- 8.5 The Committee considers that the timely appointment of Risk Management Advisers for a growing number of civil engineering projects will ensure that the insurance needs of all interested parties will be properly appraised at an early date and will be presented to Insurers in such a manner as to enable Insurers to meet these needs.

C9 Appendices

Appendix 1: Extracts from FIDIC Conditions of Contract (International) for Works of Civil Engineering Construction - 3rd Edition.

Care of Works

Clause 20. (1) From the commencement of the Works until the date stated in the Certificate of Completion for the whole of the Works pursuant to Clause 48 hereof the Contractor shall take full responsibility for the care thereof. Provided that if the Engineer shall issue a Certificate of Completion in respect of any part of the Permanent Works the Contractor shall cease to be liable for the care of that part of the Permanent Works from the date stated in the Certificate of Completion in respect of that part and the responsibility for the care of that part shall pass to the Employer. Provided further that the Contractor shall take full responsibility for the care of any outstanding work which he shall have undertaken to finish during the Period of Maintenance until such outstanding work is completed. In case any damage, loss or injury shall happen to the Works, or to any part thereof, from any cause whatsoever, save and except the excepted risks as defined in sub-clause (2) of this Clause, while the Contractor shall be responsible for the care thereof the Contractor shall, at his own cost, repair and make good the same, so that at completion the Permanent Works shall be in good order and condition and in conformity in every respect with the requirements of the Contract and the Engineer's instructions. In the event of any such damage, loss or injury happening from any of the excepted risks, the Contractor shall, if and to the extent required by the Engineer and subject always to the provisions of Clause 65 hereof, repair and make good the same as aforesaid at the cost of the Employer. The Contractor shall also be liable for any damage to the Works occasioned by him in the course of any operations carried out by him for the purpose of completing any outstanding work or complying with his obligations under Clauses 49 or 50 hereof.

Excepted Risks

The "excepted risks" are war, hostilities (whether war be declared or not), invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, or unless solely restricted to employees of the Contractor or of his subcontractors and arising from the conduct of the Works, riot, commotion or disorder, or use or occupation by the Employer of any part of the Permanent Works, or a cause solely due to the Engineer's design of the Works, or ionising radiations or contamination by radio-activity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive, nuclear assembly or nuclear component thereof, pressure waves cause by aircraft or other aerial devices travelling at sonic or supersonic speeds, or any such operation of the forces of nature as an experienced contractor could not foresee, or reasonably make provision for or insure against all of which are herein collectively referred to as "the excepted risks".

Insurance of Works, etc.

Clause 21. Without limiting his obligations and responsibilities under Clause 20 hereof, the Contractor shall insure in the joint names of the Employer and the Contractor against all loss or damage from whatever cause arising, other than the excepted risks, for which he is responsible under the terms of the Contract and in such manner that the Employer and Contractor are covered for the period stipulated in Clause 20 (1) hereof and are also covered during the Period of Maintenance for loss or damage arising from a cause, occurring prior to the commencement of the Period of Maintenance, and for any loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations under Clauses 49 and 50 hereof:

- a The Works for the time being executed to the estimated current contract value thereof, or such additional sum as may be specified in Part II in the Clause numbered 21, together with the materials for incorporation in the Works at their replacement value.
- b The Constructional Plant and other things brought on to the Site by the Contractor to the replacement value of such Constructional Plant and other things.

Such insurance shall be effected with an insurer and in terms approved by the Employer, which approval shall not be unreasonably withheld, and the Contractor shall, whenever required, produce to the Engineer or the Engineer's Representative the policy or policies of insurance and the receipts for payment of the current premiums.

Damage to Persons and Property

Clause 22. (1) The Contractor shall, except if and so far as the Contract provides otherwise, indemnify the Employer against all losses and claims in respect of injuries or damage to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and maintenance of the Works and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation or damages for or with respect to:

- a The permanent use or occupation of land by the Works or any part thereof.
- b The right of the Employer to execute the Works or any part thereof on, over, under, in or through any land.
- c Injuries or damage to persons or property which are the unavoidable result of the execution or maintenance of the Works in accordance with the Contract.
- d Injuries or damage to persons or property resulting from any act of neglect of the Employer, his agents, servants or other contractors, not being employed by the Contractor, or for or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the Contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the Employer, his servants or agents or other contractors for the damage or injury.

Indemnity by Employer

(2) The Employer shall indemnify the Contractor against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the proviso to subclause (1) of this Clause.

Third Party Insurance

Clause 23. (1) Before commencing the execution of the Works the Contractor, but without limiting his obligations and responsibilities under Clause 22 hereof, shall insure against his liability for any material or physical damage, loss or injury which may occur to any property, including that of the Employer, or to any person, including any employee of the Employer, by or arising out of the execution of the Works or in the carrying out of the Contract, otherwise than due to the matters referred to in the proviso to Clause 22 (1) hereof.

Minimum Amount of Third Party Insurance

(2) Such insurance shall be effected with an insurer and in terms approved not be unreasonably withheld, and for at least the amount stated in the Appendix to the Tender. The Contractor shall, whenever required, produce to the Engineer or the Engineer's Representative the policy or policies of insurance and the receipts for payment of the current premiums.

Provision to Indemnify Employer

(3) The terms shall include a provision whereby, in the event of any claim in respect of which the Contractor would be entitled to receive indemnity under the policy being brought or made against the Employer, the insurer will indemnify the Employer against such claims and any costs, charges and expenses in respect thereof.

Accident or Injury to Workmen

Clause 24 (1) The Employer shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workmen or other person in the employment of the Contractor or any sub-contractor, save and except an accident or injury resulting from any act or default of the Employer, his agents, or servants. The Contractor shall indemnify and keep indemnified the Employer against all such damages and compensation, save and except as aforesaid, and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

Insurance against Accident, etc., to Workmen

(2) The Contractor shall insure against such liability with an insurer approved by the Employer, which approval shall not be unreasonably withheld, and shall continue such insurance during the whole time that any persons are employed by him on the Works and shall, when required, produce to the Engineer or the Engineer's Representative such policy of insurance and the receipt for payment of the current premium. Provided always that, in respect of any persons employed by any sub-contractor, the Contractor's obligation to insure as aforesaid under this sub-clause shall be satisfied if the subcontractor shall have insured against the liability in respect of such persons in such manner that the Employer is indemnified under the policy, but the Contractor shall require such sub-contractor to produce to the Engineer or the Engineer's Representative, when required, such policy of insurance and the receipt for the payment of the current premium.

Liquidated Damages for Delay

Clause 47. (1) If the Contractor shall fail to achieve completion of the Works within the time prescribed by Clause 43 hereof, then the Contractor shall pay to the Employer the sum stated in the Contract as liquidated damages for such default and not as a penalty for every day or part of a day which shall elapse between the time prescribed by Clause 43 hereof and the date of certified completion of the Works. The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any monies in his hands, due or which may become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.

Reduction of Liquidated Damages

(2) If, before the completion of the whole of the Works any part or section of the Works has been certified by the Engineer as completed, pursuant to Clause 48 hereof, and occupied or used by the Employer, the liquidated damages for delay shall, for any period of delay after such certificate and in the absence of alternative provisions in the Contract be reduced in the proportion which the value of the part or section so certified bears to the value of the whole of the Works.

Bonus for Completion

(3) If it is desired to provide in the Contract for the payment of a bonus in relation to completion of the Works or of any part or section thereof this shall be set out in Part II in the clause numbered 47.

No Liability for War, etc., Risks

Clause 65. Notwithstanding anything in the Contract contained:

(1) The Contractor shall be under no liability whatsoever whether by way of indemnity or otherwise for or in respect of destruction of or damage to the Works, save to work condemned under the provisions of Clause 39 hereof prior to the occurrence of any special risk hereinafter mentioned, or to property whether of the Employer or third parties, or for or in respect of injury or loss of life which is the consequence of any special risk as hereinafter defined. The Employer shall indemnify and save harmless the Contractor against and from the same and against and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising thereout or in connection therewith.

Damage to Works, etc., by Special Risks

(2) If the Works or any materials on or near or in transit to the Site, or any other property of the Contractor used or intended to be used for the purpose of the Works, shall sustain destruction or damage by reason of any of the said special risks the Contractor shall be entitled to payment for:

- a any permanent work and for any materials so destroyed or damaged, and, so far as may be required by the Engineer, or as may be necessary for the completion of the Works, on the basis of cost plus such profit as the Engineer may certify to be reasonable;
- b replacing or making good any such destruction or damage to the Works;
- c replacing or making good such materials or other property of the Contractor used or intended to be used for the purposes of the Works.

Projectile, Missile, etc.

(3) Destruction, damage, injury or loss of life caused by the explosion or impact whenever and wherever occurring of any mine, bomb, shell, grenade, or other projectile, missile, munition, or explosive of war, shall be deemed to be a consequence of the said special risks.

Increased Costs arising from Special Risks

(4) The Employer shall repay to the Contractor any increased cost of or incidental to the execution of the Works, other than such as may be attributable to the cost of reconstructing work condemned under the provisions of Clause 39 hereof prior to the occurrence of any special risk, which is howsoever attributable to or consequent on or the result of or in any way whatsoever connected with the said special risks, subject however to the provisions in this Clause hereinafter contained in regard to outbreak of war, but the Contractor shall as soon as any such increase of cost shall come to his knowledge forthwith notify the Engineer thereof in writing.

Special Risks

(5) The special risks are war, hostilities (whether war be declared or not), invasion, act of foreign enemies, the nuclear and pressure-waves risk described in Clause 20 (2) hereof, or in which the Works are being or are to be executed or maintained, rebellion, revolution, insurrection, military or usurped power, civil war, employees of the

Contractor or of his Sub-Contractors and arising from commotion or disorder.

Outbreak of War

(5) If, during the currency of the Contract, there shall be an outbreak of war, whether war is declared or not, in any part of the world which, whether financially or otherwise, materially affects the execution of the Works, the Contractor shall, unless and until the Contract is terminated under the provision of this Clause, continue to use his best endeavours to complete the execution of the Works. Provided always that the Employer shall be entitled at any time after such outbreak of war to terminate the Contract by giving written notice to the Contractor and, upon such notice being given, this Contract shall, except as to the rights of the parties under this Clause and to the operation of Clause 67 hereof, terminate, but without prejudice to the rights of either party in respect of any antecedent breach thereof.

Removal of Plant on Termination

(7) If the Contract shall be terminated under the provisions of the last preceding sub-clause, the Contractor shall, with all reasonable despatch, remove from the Site all Constructional Plant and shall give similar facilities to his Sub-Contractors to do so.

Payment if Contract Terminated

If the Contract shall be terminated as aforesaid, the Contractor shall be paid by the Employer, insofar as such amounts or items shall not have already been covered by payments on account made to the Contractor, for all work executed prior to the date of termination at the rates and prices provided in the Contract and in addition:

- a The amounts payable in respect of any preliminary items, so far as the work or service comprised therein has been carried out or performed, and a proper proportion as certified by the Engineer of any such items, the work or service comprised in which has been partially carried out or performed.
- b The cost of materials or goods reasonably ordered for the Works which shall have been delivered to the Contractor or of which the Contractor is legally liable to accept delivery, such materials or goods becoming the property of the Employer upon such payments being made by him.
- c A sum to be certified by the Engineer, being the amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the Works insofar as such expenditure shall not have been covered by the payments in this sub-clause before mentioned.
- d Any additional sum payable under the provisions of sub-clauses (1), (2) and (4) of this Clause.
- e The reasonable cost of removal of Constructional Plant under sub-clause (7) of this Clause and, if required by the Contractor, return thereof to the Contractor's main plant yard in his country of registration or to other destination, at no greater cost.
- f The reasonable cost of repatriation of all the Contractor's staff and workmen employed on or in connection with the Works at the time of such termination.

Provided always that against any payments due from the Employer under this sub-clause, the Employer shall be entitled to be credited with any outstanding balances due from the Contractor for advances in respect of Constructional Plant and materials and any other sums which at the date of termination were recoverable by the Employer from the Contractor under the terms of the Contract.

Appendix 2: Clauses 2.3-2.5 of the FIDIC International Model Form of Agreement between Client & Consulting Engineer and International General Rules of Agreement between Client & Consulting Engineer for Design and Supervision of Construction of Works - IGRA 1979 D & S.

2.3 The rights and duties of the Consulting Engineer

2.3.1 The Consulting Engineer shall exercise all reasonable skill, care and diligence in the performance of the Services under the Agreement and shall carry out all his responsibilities in accordance with recognized professional standards. The Consulting Engineer shall in all professional matters act as a faithful adviser to the Client and, in so far as any of his duties are discretionary, act fairly as between the Client and third parties. The Consulting Engineer, his employees and sub-contractors, whilst in the country in which the Works are to be carried out, shall respect the laws and customs of that country.

2.3.2 The remuneration of the Consulting Engineer charged to the Client according to Appendix C shall

constitute his only remuneration in connection with the Agreement and neither he nor his personnel shall accept any trade commission, discount, allowance or indirect payment or other consideration in connection with or in relation to the Agreement or to the discharge of his obligations thereunder.

- 2.3.3 The Consulting Engineer shall not have the benefit, whether directly or indirectly, of any royalty on or of any gratuity or commission in respect of any patented or protected article or process used on or for the purpose of the Agreement unless it is mutually agreed in writing that he may.
- 2.3.4 The Consulting Engineer will provide all the expert technical advice and skills which are normally required for the class of services for which he is engaged. Where specialist technical advice or assistance is required, beyond that committed under the Scope of Services in Appendix A, the Consulting Engineer may with the prior written agreement of the Client arrange for the provision of such services. The Client shall pay for all such services.

However, the Consulting Engineer shall retain full and unseverable responsibility for all the Services which he is committed to render under this Agreement.

- 2.3.5 The Consulting Engineer, when in charge of the supervision of Works under construction, shall have authority* to make minor alterations to design as may be necessary or expedient, but he shall obtain the prior approval of the Client to any substantial modification of the design and costs of the said Works and to any instruction to a Contractor which constitutes a major variation, omission or addition to the latter's Contract. In the event of any emergency, however, which in the opinion of the Consulting Engineer requires immediate action in the Client's interest the Consulting Engineer shall have authority to issue such orders as required on behalf of and at the expense of the Client.

* This Clause should be reflected in the contract between the Client and Contractor.

The Consulting Engineer must inform the Client immediately of any orders issued without prior consent which will result in additional cost to the Client and follow up such advice as soon as possible with an estimate of the probable cost.

- 2.3.6 When the Consulting Engineer shall determine that an integral part of the Works has been completed, which the Consulting Engineer deems is capable of being accepted, the Consulting Engineer shall give forty-eight (48) hours prior written notice to the Client that such integral part is ready for tests. Such tests shall be carried out under the supervision of the Consulting Engineer. Upon completion of such tests the Consulting Engineer shall execute a Maintenance Certificate recommending acceptance to the Client. Minor deficiencies shall not delay acceptance and the Client shall take the completed works under its care, custody and control.
- 2.3.7 The Consulting Engineer shall not be the medium of payments made on behalf of the Client to Contractors and/or Suppliers unless specifically so requested by the Client. He will, however, issue certificates for such payments.
- 2.3.8 The copyright of all design documents prepared by the Consulting Engineer in connection with the Agreement rest with the Consulting Engineer. The Client shall not be entitled either directly or indirectly to make use of these documents for the carrying out of the Services other than under the supervision of the Consulting Engineer and/ or of any additional or similar Services without prior approval of the Consulting Engineer which shall not be unreasonably withheld. Notwithstanding the above, in the event that the Consulting Engineer is in default under this contract as provided in Clause 2.2.9.6 the Client shall not be limited nor require prior approval of the Consulting Engineer in using or providing such documents to other persons to complete the performance of the Services.
- 2.3.9 Equipment and materials furnished to the Consulting Engineer by the Client or purchased by the Consulting Engineer with funds wholly supplied or reimbursed by the Client shall be the property of the Client and shall be so marked. Upon completion or termination of the Services the Consulting Engineer shall furnish to the Client inventories of the equipment and materials referred to above as it then remains

and dispose of same as directed by the Client.

- 2.3.10 The Consulting Engineer shall have the right, subject to the Client's approval, which shall not be unreasonably withheld, to publish descriptive articles, with or without illustrations, with respect to the Services either on his own account or in conjunction with other parties concerned.

2.4 Liability of the Consulting Engineer

- 2.4.1 Notwithstanding anything herein contained to the contrary, the Client shall indemnify and hold harmless the Consulting Engineer for and against any and all claims, damages, expenses or costs (including those asserted by third parties) directly or indirectly related to the Services to the extent that such claims, damages, expenses and costs exceed in total the Consulting Engineer's liability as stated in Part II of this Agreement. This indemnification and hold harmless by the Client shall not apply in cases where such claims, damages and expenses arise from gross negligence or criminal action from the Consulting Engineer.
- 2.4.2 The liability of the Consulting Engineer expires as specified in Part II of this Agreement.
- 2.4.3 The Consulting Engineer shall be liable for any violation of legal provisions or rights of third parties in respect of patents and/or copyrights introduced into documents prepared by him.
- 2.4.4 Unless notice to the contrary is given in writing by the Client, the Consulting Engineer shall, at the Client's expense, take out and maintain, on terms and conditions approved by the Client, insurance against third party liability and against loss of or damage to equipment purchased, with funds provided by the Client, for the sole use of the Consulting Engineer in the execution of the Services, provided that the Consulting Engineer shall use his best efforts to maintain at his own cost, reasonable professional liability coverage.
- 2.4.5 The Consulting Engineer has no liability whatsoever for any part of the Works not designed by him or under his responsibility unless due to decisions taken and directives given by the Consulting Engineer in the course of carrying out the Services.
- 2.4.6 The Consulting Engineer has no liability whatsoever for any damage resulting from any act of the Client, the Contractors or the Suppliers which is not covered by the Scope of Services or the Consulting Engineer's instructions or written advice.

2.5 Obligations of the Client

- 2.5.1 The Client shall furnish without charge and within a reasonable time all pertinent data and information available to him and shall give such assistance as shall reasonably be required by the Consulting Engineer for the carrying out of his duties under this Agreement. The Client shall give his decision on all sketches, drawings, reports, recommendations and other matters properly referred to him for decision by the Consulting Engineer in such reasonable time as not to delay or disrupt the performance by the Consulting Engineer of his Services under this Agreement.
- 2.5.2 The Client shall facilitate the timely granting to the Consulting Engineer, and any of his personnel and, where applicable, their dependents, in respect of the country where the Works are to be carried out, of:
- i necessary visas, licences, permits and customs clearance for entry and exit;
 - ii unobstructed access to all sites and locations involved in carrying out the Services;
 - iii the privilege of bringing into the country reasonable amounts of foreign currency for the purposes of the Services or for the personal use of such personnel and of withdrawing any such amounts as may be earned therein by such personnel in the execution of the Services;
 - iv a firm authorization from the country's Central Bank or other appropriate authority that the foreign exchange component of the remuneration under this Agreement shall be allowed to be transferred to the Consulting Engineer's home country;
 - v repatriation in the event of emergencies.
- 2.5.3 The Client will facilitate the clearance through customs of any equipment, materials and supplies required

for the Services and of the personal effects of the Consulting Engineer's personnel.

- 2.5.4 Except when exemption has been arranged, the Client shall compensate the Consulting Engineer for the unrecovered cost of any taxes, duties, levies and other impositions under the laws and regulations in the country where the Works are carried out in respect of:
- i any payments made to the Consulting Engineer or the personnel he brings from other countries for the purpose of carrying out the Services;
 - ii any equipment, materials and supplies brought into the country for the purpose of carrying out the Services and which, after having been brought into the country, will be subsequently withdrawn therefrom;
 - iii any property brought into the country by the Consulting Engineer or his personnel for their personal use or consumption which, after having been brought into the country, will, if not consumed, be subsequently withdrawn therefrom upon the departure of the Consulting Engineer and his personnel;
 - iv any stamp and other duties payable on documents.
- 2.5.5 The Client shall make available, free of charge, to the Consulting Engineer and his personnel, for the purpose of the Services, the equipment and facilities described in Appendix B.
- 2.5.6 In the event that the Consulting Engineer is delayed in obtaining the equipment and/or facilities set forth in Appendix B, he shall notify the Client of such delay and shall be entitled to appropriate time extension and proportional remuneration for completion of the Services.
- 2.5.7 If the anticipated equipment and/or facilities are not forthcoming the Client and the Consulting Engineer shall agree on how the affected part of the Services shall be carried out and upon a revised remuneration therefor.
- 2.5.8 The Client will in conjunction with the Consulting Engineer arrange for the selection and provision of counterpart personnel where required, as indicated in Appendix B hereto. Counterpart personnel will be trained by and work under the exclusive direction of the Consulting Engineer. In the event that any member of the counterpart personnel fails to perform adequately the work assigned to him by the Consulting Engineer, provided such work assignment is consistent with the position occupied by the staff member, the Consulting Engineer may request that he be replaced and such request shall not be unreasonably refused. If counterpart personnel are not provided in accordance with Appendix B, the Client and the Consulting Engineer shall agree on how the affected part of the Services will be carried out and upon a revised compensation therefor.
- 2.5.9 The Client undertakes to arrange the provision of services from others in accordance with Appendix B hereto. The Consulting Engineer shall co-operate with the firms and/or individuals listed in the Appendix. In the event that the Consulting Engineer is delayed in obtaining the services from others set forth in Appendix B he shall notify the Client of such delay and shall be entitled to appropriate time extension and proportional remuneration for completion of the Services. If the anticipated services are not forthcoming, the Client and the Consulting Engineer shall agree on how the affected part of the Services will be carried out and upon a revised remuneration therefor. The Client shall hold the Consulting Engineer harmless against any losses or claims resulting from the failure of others to provide the services to be arranged by the Client in accordance with Appendix B.

Appendix 3: Schematic overview of the pattern of risk-allocation and transfer resulting from the Clauses reproduced in Appendices 1 and 2.

N.B. The "Liability and Insurance Table" reproduced on below was first published in the brochure listed as No. 2 in the Bibliography attached hereto. With the permission of the Clarkson Puckle Insurance Group the table is here reproduced in its original version which explains that the owner is referred to as the Employer.

Appendix 4: Extract from the FIDIC Notes on Documents for Civil Engineering Contracts (page 23).

Liability and Insurance Table

Risks	Employer	Engineer	Contractor
<i>Physical loss or damage to the Works up to date stated in Certificate of Completion or arising from work performed during Maintenance period.</i>			
1	War etc., riot, commotion, disorder	Suffers loss [1] No cover	Not res. Not res.
2	Nuclear pressure wave risks, hazardous explosives	Suffers loss [2] No cover	Not res. Not res.
3	Unforeseeable forces of nature	Suffers loss CAR	Not res. Not res.
4	Loss or damage during transit	Potential loss, if fin. advanced	Not res. Suffers loss [3] Trans. pol.
5	Faulty materials or workmanship	Potential loss	Not res. Res. [4]
6	Solely due to Engineer's negligent design, Incl. specifying unsuitable materials	Potential loss	Res. PI Not res. CAR [6]
7	Solely due to Engineer's NON-negligent design	Suffers loss	Employer's normal ins. programe Not res. Not res.
8	Use or occupation by Employer	Suffers loss	Not res. Not res.
9	All other causes	Potential loss No cover	Not res. Res. CAR
<i>Loss of or Damage to Plant</i>			
1	War etc., riot, commotion, disorder	May assume loss under Cl. 65 [1]	Not res. Suffers loss No cover [7]
2	Nuclear & pressure wave risks	May assume loss under Cl. 65 [2]	Not res. Suffers loss No cover
3	Loss or damage during transit	Not res.	Not res. Suffers loss [3] Trans. pol.
4	All other causes	Not res.	Not res. Suffers loss [5] CAR
<i>Third party losses</i>			
1	Unavoidable result of carrying out contract	Liable	Employer's TP Not liable Not liable
2	Negligence of Employer	Liable	Employer's TP Not liable Not liable
3	Negligence of Contractor	Not liable	Not liable Liable Cont. TP
4	Professional negligence of Engineer	Not liable	Liable PI Not liable
5	Other negligence of Engineer	Not liable	Liable Eng. PI Not liable
<i>Injury to employees of Contractor / Sub-contractor</i>			
1	Negligence of Contractor	Not liable	Not liable Liable Cont. EL
2	Negligence of Employer	Liable	Employer's TP Not liable Not liable
3	Professional negligence of Engineer	Not liable	Liable PI Not liable
4	Other negligence of Engineer	Not liable	Liable Eng. PI Not liable

Notes

- [1] Possible Government compensation.
- [2] Possible recourse against nuclear operators or licensees.
- [3] Possible recourse against carrier.
- [4] Possible recourse against supplier of faulty materials.
- [5] Possible recourse against negligent party causing loss or damage.
- [6] Excluding the part or 'item' immediately affected. It is often difficult to determine the scope of this exclusion.
- [7] No cover. Export credit agency scheme may apply.

This table is related to the contractual risk-allocation pattern resulting from the applicable FIDIC clauses, and particularly from Clause 20 (2) "Excepted Risks". This is why in 1 of the top section of the table we show "no cover" for "riot commotion disorder", even though C.A.R. policies can be endorsed to give fairly wide cover in respect of these risks. The same applies to "pressure waves" (i.e. sonic booms) mentioned in 2, of the same section.

It is stipulated that the Contractor should insure in joint names. This provision is not met by noting the interest of the Employer on the policy; the Employer in that case would not be a party to the contract of insurance.

Strictly construed the clause states that all loss or damage, other than from the "excepted risks", for which the Contractor is responsible, shall be insured. In practice, however, any policy of insurance has exclusions and conditions, and this is tacitly recognised in the last paragraph of the clause where it is stated that the terms of the insurance must be approved by the Employer.

For commercial reasons the Contractor may be prepared to accept responsibility for some of these "excepted risks" in terms of the insurance cover he can obtain. It is not possible to generalise on what cover can be obtained for "excepted risks". In some parts of the world some can be covered, but not in others.

"War Risks" generally cannot be covered, other than in a most limited way under a marine policy.

"Riot, commotion, or disorder" is a usual and unqualified exclusion in many policies of insurance. A Contractor would therefore not have cover, even where the acts are "solely restricted to his employees or of his subcontractors and arise from the conduct of the Works". However, so long as local conditions are not unsettled, it may be possible to insure against these risks.

There is usually a policy exclusion regarding loss or damage due to faulty design. However, the "excepted risk" refers to "a cause solely due to the Engineer's design" and the Contractor should endeavour as far as possible to limit the exclusion to the terms of the "excepted risk", particularly with reference to the Temporary Works. This question should be considered in conjunction with any professional indemnity cover the Contractor may have.

The excepted risk relating to radioactive contamination is a usual market insurance exclusion, in many parts of the world. Some such exclusion would invariably be included.

With regard to the "excepted risk" relating to pressure waves caused by supersonic aircraft, most countries have no government policy to reimburse loss or damage so caused. At the same time in such countries the world insurance market may well give cover for loss or damage caused by pressure waves from supersonic aircraft.

The last "excepted risk" is in respect of the operation of the forces of nature, and depending on the particular area where the contract is taking place the Contractor may be able to effect a policy with no such exclusion.

Appendix 5: FIDIC - IGRA Agreement - Important Notice - Professional Liability.

A Consulting Engineer who goes beyond the strict confines of his Terms of Reference into areas which are peripheral to his specialization leaves himself unnecessarily open to liability in negligence and perhaps in contract.

Paragraph 2.3.4 in IGRA 1979 P-I and IGRA 1979 D&S clearly states that where specialist technical advice or assistance is required, beyond that committed under the Scope of Services in Appendix A, the Consulting Engineer may, with the prior written agreement of the Client, arrange for the provision of such services. The Client shall pay for all such services.

It is in the best interests of the Client and the Consulting Engineer that the latter should not attempt to give advice upon matters in which he is not qualified.

If considered appropriate the following paragraph can be inserted in Part II of the Agreement.

“The Consulting Engineer’s services will not include any services of a non-engineering nature, in particular, all legal, accounting, bonding and insurance counselling services, safety management, construction or contracting services in connection with the carrying out of the Project, nor will the Consulting Engineer be or become an insurer or guarantor of any contractor’s work.”

For further comments on completion of IGRA documents attention is drawn to the relevant appendix in the FIDIC publication *Guide to the Use of Independent Consultants for Engineering Services*.

Appendix 6: Suggested amended wording for Clauses 21 and 23 of FIDIC Conditions of Contract (International) for Works of Civil Engineering Construction, Third Edition, to allow for owner-Controlled insurance.

Clause 21 to be deleted and replaced by the following:

Insurance of Works, etc.

21. Without limiting the Contractor’s obligations and responsibilities under Clause 20 the Employer shall in the joint names of the Employer and the Contractor insure (subject to the terms, limitations, exceptions and conditions of such insurance) against loss or damage to the Works or to any materials for incorporation therein:

- a during the period of the construction of the Works; and
- b during the Period of Maintenance for loss or damage arising from a cause occurring on Site prior to the commencement of the Period of Maintenance and for loss or damage to the Works occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with obligations under Clauses 49 and 50 hereof;

Provided always that:

- 1 The obligation of the Employer to insure under this Clause shall be limited to providing the Contractor’s/Erection “All Risks” insurance, (as set out in the policy that would be attached, and designed for the particular project).
- 2 The Employer is not liable for and shall not insure the Retained Liabilities as set out in the Project Insurance Policy (hereinafter referred to as the deductibles).
In the event of any insured claim for loss or damage to the Works or materials which are the subject of more than one contract with the Employer the deductible shall be applied proportionately to the total amount of such insured claim.
- 3 The Contractor shall comply with and be subject to the terms, exceptions, conditions and limitations of the insurance effected by the Employer pursuant to this Clause.
- 4 Nothing in this Clause shall render the Employer liable to insure against loss or damage to materials or equipment not for incorporation into the Works.

Clause 23 to be deleted and replaced by the following:

Third Party Insurance

23. Without limiting the Contractor's obligations and responsibilities under Clause 22 the Employer shall in the joint names of the Employer and the Contractor insure (subject to the terms, limitations, exceptions and conditions of such insurance) their legal liability for compensation and claimant's costs and expenses in respect of accidental loss of or damage to property (not being loss of or damage to property to which Clause 21 applies) arising out of the execution of the Works or in the carrying out of the Contract.

Provided always that:

- 1 The obligation of the Employer to insure under this Clause shall be limited to providing the Third Party Liability insurance - (as set out in the policy that would be attached) - and shall be for an indemnity of such a sum as together with the amount of a similar liability (if any) of the Employer or any other of his Contractors in respect of the same occurrence or series of occurrences arising out of one event, does not exceed the Limit of Indemnity specified in the Project Insurance Policy.
- 2 The Employer is not liable for and shall not insure the Retained Liability as set out in the Project Insurance Policy.
- 3 The Contractor shall comply with and be subject to the terms, exceptions, conditions and limitations of the insurance effected by the Employer pursuant to this Clause.
- 4 Nothing in this Clause shall render the Employer liable to insure against:
 - i any claim made against the Contractor by an employee of the Contractor for death or personal injury arising out of and in the course of his employment;
 - ii loss of or damage to property in the ownership, care, custody or control of the Contractor;
 - iii death or personal injury and loss of or damage to property caused by, through or in connection with the ownership, possession or use of any private car or goods-carrying vehicle.

The first two lines of Clause 25 to be deleted and replaced by the following:

If the Contractor shall fail to effect and keep in force the insurance referred to in Clause 24 hereof or any other insurance which he may be required to

Observation

In this revision, no specific provision has been made for insurance of the Contractor's Constructional Plant and Equipment. An appropriate provision can be made should the circumstances of the contract dictate that a more specific course of action be adopted.

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