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❖ Turnkey contracting under the FIDIC
Silver Book: What do owners want?
What do they get?

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Introduction

This paper concerns turnkey contracting and asks the questions ‘What do owners want? What do they get?’ The analysis is given a contractual setting by reference to the *Conditions of Contract for EPC Turnkey Projects* published by FIDIC, otherwise known as the Silver Book.² Reference was also made to the ICC Model Contract when this paper was first planned, though the ICC’s new Model Contract for Major Projects has not yet (August 2007) been published.³

The FIDIC Silver Book was produced in 1999, in response to a perceived need for a form of contract ‘where certainty of final price, and often of completion date, are of extreme importance.’⁴ Its publishers also recognised that turnkey projects are popular in project financed deals, where lenders require greater certainty about a project’s final costs than is allowed for under contracts that reflect the traditional allocation of risks, such as FIDIC’s Red and Yellow Books.⁵

The introductory notes to the Silver Book further recognised the practice that prevailed prior to its publication, namely for parties to take the pre-1999 versions of the FIDIC Red or Yellow Books and alter these in order to transfer significant additional risks to the contractor, in an attempt to obtain a higher level of assurance as to outturn cost, quality and time.

This paper looks at some aspects of turnkey contracting at the macro level and, in terms of specific features of the FIDIC Silver Book, at certain issues at the micro level. The thesis developed is that owners do not get the turnkey solution they want. This is primarily because a turnkey solution is not as simple as it sounds, due to the inevitable complexities of large projects and the decreased risk appetite of contractors in the global projects arena. There is a shortfall between expectation and actuality in many of the FIDIC provisions, which means that the appearance of risk transfer to the contractor is not as complete as might be suggested by FIDIC’s use of the term ‘Turnkey’ to describe the Silver Book.

1 The views expressed in this paper are personal to the author and are not intended to be imputed to Mayer Brown International LLP or to any client of that firm.

2 FIDIC (International Federation of Consulting Engineers), 1999 suite of standard forms (eg *Conditions of Contract for Construction (new Red Book)*, *Conditions of Contract for Plant and Design-Build (Yellow Book)*, *Conditions of Contract for EPC Turnkey Projects (Silver Book)*), obtainable via www.fidic.org. Direct quotations from the FIDIC Silver Book in this paper retain the formatting of the original.

3 *The ICC Model Contract for the Turnkey Supply of an Industrial Plant* was first published in 2003 (ICC Publication 653, obtainable from www.iccbooks.com). The ICC’s Task Force on turnkey transactions, under the Commission on Commercial Law and Practice (CLP), has drafted the ICC Model Turnkey Contract for Major Projects (due for publication later in 2007), designed to be more suitable for large civil works or for contracts for the supply of plant, where the contractor undertakes to supply a complete facility.

4 Introductory note to First Edition of FIDIC Silver Book (see note 2).

5 See note 2.

Turnkey contracting

The idea behind the turnkey approach is, putting it crudely, for the contractor to be given the job to engineer, procure and construct the required works and then, once ready for operations, to hand over the keys to the owner so that it may operate the facility. Turnkey, in principle, means a contract whereby the contractor provides whatever is necessary for a certain purpose.

Turnkey contracting is sometimes also referred to as ‘Lump Sum Turnkey’ or ‘LSTK’, emphasising the intended bargain of the parties, with responsibilities allocated to the contractor to deliver the project on time and to a required performance level, in return for payment of a fixed price. A lump sum turnkey price will include contingency allowances to hedge against the risk of things costing more or taking longer to deliver. Owners expect to pay a premium for a turnkey contract.⁶

Another acronym seen frequently in this context is EPC: ‘Engineer, Procure and Construct’. Thus, an EPC contractor is responsible for the engineering design of the works, its procurement and subsequent construction.⁷ Indeed, the Silver Book’s full title is ‘Conditions of Contract for EPC Turnkey Projects’. Thus it uses the terms EPC and turnkey interchangeably, meaning the same thing.

A feature of the turnkey approach to contracting, including revenue-generating facilities, is the requirement for the contractor to prove the reliability and performance of the plant and equipment. Thus particular prominence is given in the drafting of turnkey contracts to the testing, commissioning and handover of the works and how this is to be undertaken. Such approaches are common in process engineering projects, where the output may be energy generation, water treatment, petrochemicals or natural resource processing (mining). It is of critical importance in such projects not only for the project to be delivered within time and cost constraints but also to be delivered so that it is capable of meeting its designed production and output levels.

Performance of the asset is particularly key in those turnkey projects funded through project financing. Lenders’ security is dependent largely on the ability of the completed facility to operate and generate revenue, whether power, chemicals, processed metals or road toll revenue. This prominence is reflected in the General Conditions of the FIDIC Silver Book: the ‘Time for Completion’ of the works includes not simply completing the works so that the owner can take them over, but also ‘achieving the passing of the Tests on Completion’.⁸

Against this background, we can start to ask (and suggest some answers to the question): ‘What do owners want?’

⁶ However, it is increasingly common for turnkey contracting to be based on, or involve, an initial cost reimbursable or target cost element. See also notes 7 and 12.

⁷ The acronym ‘EPCM’ is also encountered frequently on international projects, but this is very different from EPC. EPCM is a services-only contract, under which the contractor performs engineering, procurement and construction management services.

⁸ Clause 8.2 of the FIDIC Silver Book (see note 2).

Projects have a large number of moving parts

A point worth stressing at the outset is perhaps obvious, but nonetheless important. This is the fact that a turnkey contract will be but one part of the contractual framework and one component of the risk management arrangements and contractual framework used on large projects. Thus, the extent to which risk is allocated to the contractor under turnkey arrangements will depend upon a range of other factors, including the availability and strengths of guarantees from the project's sponsors. Where a sponsor will not provide any, or only a limited form of, completion guarantee to lenders, this obviously increases the need to allocate completion risk away from the sponsor. In these circumstances, the obvious candidate for the risk, given that it will be in the best position to manage it, will be the turnkey contractor. The turnkey contract is the means by which the risk is allocated.

A linked point is that projects commonly require a range of skills and products which are not always available from a single turnkey contractor. By way of example, large petrochemical projects may have a series of turnkey contracts for various technologies represented by different process units, plus an infrastructure or utilities turnkey contract. Each process unit will be engineered, procured and constructed by a different turnkey contractor, working alongside each other albeit within the site locations or 'battery limits' of their respective process plants.⁹

The key risk in any construction project is *completion risk* – that the works may not be completed:

- 1 Within the agreed lump sum price; or
- 2 Within the agreed time scale programme; or
- 3 To the required performance quality.

In a turnkey arrangement, it is the contractor who has responsibility for and control over (at least in theory) each of these elements of completion risk. However, even at this fairly fundamental level, difficulties can be encountered depending upon the sources of information that make up the design for certain plants which may threaten the intended turnkey product the owner is procuring.

The idea that turnkey contracting provides the owner (and its lenders) with single-point responsibility is attractive, because it suggests that costly disputes and recourse difficulties when something goes wrong will not be increased by arguments within the supply chain as to who may be at fault. However, and as noted above, large projects will frequently involve a number of turnkey contractors undertaking different parts of the overall project, each according to its own specialist skills.

Further potential for interface clashes (and additional erosion of the single-point responsibility quality that owners expect from a turnkey solution) arises where a plant contains one party's proprietary technology but is otherwise delivered by another contractor. In these circumstances the so-called 'turnkey' contractor will not necessarily be willing to provide the full wrap in terms of assuring the outturn performance of

⁹ For the US\$5bn SABIC petrochemical project in Saudi Arabia, turnkey contracts were entered into for various plants forming the project, including Technip for the olefins plant; Toyo for the glycol ethylene plant; Aker Kvaerner and Sinopec for the polyethylene and polypropylene plants; and Foster Wheeler who are undertaking the project management plus utilities and offsites.

the plant. This can be seen particularly in the petrochemical sector, where process units often involve the use of technology owned and licensed by third parties. If the third party company which owns the technology licence is not the same company that undertakes the works under turnkey terms, there is an obvious difficulty in obtaining a single-point responsibility wrap under one contract from one EPC contractor.¹⁰

Impact of an over-heated market

Another factor that militates against some of the perceived advantages of turnkey contracting is that of market pressure. At the time of delivering this paper, it is probably no exaggeration to state that the global construction economy is overheating. Demand for construction goods and services is high, driven particularly by the industrialised growth of large economies in both the People's Republic of China and in India.

This demand (and the high price of crude oil) is also driving the further exploitation of raw materials and processed goods. Thus, the mining sector has, over the last 18 months, enjoyed a significant resurgence, which has led to a large number of new and old reserves being developed. Equally, petrochemical companies have seen a series of mega-projects in areas close to feed stock supplies in the Middle East, as global construction activity drives the demand for products such as polyethylene, polypropylene and other processed carbon derivatives.¹¹

These market pressures are having a big impact on the risk appetite of the turnkey contracting market (as well as on prices and programmes, as the entire supply chain feels the strain of excess demand). In particular, the decreased appetite for risk amongst contractors means that it is no longer a feasible procurement strategy to transfer all completion and other risks to the turnkey contractor. Different sorts of deals are being engineered, notably ones where contractors are engaged effectively on a two-stage basis, the first stage being a reimbursable Front End Engineering Design ('FEED') contract. During this stage, the contractor undertakes its design, obtains firm vendor quotations, may be even places orders for certain long lead equipment and generally firms up on the scope of supply. When the contractor can be sufficiently certain as to the scope of design and expected outturn cost and date for completion, such matters may then be fixed as the contract is 'converted' into an LSTK or turnkey arrangement.¹²

Such arrangements may be engineered through a single contract, which contains a mechanism to convert the contract from a reimbursable to a fixed LSTK basis. Alternatively, owners and their preferred contractors may enter into a separate FEED or Preliminary Engineering contract which, once completed, can form the basis of the parties entering full EPC terms. However, in the latter case owners will seek to find some enforceable mechanism to help ensure that the contractor will enter into the LSTK arrangement (with all its attendant risks). The risk for the owner otherwise is that its preferred contractor seeks to re-negotiate underlying terms and conditions under the full EPC contract to reduce its overall risk.

¹⁰ The turnkey contractor will likely seek to carve out from its liability problems arising due to technology performance, or to cap its liability by reference to the recourse available from the technology provider.

¹¹ *Plastics & Rubber Weekly* (3rd February 2007 and 22nd May 2007 – see www.prw.com) reported that Nova Innovene will de-bottleneck all its expandable polystyrene (EPS) production units in Europe to boost output, and will increase its production capacity. Demand for this product is expanding, driven by the buoyant construction market.

¹² For a more in-depth look at such procurement strategies, see Nick Henchie and Phil Loots, 'Worlds Apart: EPC and EPCM contracts: Risk Issues and Allocation', ICLR July 2007.

A scoresheet for the FIDIC Silver Book

Against the background of all these issues, it may be instructive to see how the FIDIC Silver Book Conditions deal with such matters. As a general rule, FIDIC discourages amendments to its forms. However, market practice (for better or for worse) is to amend these documents to cater for issues which commonly arise in practice and, of course, to take account of the particular features of each project.

Rather than a review of the entire provisions of the FIDIC Silver Book, this paper proposes to concentrate on a number of key areas. First to be considered will be how unforeseen ground conditions are dealt with. The second is how design liability risks are addressed. Also reviewed are the arrangements for testing, completion and taking over of the plant. The analysis will conclude with a review of force majeure, limitation on liability and extensions of time provisions.

This analysis establishes that there is probably a shortfall between expectation and actuality when the FIDIC Silver Book is used. Risk is not fully transferred to the contractor (absent further amendment to the contract conditions). Overall, this analysis bears out the proposition that owners who opt for the turnkey approach using the FIDIC Silver Book do not get what they want.

Unforeseen ground conditions¹³

The approach taken by standard forms of engineering contract to unforeseen ground conditions has, traditionally, been to adopt a test of foreseeability. Thus, clause 12 of the ICE Conditions provides:

‘If during the carrying out of the Works the Contractor encounters physical conditions (other than weather conditions or conditions due to weather conditions) or artificial obstructions which conditions or obstructions could not, in his opinion, reasonably have been foreseen by an experienced contract, the Contractor shall as early as practicable give written notice thereof to the Employer’s Representative.’¹⁴

The FIDIC forms were originally based on the ICE Conditions of Contract.¹⁵ Thus, it is not surprising that under the FIDIC Red and Yellow Books this traditional foreseeability test is applied. Clause 4.10 of those FIDIC forms requires the employer to have made available all relevant data in his possession on sub-surface conditions, not later than 28 days prior to the submission of the tender. Clause 4.11(b) then dictates that the contractor is deemed to have based the contract amount on such data. The owner warrants the accuracy of the information he has provided and the contractor is only responsible for interpreting the data. Further, under the FIDIC Red and Yellow Books the contractor is deemed to have obtained all necessary information as to risks which may influence or effect his tender for the works. He is also deemed to have inspected and examined the site and other available information. However, these deeming provisions are limited to the extent that the investigation by the contractor is practicable, taking into account cost and time.

¹³ See also Julian Bailey, ‘What Lies beneath: Site Conditions and Contract Risk’ (SCL paper 137, May 2007).

¹⁴ Institution of Civil Engineers, *ICE Conditions of Contract 7th ed* (ICE7), Design and Construct version, London, ICE/Thomas Telford (2001).

¹⁵ Indeed, further editions of the FIDIC forms have followed later editions of the ICE forms and vice versa. As Edward Corbett notes in the introduction to his book, *FIDIC 4th: A Practical Legal Guide*, London, Sweet & Maxwell (1991), the drafting of FIDIC’s 4th edition of the Red Book was heavily influenced by the ICE’s 5th edition, after which the ICE’s own 6th edition adopted some of the innovations introduced by FIDIC’s 4th.

On the allocation of risk for unforeseen ground conditions, the FIDIC Red and Yellow Books thus adopt the ICE clause 12 approach: the owner carries the risk of physical conditions which could not have reasonably been foreseen by an experienced contractor at the date of tender.

The FIDIC Silver Book, in keeping with its turnkey approach to risk allocation, takes this one important step further. Whilst the owner provides information to tendering contractors, it is the contractor who is responsible for verifying as well as interpreting that data. There is no warranty by the owner as to the sufficiency or completeness of the information provided. Under the FIDIC Silver Book, the risk of adverse ground conditions is intended to be allocated to the contractor. Clause 4.12(c) provides a catch-all statement to the effect that the contractor accepts responsibility for having foreseen all difficulties and costs, even those which are not foreseeable:

‘The Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs.’

It will not be surprising to learn that, in practice, the provisions of the Silver Book are commonly subject to heavy negotiation between the parties. This is particularly so in the current global construction market, where contractors’ appetite for risk is much reduced by the sheer volume of work opportunities available to them. It is at this point that the expectation of owners that they will receive turnkey assurance starts to dissipate. This may occur in a variety of ways in relation to unforeseen ground conditions.

One device is simply to revert to the more traditional test of foreseeability so that the risk of the unforeseeable remains with the owner. Another is for the risk to be taken by the contractor but only after it has had ample opportunity to satisfy itself as to risks, contingencies and other circumstances concerning the site conditions. This would be commonly undertaken during the FEED stage, where testing is undertaken on a reimbursable basis (ie paid for by the owner), so that the contractor can take an informed view as to the likelihood of there being adverse ground conditions.

A further variant on this is to take the existence of ground condition reports and all the surveys and to use these to extrapolate assumed conditions. If variances are found in practice from the assumed conditions which affect time or cost, their impact is allocated back to the owner rather than transferred to the contractor.

Thus and in a number of ways, the global projects market finds ways around the standard form risk allocation represented by the FIDIC Silver Book conditions. Such approaches tend to ameliorate the rigidity of the turnkey solution: a number of risks remain with the owner.

Design liability

In the same way that unforeseen ground conditions may impact the certainty as to outturn of the contract price and time for completion, the issue of design liability can play a major role in determining the extent to which the turnkey solution is deliverable.

Again, and as noted in the introduction to this paper, turnkey arrangements necessarily suggest that the contractor is required to take full responsibility for the entirety of the design of the works. This will often be a point of contention, particularly where initial design work has been undertaken on behalf of the owner, with such designs being

provided to the contractor during the tender stage with the requirement that it is to take on full responsibility for such design.

Numerous disputes arise in practice where there are changes in the design of the works following award of the contract. Such variations in design will be argued to give rise to relief for the contractor in terms of time and money entitlement. The counter-argument to this (in the case of changes in design) is to characterise the change as simply design development, which does not serve to increase the contractor's entitlement to time or money. It may be instructive to consider the treatment under clause 5.1 of the FIDIC Silver Book, which addresses general design obligations:

'The Contractor shall be deemed to have scrutinised, prior to the Base Date, the Employer's Requirements (including design criteria and calculations, if any). The Contractor shall be responsible for the design of the Works and for the accuracy for such Employer's Requirements (including design criteria and calculations), except as stated below.'

Having established this deemed universe where the contractor has scrutinised the owner's designs (presumably to verify and satisfy itself, although this is not stated explicitly),¹⁶ the FIDIC Silver Book pushes home the point further, clause 5.1 going on:

'The Employer shall not be responsible for any error, inaccuracy or omission of any kind in the Employer's Requirements as originally included in the Contract and shall not be deemed to have given any representation of accuracy or completeness of any data or information, except as stated below. Any data or information received by the Contractor, from the Employer or otherwise, shall not relieve the Contractor from his responsibility for the design and execution of the Works.'

The rest of the same clause then goes on to carve out from the matters for which the contractor is responsible a number of matters for which the owner retains responsibility; but the list is very limited in scope. Hence the approach of the FIDIC Silver Book is for the EPC/turnkey contractor to create a single design liability wrap around the project, with the contractor being responsible both for the integration of the design and the construction of the works.

However, in practice this risk allocation is frequently changed. Depending on the market, the change may be to increase the risk to the contractor; or to increase the extent of the carve-out in respect of liability for which the contractor is not liable, thereby decreasing the contractor's risk. Conversely, there may be other provisions in the contract, such as notes on drawings or process diagrams forming part of the employer's requirements, that indicate that the design has not yet been fixed and remains to be confirmed, say by the equipment vendors.

Owners may seek to tighten up and improve on such provisions by using devices seen elsewhere in the FIDIC Silver Book (as well as in the ICE forms), namely further deeming provisions. Thus, clauses that deal with the sufficiency of the contract price and all of the risks, contingencies and other factors that the contract is deemed to make allowance for, help ensure that the owner has an LSTK assurance from the contractor. The FIDIC Silver Book scores well in this aim.

¹⁶ In *Co-operative Insurance Society v Henry Boot (Scotland) Ltd* [2002] EWHC 1270 (TCC), 84 Con LR 164, 19 Const LJ 109, Judge Richard Seymour QC held that an obligation for a contractor to 'complete' the design provided by an owner necessarily imported a duty for the contractor (under the JCT80 contractor design supplement form) to use reasonable care to verify the adequacy of that design.

Of course, it is a matter for negotiation on each project exactly how complete a full design liability wrap can be achieved. It may be, in a particularly soft market where contractors and equipment vendors are in short supply and high demand, that owners will face substantial resistance to their attempts to achieve the full wrap. Equally, such risk transfer may be agreed, provided the financial risk contingency for the obligation is sufficiently generous to persuade the contractor to take that risk.

At the macro level on large projects, one also sees that the contract structure adopted for delivery of the project also militates against the turnkey assurance. This is because, as previously noted, large projects will frequently be delivered by a number of different EPC/turnkey contractors. That creates interface issues, which means it is just not possible to have one EPC/turnkey contractor giving a single-point responsibility risk assurance wrap for the entire project.

Handover, testing and commissioning

If one starts from the proposition that owners want an LSTK product, then that assumes that the owner allocates to the contractor control of the works up to the point at which the contractor hands over the keys. Is this realistic on projects for which the standard form FIDIC Silver Book is adopted?

In many cases, the owner does not want to wait to take over the plant (in the sense of having control) only after the plant is tested, commissioned, performance-tested and ready for start-up. Often the owner will in fact be an experienced operator of the plant. It will therefore want its own people operating the plant as soon as it is able. In the energy sector, it will want to start selling electricity as soon as it is being generated following commissioning, but often prior to performance testing. In the petrochemical sector, owners will want this level of control at the point at which hydrocarbons are introduced into the various systems making up a plant. For mining projects, the same applies in relation to the start-up and commissioning activities where ore enters the processing plant to be treated. Whether it is the generation of electric current or the introduction of the hydrocarbons or ore into the processing system, at this point the plant will simply be at the stage of testing and commissioning. The project will not yet have reached final completion and passed its performance tests.

How does the FIDIC Silver Book address the issue? The short answer is that it does not. The Silver Book simply moves through the stages whereby the plant is first engineered or designed (clause 5, *Design*), to how it is to be constructed (clause 7, *Plant, Materials and Workmanship*, and clause 8, *Commencement, Delays and Suspension*), then on to what would normally be mechanical completion (clause 9, *Tests on Completion*). It then deals with the process of handover to the owner (clause 10, *Employer's Taking Over*). Following this, the FIDIC Silver Book provides an option for further testing (clause 12, *Tests after Completion*).

The FIDIC Silver Book does not deal explicitly with the issue commonly encountered on many large projects: the need for provisions to reflect the pre-completion control required by the owner. The testing and commissioning of plant is always a risky enterprise: vessels and pipework are pressurised and 'hot' testing may be implemented. This is an important issue, because control brings with it responsibility and risk. This has contractual implications (eg possible triggering of warranty or defects liability provisions), as well as impacting on insurance coverage (signalling, potentially, the end

of the contractor's All Risk cover and the commencement of the Operational or Business Interruption cover). This is another area where it is suggested that owners do not get what they want (absent amended provisions to deal with the issue).

Clause 17 (*Risk and Responsibility*) and clause 18 (*Insurance*) will also need careful review and likely revision in this regard. It is worth mentioning that clause 30 of MF/1 (*Use before taking-over*)¹⁷ recognises the possibility of early owner use of the works for commercial operation. This applies where, due to default of the contractor, issue of a taking-over certificate has been delayed by over one month but is subject to the works being 'reasonably capable of being used.'

In practice, the FIDIC Silver Book terms will often be subject to amendment to allow the owner's team to have control and commercial operation (but not responsibility), by providing expressly for such an apparent dichotomy. There will also be a need to provide some protection for the contractor. Balancing of interests can be achieved by allowing for the contractor to disclaim liability where the owner's team fail to act in accordance with the contractor's reasonable instructions.

Force majeure

If turnkey means the allocation of risk to the contractor, then clause 19 of the FIDIC Silver Book (*Force majeure*) leaves the door open for that risk to migrate back to the owner. Indeed, in a sense, much of this risk never leaves the owner.

The impact of the risk of a *force majeure* occurrence receives a similar treatment across all FIDIC forms: both the time and cost impacts of such an event are allocated to the owner.¹⁸ I am not aware of any other standard form of construction contract that adopts this approach, other than the UK's Engineering and Construction Contract (otherwise known as the NEC).¹⁹ Most other standard form contracts allocate the time risk of the *force majeure* event to the owner, but leave the cost impact as neutral. Not so with FIDIC, even under the Silver Book.

The other point is that the FIDIC Silver Book's definition of what constitutes *force majeure* is wider than one might have expected, given the supposed turnkey qualities of this form. Whilst under clause 19.1 *force majeure* has to be 'an exceptional event or circumstance', all that is also required is that it is beyond the reasonable control of the party and could not have been reasonably provided for before entering the contract, or having arisen, have been reasonably avoided or overcome; and is not substantially attributable to the other party.

It is, of course, possible to draft *force majeure* clauses more tightly than this. As frequently seen on non-recourse financed projects, tighter definition of the risk can be achieved by providing a list of what is not *force majeure*. From an owner's perspective, it may not get its supposed turnkey solution unless the Silver Book's standard provisions are amended.

¹⁷ Institution of Mechanical Engineers/Institution of Engineering and Technology, *Model form of General Conditions of Contract* (MF/1), 2000 Edition (Revision 4); obtainable via www.theiet.org/publishing/.

¹⁸ The treatment of *force majeure* is slightly different under FIDIC short form and dredging contracts, in that these erroneously fail to provide that a *force majeure* event releases the affected party from its obligations under the contract. For further details, see the author's paper presented to the FIDIC International Users Conference (London, 11th-12th December 2006). A later version of this paper is available at <http://www.mayerbrown.com/london/practice/article.asp?pnid=1544&cid=3288&nid=1562>.

¹⁹ Institution of Civil Engineers, *Engineering and Construction Contract/The New Engineering Contract* (NEC3), London, ICE/Thomas Telford (2005); obtainable via www.neccontract.com.

Limitations of liability

The turnkey credentials of the FIDIC Silver Book are further undermined by the provisions of clause 17.6 (*Limitation of liability*). This clause is in two parts. The first part consists of a mutual waiver and release by each party in favour of the other in respect of liability for any indirect or consequential loss, subject to exceptions. Those exceptions relate to the owner's obligation to pay the contractor any loss of profit or other loss sustained, where the contractor is entitled to terminate the contract due to the owner's default. A further exception relates to the indemnities provided by the contractor in favour of the owner in respect of loss or damage to people or property not attributable to any act or omission on the part of the owner. These two categories of exception are therefore limited in scope.

Of course, on large projects with revenue generating facilities, the indirect losses have the potential to be very great indeed. However, the wholesale exclusion of such losses from those recoverable against the contractor underline the lack of realistic assurance obtained by owners when engaging contractors to undertake works under the FIDIC Silver Book turnkey conditions.

The second part of clause 17.6 comprises a financial cap on liability. Again, there are a number of stated exclusions to this (certain types of loss, which are, in effect, carved out of the cap) but the default position under the FIDIC Silver Book is that the total liability of the contractor shall not exceed the contract price.

Of course, having excluded liability for indirect or consequential losses, it might indeed be difficult for any contractor to perform so badly such that the recoverable loss would exceed the contract price. Such direct loss would presumably involve the cost of repairs or replacement of works. Such loss may also be incurred through the imposition of delay damages.

Furthermore, in the current market, it is rare for contractors to agree anything approaching 100% of the contract price when negotiating caps on liability particularly on the mega-projects where the contract price is in multiple hundreds of millions of dollars or in the multi-billion range. Contractors will simply not risk their balance sheet. Each case, of course, turns on its own facts and much will depend upon the contract price and the overall risk profile. That said, owners may start off suggesting a cap at less than 50% of the contract price, only to find themselves engaged in a downward trajectory as the contractor uses its market power to reduce its potential exposure.

Extensions of time

The FIDIC Silver Book adopts the term '*Time for Completion*', allowing the flexibility to apply this to a series of milestones. These can include passing of the tests on completion or other significant milestones during the course of the project.

In common with other standard form construction contracts, FIDIC Silver Book contains a mechanism for the extension of this Time for Completion in clause 8.4. The events giving rise to an entitlement to an extension of time include the issue of formal variations and any other delay or act of prevention attributable to the owner. The latter is a useful catch-all and helps counter arguments that any such act of prevention by the

owner might otherwise put time at large.²⁰ Nevertheless, the operation of this provision creates a potential gateway for increased time (and subsequent cost) claims.

In addition, and rather unhelpfully, the other event giving rise to potential extension entitlement is defined in clause 8.4(b) as:

‘a cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions ...’

One therefore has to search the rest of the FIDIC Silver Book to find those sub-clauses which confer on the contractor an entitlement to an extension of time. One example is sub-clause 4.24 (*Fossils*). If any fossils, coins or articles of value or antiquity, structures or other remains or items of geological or archaeological interest are found on the site and if the contractor suffers delay, it is to give notice to the owner and is entitled to an extension of time for any delay ‘if completion is or will be delayed ...’. This is the same formula as in clause 8.4 and involves, potentially, a prospective assessment as to the impact of the event upon the Time for Completion.

It is perhaps surprising that, under the FIDIC Silver Book, the extension of time provisions do not expressly require the contractor to take steps to avoid or mitigate the cause of delay, nor do they seek to make entitlement to any such extension conditional upon taking such steps.²¹ For owners seeking a turnkey solution, it is likely that they will want the extension of time provisions under the FIDIC Silver Book to be strengthened considerably and clarified to gather in all those conditions which might give rise to an entitlement. Such clarity allows the events to be more closely managed and delays to be avoided, or at least mitigated.

As to how progress and, indeed, extensions of time may be measured, the FIDIC Silver Book contains provisions requiring the contractor to submit a programme and to revise this:

‘whenever the previous programme is inconsistent with actual progress or with the Contractor’s obligations.’²²

This, of course, gives rise to the potential for confusion, as the programme may be updated for actual progress which represents a position of default (due to culpable delay on the part of the contractor). This makes it difficult to assess the impact on the Time for Completion, which may not have changed if there had been no events giving rise to an entitlement to extend. This is another area where care needs to be taken in the operation of the contract. Amendments to the Silver Book may be appropriate.

Of course, such extension of time provisions are necessary in order to provide the contractor with relief against its potential liability for liquidated damages, if it fails to complete the works by the Time for Completion. However, and equally, the reality is that if there are changes in design which, arguably, go beyond design development and constitute a formal variation, or if there are acts or omissions on the part of the owner which delay, impede or prevent the contractor from maintaining progress and achieving

²⁰ Assuming, for this purpose, that the governing law of the contract is one that recognises such a concept; not all legal systems do.

²¹ The exception is in the case of *force majeure*. The definition in clause 19.1 of the FIDIC Silver Book (see note 2) requires that the event, as well as being ‘exceptional’, must be something which the party affected could not reasonably have provided against, or once having arisen, is not something which could reasonably have been avoided or overcome.

²² Clause 8.3 (see note 2).

the Time for Completion (or to the extent that the contractor can demonstrate that such completion 'will be delayed', as above) then the supposed certainty of the turnkey solution is again rendered more illusory than real.

Such practical difficulties are frequently compounded on large projects where there may be a number of separate EPC/turnkey contractors engaged by the owner, undertaking different parts of the project. The possibility that one EPC contractor may cause (allegedly or otherwise) delay to another is a potent risk. In practice, owners will engage one contractor to oversee and project manage all project activities, from engineering and procurement through to construction management. Whilst that contractor will not underwrite the performance of the various EPC/turnkey contractors engaged on the project, it will commonly be incentivised to ensure tight control and monitoring of their activities. This provides a system whereby the project can be managed effectively so that the owner has some assurance that the project will complete within its time, cost and performance targets. Frequently the project management role is also given to the same contractor who undertakes the infrastructure EPC contract for the works. This is because that same contractor has most direct physical and technical interface with each of the separate EPC/turnkey contractors. As noted earlier, large projects have a number of moving parts, when viewed as a series of contracts.

Conclusions

This paper did not set out to be critical of the FIDIC Silver Book, in the sense of producing gratuitous complaints. It is easy for lawyers to criticise any standard form, equally any form of bespoke construction contract. It is right too to recognise that, in many respects, the FIDIC Silver Book does what it says on the tin: the provisions dealing with unforeseen ground conditions, responsibility for the owner's design and the provisions as to the sufficiency of the contract price are all good devices that help assure the Silver Book as a true turnkey contract. However, there are undoubtedly a number of areas where the turnkey qualities of the form can be improved by tighter drafting. This may be something FIDIC wish to take on board in its next edition of the Silver Book.

The other major factor militating against the FIDIC Silver Book achieving turnkey credentials for owners' projects is the size, shape and structure of the projects on which it is used. These factors cannot be attributed to FIDIC, though a clearer recognition of their impact by both owners and contractors (and their respective advisers) can only help improve the eventual quality of the contractual and management arrangements established for such projects.

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