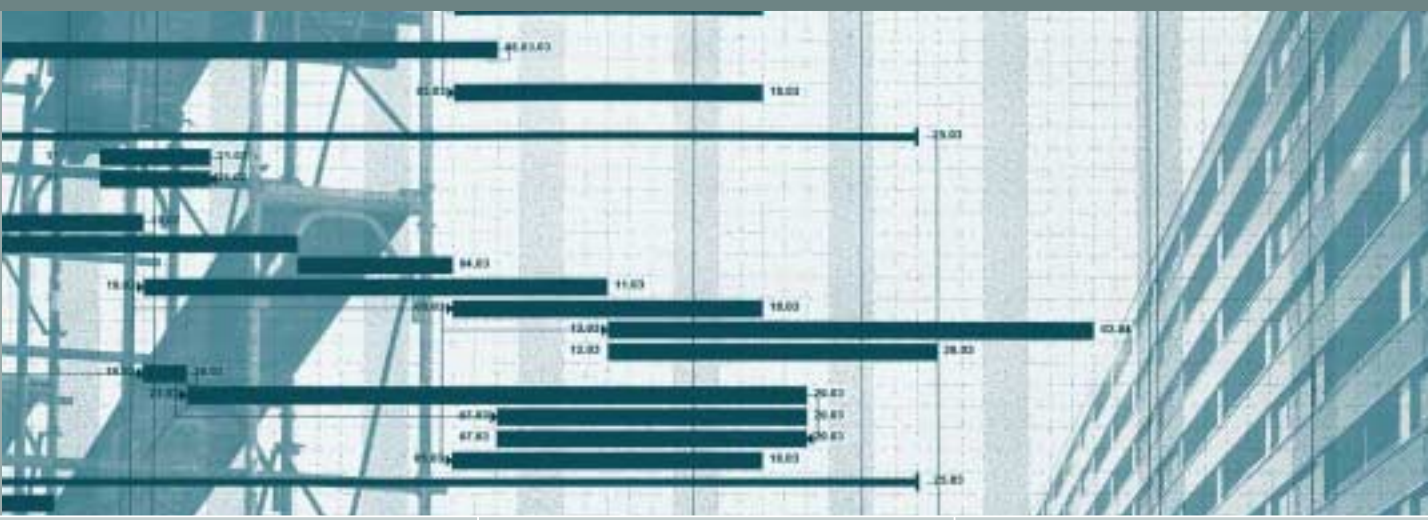
Swiss Re

Delay in start-up insurance



Technical publishing
Engineering

Delay in start-up insurance

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Foreword

The global privatisation trend in recent years has had a profound impact on the risk situation of the various parties involved in large infrastructure projects. Principals and contractors alike are being confronted with increasing financial risk exposure in the wake of the shift from governmental funding programmes to private financing schemes.

Parallel to this development, the approach towards private financing for large capital investments has also undergone considerable change. Principals now often collateralise loans with project assets and repay them purely on the basis of projected earnings. The revenue generating capability of a project has thus become a critical financing factor and, accordingly, stringent conditions regarding delays in scheduled project completion have been added to contracts between financiers and principals, and particularly to those between principals and contractors. In turn, these conditions compel the parties involved to acquire the broadest possible insurance cover available in the market. This has prompted a sharp rise in demand for delay in start-up (DSU) cover, which is also known as advance loss of profit (ALOP) insurance.

Maintaining insurance standards in this line of business at an appropriate level for all parties involved demands prudent underwriting, adequate pricing, clearly drafted wordings, comprehensive progress monitoring and thorough claims investigation routines. Accordingly, this brochure is designed to assist underwriters and the parties involved in large construction projects in this challenging field of insurance by providing sound fundamentals before discussing specific technical details and typical problem areas of delay in start-up insurance.

The risk

Essentially, any given insurance cover is defined by the risk to be insured. Apart from the actual physical aspects, large construction project risks inherently include many other features, such as related legal and contractual liabilities. For principals and contractors, these additional factors primarily concern various types of financial risk arising from potential delays in scheduled project completion, some of which are indicated below.

Principal's financial risks	Contractor's financial risks
▪ revenue loss ▪ accepted amounts payable to customers or suppliers ▪ cost overruns ▪ consultant fees	▪ additional cost of construction, material, labour ▪ rental or lease expenses ▪ insurance premiums ▪ loans to finance repairs ▪ design ▪ liquidated damages ▪ loss of bonus

While the parties involved in a given project may be exposed to a homogeneous *physical risk* profile, their *financial interests* are likely to differ considerably. Accordingly, insurers need to prepare separate covers for each party involved, clearly specifying the individual financial risks to be insured. The main insurance products and the risks they are designed to cover for principals and contractors include:

Principal	Contractor
Risk covered by DSU/ALOP ▪ loss of gross profit *Possible extensions* ▪ suppliers and customers ▪ penalties to off-takers and suppliers of raw materials	*Risks covered by contractor´s delay/extra expenses* ▪ additional fixed cost for site activity ▪ general overhead, wages, salaries, personnel expenses not reasonably avoidable during delay
Risks covered by contingency covers ▪ force majeure ▪ cost overruns	*Risks covered by contingency covers* ▪ liquidated damages for delay and performance ▪ cost overruns

The main focus of this brochure is on delay in start-up, ie on the potential loss of revenue sustained by principals involved in new construction projects.

Principals are generally under substantial pressure to ensure the economic viability of their construction projects by generating revenue immediately following the scheduled completion date. For example, they may be dependent on collecting rent promptly from prospective tenants, or on generating sales proceeds from retail outlets or manufacturing plants. Any delay in the start-up of a construction project of this type would immediately cause a loss in anticipated revenue. The potential triggers for such delays range from technical failures to cost overruns, force majeure events and onsite accidents. This pressure on principals has become more acute with the recent trend towards private financing schemes, such as non-recourse financing[1], in which debt servicing is based purely on these projected earnings.

The works contract between the principal and the EPC[2] contractor stipulates that, as a rule, the contractor is accountable vis-à-vis the principal for any project start-up delay arising through any fault on the part of himself or his subcontractors. Generally, however, the contract provisions relieve the contractor of this obligation for any risk explicitly assumed by the principal. While these risks may vary from contract to contract, they usually include force majeure events, such as earthquake, flood or windstorm, as well as other physical destruction or damage and any cause beyond the control of the contractor, subcontractor or supplier.

Moreover, in his function as the borrower, the principal is also obliged to observe debt servicing as stipulated in the loan agreement. Not surprisingly, then, he endeavours to transfer as much of this financial risk as possible to an insurer. Today, the principal's risk of an economic loss, ie a delay or interruption of anticipated revenue resulting from a delay in start-up, is readily insurable, provided that the loss is derived from insured physical damage.

1 Non-recourse financing schemes refer to debt financing provided for projects with no or very limited recourse to the assets of the project sponsor. The financial backer relies on the technical, commercial and financial viability of the project and its earnings as the sole source for debt servicing (principal).

2 EPC (Engineering, Procurement and Construction). As defined here, EPC refers to the contract between the contractor and principal and is assumed to be an engineering, procurement, construction contract. This term is also used for a design/build or any other form of works contract.

The cover

Delay in start-up (DSU) cover is designed to secure the portion of revenue which the principal requires to service debt and realise anticipated profit. It provides fairly broad protection against delays arising from physical damage caused by any type of peril included in the relevant material damage cover, ie the builder's risk (CAR/EAR) and/or marine cover. However, it does not cover delays caused by other events which are cited in an exclusion and consequently do not qualify as accidental physical damage. A prerequisite for triggering DSU cover is that the property insured under the material damage section sustains physical damage from an insured peril during the insurance period, and that any interference with the construction or erection works or testing schedule caused by the loss occurrence either delays or interferes with the principal's business operations.

If this condition is met, the principal is indemnified for the actual loss of gross profit he sustains if completion of the permanent works is delayed beyond the scheduled business commencement date. The amount of indemnity is limited to specified items, ie to fixed costs and debt servicing paid, and to net profits earned from revenue which the principal would have received if the delay had not occurred. The category of indemnifiable costs also includes increased cost of working (ICOW), ie additional expenditures necessarily and reasonably incurred by the principal or on his behalf for the sole purpose of preventing or mitigating a delay. However, the ICOW indemnity is limited to an amount which would have been otherwise payable during the delay period. Other specified expenses suffered by the principal, ie "soft costs" such as auditor's fees, could also be considered for cover, albeit on a first loss basis only and by means of an endorsement or memorandum.

While the insurance industry offers various forms of cover for this risk, several contract features are common to all DSU policies. For example, the amount payable is invariably subject to the actual loss sustained which must be substantiated by the insured. Accordingly, if there are no tenants for a rental property or no buyers for manufactured products, there will be no recovery from insurance. Further, coverage is determined by the amount of insurance acquired and by the agreed indemnity period, which should be commensurate with the risk. For example, if repair or rebuilding requires 12 months, the indemnity period should be at least 12 months and include a buffer for contingencies. The first one or two years of operation are usually critical in determining the extent of the insurable loss.

One prominent feature to bear in mind before launching into the details of DSU is that this cover is uniquely characterised by the following single factors:

- one insured party
- one completion date
- one scheduled business commencement date, ie the date from which the project is expected to generate revenue
- one delay, irrespective of the number of individual accidents contributing to the overall delay
- one indemnity resulting from lost revenues (no reinstatement)
- one time excess

Note: the overall project delay can be longer than the agreed indemnity period, which is not affected by delays caused by non-insured events. Once triggered, the indemnity period is in effect without interruption.

Soft costs

Though less tangible, soft costs represent an equally significant exposure for the contractor and the principal as the loss of revenue or projected sales. In case of a claim, the cost of repairing the physical damage can be roughly assessed. While this facilitates a reasonable estimate of the revenue lost due to delay in project completion, there may still be a shortfall resulting from consultants' fees, interest on interim loans, legal fees, costs for permits and the inefficient use of labour forces and materials.

Soft costs are incurred by both the principal and the contractor. For example, work is generally interrupted in that part of the project where the damage occurred, or if an onsite accident may restrict work to half days. This translates into extended rental periods for machinery and equipment, etc. While such cost items are tangible and provable, they are the result of physical damage which is not covered under any standard CAR/EAR policy. The principal's exposure to soft costs that are not already covered under ICOW may be insured by way of a DSU extension. By contrast, the contractor's exposure is more difficult to determine and, although additional coverage is available for the soft costs incurred by the contractor, it is rarely purchased out of reluctance to pay the additional premium.

Typical wording for DSU cover

The Insurers agree that if, at any time during the Period of Insurance stated in the Schedule, any or all of the property insured specified under item ... of the material damage section be physically lost or physically damaged at the contract site by an Accident or (Accidents) as insured under the material damage section, thereby causing an interference in the construction/erection works and/or testing schedule resulting in a delay of commencement of and/or interference with the business to be carried on by the principal, herein referred to as Delay.

Then subject to the provisions, terms, exceptions, conditions and memoranda contained herein, the Insurers will indemnify the Principal in respect of the actual loss sustained from deferred receipt or partial receipt of revenues as a result of the Delay in completion of the permanent works beyond the scheduled commencement date of the business. Actual loss sustained shall mean:

Fixed Costs:
Fixed costs that would have been paid or payable out of the revenues that would have been received or receivable had the delay not occurred.

Debt Service:
The interest, scheduled principal payments, commitment fees, agency fees, etc in respect of advances made or monies borrowed that would have been payable out of the revenues that would have been received had the delay not occurred.

Net Profit:
Net profit that would have been earnable from the revenues that would have been received had the delay not occurred less any sum saved in respect of such of the foregoing amounts as may cease or be reduced in consequence of the delay.

Insurers will also pay as Increased Cost of Working:
Additional expenditures necessarily and reasonably incurred by the Principal or on his behalf (with the consent of Insurers) for the sole purpose of avoiding or diminishing the amount for which the insurer would have been liable without such expenditures, but not exceeding the amount of loss thereby avoided.

Insured perils

DSU cover is commonly based on builder's risk (CAR/EAR) policies, which provide a very broad scope of cover due to their quasi all-risk nature. However, in their standard form, DSU covers often exclude cat perils, such as earthquake, volcanic eruption and tsunami, and any cover extensions included in the CAR/EAR policy by means of memoranda and endorsements. These exclusions are usually not irreversible. They are simply safeguards for the insurer against assuming too much exposure which may easily exceed capacity, particularly in the event of cat perils accumulations in specific loss zones.

In exceptional cases, the category of insured perils is extended to include perils usually covered in a marine cargo policy since the insured economic loss incurred by a delay in project completion due to marine cargo damage is the same. More commonly, however, marine perils are insured by way of a separate marine DSU policy, even though this involves a greater effort in terms of correlating the covers and handling the losses (see also *Cover extensions*, p. 20).

The insured

DSU cover is designed to indemnify only the principal against the financial loss arising from a delay in start-up attributable to an indemnifiable physical loss since, in contrast to the material damage cover, the principal and contractor have conflicting interests with regard to DSU. Therefore, only one party – the principal – can be insured. Accordingly, the cover is often referred to as the *principal's DSU*.

For example, DSU would grant protection for a production plant facility if it failed to generate revenue from a specified point in time. The insured risk is defined as those cost items which would have been paid from revenue generated if the delay arising from the insured accidental physical loss had not occurred. Since the principal alone is entitled to collect revenue derived from plant operation, he is the only insurable party. Even though contractors often request to be included as named insured under DSU, this is not feasible since they have no legal claim to the financial risks under this cover.

Financial institutions which provide loans for construction projects often ask to be the named insured in the relevant DSU policy and, since project revenues contribute significantly to debt servicing, this would appear to be a legitimate request. However, since the loan agreement between the financier and the principal obliges the latter to service the debt irrespective of the DSU cover conditions, the financial institution does not need to be the named insured under DSU. A loss payee clause in the loan agreement would already entitle the financier to collect insurance proceeds and all the protection provided by the relevant insurance policy.

Similarly, additional parties are not included as named insureds under DSU as this would extend the insurer's liabilities way beyond the original intention of the cover. For example, a legal interpretation of the term *actual loss sustained* would enable a contractor listed as a named insured to extend his claim to financial consequences which are not the object of DSU coverage. Although the contractor's financial consequences are not related to revenues derived from the respective project operation, they may be insured under a separate cover which clearly sets forth the recoverable cost items. As a rule, however, the financial risks specified in conventional DSU policies relate to the principal's – not the contractor's – anticipated revenues. Including the contractor under DSU would entitle him to claim for "actual loss sustained" and, in view of the lack of any definition and limits regarding the contractor's financial consequences intended to be covered, the court may – in case of litigation – award the contractor any amount it may consider justified.

The sum insured

The objective of any commercial project is to generate profit and a reasonable return on investment. Regardless of the financing scheme, the principal expects sufficient revenues to cover all fixed and variable costs while generating a net profit. Generally, the sum insured under DSU amounts to the difference between expected revenues and the variable costs, ie costs not incurred if the project is inoperative. The result is gross profit, which could also be determined by adding the anticipated net profit to the total fixed costs. Ordinarily, the sum insured under DSU cover is the annual gross profit. In many cases, however, only parts of it are actually insured, for example, fixed operating costs[3] and debt servicing.

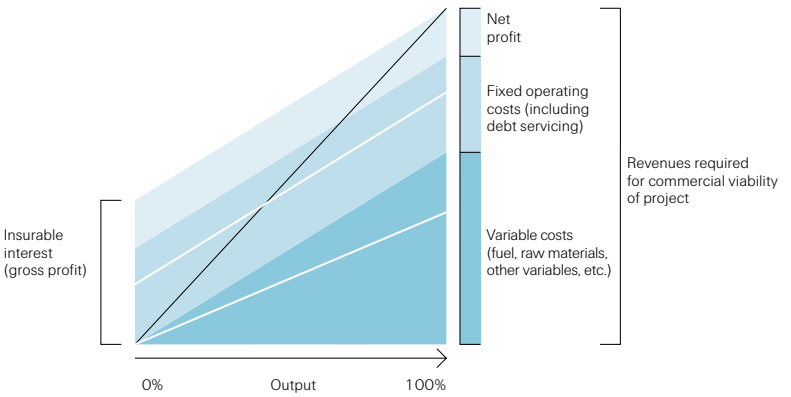
While the insured himself is basically free to determine the sum to be covered under DSU, the indemnity is invariably subject to reasonable evidence that revenues would be sufficient to cover all operating costs, ie total fixed operating costs including debt servicing and variable costs.

Variable costs

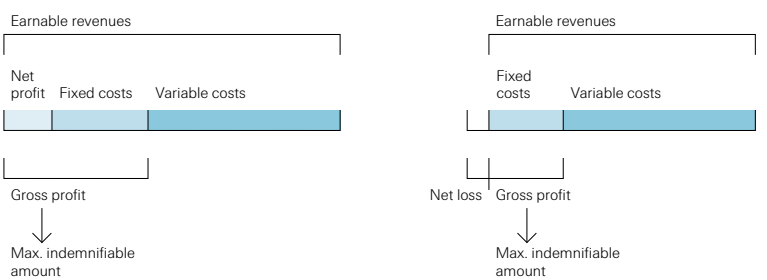
In the case of non-recourse financed projects, the principal is often obligated to purchase a certain fixed quantity of raw materials and/or operating materials – for example, oil or gas for power plants or refineries, ore for metal production or wood for paper mills – as of the scheduled business commencement date. Such items represent variable costs which are not normally insured under DSU cover since they are incurred only if there is no delay. However, if the principal enters a so-called take-or-pay agreement, he may request that these variable costs be included in the DSU cover. Although it might appear that, by having such costs covered, the principal could enrich himself through insurance, this is not the case, since he is obliged to reimburse the other party in the first place. These raw material costs could, of course, be included as fixed costs in the normal sum insured for DSU. However, it is advisable to arrange a separate cover for them to ensure greater flexibility in catering to the specific conditions of the supply contract, ie the take-or-pay agreement. For perishable products, insurability largely depends on the time margin available between the scheduled business commencement date and product delivery. When insuring variable costs under DSU, particular attention must be paid to ways of minimising these potential losses by exploring possibilities to sell such products to third parties.

3 Fixed operating costs: fixed operating and management costs, operation and management fees, essential services

Graph 1
DSU sum insured (revenue linked)



The insured must provide evidence that – had no delay occurred – the project could have generated revenues sufficient to pay for variable costs, fixed costs and net profit or that portion of the latter two included in the DSU sum insured.



Periods and dates

DSU insurance features several specific date designations, eg the insurance inception date, the targeted and guaranteed completion dates, the scheduled business commencement date, and the actual completion or actual commencement dates of business. Some of these coincide at the beginning of the project but may need to be readjusted individually as work progresses. Besides specific dates, DSU cover is also characterised by two relevant periods. These are the *insurance period*, during which an insured event must occur to trigger the indemnifiable delay, and the *indemnity period*, which represents the maximum length of time during which insurers agree to indemnify. Further important periods for DSU insurance are the *delay period*, which stretches from scheduled to actual business commencement date, and the *time excess* or *deductible period*, ie the period for which the policyholder himself is liable. These dates and periods are examined more closely in the following sections.

DSU insurance period

At the inception of the DSU policy, the insurance period is arranged to coincide with the works period, which includes the commissioning/testing cited in the material damage policy. The DSU insurance period usually commences with onsite construction work and ends with either the *guaranteed completion date* (GCD)[4] or *the scheduled business commencement date* (SBCD)[5] cited in the works schedule, whichever is earlier. Any accidental physical loss or damage which delays the project must occur within this period to trigger DSU cover. In the case of projects providing for a phased handover of individual production units which are capable of generating revenue, the cover must be adapted by specifying separate scheduled business commencement dates for each unit and the relevant portion of the total DSU sum insured. In effect, this amounts to establishing a separate cover for each unit (see also *Impact of phased handover on DSU cover*, p. 31). The DSU insurance period does not include the maintenance period which runs concurrently with the operation period. Once the plant becomes operational, revenues are protected through standard business interruption (BI) covers.

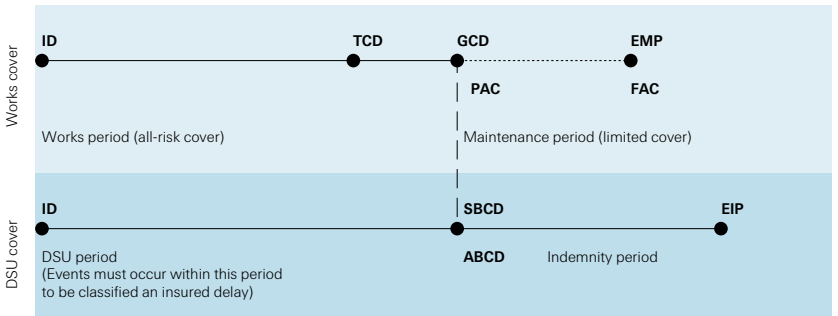
Any prudent contractor incorporates buffer time in his works programme, and targets project completion earlier than the guaranteed completion date. In many cases, he may be entitled to a bonus for successful project completion prior to the guaranteed completion date, yet this has no impact on DSU cover. The scheduled business commencement date is the earliest trigger date for DSU cover. This is the date on which business could have commenced had no insured event occurred, but not earlier than the date stated in the schedule. The period between target date and guaranteed completion date accommodates time lags in works progress which must be expected in any project.

4 The works contract between principal and contractor specifies the date for handover to the principal, ie the guaranteed completion date. As of this date, the principal will accept the project if it meets the minimum performance criteria defined in the works contract. This is also the date from which the principal expects the project to generate revenues.

5 Scheduled business commencement date: The date on which the business could have commenced had no insured event occurred which ultimately results in a delay of the actual business commencement date, but not earlier than the date stated in the schedule.

Graph 2
Key data during the cover period

ID Inception Date of cover
End of all-risk cover
TCD Target Completion Date
GCD Guaranteed Completion Date
(PAC [Provisional Acceptance Certificate] issued)
EMP End of Maintenance Period
(FAC [Final Acceptance Certificate] issued)
SBCD Scheduled Business Commencement Date
Earliest trigger date for DSU cover
ABCD Actual Business Commencement Date
EIP End of Indemnity Period



Definition of insurance period
The insurance period for this policy section shall begin upon commencement of physical work or storage of material at site or the inception date stated in the schedule, whichever is later. It shall cease (unless otherwise endorsed) on the scheduled commencement date of business as stated in the schedule or on the date of actual commencement of business (as defined hereinafter), whichever occurs first.

Extensions of the underlying material damage cover do not automatically extend the DSU insurance period. Rather, any extension of the DSU insurance period requires written consent by the insurer in a separate endorsement entitling him to readjust the premium and the initially agreed time excess according to the additional risk assumed.

Insured delay period
The delay period is triggered on the date on which business would have commenced if no indemnifiable delay had occurred, but not prior to the scheduled business commencement date cited in the schedule. It lapses with the *actual business commencement date*[6] at the contract site and does not exceed the period required for prompt rebuilding, repair or replacement of the property that was lost or damaged. In other words, the insured delay is the period between the scheduled and the actual business commencement dates less any time resulting from delays caused by loss, damage or events for which the insurer is not liable.

The indemnity under DSU cover is calculated on the basis of the loss of revenue which the principal sustains during this delay period. At this point, the scheduled business commencement date is the crucial issue, and it must be revised if construction progress – and hence the period of the underlying material damage cover – changes for whatever reason. However, since it is the most difficult to define, the principal and the insurer often find it difficult to agree on a revised scheduled business commencement date (see graph 2).

6 Actual commencement of business (recommended policy definition):
For the purpose of DSU cover, the business shall be deemed to have commenced as of the issue date of the certificate of practical completion, acceptance/takeover by the principal (PAC), the date of operation start-up or the date operation could have started, whichever occurs first.

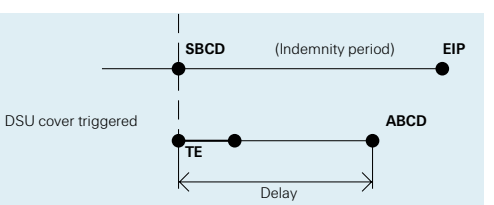
Deductible period (time excess)

The deductible amount for loss of profit covers in general is determined on the basis of the so-called time excess[7] – also referred to as the deductible period or waiting period – during which the policyholder must bear the loss of profit before insurance cover applies. With *operational* loss of profit covers, eg business interruption, the time excess – and hence the deductible – is immediately triggered by the event. By contrast, the time excess with DSU covers is not triggered by an individual occurrence but by failure to meet the scheduled business commencement date. Accordingly, DSU cover can be triggered only once, and only one deductible is applied, regardless of the number of individual events that cause the delay.

An individual time excess per physical event would not be plausible in DSU and would be likely to prompt claims settlement disputes, since a time excess per event would have to be shorter than the single deductible period for the entire project. With a per event cover, the individual events would be regarded as the time excess triggers even though their full impact on the project could not be assessed at the time of their occurrence. If only one event occurred, the insured's share of the loss would be relatively minor. However, if there were several events – even if they did not affect the schedule – the insured would have to face an accumulation of deductibles, which would defeat his objective of transferring as much of the risk as possible to the insurer.

DSU cover, therefore, features a single time excess which is usually expressed as a monetary proportion of the indemnifiable amount and, depending on the type of risk and the construction period involved, usually has a duration of 30 to 90 days and more, in some cases. The contractor's professional qualifications represent an important criterion for the insurer regarding the time excess he is prepared to grant and the premium he charges. If he has any doubts regarding the qualifications of the selected contractors and anticipates numerous (minor) individual claims, he must set a time excess which takes adequate account of the problem of high loss frequency. At all events, works progress must be carefully monitored to promptly evaluate the impact of any loss event, and loss minimisation measures must be implemented whenever necessary.

Graph 3
Time excess



Indemnity =
Loss of GP during delay • $\frac{\text{Delay} - \text{TE}}{\text{Delay}}$

7 Definition of time excess for operational loss of profits (as per policy wording):
The time excess is the period for which the insurer is not liable. The time excess commences concurrently with the delay trigger. When a delay exceeds the time excess, the indemnity is reduced by the monetary amount calculated by multiplying the average daily value of loss sustained during the delay period by the number of days stipulated as the time excess.

Progress monitoring

Changes in the works programme are virtually inevitable during construction, and insurers need regular progress reports to keep abreast of developments. This monitoring function is often assigned to independent consultants or claims adjusters, who must obtain in-depth knowledge of the project's progress to adjust any material damage claim that may arise. Their familiarity with the project enables claims adjusters to easily identify whether a delay is caused by an insured or a non-insured event.

The guaranteed and scheduled business commencement dates are often adjusted for a variety reasons and may need to be redefined during construction. Since DSU cover is strictly limited to delays caused by accidental physical loss or damage, the insurer must ensure that the cause of any delay is clearly recorded. If a delay occurs, the insurance periods of both the material damage and the DSU covers must be extended, and a revised scheduled business commencement date must be agreed upon. However, this does not apply to the guaranteed completion date, which triggers liquidated damages payable by the contractor in the event of a delay, provided that the works' EPC contract stipulates such an obligation. As the project progresses, the scheduled business commencement date and the guaranteed completion date – which coincide at the beginning of the project – may drift apart.

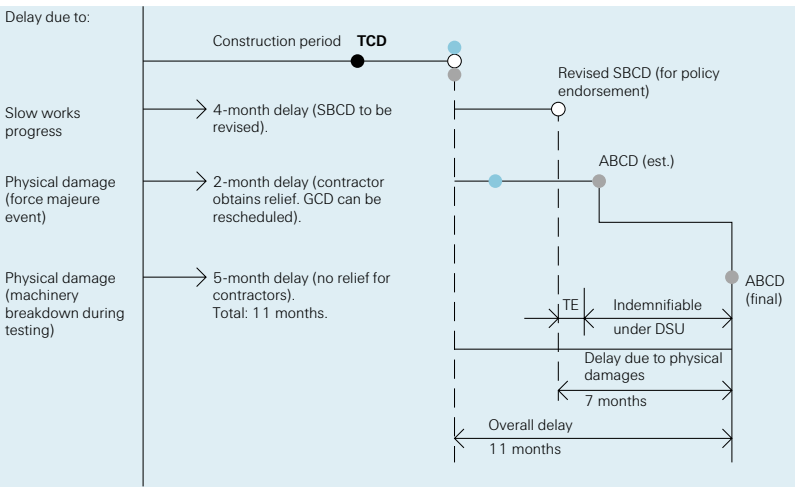
Due to the apparent conflict of interests among the contractor, the principal and the insurer, the revision of the scheduled business commencement date and the stipulated guaranteed completion date is often a contentious point. While postponing the guaranteed completion date would hardly be in the interest of the principal, it may help the contractor to avoid liquidated damages. Similarly, the scheduled business commencement date may be a point at issue between the principal, who strives to ensure that the scheduled business commencement date remains unchanged, and the DSU insurer, who endeavours to postpone this date as far as reasonably possible to accommodate unexpected delays.

Therefore, it is essential for DSU insurers to monitor works progress closely and negotiate any adjustment of the scheduled business commencement date with the principal as early as possible. Any revision, ie extension, of the insurance period entitles the insurer to adjust the premium and, if necessary, the excess period to the increased risk exposure.[8]

8 Recommended wording for extension period due to non-insured events:
It is noted and agreed that the insurance period is extended by .... months and the scheduled business commencement date, ie the earliest trigger date for DSU cover (commencement of indemnity period) as stated in the schedule, is amended to read ...

Graph 4
Monitoring delays

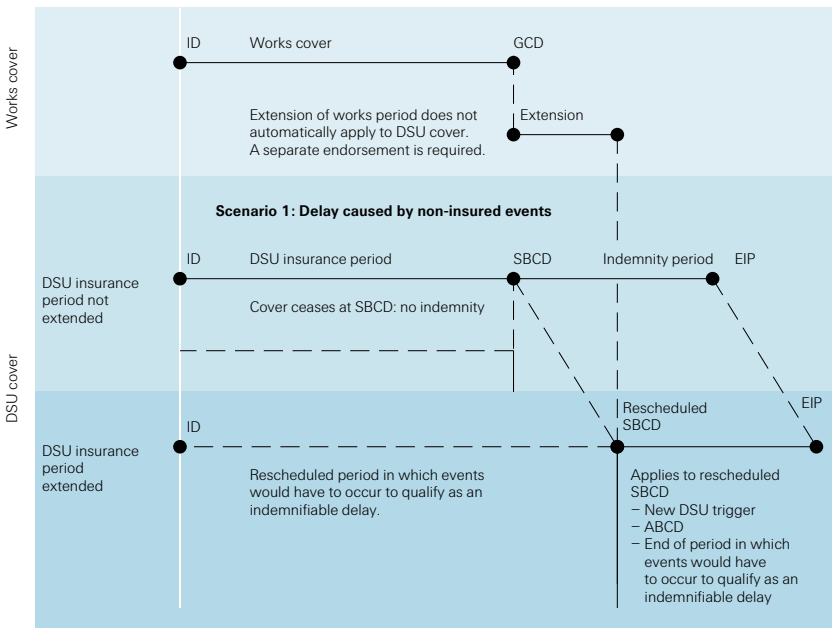
● Target Completion Date (TCD)
● Guaranteed Completion Date (GCD)
○ Scheduled Business Commencement Date (SBCD)
● Actual Business Commencement Date (ABCD)



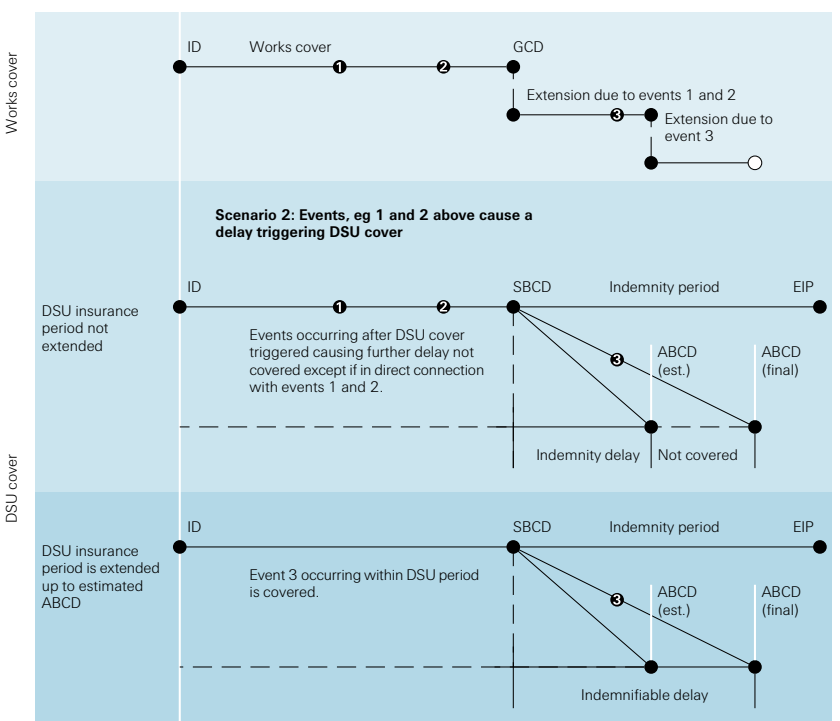
If a project falls behind schedule due to delays caused by events covered in the underlying material damage policy, the insurance period for DSU cover must be extended to maintain full cover, while the scheduled business commencement date remains unaffected.[9] Any physical damage triggering a loss of profit which qualifies for DSU cover must occur within the DSU insurance period. Damage occurring after DSU cover is triggered is no longer insured under the policy, unless it concerns accidents directly associated with the repair or replacement of the initially damaged items.

9 Recommended wording for period extension due to insured events:
It is noted that the project is delayed beyond the (revised) scheduled business commencement date due to insured event(s) and thus it is agreed to extend the period for DSU cover from the (revised) scheduled business commencement date from (.....) to (.....) the date which is the estimated completion of the project, or up to the actual commencement of the business, whichever comes first.

Graph 5
Cover extension period
(due to non-insured events)



Graph 6
Cover extension period
(due to insured events)
DSU insurance period



Cover extensions

As mentioned earlier in the section on *Insured perils*, the underlying material damage cover, ie CAR/EAR, provides fairly broad protection, while the DSU section excludes any cat perils and cover extensions provided by way of memoranda and/or endorsements in the material damage cover. However, DSU cover may be broadened in some cases to accommodate specific client requirements. The most common DSU cover extensions are briefly explained below.

Cat perils inclusion
Subject to the policy concerned, these perils may be included by issuing a corresponding endorsement. In this case, however, insurers must supervise their cat perils accumulation and often need to apply a sublimit which must be explicitly granted as a combined limit for material damage and DSU cover.

Supplier's extension
This extension covers delays resulting from damage to a supplier's premises which prevents him from delivering equipment to the contract site on schedule. The extension is strictly limited to damage at his premises and excludes loss of or damage to equipment during the ordinary course of product manufacture, the use or misuse of tools or faulty workmanship. Rather than being granted in any blanket all-risk form, it is generally limited to the named insured, named perils and named locations. An equipment suppliers' extension could, however, also include take-or-pay agreements as discussed in the *Sum insured* section on page 12.

Customer extension
This extension may be granted for projects which ultimately will be involved in supplying a single customer, for example, an independent power producer (IPP) generating power for a single purchaser, or a refinery which conveys its products to a single off-taker. Any delay in completing the off-takers' facilities may, in turn, delay revenues for the producer. DSU covers revenue loss resulting from such delays – again, provided that it arises from physical loss or damage. This extension is largely governed by relevant contractual agreements between the supplier and the off-taker. The impact of this type of extension is difficult to assess and requires detailed information of the customer's facility, which often is not readily available. Underwriters are advised to exercise special care with this extension.

Marine perils

The issue of whether or not marine DSU should be a separate cover attached to the marine policy is debatable. Irrespective of whether the delay results from damage covered under the marine or the contract works policy, the trigger date remains the same. Hence, a single DSU policy would cover all physical damage causing a delay in project completion. However, this cover extension must be granted only if the extent of the marine cover is known and if it does not include any non-standard elements.

Recommended wording for inclusion of marine perils:
It is noted and agreed that – otherwise subject to the terms, conditions, definitions and exclusions applicable to this Section of the Policy – if any property insured specified under item ... of the material damage section, during the transportation from suppliers' or manufacturers' premises to the construction site (loading and unloading included) be physically lost or physically damaged by an Accident or Accidents as insured under relevant marine cargo policy (Institute cargo clauses), thereby causing an interference in the construction/erection works and/or hot testing/commissioning schedule resulting in a delay of the commencement of and/or interference with the business to be carried on by the principal, then such Delay shall be deemed to constitute a Delay covered under this section of the policy.

Risk evaluation

A DSU risk evaluation is conducted to assess those events which may cause physical loss or damage and to evaluate their impact on the project's scheduled business commencement date. Comprehensive information on the construction risk must be available for the material damage policy as well as for any special conditions stipulated under the contract works policy. Experience shows that the majority of material damage claims under CAR or EAR policies occurs towards the end of the construction and during the testing/commissioning phase. At this point in the project schedule, it is not likely that lost time resulting from these claims can be made up to meet the scheduled business commencement date and/or guaranteed completion date. Therefore, the works progress schedule (and the critical path for complex projects) must be carefully analysed. This schedule must indicate the date and duration of each project phase and highlight those phases which, if delayed, will result in an interruption of the entire project.

A study of project interruption is useful for evaluating the consequences of a particular onsite event. For example, it may reveal how works progress might be affected by seasonal weather patterns since certain works may not be feasible at certain times during the year. This type of study typically includes a process diagram indicating the number and capacity of primary production units and their targeted output. It also provides details on the lead times for key machines and equipment or the time required for obtaining replacements in the event of loss or damage.

Anticipated revenues and operating costs should also be analysed to verify the accuracy of the declared sum insured and to determine the extent of a potential claim. Contingency plans should be analysed to determine how to minimise the extent of a potential loss and to establish appropriate and cost-effective loss prevention measures to reduce interruption and delay.

If DSU is required to cover loss of or damage to a contractor's machines and equipment, the interruption study must focus on key items, such as heavy lifting equipment or tunnel boring machines. Since this type of equipment cannot be replaced on short notice, significant delays in completion will result if it is affected by a loss occurrence.

Another important factor in assessing DSU cover is the contractor's reputation and expertise. Underwriters should obtain as much background information as possible on the designated contractors and subcontractors and on their competence in handling the project concerned. Other major aspects include the project site, availability of skilled labour, existing infrastructures and the overall feasibility of the works schedule. Information on suppliers and manufacturers and an evaluation of their capabilities to furnish spares or replacements and their relevant delivery periods also prove useful in assessing potential delays.

Specific DSU cover features

Material damage covers for major projects and their related DSU covers are tailored specifically to the risk and needs of the insured. The following list indicates key cover aspects which, in addition to the elements common to the material damage policies, must be considered in preparing a DSU policy.

Insured (ie the principal)
- Territorial risk (contract site, suppliers' premises, transit risk)
- Insuring clause
- Limits of works (exclusions of existing property, contractors' machines and equipment)
- Insurance period (works/testing)
- Scheduled business commencement date
- Sum insured (appropriate specification of insured risk)
- Potential delay period (period between the scheduled business commencement date and the date on which business actually commences or would have been able to commence)
- Time excess
- Indemnity period (maximum period during which the insurer is liable for indemnity)

Besides these components, DSU customarily includes specific exclusions and special conditions related to this cover section, for example:

Special exclusions
The insurer is not held liable for delays due to:
- loss of or damage to adjacent property, construction machines and equipment
- non-availability of funds for prompt execution of repairs
- loss of or damage to operating media or feedstock
- shortage, destruction, deterioration or damage of any materials necessary for the insured business
- alterations, additions, improvements, rectification of defects or faults or elimination of any deficiencies performed after an event

This exclusion category also encompasses any liquidated damages or fines imposed for breach of contract or for late or non-completion of orders or any penalties accepted by the principal.

Special conditions

Progress reports
The DSU policy stipulates that the insured must submit progress reports to the insurers at intervals cited in the schedule. Each report must be submitted within 14 days of the end of the period to which it relates, and it must indicate the latest scheduled completion date of the construction/erection phase of each of the primary production units of the project (if construction/erection is still in progress) and the anticipated hot testing/commissioning periods that will probably be required. If any insured or non-insured material delay occurs after the latest report, it must be indicated together with the latest scheduled business commencement date.

Change in the business status or the insured's risk
Unless specifically agreed by endorsement signed by or on behalf of the insurers, this policy section will be invalidated at any time after commencement of the insurance if:

- business is discontinued or is directed by a liquidator or receiver; or
- the insured no longer has a financial commitment.

Premium adjustment
Some policies may include a premium adjustment clause if estimated total revenues either exceed or are less than total revenues as certified by the insured's auditors.

Claims
Further, special conditions in the DSU section contain the particular obligations of the insured and procedures the insured must follow in case of a possible claim.

Stand-alone versus dependent policies
Most DSU covers are a separate section of the material damage cover and provide protection against delays resulting from any event insured under the material damage cover. However, it is also possible to issue a stand-alone DSU wording with its own scope of cover clauses, exclusions and conditions. Since material damage covers are often extended to include a large variety of perils and risks for which DSU cover is not available, the stand-alone DSU cover does have its advantages. It provides the insured (principal) with an entirely separate document without involving those contractors who are not insured under this cover. At the same time, it eliminates any false expectations on the part of the contractor of also being able to benefit from this cover. Regardless of the policy type selected, it must be made clear that any financial consequences for which the contractors are legally and/or contractually obligated cannot be claimed under the DSU policy section.

Claims handling

Since DSU covers are limited to delays resulting directly from an insured physical loss or damage, the number and frequency of individual events are irrelevant; the key criterion being that they arise within the scope of the underlying material damage cover and the DSU insurance period.

Apart from the insured events, various other incidents may also adversely affect the scheduled business commencement date, eg inclement weather, a general lack of progress and additional delays for correcting faulty design. One of the most challenging tasks in handling DSU claims consists of distinguishing between insured and non-insured delays, ie differentiating between those which are truly related to insured material damage and those which are triggered by other events which impede construction progress. The indemnifiable delay is restricted to the time required to reinstate the damaged item to its condition prior to the event. Unindemnifiable delays include additional time required for correcting design fault, modifications for improving performance, etc.

Actions and measures designed to minimise a potential loss are crucial in DSU insurance. They are normally implemented during the construction period to minimise or avoid the time required for repairing, rebuilding or replacing damaged items. However, during the indemnity period, these measures are confined to reducing the impact of delays on business operation.

In the event of material damage capable of delaying the project, it is essential to determine whether or not the project was on schedule when the delay occurred. If so, a loss will most probably result if a critical path activity is involved. At this point, it must be ascertained if uninsured events have already occurred and impeded works progress, necessitating a revision of the scheduled business commencement date. This is also the point in time for initiating loss mitigation measures for the remainder of the construction period.

Claims handling and ICOW

All measures must be considered to effectively minimise loss, for example, increasing the workforce, implementing shift work and overtime, rescheduling the works programme and using different materials. Additional costs will be incurred regardless of the measures employed, and this may pose another hurdle in handling DSU claims. Loss minimisation measures implemented during this project phase may not only serve to prevent a potential DSU claim (in the principal's interest) but may also prevent potential liquidated damages or even safeguard possible bonuses (in the contractor's interest). Cost allocation for loss minimisation measures cited in the ICOW section of the DSU cover must be handled with prudence, since only the principal benefits from the ICOW under DSU, while costs to be assumed by the contractor are not indemnifiable under this cover. Moreover, costs claimed as ICOW are indemnifiable only if incurred with consent of the insurer. Some of the contractor's costs can be insured either under the material damage section – eg expediting costs, equipment rental fees – or by way of a separate cover for the benefit of the contractor.

Another ICOW-related problem concerns the point in time at which insurers must pay such costs. As mentioned above, DSU cover is triggered upon failure to meet the (revised) scheduled business commencement date as a direct result of insured physical damage. However, ICOW may be incurred long before that date. Hence, any payment made prior to the trigger of the DSU policy would be made only under the condition the insured agrees to reimburse the insurer this amount if it is subsequently ascertained that these measures did not prevent or preclude the delay.

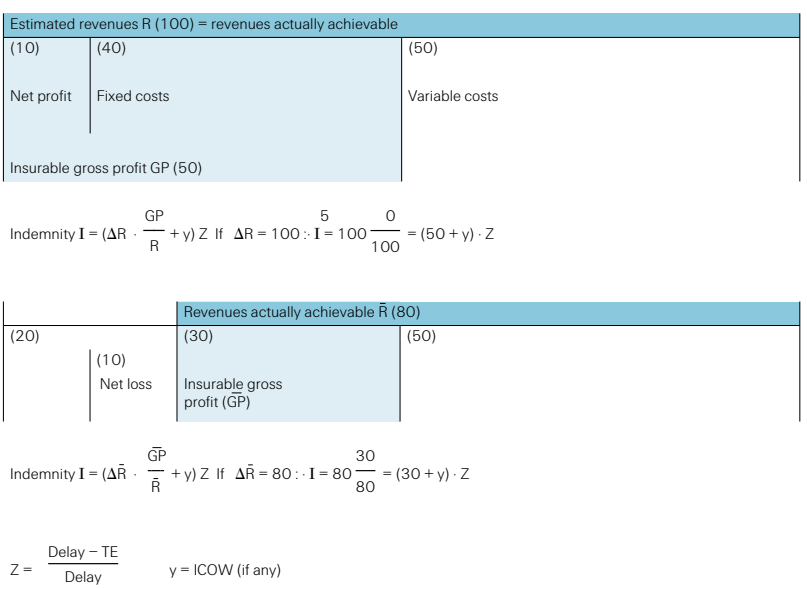
Determining the relevant loss of revenue

The sum insured is based on estimated figures from the project feasibility study. However, since project-relevant circumstances may change considerably between the stage of the feasibility study and the scheduled business commencement date, the initial set of data must be re-evaluated, focusing on:

- the actually attainable market price
- whether the products can still be marketed at the previously specified quantity and price levels
- anticipated business hindrances (eg weather, transport facilities, currency exchange or political problems)

The generated revenues determine a project's commercial viability and must provide a net profit after covering all variable costs (non-incurred if the project is not operational) and fixed operating costs, including debt servicing.

Graph 7
Indemnity



While most policy wordings stipulate that insurers will indemnify the insured for the actual loss of gross profit sustained, the following two items are compared to calculate the indemnity:

- gross profit which would have been achieved during the delay period. This figure is attained only on the basis of best calculation and estimate; and
- actual gross profit during the indemnifiable delay.

The indemnity is the difference between the two figures. However, the actually attainable gross profit can be established only after the project has been in operation for at least 12 months. Accordingly, the indemnity may need to be adjusted after this period. If revenues actually derived from operating the facilities fail to cover all relevant cost items (variable and fixed costs), the indemnity is reduced accordingly. This pertains to revenues which would have been derived from the operation had no indemnifiable delay occurred.

DSU claims handling is complex and must be conducted by an experienced loss adjuster. It is a time-consuming process and may be extended over the entire insurance period. Therefore, while the adjuster must be prepared to commit the time required for the monitoring and settlement process, the insurer must be aware that DSU claims handling involves substantial cost.

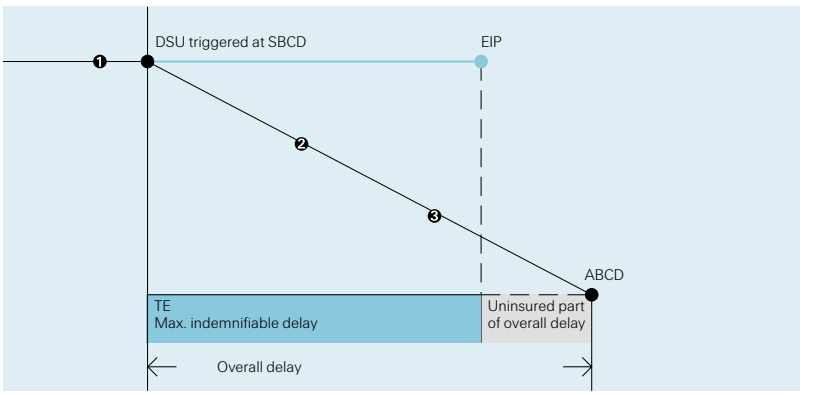
Typical problem areas of DSU

Reinstatement

A problem frequently encountered with DSU cover is the insured's request for reinstatement, ie for prolonging the indemnity period to cover additional events. On principle, DSU cover cannot be reinstated since only one delay of the scheduled business commencement date is permissible and consequently, there is only one indemnity.

Graph 8
Reinstatement

Events
❶ Cause delay of approx. 6 months
❷❸ New events triggering a further delay resulting in an overall delay in excess of the indemnity period



Reinstating the indemnity period would essentially amount to increasing the cover limit. Even in basic property coverage, insurers would hardly be expected to increase a previously selected loss limit when the insured realises that his cover limit is insufficient for a loss which has already occurred. By analogy, at the inception of the DSU cover, the insured must decide on the relevant cover requirement, ie on the length of the indemnity period. This decision is based on an in-depth assessment of project-specific risks, ie repair, rebuild/replacement time of items probably damaged in an assumed loss scenario, in addition to an appropriate time buffer for contingencies. Selected on the basis of these criteria, this period equals the maximum coverage available.

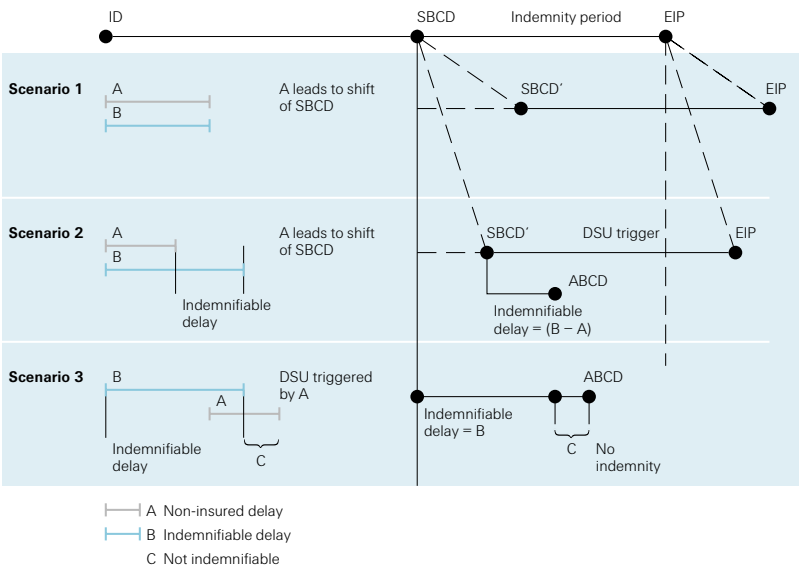
After the cover is triggered, ie the revised scheduled business commencement date is overrun, the indemnity period is effective without interruption until either the project is completed or the indemnity period lapses. This applies regardless of whether another indemnifiable event occurs during this period, thereby prolonging the delay in actual project completion. In the worst case, the project may not be completed until after the indemnity period has lapsed, and the insured may be faced with insufficient coverage.

To avoid this situation, the insured could adopt a defensive risk position and request a longer indemnity period which, however, would not be economically justified. There are some possibilities for dealing with this situation, but there is no standard solution. Although rare, these instances do occur, potentially rendering the project economically inviable and thus an unacceptable insurance risk.

Overlap of insured and non-insured events

As previously mentioned, the guiding principle for establishing an indemnifiable delay in DSU insurance, ie the trigger date, is defined as that on which business could have commenced had no insured event occurred. The following example serves to illustrate three different situations which could conceivably develop with an overlap of insured and non-insured events:

Graph 9
Insured vs. non-insured events



An inherent defect is discovered in a production unit and must be remedied before any physical damage occurs. Project completion is delayed by this non-insured event as a result. Then another unit is physically damaged – virtually at the same time – thus necessitating repair. Both the repair and rectification periods are essentially equal in length. The issue is whether the trigger causing the delay is a physical event triggering DSU cover or a non-physical event causing an uninsured delay. The following three scenarios serve to clarify this question.

In Scenario 1, rectification of the inherent defect is the earliest date the project could have been completed and ready to commence operation. The repair of the physically damaged item is completed at the same time and therefore does not affect project completion as far as DSU is concerned.

If the repair of the physically damaged item takes longer than the time required to rectify the inherent defect as illustrated in Scenario 2, an indemnifiable delay is understood as the difference between the times required for repair and for rectifying the defect.

In Scenario 3, it is assumed that the physical damage occurs before the inherent defect is discovered. The damaged item is on project's critical path, and repair work will bring the project behind schedule. After the inherent defect is discovered and its rectification further delays project completion, the full repair time will be considered the indemnifiable delay, but not the additional time required for rectifying the defect.

When does DSU cover end?
DSU cover ends with the actual completion of the facility and subsequent business start-up, which is defined as the point in time when one of the following criteria is fulfilled:

- the official issue date of the PAC (certificate of practical completion, acceptance/takeover by the principal) is reached
- the principal takes over the facility
- the facility is put into operation (partially or fully) and is capable of generating revenues.

According to these criteria, DSU need not necessarily end with the legal transfer of the project from the contractor to the principal, but once the facility starts operation or is capable of generating revenues.

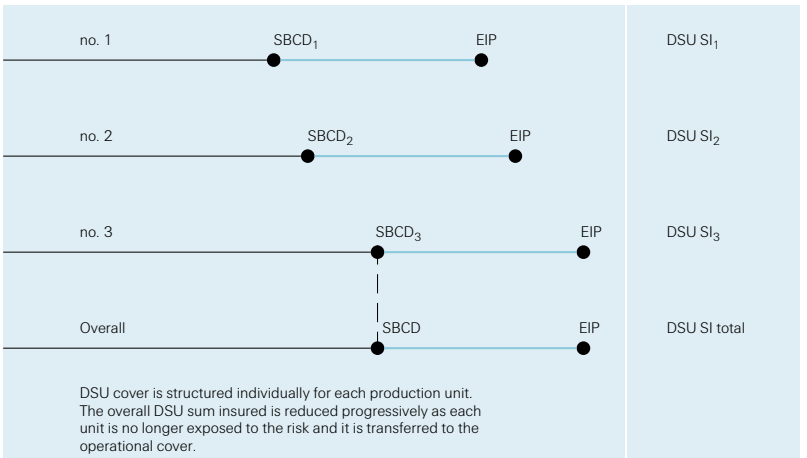
The PAC mentioned as the first criterion is the legal document governing the transfer of the risk from contractor to principal, and its signature may be delayed for various reasons. Since the inception of operational (ie material damage and BI) cover is normally linked to the PAC, this type of cover does not usually apply to claims occurring before the PAC is issued. Even so, the facility may already be in operation before the risk is transferred to the principal. It is in these situations that the third criterion listed above needs to be considered.

While the risk of loss remains with the contractor until the PAC is issued, this applies only to material damage claims and possibly liquidated damages, but not to DSU, from which only the principal benefits. Accordingly, if the facility is in operation before the PAC is issued, the principal must ensure that there is no coverage gap in the interim period between the end of the DSU and the inception of the BI operational cover. If, for whatever reason, the principal delays facility acceptance once the facility is capable of generating revenues and thus delays inception of the BI cover, he will face a coverage gap between DSU and BI covers.

Impact of phased handover on DSU cover

As mentioned above, DSU cover generally applies to only one single completion date. However, certain project contracts stipulate a phased handover of individual facilities, eg power plants with more than one unit, as the individual units become operational upon completion of their own testing/commissioning.

Graph 10
Phased handover



Applying a single DSU cover to the entire project would, in such cases, conflict with the single completion date principle. By contrast, the basic DSU principle remains unaffected if DSU cover is structured to apply to each unit individually and separate scheduled business commencement dates are set accordingly. With this approach, the relevant part of the DSU sum insured must be allocated to each individual unit. The overall DSU sum insured is then reduced as each unit commences operation and, in turn, the BI sum insured increases with each unit added to the operational cover.

Increased cost of working (ICOW)

The ICOW clause included in DSU cover is commonly understood as expenditures reasonably and necessarily incurred by the principal (or on his behalf) for the sole purpose of preventing or minimising loss of gross profit which the principal may face and for which the insurer would ultimately be liable to pay. ICOW is also subject to the time excess and can be triggered only by accidental physical loss of or damage to an item on the project's critical path which occurs during the insurance period and would inevitably result in a delay beyond the scheduled business commencement date.

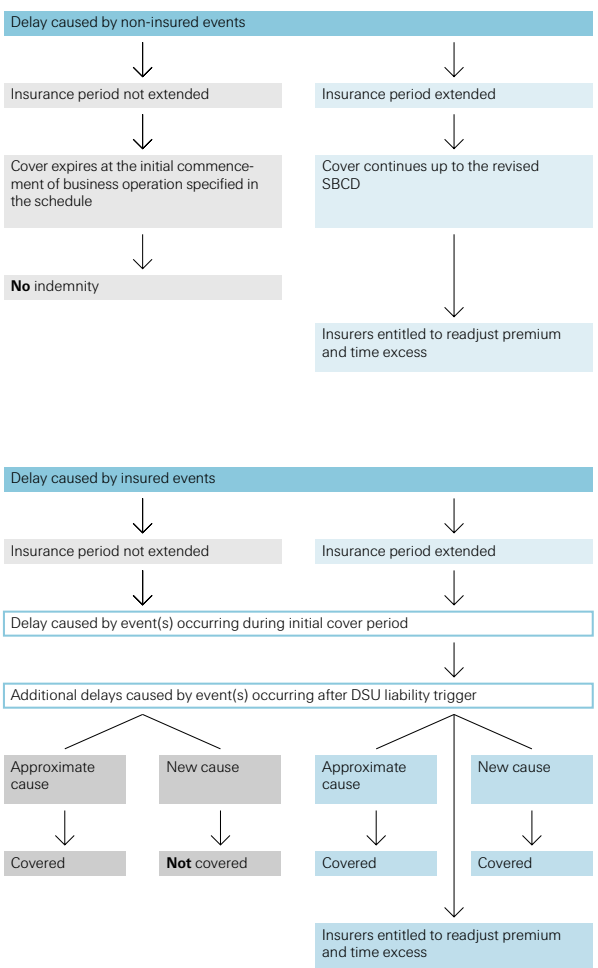
The insured is obligated to take any reasonable measures to ensure that construction is completed according to schedule. Following an occurrence, the insured must not undertake any repairs or alterations until the insurer has had a reasonable opportunity to inspect the damage. Moreover, the insured must actively involve the insurers in measures implemented to ensure that construction proceeds on schedule if these measures involve expenses which will be recovered from insurers.

Since DSU is limited to losses sustained by the principal, an ICOW clause in the DSU cover does not concern any expenditures which the contractor may incur from his obligation to repair or replace damaged items. The same applies to any expenses arising for the contractor from his efforts to minimise delays in the works progress. Accordingly, he must obtain a separate cover for such expenses.

Delay in works progress and its influence on DSU cover

Graph 11
Delay in works progress and its influence on DSU insurance

Note:
Approximate cause = direct connection with repair or event(s) occurring within initial cover period



Contractors' extra expenses resulting from start-up delay (soft costs)
The term *soft costs* is often used in connection with DSU cover. It represents a wide range of cost components, including accounting fees, additional costs of construction, labour and material, additional design costs and additional interest on loans for financing construction or repair. As mentioned earlier, soft costs incurred by the principal, which are not already included under ICOW, can be easily covered by DSU through endorsement, provided that they are clearly defined. By contrast, soft costs incurred by the contractor need to be addressed in a separate policy specifying the extra expenses to be covered. Occasionally, endorsements attached to the material damage section provide cover for specific extra expenses which the contractor may incur.

Recommended wording for coverage of the contractor's extra expenses:
Section (4) Contractor(s) Delay in start-up Extra Expenses.
The Insurers agree, subject to the terms, exceptions and conditions contained herein, that if the property insured specified under item ... of Section 1, shall suffer accidental physical loss or accidental physical damage at the Contract Site as insured by Section 1 and causing a Delay in the completion of the Project Works beyond the scheduled business commencement date, then the Insurer will indemnify the insured Contractor(s) for their specified extra expenses due to such delay.

Specified Extra Expenses are:
- (i) continuing expenses related to the construction project limited to:
  - site facilities and equipment expenses
  - equipment rental fees
  - interim construction loan

unless otherwise agreed
- (ii) general overhead expenses limited to: wages, salaries and personnel expenses which cannot be reasonably avoided during the delay, unless otherwise agreed
- (iii) increased cost of working defined as those costs necessarily and reasonably incurred in order to make good a delay in the works programme which is the result of the physical loss or damage and would otherwise result in delay in completion of the works.

The coverage for these expenses is limited to (i) the amount in excess of the amount that would have been incurred had no Delay occurred and (ii) the amount actually incurred during the period of the Delay less any amount recoverable either from the Employer (Principal) or under any other Section of the policy.

Limit of Indemnity: .....or (5)% of total Contract Value, whichever is less.

Time Limit: .....months (costs incurred for that part of Delay which exceeds the Time Limit will not be indemnified).

Outlook

Non-recourse financed projects must fulfil the prerequisite of being completed on time in order to generate sufficient revenues for fixed and variable costs and to provide adequate return on investment. Any delay in start-up may increase overall costs and undermine the financial viability of the project. From the financial backer's standpoint, a delay causes a deterioration of the debt/equity ratio, thereby increasing the project's credit risk exposure. In view of the risks involved, financial backers are now more apt to demand that the principal insure the project against delayed start-up, thus prompting a pronounced increase in demand for DSU cover.

The premium volume is relatively high in this line of business. Yet profitability, rather than volume, is the issue and more importantly, what the future will present for this type of cover. For the most part, risks currently on the books were written when DSU cover was still considered a special line rather than a standard line as it is today. In the past, adequate premiums and time excesses were more easily obtained, the sums insured more moderate and only limited capacity was made available.

Current and future requirements, however, create an entirely different situation since DSU cover is now an integral part of virtually every new project policy. Demand for DSU cover will continue to grow due to complex infrastructure and private sector developments, including projects utilising novel, and in some cases, insufficiently tested technologies. DSU sums insured have also increased considerably for certain risk categories.

By its very nature, DSU cover is difficult to evaluate from an insurer's standpoint and requires in-depth assessment of technology and construction risks and relevant cat perils exposure. There is a strong tendency on the part of all involved in project realisation to transfer all possible risks – including entrepreneurial risks – to the insurance industry. However, this is neither feasible nor acceptable and there will always be some risks which cannot be transferred. While current DSU cover provides fairly comprehensive protection, some of the risk must be borne by the insured. Beside standard DSU cover, the insurance industry also has other contingency type covers which may help cushion the impact of project delays.

Other publications in the "Technical publishing/Engineering" category include:

Machinery insurance
Both surging technological progress and adverse competitive environment compel industry players to tighten production and testing schedules; new machines and equipment are often installed onsite without prior comprehensive testing. Insurers may also be asked to provide cover for machines and equipment featuring novel designs and new, unproven materials and processes.
Order no.: 202_00247_en

Standstill covers under CAR and EAR insurance
Many CAR and EAR projects run smoothly, allowing the contractor to transfer the works according to the original schedule. Other building or construction works are subject to delays or may even be suspended altogether. If the financial foundations of ambitious engineering projects are shaken in the wake of an uncertain economic environment, there is a marked increase in demand for insurance against the risk of interruption or standstill.
Order no.: 202_99181_en

Contingency covers: Force majeure and liquidated damages insurance
The globalisation of the industrial sector has prompted manufacturers to introduce new machinery and equipment which promise higher efficiency and greater output. At the same time, buyers are imposing more stringent conditions on contractors, aiming to protect themselves against possible drawbacks and shortcomings that may result from this trend. As such, there will be increasing demand for various types of cover, such as contingency risk, force majeure and liquidated damages. This publication provides useful insight into these covers.
Order no.: 202_99179_en

Contractors' all risks insurance
This publication outlines the insurer's influence on the various project phases, and the insurance-related clauses of the standard FIDIC contract and the CAR policy.
Order no.: 202_99170_en/es

Contractors' plant and equipment insurance in international markets
This publication cites the essential differences between CPE and Machinery Breakdown insurance. In addition, key marketing aspects are emphasised. Risk assessment and selection is dealt with, and insurable plant and installations are shown, together with examples of losses.
Order no.: 202_98141_en/fr/de/es

Engineering insurance and reinsurance. An introduction.
In this overview, the main topics covered are history, non-renewable (one-off) and renewable covers, including the most common extensions of cover/special clauses, as well as engineering reinsurance basics. It is intended for companies and underwriters who have no in-depth experience in this field.
Order no. : 202_98106_en/fr/de/pt/es

The brochure entitled **Swiss Re Publications** includes a complete overview of all available Swiss Re publications.
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