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Guideline for preparing comprehensive extension of time (EoT) claim

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Abstract Any project faces delays and disruptions especially the mega/complex projects of today, with many interfaces. Proving delay and/or disruption is not an easy task and it is a time consuming process especially in the mega/complex projects with thousands of activities, lots of details and interfaces with the involvement of many stakeholders. The different methods that are used to prove delays, as explained in industry standards and handbooks, are theoretical and could be applied in the small simple projects with few numbers of activities but the same methods cannot easily be applied on mega/complex projects. Proving delays in mega/complex projects, whose schedules contain thousands of activities with many interfaces and lot of causes for delay and disruption is a complicated process and involves lots of details. When any degree of complexity in the project is examined, it becomes more difficult for the project team to record the delays and disruption events properly because they are always busy dealing with the site issues and other project pressures. In order for the contractors to be successful, a time extension claim or disruption claims should adequately establish causation and liability and assist in demonstrating the extend of time-related damages experienced as a direct result of the delay events relied upon. The process of recording the delays and disruption is a dynamic process and needs continuous involvement from the planning team with the support from all other departments.

Introduction

A practical approach that is recommended to be followed to enable the contractor to prove the delays and build a well-supported claim for extension of time is introduced. The proposed approach was based on a combination between the theoretical information and practical experience. The sources for the theoretical information were Keane and Caletca [1] and Haidar and Barnes [2] while the source of the practical experience was a case study in PhD thesis prepared by the author [3]. This approach consists of; (1) preparing the baseline programme (planning

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stage), (2) proper programme updates, (3) accurate programme revisions, (4) defining and introducing the delays to the programme updates, (5) identifying the concurrent delays and splitting between the contractor and employer delays, (6) defining the contractual basis for the entitlement, and finally (7) preparing the evidences of delay.

Preparing the baseline programme-planning stage

In order for any competent project management team to maintain a proper planned and controlled project, it is imperative to have the following elements addressed prior to the planning stage; (1) a well-defined scope of the project, (2) skilled and experienced staff, (3) time and cost limits (programme and budget), (4) identified risk contingencies (contingency for known-unknown risks and management reserve for unknown-unknown risks), (5) a proper work breakdown structure, (6) a well-established change management procedure, and finally (7) clear completion criteria.

It is essential for the project management team to carry out the following pre-planning tasks once the project is awarded:

a. Definition of project scope and contractual milestones or sectional completion dates if any;
b. Defining the project objectives;
c. Prepare a project specific risk register defining all risk that could occur during the project life cycle;
d. Assign a project team that can achieve the defined objectives and definition of key roles and responsibilities for each team member;
e. Defining all project stakeholders, and defining the required strategies to deal with each stakeholder in accordance with their interest, influence and power;
f. Establishing project budget;
g. Development of the project management plan;
h. Development of project risk management plan;
i. Development of project execution plan;
j. Defining logistic plan; and
k. Preparation of project procurement plan with a clear definition for any long lead items;

Based on the pre-planning tasks defined above, the contractor can produce an accurate baseline programme which is considered the solid base for any future claim. Baseline programme represents the contractor's approach to execute the contract scope prior to the project commencement date showing the planned productivity rates for all types of work which is considered also the non-impacted benchmark for any future claim.

Normally, preparation of the baseline programme starts with the identification of the activities required to execute the work in accordance with the project work breakdown structure and contract plan and specification. Once all activities have been defined, the interrelationships between the activities should be determined in accordance with the sequence of work and construction logic in order to finish the work by the contract completion date. The number of activities and interrelationships depends on the level of detail required by the contract documents and increases based on the complexity of the project.

The next step in producing the baseline programme is to calculate the durations required to execute each activity on the network. There are many factors which should be considered during this process such as, quantities, contractor's norms, availability and quality of manpower, machinery resources, weather conditions, and site conditions as well as other constraints. All resources should be loaded and allocated to their relevant activities in terms of man-hours, machine-hours and costs in order to produce the overall manpower and machinery histograms that show the total planned number required to perform the contract scope over the contract period. This will be considered the non-impacted benchmark to be used for comparison purpose in case of any future claims for delay, acceleration or disruption. In addition, the contractor has the right to assume any missing information, but all assumption made should be qualified clearly in the schedule narrative that is submitted along with the schedule.

After time estimation and loading the resources, the mathematical calculation using CPM will be conducted to determine the chain of interrelated activities through the network from the project start to its completion date. The early dates and critical path will be defined during forward calculation while the late dates and floats will be calculated during the backward calculation.

Normally, the planning team conducts this process many times because the completion date derived from the first run may not meet the contract completion date. Therefore, the planning team should recalculate the durations of the critical path activities and accordingly the related resources in order to obtain the required date.

There is a big argument which inevitably arises during the extension of time (EoT) claims review process "*which party owns the float?*" The contractor may argue that he owns the float because the contractor is the producer of the programme and this reflects how the contractor will carry out the work with a sequence that allows the contractor to maximize the utilization of resources. The contractor always gives himself flexibility in the event that the contractor is not able to perform the work as planned assuming a certain degree of risk. These floats also allow the contractor re-sequencing of the network to mitigate any delays and also the level of its resources. In the case of any delay to the contractor's progress for reasons attributable to the employer, the contractor may argue that it is entitled to an EoT even if the delay will not delay the contract completion date on the basis that the float has been consumed due to employer's risk events. This argument by the contractor will be denied because no EoT would be considered unless the project completion date has been delayed. On the other hand, the employer may argue that as "they" own the project, it also must own the float and the contractor is not entitled to any EoT unless the employer risk events delayed the contract completion date on the basis of that the employer or the project owns the float. If the contract is "silent (not specifically identified within the clauses) on the float ownership and does not state clearly that the contractor owns the float, then the contractor has no case for EoT if the floats were utilized due the employer risk events.

Keane and Caletca [1], Haidar and Barnes [2] and SCL [4] agreed that if the contract is silent on the float ownership, the float should be owned by the project and to be shared by the employer and contractor. The float should be available for use by whoever needs it on the basis of 'first come-first served' [1] In addition, SCL [4] stated that if the employer uses part of the float first and the contractor suffered financially due to

non-availability of the float when required, then the contractor may ask for compensation.

Therefore, it is crucial to the contractor that the contract states clearly who owns the float to avoid such argument.

After completion of a baseline programme or as-planned programme, and before submission to the employer for review and validation, the contractor planning team should check the following points to make sure that the baseline programme is reliable and can be used as solid base/benchmarks for any future claim;

1. Confirm that all activities have at least one predecessor, and one successor activity i.e., there are no open ends. In addition, the programme should have only one start and one finish. Using a "start to start" relation only should be restricted and "finish to finish" relation should be used in parallel with "start to start" to close the loop;
2. Confirm there is at least one critical path which has a continuous chain of activities from start to completion;
3. Confirm logic along the critical path, and near critical paths, is reasonable and feasible (based on information available at tender stage);
4. Confirm durations for all activities along critical, and near critical paths, are reasonable;
5. Confirm floats are reasonable and there are no negative floats;
6. Confirm not using of the mandatory constraints because they are not flexible and its total floats are always zero;
7. Calculate the planned resources required to carry out the defined scope of work. In this process, the planned productivity rates will be used to calculate the planned man-hours required for each activity and accordingly calculate the number of resources in accordance with the following equations: (Based on current project)Man-hours required = Budget Quantity × Productivity Rate (MH/UOM)No. of resources per month = Man-hours required/260While 260 are the total planned man-hours per month for each worker260 = 26 working days per month × 10 working hours per day.
8. Confirm that all activities are loaded with planned resources to finish the activities on its allocated durations. The contractor should look at the crew resource table/profile and make sure that all required resources are available or could be secured on time. If the required resources are allocated to the programme without taking into account the availability of the resources, then this programme is not workable and reflects a plan of failure;
9. Confirm 100% of the contract scope is represented in the programme without additions or omissions;
10. Confirm that there are no delays, changes or intermediate milestones imposed by the employer incorporated to the baseline schedule that would not have been known at tender stage/contract documents;
11. Confirm all contractual milestones, constraints and sectional completion milestones are represented accurately in the programme;
12. Confirm appropriate working calendars have been assigned;
13. Confirm appropriate regional/national holidays are allowed for in the programme calendar;
14. Confirm all third party interfaces are well represented, with appropriate notification for statutory services, easements and rights of way;
15. Confirm employer's review times are adequate, and are compliant with the contract.

After producing the baseline schedule, the contractor may consider performing a 'what if analysis' calculation in order to examine that the programme will react to the changes and the critical path/s will be impacted. Any identified errors or concerns should be corrected so that the programme can be used as a reliable basis for measuring delays and future claims for extension of time and disruption.

The contractor should submit a programme narrative that includes how the programme has been built, programme of key dates (intermediate milestones and/or sectional completion dates), productivity norms, work break down structure, assumptions used, major quantity histograms, manpower and machinery resource histograms, S-curves, etc.

In reality, taking into consideration experience of previous and ongoing construction projects, the approval of baseline programme by the engineer/employer is a time consuming process. The contractor normally receives the engineer' s comments after six to eight weeks from the date of the programme submission while the whole approval process takes almost three to four months from the date of submission of the programme by the contractor. The FIDIC [5] stated clearly in clause 8.3 that "*Unless the Engineer, within 21 days after receiving a programme, gives notice to the contractor stating the extent to which it does not comply with the Contract, the contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Employer's Personnel shall be entitled to rely upon the programme when planning their activities*". The initial delays occurring during the baseline programme approval period have no proper basis to measure and are debatable. Hence the recommendation is that the delays that occurred during this period should be properly recorded and monitored by giving advance notices to the employer for the requirement of any urgent information by referring to the first submittal of the program.

Proper programme updates

Construction projects by their nature are very dynamic and subjected to changes compared with the original plans and assumptions. A construction project could face many changes when it comes to the construction phase such as but not limited to unforeseen soil conditions, delay to engineering and procurement deliverables, adverse weather conditions, political issues, changes to scope of work. Therefore, all parties involved in any construction project such as employer, contractor, supervision consultant and any relevant stakeholders are always keen to have accurate status reports of the project performance and to be updated to envisage changes or delays to the original plan.

Accordingly, the project programme should be continually updated or revised whenever required, in accordance with the frequency stated in the contract documents, to reflect the current site conditions and constraints. Delays to the engineering and procurement deliverables including any changes and their impacts on the critical and near critical paths of the project

must be included otherwise the project programme will be outdated and misleading to all stakeholders. Failure by the contractor to provide proper programme updates can result in any delay and disruption claim being easily declined by the employer.

The purposes of programme updates are; (1) to determine the actual physical progress achieved compared to planned, (2) provide a complete and accurate report to the actual progress compared with original plan, (3) it is often a contract requirement and may be required for payment purposes (in case of lump-sum price contracts), (4) it identifies the changes to the critical path and identifies out-of-sequence activities, which may require an adjustment to the plan for completing the remaining work and (5) predict a more accurate completion date as of the date the project status is measured. Accurate updated schedules can also be used to record the performance of the employer, its representatives, the contractor and their ability to meet commitment dates as stipulated in the original plan. Periodical updates provide a record of the adherence to timelines and completeness of each party's effort. These also measure the impact of change to the work and any changed methods or sequences of performance.

In addition, the programme updates should consider the impact of any disruption event which affects the efficiency of the resources required to complete the work and thus increase the duration of the affected activity or group of activities due to such disruption.

A reliable programme update will give the project management the opportunity to assess the impact of changes or unforeseen events and implement timely remedial measures if required in order to mitigate/avoid the impact of such changes or unforeseen events. When documenting a project's history, a delay analysis could be easily performed to identify the causes of delays, measure the contribution of each party to such delay and accordingly the impacts can be calculated. When updated properly, the final updated schedules can be relied upon as an as-built schedule.

If the anticipated completion date becomes shifted beyond the contract completion date after completing the programme update due to the contractor's risk events, then the contractor is responsible to take all necessary actions to bring back the completion date to the contract completion date. In case of contractor's failure to mitigate its delays, such delay is not compensable and the contractor will be subjected to penalties or liquidated damages unless the contractor's delays occur concurrently with the employer's delay.

In all cases, the contractor is obligated to mitigate the impact of any risk event regardless of the owner of the risk events and show what actions have been taken to mitigate such delays.

Programme revisions

Taking into consideration the span of construction projects, the frequent scope changes and the delays which can occur during the execution phase, the approved baseline programme becomes misleading and needs to be revised from time to time to incorporate the changes, revise logic and sequence of work and to incorporate the mitigation measures. The interval of the programme revision depends mainly on the volume of changes received during the period and validity of the construction sequence of work along with the current site conditions and constraints.

The revised program should be developed from the latest updated schedule including all the delays, scope changes to that point of time and the proposed mitigation measures. In result the project completion date may remain the same or go beyond the contractual completion date.

In the first case, i.e. if the project completion date remains same, there is no problem on the approval of the revised program from the engineer and/or the employer. The approved revised program will replace the approved baseline programme and will be the new benchmark which will be the base for any future claims for extension of time and/or disruption. It will also be used for the progress updates, monitoring delays and any other scope changes, etc.

However if the project completion date extends beyond the contractual completion date, the revised programme will not be approved by the engineer/employer until the related extension of time claim is approved. The engineer could give conditional approval only for progress monitoring purpose or sometimes delay the approval requesting additional information and substantiations. In general, the approval of extension of time claim by the employer is a very time consuming process and normally takes four to six months and sometimes the extension of time will be granted only at the time of expiry of the original contractual completion date. During this time, there is no approved revised program to monitor the delays although the revised program is being updated only to monitor the progress. Hence any analysis of delays in the extension of time submittals becomes debatable and may lead to arbitration. The contractor will face problems in obtaining the extension of time in this process.

Thus in order to avoid or minimize the conflicts in measuring delay, we recommend to update the baseline programs simultaneously in the case that revised programs are approved for progress monitoring purpose only. The contractor should submit the baseline and revised program updates to the employer or his representative to see exactly how the delays are affecting the project execution. Although it is difficult to measure the delays on the baseline program updates (when there is revised program in force with current logic and sequence of work), this will help the contractor to ease out some of the problems until the revised programs are approved.

Defining and introducing the delays to the programme updates

After completion of the programme update, it is necessary to calculate the delays occurred or expected to be occurred, due to the various risk events, especially those which are attributable to the employer, throughout the project life cycle. Determining the impact of the various risk events can be carried out through a process called ''time impact analysis'' as defined in items 1.0 and 2.0, fragnets technique could be used as a tool to show the effect/impact of each risk event on the overall project schedule. Cushman et al. [6] defined the fragnets as ''*fragnets is defined as a sequence of new activity or activities that are proposed to be added to the existing programme to demonstrate the influence of delay and also the method for incorporating delay and any impacts into the schedule*''. The objective is to identify and quantify any time impact associated with each risk event and calculate its time relationship to previous or current delays.

In order to have a successful claim, the contractor should define causation, liability, and damages related to each risk event. Liability is always defined within the contract

documents which state in detail the obligations of each party. It also requires the demonstration of the cause–effect analysis for each risk event, i.e. one which is an employer's liability ''the cause'' and the resulting impact on the contractor's ability to carry out the project works ''the effect''.

Delays can be excusable, non-excusable, compensable and non-compensable. There are a few tests which must be satisfied for a delay to be considered excusable and compensable. Excusable and compensable delays are those resulting due to risk events beyond the contractor's control and always attributable to the employer. If a delay event cannot be shown to be excusable, it will be deemed non-excusable, and if a delay event cannot be shown to be compensable, it will be deemed non-compensable by default.

The contractor has the sole responsibility to prove that the delays occurred are excusable and compensable by referring to reliable critical path analysis. In order for the delay to be excusable and compensable, the contractor has to prove the following:

1. Delay is not attributable to events within its control and is fully attributable to the employer risk events,
2. None of its own delay was ongoing concurrently with the delay events being relied upon.

If the contractor proved that the exercised delay was due the employer risk events but there was concurrent delay due to the contractor's risk event, then the delay will be excusable but non-compensable and contractor is entitled for extension of time without compensation. If the contractor can segregate the portion of the excusable delay from that which is not, then the contractor is entitled for extension of time with partial compensation for the portion of the excusable delay only.

Identification of delay

Usually causes are categorized as contractor risk events, or employer risk events. Until any of these events are confirmed as having caused actual delay or intended to cause expected delay, they are only risk events. The type of the contract is a factor in defining the risk events and its allocation. For example, lump sum price and EPC contracts have the highest risks to the contractor and lowest to the employer while the re-measured contracts has the lowest risks to the contractor and the highest to the employer.

Contractor's risk events in general are limited to the following:

1. Wrong assumptions;
2. Poor planning;
3. Unrealistic activity duration or interrelationships;
4. Low productivity of resources;
5. Lack of manpower and machinery resources;
6. Poor quality of work; (extensive remedies)
7. Commitment to HSE requirement;
8. Financial issues; and
9. Late delivery of the required materials.

Any delays that can occur due to any such events are non-excusable and non-compensable delays and the contractor is responsible to recover such delays at its own cost otherwise the contractor will be subjected to the application of penalties or liquidated damage clauses as stated in the contract.

Employer's risk events in general are the following:

1. Delay in handing over the job site;
2. Use or occupation by the employer of any part of the permanent works, except as may be specified in the Contract;
3. Different physical conditions from those provided during the tender stage;
4. Changes to the original contract scope;
5. Late engineering deliverable;
6. Late procurement deliverables;
7. Frequent revisions for engineering deliverable;
8. Delay in approval above the contractual allowance;
9. Delay in payment,
10. Out of sequence for engineering and procurement deliverables;
11. Suspension of the work;
12. Adverse weather conditions;
13. Changes to project specifications;
14. Force Majeure (War, hostilities, invasion, act of foreign enemies' revolution, terrorism, sabotage by persons other than the contractor's personnel, or civil war within the country, etc.); and
15. Existing underground utilities which are not shown in the as-built drawing received by the contractor during the tender stage.

Any delays occurring due to such events are excusable and compensable delays but the contractor at the same time is responsible to mitigate totally or partially the impact of such delays.

In case of occurrence of any of the employer risk events, the contractor should take necessary actions to record the delay impact due to such events. Recording the delays is explained in the following Section 4.2.

Recording delays

On any complex/mega scale project, there are frequent multiple potential causes of delay to be investigated which can number in the hundreds and occasionally thousands. For each potential delay event a 'delay notice' should be prepared and submitted to the employer within the time stipulated in the contract documents. The delay notice should provide all relevant information related to each delay event which are:

1. Employer request for change if any;
2. Detailed description of the change and the quantities related to such change;
3. Related drawings and specification;
4. All correspondence (letters, transmittals, technical queries, ...)
5. Relevant contract clauses; and
6. Time impact analysis performed to quantify the impact of such delay.
7. Estimated cost impact if any

Normally, the time impact analysis is carried out after the programme update at the time of the occurrence of the risk event. The risk event/events are introduced as a new activity or activities to the project network to calculate the impact of such events on the project completion date.

Details of all the delay issues identified should be recorded in a delay register. This register is designed to capture all delays, regardless of how small they are, which could have contributed to the cause of the critical delay incurred. Effective project control teams will keep live register of 'early warning notices'. These projects are more likely to avoid long-term disputes due to the transparency added to the perspective of both parties allowing issues to be resolved in the first instance not using the concept of "wait and see".

Understanding concurrent delays

Concurrent delay is one of the most important issues in reviewing and validation of any extension of time claims. Therefore, it is essential to establish a proper understanding of concurrent delay and its effect on time impact analyses. In general, concurrent delay can be described as a situation in which two or more delay events are occurring at the same time during all or a portion of the delay periods being considered. Whether such delays are excusable and compensable depends on the terms of the contract, the cause of the delays, the timing and duration of the delays, the party or parties responsible for the delays, and the availability of float (contingency time in critical path analysis that allows the non-critical activity or activities to be delayed beyond its planned date without impacting the project completion date).

There are three different situations in which concurrent delay could occur. First is the situation in which, in two separate delays, both the employer and the contractor each simultaneously delay an activity on critical path and, thus, the overall project. A second type of concurrent delay occurs when one party is being delayed by another party in two separate situations (different paths of activities) at the same time, and both delays affect the overall completion of the project. A third type of concurrent delay occurs when, in a project involving multiple-prime contractors, three different parties, interface contractors, cause delays that occur at the same time and each delay has some impact on the overall project completion date.

In all cases of concurrent delays, the contractor is entitled for an extension of time but the additional compensation will be declined unless the contractor can segregate the portion of its delays from those that are attributable to the employer risk events.

Contractual basis of the entitlement

The contractor should define in a separate section of the claim document the contractual basis of his entitlement for EoT and should state clearly the contract clauses he has referred to in his request such as the different clauses defined by the FIDIC [5].

Preparing evidences of delay

When change orders, delays, or relevant issues occur, a time impact analysis/delay analysis should be prepared to document and record the facts and circumstances pertaining to each delay event qualifying the delay and the impact on the project completion date. The time impact analysis usually includes the current updated schedule, excusable delays for which time extensions may still be pending, job conditions encountered, the progress achieved up to the point in time when the present delay occurs and the mitigation action taken by the contractor. The analysis should also include the pertinent facts associated with the proof required to support the delay issue.

The following procedure is proposed to be followed to illustrate a mechanism for preparation of a time impact analysis and documenting the impacts.

Proposed Checklist for Time Impact Analysis

1. Study the scope of the change/risk event, and the extent of the delay encountered.
2. Issue a notice of delay to the employer once the contractor comes to know about the change/risk event. Submittal of such notice/s should be within the allowed period stipulated in the contract clauses.
3. Review all reference materials, such as appropriate contract clauses, construction drawings, sketches, specifications, vendor data, regulatory and administrative codes, field directives, correspondence, and cost estimates.
4. Prepare an accurate description of the changed condition or the delay encountered.
5. Identify the contracting parties who are responsible for such change/risk event.
6. Identify all contracting parties who are affected by the direct or indirect delay and request any participation or documentation assistance that may be necessary.
7. All verbal instructions or instructions received vide e-mails should be recorded and confirmed by the employer in writing.
8. Determine which activity or activities on the project programme is or are potentially impacted by the added, delayed, changed work or any other risk event.
9. Review the programme and determine the scheduled start and finish dates for all affected activities.
10. Establish the record-keeping systems and form contacts with key project staff, identify and document the facts associated with the change and/or delay issue.
11. Update the project programme, as of the date just before the change or the risk event. In case of any delay exercised due to contractor's risk events, the contractor is obliged to recover such delay totally or partially if possible. The contractor should describe in detail the action taken to mitigate or recover its delays.
12. Prepare a fragnet analysis illustrating the sequence of delay and define its relationship to the current adjusted schedule. The fragnet should identify the first notice involved and the sequence of activities necessary to mobilize the required work, and it should clearly demonstrate the effect or lack of effect of the expected delay on the existing programme and the remaining activities required to be performed.
13. Prepare a written narrative of the overall programme analysis and derive a time impact position to be taken for each delay. Factual references to contract clauses, programme information, drawings, specifications, sketches, industry standards, minutes of meetings, technical queries and any written or oral communications should be properly identified to support positions and ultimate conclusions. Weekends, holidays, and any recovery periods involved in the calculations should be noted.

14. Monitoring of three categories of activities; critical path (because those are the activities that will directly cause delay), near-critical path (because those are the activities that will be critical and will be delayed in the next period), and non-critical path (because those are the activities that will stack up at the end of the job and will negatively impact the costs and quality at the same time). Therefore, the impact of the change on the use or absorption of available float for the non-critical activities should be analyzed and reported with each programme update. This will give an early notice that another path is near-critical and another delay is expected.
15. Make sure that any extension of time for excusable delay is the direct result of the change or delay, and not for any non-excusable cause.
16. Formal documentation of each situation is encouraged. This can be accomplished by preparing a written time impact analysis to support each change order proposal and time extension request.

For multiple and simultaneous time impact analyses and/or several sequential change orders or delay issues (portfolio of events), the overall analysis should be performed chronologically and cumulatively. One of the primary concepts contained in established case law is analyzing the delays on a programme at the commencement of the delay. This method will ensure that the programme includes the effect on the critical path of all previous changes or delays and will also identify any concurrencies.

Ian Wishart [7] advised that the contractors are advised to establish and maintain a good document control procedure in order to enable for the planning team and contract administrator the huge quantities of both electronic and hard-copy records. The type of such records includes but not limited to; the contractor estimate, details of the contractor costing system and cost reports, internal reports to management, ad-hoc studies and reports on profit and loss, time sheets, bonus records, progress records and reports, programme updates, payment applications and any other records which provide details of labor hours expended and/or progress achieved. This will allow the contract administrator to access the required information at any time to respond and manage any delay event once this has occurred. The contractor is always required, under the contract clauses, to notify the employer of its intention to make a claim for time and/or money within certain period defined in the contract. Failure by the contractor to abide with the contract requirements for notification makes the entitlement for the claim declined. Also, the contractor has to submit all documents and records that support its claim for time and/or money. The documents and records required to develop a properly substantiated claim are shown herein below in Table 1:

Approval of extension of time claims

Most contract administrators separate between the extension of time claim and its related prolongation costs because the approval of the extension of time claims is a lengthy process by the engineer/employer especially when it comes to the financial part of it. The engineer and employer are always reluctant to approve any claim for money. Therefore, it is highly recommended for the contractor to split between the claim for extension of time and the claim for the related prolongation costs. The contractor has to submit the extension of time claim first with a notification that the related prolongation cost claim will be submitted once the extension of time claim is approved. The critical issue for the contractor is the prevention of damages or penalties.

Even so, the engineer/employer may take an inordinate time to review and verify the extension of time claims often requesting very detailed documents normally only requested by an Arbitrator. This is also applicable on the interim extension of time claims. Most contracts restrict and stop the payment for contractors on the contract completion date if there is no approved extension of time claim. The contractor will not get paid for any work executed after the contract completion date if there is no approved extension of time by the employer. Consequently, the contractor will suffer financially and the cash flow will be greatly and negatively impacted which could in turn cause disruption to the progress of performance and extra costs. Only the most prestigious contractors could continue performing in such case while small contractors will be unreasonably impeded because they are not in a financial position that allows them to indirectly finance the job. If the contractor exercised this situation, the contractor may claim ''Time At Large''.

Time at large is a very important concept and often missed by the contractors despite that it could help them to avoid the application of liquidated damages or penalties in case of the approval delay by the engineer/employer for the extension of time claims and allows the contractor to complete the work within reasonable time.

The term time at large concept describes the situation where there is no identified date for completion, either by absence from the contract terms or arising from events and the operation of law. Time is said to be at large because the time or date for completion is not fixed before carrying out the work, but determined after the work has been completed.

The concept of ''time at large'' is applicable only in the common law countries such as United Kingdom, America and Australia where there is no civil law or written law to be followed. Common law depends on case by case analysis which is based on reference to previous cases and the decisions previously made by the courts. Common law is not applicable in all Arab countries as each country has its own civil law where there are conditions that need to be followed. Civil laws may not allow for time at large concept as described in the common law as the liquidated damages cannot be waived. Time at large could be applied partially in the countries under civil law by allowing the contractor to complete the remaining works in a reasonable time but the liquidated damages to be applied after this reasonable time. In other words, under the civil law, the liquidated damages cannot be waived completely but to be applied after the reasonable time allowed for by the concept of time at large.

The term time at large is usually used in construction contracts in the situation where liquidated damages or penalties are an issue. If the time at large then it is argued liquidated damages cannot be applied, because there is no date fixed from which the liquidated damages can be calculated. In some situations, the date for completion may be relevant to termination

Table 1 List of required records to establish properly substantiated claim.

S.N.	Record description	Frequency
1	Baseline schedule	Once in the project life cycle. Should be submitted within certain period from the project effective date.
2	Method of construction identifies the works that are intended to be executed by subcontractors.	To be submitted with the baseline schedule. Also, should be updated and submitted with any new schedule revision.
3	Planned manpower and machinery resources	To be submitted with the Baseline schedule and its revisions.
4	Programme updates	Could be weekly or monthly based on the contract requirements(*)
5	Notices for delay	Once the contractor knows about the event and within certain period as stipulated in the contract documents. Should be prepared for each event.
6	Programme revisions indicating changes and its required resources and the impact on the contract completion date.	In case of major changes or the current programme becomes out dated or misleading.
7	Delay analysis	With each programme update. It is recommended to be done weekly.
8	Time impact analysis showing the potential impact of the changes prior to carrying out the changes.	Once the contractor knows about the event. Should be done for each delay event.
9	Cause and effect analysis for each delay/disruption event.	Once the contractor knows about the event. Should be done for each delay event.
10	Productivity analysis reports	Weekly
11	Minutes of the daily, weekly, and meetings.	Upon request
12	Minutes of any special meeting.	Upon request
13	Change of work notices	Within certain period, as defined in the contract, from the date that contractor came to know about the change
14	Daily progress reports	Daily
15	Weekly progress reports	Weekly
16	Monthly progress reports	Monthly
17	Claim register	Monthly
18	Delay events log	Monthly

(*) It is recommended for the contractor to perform the schedule updates on a weekly basis even when the contract requires monthly updates. This will allow the contractor to keep a highly accurate history that would enable the contractor to prepare a well-supported claim.

and the issue whether or not there has been breach of contract by failure to complete.

Daniel Atkinson [8] stated that time is made at large in four situations:

1. No time or date is fixed by the terms of the contract by which performance must take place or to be completed.
2. The time for performance has been fixed under the contract, but has been ceased to apply either by agreement or by the act of prevention, which includes instructed additional works, or breach of contract by the employer with no corresponding entitlement to extension of time.
3. The employer has waived the obligation to complete by the specific time of date. An alternative solution is that the employer is faced with a breach of contract by the contractor which would entitle the employer to terminate the employment of the contractor and/or to bring to an end the primary obligations of the parties to perform, but instead elects to continue with the performance of the contract.
4. The employer has interfered in the certification process to prevent proper administration of the contract.

Many events may prevent completion on time including adverse weather conditions, labor or material shortages, strikes or local destructions, lack of information or plain human error, interference, hindrance or prevention by the employer and due to any breach of contract by the employer without EoT. The rights and remedies of the parties depend upon the apportionment of liability for the delay and the express terms of the contract which limit the remedies otherwise. If part of the delay in completion is at the risk of the contractor, then the employer is entitled to damages for breach of the obligation to complete on time. If the contract makes proper provision for liquidated damages, then the measure of damages is the stated sums of liquidated damages. If on the other hand the delay is at the risk of the employer then the contractor will be entitled to damages for breach of the particular obligation causing the delay.

Standard forms of contract apportion liability for delay through extension of time clauses by defining the contractor's and employer's risk events.

The wording of the extension of the time clause will determine when and the extent to which the risk of delay passes from the contractor to employer. The description of the particular event is all important. If notices and/or substantiation are a condition of an entitlement to an extension of time, then the risk will only pass to the employer if and/or when the contractor provides that information.

Both the order of variations and the employer breaches of contract are acts of prevention that may delay the contractor. If the extension of time clause does not entitle the contractor to have the time for completion extended for delays actually by such acts of prevention, the contractor then will no longer be under an obligation to complete within the specified period.

His obligation is instead only complete within a responsible period. Time is said to be longer. What is a responsible time is a question of fact and all the factual circumstances must be taken into account.

If the contract provides for the deduction of liquidated damages should the contractor overrun the time for completion, then the provision will no longer be enforceable time is at longer. There if no specific certain date from which liquidated damages can run. The employer will then only be entitled to damages that he can prove in the normal way if he can establish that contractor has not completed within a reasonable time that was agreed by both parties.

Conclusion

Proving delay and/or disruption is not an easy task and will be a time consuming process especially in the mega/complex projects with thousands of activities, lot of details and interfaces with involvement of many stakeholders. It needs a lot of effort especially the process of recording and analyzing each delay event. It is highly recommended not to follow the concept of "wait and see" which results in contractors submitting their claims for extension of time at the end of the project or after the contract completion date. The contractor is requested to submit the EoT claim whenever he believes that the delay event will delay the project completion date and the delay event is excusable and compensable. The contractor can submit more than one EoT claim based on the delay or risk events that the contractor might face.

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