

Examining the Indian Metro Rail Construction Industry's EOT (Extension of Time) Claim Process and Including a Case Study

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Abstract: A project is a series of tasks with a predetermined end date. Any action that is on the project's critical path that is delayed will affect the project's completion date and result in time overruns. One of the key determinants of the project's success is time overruns. It might be the result of force majeure, employer error, interface contractor error, or contractor error. Analyzing the reason for the delay is necessary, and if the contractor is not at fault, they are entitled to the extra time. India takes a distinct method while requesting EOT from FIDIC and other foreign agencies since contracts are structured in accordance with CPWD and military engineering services.

Keywords: Extension of Time, Baseline Programme, Delay Analysis, Claims, Dispute Areas.

1. INTRODUCTION

As the project's cost and duration are assessed. The project's success is determined by two factors: the amount of time it takes to accomplish and the expense involved in doing so. India has a separate process for claiming early termination since contracts are structured in accordance with CPWD and military engineering services. The steps involved are as follows:

1. Within 15 days of receiving the acceptance letter (LOA), the initial work program, including an outline narrative statement, must be prepared.
2. The first is a rolling three-month program that must be presented within 30 days after receiving the acceptance notice.
3. Providing a full version of the planned beginning work program with employer and engineer approval.
4. Submission of the Detail Work Programme (DWP), against which the contract's actual progress will be measured, following consultation with any further interacting contractors.
5. Employer review and any necessary program modifications.
6. The software is updated appropriately.
7. Determine the reasons for any delays if the revised program shows a real or possible delay in the contract's completion date or other important dates.
8. Divided into employer-caused delays, interface contractor delays, and delays brought on by force majeure.
9. Get the documentation ready for the postponed tasks.
10. After deducting concurrent delays, claim EOT for delays that were not the contractor's responsibility.
11. Update the baseline program with the competent authority's decision to grant a time extension.
12. After deducting concurrent delays, claim EOT for delays that were not the contractor's responsibility.
13. Update the baseline program with the competent authority's decision to grant a time extension.

2. CRITICAL PATH METHOD

The contractor has constructed a computerized Critical Path Method (CPM) network with cost-loaded charts and tables, utilizing project management tools such as Primavera P6 and Microsoft Project. In order to plan, carry out, maintain, and manage the pre-construction, construction, planning, design, and subcontracts in carrying out the CPM scheduling by PDM, the contractor is required to install and operate a computerized system throughout the life of the contract. In order to avoid interfering with the development of his original work program and/or the work of the approved contractors, the contractor must make sure that timely coordination with them is maintained.

3. WORK PROGRAMME

1. The work program outlines the contractor's strategy for planning and completing the whole project.
2. The work schedule will be created using the computerized Critical Path Method (CPM) network development software Primavera P6, and it will be shown in a weekly or monthly time scale bar chart and time-scaled network diagram style.
3. The work schedule should have sufficient depth to outline the following kinds of tasks and events, among others:

- a) Important dates.
 - b) Every physical task, including temporary labor, which must be completed in order to fulfill the contract's requirements.
 - b) The employer's desired date for the release of any information or drawings.
 - c) Including the main elements of the program for design submission.
 - d) Purchasing significant supplies and scheduling the full or partial delivery of the contractor's equipment's main items on-site.
 - e) Any off-site labor, including component prefabrication or manufacture.
 - f) Setting up temporary facilities for construction.
 - g) The term of interaction with utility projects or approved contractors.
 - h) Subcontractors' design, supply, and/or construction operations
 - i) Any external factor that might have an impact on the work.
4. The work programme must show the achievements of all key dates.
 5. Activity descriptions are to be unique, describing discrete elements of work. Any activity creating an imposed time or another constraint to be fully defined by the contractor.
 6. The works programme is to be organized in a logical work breakdown structure (WBS) including work stages and phases and clearly indicates the critical path/paths.

4. BASELINE PROGRAMME

5.

Following pre-planning, the contractor creates a baseline schedule. The baseline program displays an ordered list of tasks completed in a predetermined order, along with an estimate of how long each task will take. Following acceptance of the first work program, all future submissions of the planned work program must include an accurate assessment of the remaining work as well as the actual physical progress of the project. In addition to being a contract, the program serves as a management tool and, more importantly, a vital channel of communication. A crucial communication point between the parties is the program's follow-up and audit at regular intervals, which the contractor should use as a warning indicator if a delay starts to show. The program is to be utilized as the foundation for any potential effects of a delay event on the completion date. To analyze the effects of a delay event and produce a contractor's claim in order to justify a time extension, such a technique is necessary.

6. DELAYS IN PROJECT

Delays in the project are mainly due to:

1. Hired Party
2. Master Builder
3. Additional Contractors for Interfaces
4. A moment of force
5. Parallel postponements

In general, the contractor's risk events are restricted to the following:

1. The incorrect assumption about the task at hand.
2. Monetary issues
3. Inappropriate links between activities or an impractical length for them.
4. The necessary equipment and supplies are delivered belatedly.
5. Insufficient resources to finish the job.
6. Bad craftsmanship that necessitates significant fixes and further effort.
7. The demand for HSE (Health, Safety, and Environment).
8. Ineffective use of time.
9. Lower resource productivity than what the codes provide.

Employer's risk events, in general, are the following:

1. The land's delayed transfer.
2. As a result of different physical conditions than those specified during the tender stage being discovered during the excavation of the geometric or utility survey site.

3. A delay in issuing authorization for tree trimming, utility diversion, etc.
4. Modifications to the initial scope of the contract.
5. A delayed engineering output.
6. Late deliveries from procurement. Frequent revisions for engineering drawings.
7. A payment latency.
8. As a result of the job being delayed.
9. Bad weather circumstances.
10. Modifications to the project requirements.
11. Force Majeure (such a 'Act of God' or a pandemic).
12. The approval of the architectural drawing was delayed.

7. DELAY ANALYSIS

Delay in the project is identified:

- I. I. By seeing how the real program differs from the baseline program.
- II. By seeing forecasted cumulative physical progress 'S' curve and actual progress 'S' curve based on the time-phased distribution of cost in the CPM network logic diagram, which is expressed in percentage form. For this Earned value analysis is performed. Earned value (EV) is also referred to as Budgeted Cost of Work Performed (BCWP). EV or BCWP is the total cost of the work completed/performed as of a reporting date. SV or Schedule variance is calculated and if its value is less than 1, then the project is behind schedule.

For making (EOT) extension of time claims with references of delays following four methods is generally used:

1. As planned Vs. As-Built Comparison
2. Impacted As planned.
3. Time-Impact Analysis Method
4. Collapsed As built Method.

The contractor can apply extension of time for completion if work is delayed due to following reasons-

1. Force majeure
2. The contractor is not given access to the site in accordance with the contract.
3. Instruction of the employer to suspend the work and the contractor not in being default as to the reason for the suspension.
4. Acts or omissions of the other designated contractors in executing work not forming part of this contract and on whose performance, the performance of contractor necessarily depends.
5. Any act of prevention or breach of contract by the employer.
6. Any order or court restraining the performance of the contract in full or in part thereof.
7. Any other event or occurrence which, according to the employer is not due to the contractor failure or fault and is beyond his control without the employer being responsible for the same.
8. An employer's variation.

However, the contractor is not to be entitled to any extension of time where the instructions or acts of the employer or the employer representative are necessitated by or intended to cure any default of or breach of contract by the contractor or where any delay is due to

- a) The failure of a subcontractor to commence or to carry out work in due time.
- b) Non-availability, or shortage of contractor's equipment, labour, utility services, plants, and material.
- c) Inclement weather conditions and
- d) The contractor is not fulfilling his obligations given in the contract.

8. REVISION OF PROGRAMME

For the revision of the programme the contractor must immediately notify the employer's representative in writing of the need for any changes to the work programme, whether due to a change of intention or of the circumstances or for any other reason. If there is a delay and such delay affects timely completion of works or any other key date then contractor shall within 14 days of the date of notifying the employers representative submit for the employer consent its proposed

revised works programme and accompanying narrative statement. The proposed revised works programme shall show the sequence of operation of all works related to the change and impact of changed work and changed condition. If the delay is not due to the contractor’s fault, then the contractor is entitled to the EOT.

Rescheduling of milestones is done after acceptance of extension of time (EOT). The first milestone is rescheduled based on the hindrances occurred during the time allowed for that milestone. The other milestones are also suitably shifted based on the rescheduling of the milestone as mentioned above.

9. DISPUTE AREAS

Following are the major areas of the dispute between Contractor & Employer-

1. Critical Path
2. Ownership of the Float
3. Concurrent (or Contractor) Delays and how these effect Entitlement

The critical path is the longest path in a project. Project duration is calculated by calculating the duration of time taken by activities along the critical path. The entire project will be delayed if any activity is delayed on the critical path. During execution phase, the critical path keeps on changing from the baseline programme. When investigating the impact of the Employer's Delay Events, both the parties keep disputing as to which critical path should be referred to check the impact of delay events.

Float or slack is the amount of time that an activity in a project network can be delayed without causing a delay to the project. If the contract is silent about ownership of float, then it will be available on a first come-first served basis. As the contractor argues that these floats are given by him to compensate any delay in the non-critical activities and client argue that he is a stakeholder in the project hence he should have share or rights on the float. There is always a dispute between parties on the ownership of float.

Concurrent delay refers to the complex situation where more than one event occurs simultaneously, but where not all those events enable the contractor to claim an extension of time or to claim loss and expense. In the case of delay overlapping with employer and interface contractors delay, there is a state of dispute arises between the main contractor and employer/interface contractor or between interface contractors.

10. CASE STUDY

A case study of an infrastructure project for construction of underground metro stations involving complex and tremendous activities.

Project: KNPCC-06: Design and Construction of TBM Tunnel, Cut & Cover Tunnel, and underground ramp from Kanpur Central end of Nayaganj station to elevated ramp after Transport Nagar and 3 Nos underground metro stations (viz. Kanpur Central, Jhakarkatti and Transport Nagar) including Architectural finishes, E&M, TVS, ECS etc. on Corridor I of Kanpur MRTS Project at Kanpur, Uttar Pradesh, India.

Employer: Uttar Pradesh Metro Rail Corporation Limited

General Consultant: Tynsa-Italferr JV

Contractor: Afcons-Sam India Consortium

Causes of delay and their impact on completion of various key dates		
Sno	Delay Events	Delay (In Days) w.r.t base Programme
A	Delay due to non-availability of Hindrance free access to and possession of site	
A.1	Delay in handover of land for station	
A.1.1	Delay in handover of Railway land for Kanpur Central Station	262 Days
A.1.2	Delay in handover of land for Transport Nagar Station	75 Days

Causes of delay and their impact on completion of various key dates		
Sno	Delay Events	Delay (In Days) w.r.t base Programme line
A.1.3	Delay in handover of land for Jhakarkatti Station	25 Days
A.2	Delay in Permission for demolition of structure	
A2.1	Delay due to non-availability of hindrance free land due to presence labour union camp & cooperative bank at Grid 3-4 LHS at Kanpur Central Station	267 Days
A2.2	Delay due to non-availability of hindrance free land due to presence temple at Grid 9 at Kanpur Central Station	
B	Delay in issue of final architectural drawings	
B.1	Delay in issue of final architectural drawings (Kanpur Central Station)	188 Days
C	Delay due to non-availability of final load details for Kanpur Central Station Design	
C.1	Delay due to non-availability of final load details for Kanpur Central Station Redevelopment Design	266 Days
D	Additional time required due to Employers Variations	
D.1	Additional time required for design and construction of additional Entry Exit-02 at Jhakarkatti station (Employers Variation 12.3 GCC)	350 Days
D.2	Additional time required for design and construction of utility gallery connecting ancillary building and Kanpur central station, including the additional foundation works for ancillary building (Employers Variation)	60 Days
E	Delay in issuance of CRD drawing for E&M, ECS & TVS works	
E.1	Delay in issue of final architectural drawings (Kanpur Central station)	230 Days
E.2	Delay in issue of final architectural drawings (Jhakarkatti station)	234 Days
E.3	Delay in issue of final architectural drawings (Transport Nagar station)	160 Days

The contractor has applied the Time Impact Analysis method and was fruitful in getting a time extension due to the various delays which didn't involve contractor fault. The overlapping delays or concurrent delays were deducted with the consent of the employer. The contractor used the As Impacted Baseline Program method to find out the concurrent delays from his side and after granting of EOT contractor had used this record to claim monetary compensation.

11. CONCLUSION

The disputes over ownership of Total Float & definition of Critical Path should be minimised by referring to rules set out by SCL, UK or by framing rules like these with some modification if required as per Indian scenario. Calculating delays in an infrastructure project is not an easy task and requires lots of data and records. It requires integration of all the departments like planning, contracts, and execution etc. A lot of effort is required to record and to analyse delay causes. It is also suggested not to wait until the completion of the project to claim EOT and should be applied for the claim of EOT as the delay occur if it is excusable and consumable. The critical path must be chosen by the consent of both the parties during updating of programme. For concurrent delays, it is necessary to carry out an investigation of each delay individually and in the order in which they arose. This study is vital for determining whether any compensation will be due for the employer delay. Delays are analyzed, manipulated, and segregate only by following protocols given in contract documents or by following international protocols.

12. REFERENCES

1. The assessment of applications for Extension of Time Claims in Malaysian Construction Industry by LweYokeLian, SHassim, R Munaidy4J. Breckling, Ed., the Analysis of Directional Time Series: Applications to Wind Speed andDirection, ser. Lecture Notes in Statistics. Berlin, Germany: Springer, 1989, vol. 61.
2. Indian Standard Construction Project Management Guidelines. Part 2-Time management. IS15883 (Part-2) 2013. M. Wegmuller, J. P. von der Weid, P. Oberson, and N. Gisin, "High-resolution fiber distributed measurements with coherent OFDR," in Proc. ECOC'00, 2000, paper 11.3.4, p. 109.
3. Ng, S.T.; Skitmore, M.; Deng, M.Z.M.; Nadeem, A. Improving existing delay analysis techniques for the establishment of delay liabilities. Constr. Innov. 2004, 4, 3–17.
4. SCL- The Society of construction law, delay and disruption protocol, October 2002
5. CPWD works manual, 2021.