DELAY ANALYSIS MADE EASY

A NEW AND SIMPLE-TO-USE METHOD: THE "NEUTRALISATION" METHOD

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DELAYS? WHAT DELAYS?

An industrial project, and particularly a construction or infrastructure project, almost always has its own uniqueness, it is a singleton. Even though its constitutive parts might have been used also in other projects or even if the way it was realised followed a well-known and used pattern, the end-result is generally unique. A sample.

Other projects may be comparable but are extremely rarely identical. Therefore, what is learned from one project is mainly what to avoid doing in the next. And even if the technical aspects are theoretically (!) quite well mastered, the non-technical aspects are often those that lead to delays and to related costs.

Take the example of the erection of a windmill farm. Contract: Delivery and mounting on existing foundations of standardised steel elements, followed by a standardised connection to the local electrical grid. The location and the height of the windmills is decided by the planner well before the contract is signed. It looks like a game of LEGO where only the timely delivery of the parts on site and the organisation of the work flow can have an impact on possible delays.

Is that really the case? And what about the possible effects of:

- *non-respect of the contractual payment schedule (in cases where the law changed and there are fewer government subsidies for renewable energy sourcing)*
- *lack of site access for delivery of the parts or of cranes (road works in the area making large, heavy transport impossible; lack of agreement from neighbouring land owners to cross their land with the steel elements)*
- *weather conditions (strong wind that does not allow the cranes to operate a certain number of hours a day; heavy rain that makes dirt roads impracticable for some days)*

- *the social context (last minute local or regional oppositions to the project; theft of valuable spare parts made of copper, the lack of which makes connection to the grid impossible)*
- *the grid connecting process (procedures or taxes changed since the signature of the contract)*

Sounds familiar? All of these events or maybe also others can make an expected straightforward contract last much longer than planned, while incurring unplanned extra costs. And that is where technical experts are asked to come to the rescue: understand what happened, who was at fault, who was late, what delaying action and/or event led to the delaying of another task, and whether there were any concurrent delays etc. In other words, simply business as usual for us at PMG.

Of course, contracts based on the FIDIC books or on NEC, JCT, CCAG rules or alike envisaged some of the most common situations, in particular when it comes to physical conditions, influence of local or regional authorities or some other unpredictable situations. They also treat the easily definable causes for delays and allocation of risks. But the reality is often much more complex and increasingly more complications than these are the industrial reality today. Therefore, delay analysis has become a science in itself.

The libraries are full of books making distinctions between, for instance:

- delay to progress vs. delay to completion;
- primary, secondary and tertiary causation;
- concurrent vs. parallel delays;
- concurrent vs. sequential delays;
- concurrent vs. pacing delays to progress.

All of them built theories related to the reciprocal influence of the different types of delays and of their causes.

WETHERED DELAY ANALYSIS METHODS

Various methods have been developed to identify these delays and to analyse their causes and the effects on other delayed tasks. The most well-known and used analytical methods are either

<u>Static</u>

- As-planned vs. as-built
- As-planned impacted

- Collapsed as-built (known also as the “as-built but-for” method)

or Dynamic

- As-planned updated vs. as-planned updated (known also as the “contemporaneous period analysis”)
- Time Impact Analysis (known also as the “snapshot” or “time slice” method)

Each method has its own field of application, its limits, its advantages and disadvantages. The most recurrent criticisms to the first 4 methods are linked to their inability to deal with:

- the changing nature of the critical path due to delays, recovery and acceleration
- concurrent delays
- the degree of recovery and acceleration at a given point in time.

At first sight, the Time Impact Analysis seems to be THE ultimate method offering only advantages. It’s only perceived disadvantages are its relative complexity and the need of an experienced operator to obtain relevant results, and as a consequence, its cost. Nevertheless, in order to obtain a useful result, Parties have to provide the Expert with the native form of the initial programme of works and with a very detailed level of defined tasks with transparent relations/links between them. The same applies to newly added tasks or tasks that have been eliminated during the project. In practice, provision of this information rarely happens, as these documents are either missing or are difficult to find, to say the least...

SO FAR, NO CONTEMPORARY DOCUMENTS, NO DEFINITIVE ANALYSIS

Even the simplest method to understand and apply requires a “fuel” that is often lacking: contemporary information. This “raw material” should be a genuine reflection of what happened during the realisation of the contract. It consists of all documents tracing the reasons for which the tasks were executed in a different manner to the initial plan, or at a different time, or in a different quantity than what was contractually agreed upon. It allows to understand why certain tasks were not executed at all, or on the contrary, why other tasks, not contractual, were requested by the Employer and executed by the Contractor. It also allows us to understand the evolution of the social, environmental, administrative context between the time of signature of the contract up to the final reception of the works.

In the absence of this “raw material”, the Expert is the one who has to complete the missing information and gaps, by making assumptions, by applying extra- and/or interpolations, by deductions, by

interviewing participants (as subjective and imprecise as they are years after the facts) and without having absolute certainty that things happened as imagined in the "fill-the-gap" scenario.

Collecting, archiving and keeping easily accessible the "raw material" that accompanied the realisation of a project is an objective in itself, an essential subject that is not the focus of this article but that should highly be deserving of attention.
Nevertheless, to illustrate the size of the task, the following numbers are an estimate of the number of pages (plans set apart) of "raw material" that were created by the stakeholders of the construction of a large European gas power plant (real case), over a period of 7 years:

- total number of pages 950'000
- number of pages relevant to time and cost issues 46'000
- number of pages with critical content 7'000
  (these numbers were obtained after all duplicates were removed from files)

And when, after a long sorting and screening process, the number of important pages was brought down from almost a million to 7'000, a large number of facts described there did not fit the understanding the Parties had of them. And this was by far not a rare case.

HOW TO OVERCOME THE POOR NUMBER OF CONTEMPORARY DOCUMENTS

THE NEUTRALISATION METHOD and ITS ADVANTAGES FOR THE ARBITRATOR AND THE PARTIES

Amongst these thousands of pages, there is always some information that is not disputed by the Parties. This information can be, for instance, the period and the duration of the geotechnical studies, of pouring the concrete into a foundation, of the application of the geotextile on a certain surface or of the water proofing layer on a flat roof. It could be the time that the Contractor took to come up with an offer for an extra task or that the Engineer requested to approve an alternative technical solution presented by the Contractor.

There are also some (not many!) undisputed facts leading to confirmed delays.

Example: A Contractor was supposed to execute a certain number of meters of footpath kerbs within 2 weeks starting on 1st June. The weather was perfect, the material was delivered on site in advance, and all preparatory works were executed correctly and in a timely manner. It took the Contractor 3 weeks to execute the kerbs while experiencing a documented work force shortage, due to documented late start

of skilled labour force recruiting procedures. In other words, it was the Contractor's entire responsibility for the 1-week delay.

The neutralisation method described below is based on this undisputed information sources. It addresses the delays attributable exclusively to the Contractor. It allows a comparison between the contractual duration of the project (or of the part of the project under Contractor's responsibility) and the documented duration of the activities executed by the Contractor free of any intervention and/or influence. It is an intuitive, very easily understandable method. It is closely related to actual events and does not need to have access to the links between the tasks of the as-planned programme. It is applicable to projects that are either short or long. It does not deal with concurrency, nor with re-sequencing or recovery issues. It is based on objective and undisputed information sources. Its main rationale is the so-called "principle of neutralisation".

By looking at the as-built programme, the Expert puts aside - "neutralizes" - all tasks executed by other parties, other than the Contractor (Employer, Engineer, authorities), the tasks that implied the involvement of other parties, other than the Contractor (collaboration with other stakeholders) and all tasks for which the total duration is not clearly defined or at least the period of time when it happened that is not clearly defined.

Example: There is information indicating that a task was already under execution on a certain date, but without knowing exactly when it started. The Expert will consider the task as starting at the date when all stakeholders agree the Contractor was already executing the task. The unclear durations are "neutralized", thus ignored, and therefore in this case, the period between the unknown start of the task and the date when all stakeholders agree the Contractor was executing the task, is ignored.

As a result, the Expert retains only the tasks carried out without hindrance by the Contractor alone for analysis. By adding the undisputed durations of these tasks, the Expert obtains a certain Total Confirmed Duration (TCD) of the Contractor's intervention. The TCD is then compared with either the planned or the contractual duration of the works. The difference between the TCD and the contractual duration of the works represents the Confirmed Delay (CD). The CD can be either positive or negative.

A. The CD is positive. This implies that even by ignoring all tasks that are unclear with respect to their duration or responsibility, the Contractor was or would have been late. The value of the CD may serve to define the level of delay related penalties.
B. The CD is negative. It does not automatically mean that the Contractor was not or would not have been late. It means that a more speculative analysis of the facts is required.

Example. The CD is equal to – 50 days. The Expert will start using information that he considers reliable at 90% and "lifts the neutralization" on the respective tasks and on their durations (he takes account of them). He calculates a new TCD, called TCD 90. The resulting CD goes down to – 8 days. Then, he uses information that he qualifies as reliable at 80%, and "lifts the neutralization" on the respective tasks and on their durations. He calculates a new TCD, called TCD 80. The resulting CD becomes positive by 20 days. Conclusion: by accepting information 100% or 90% reliable, there is no delay; by accepting information 80% reliable, the delay is of 20 days.

The essential role of the Expert is in the appreciation of the quality of the information, and of its level of reliability. The simple mathematical calculation makes the method very transparent and easy to understand. The result of the method allows the arbitrator to decide on the existence and size of the **minimum** delay with a relative degree of certainty.

A detailed, long and laborious analysis carried out according to the Time Impact Analysis (TIA) method and based on often-lacking supporting documentation, only leads to results showing longer delays than those obtained with this method. This method allows to very quickly find out if there are confirmed delays attributable to the Contractor (CD positive), delays that could lead, for instance, to applying liquidated damages. If the CD is negative, and according to the value of the CD, this method allows both the Expert and arbitrator to decide whether a costly TIA is necessary, or if a TCD 90 or TCD 80 is sufficient for the arbitrator to rule.

The neutralisation method is also a rapid evaluation method for the Parties. It allows them to quickly understand where they stand on issues related to delays, and to decide on the best attack or defence strategy according to the value of the CD.

The author has defined and successfully applied this method for the last 3 years. It led the Parties and arbitrators to a "rough and ready" understanding of the situation as far as contractual delays were concerned. It avoided the use of complex and cumbersome methods and the costly and often futile search for more contemporary documents.