



Time related issues in the supply chain of complex engineering projects

22nd Conference of the German International Construction Law Committee

18 November 2021



Agenda

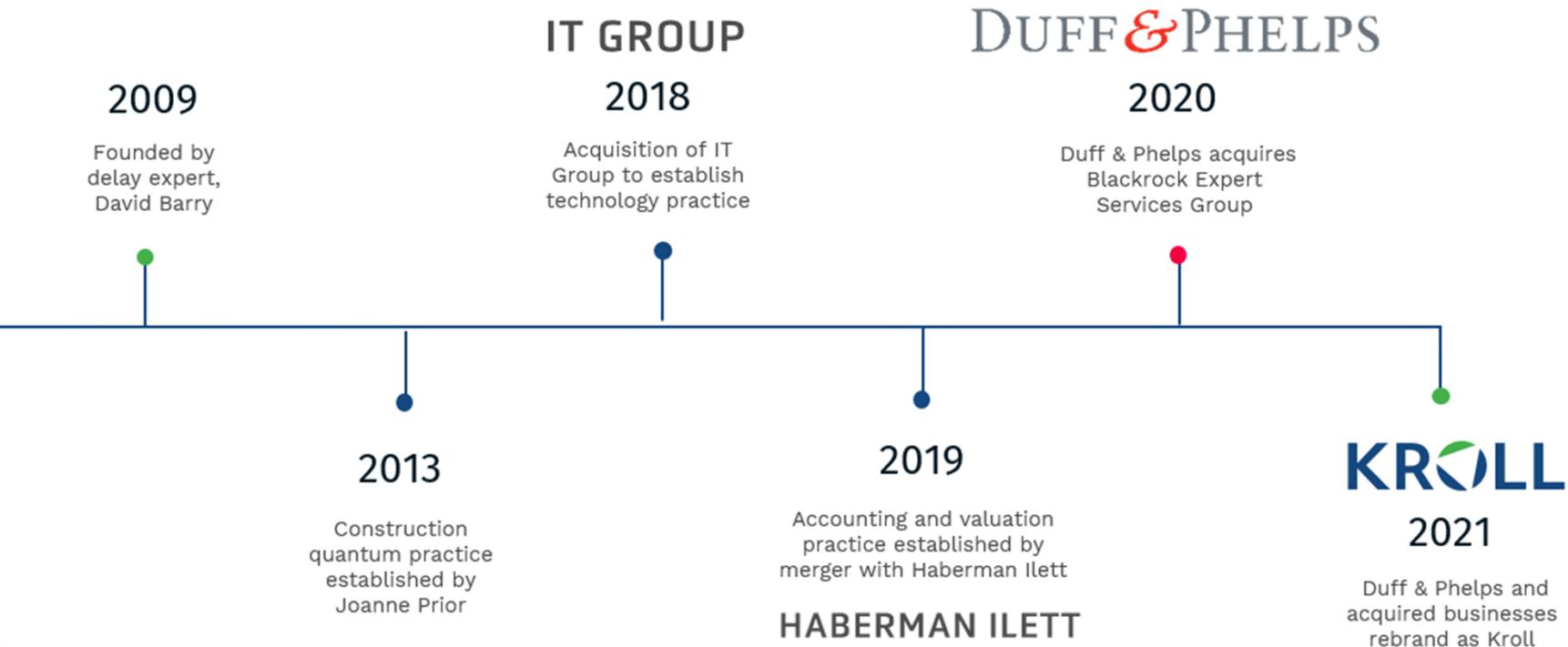
- Brief introduction to Kroll
- Delay? Expert? Analysis method?
- Approaching different types of projects
- Likely issues in complex construction projects
- A case study
- Take away and discussion

About Kroll | Expert Services

(formerly known as Blackrock Expert Services)

EXPERT SERVICES

Our timeline



EXPERT SERVICES

Our people

As a part of Kroll, we are the world's premier provider of services and digital products related to governance, risk and transparency.

Our clients include **international contractors, government agencies, blue chip multinationals, investors, developers, banks and insurers.**

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**PROFESSIONALS IN 30 COUNTRIES
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EXPERT SERVICES – CONSTRUCTION DISPUTES

Our service areas



Delay and Quantum

Our delay and quantum teams are often from specialist construction and engineering fields, enabling us to undertake thorough investigations into complex construction issues and present clear opinions. For **delay**, these issues typically include delay and disruption, programme management and productivity analyses. For **quantum**, these issues typically include the valuation of measured works, variations, prolongation, damages, disruption and acceleration.



Project and Construction Management

Drawing on our in-depth industry knowledge and experience in delivering complex construction and engineering projects, we provide our clients with independent and objective opinions in assessing the performance of professional project and construction managers.



Project Advisory

Our project advisory team has extensive experience in delivering major projects. We provide strategic advice early in the project lifecycle to ensure that the project definition and the implementation strategy are aligned. During the implementation phase, we collaborate with the delivery team, proactively support the management of the project, assist in risk management and provide independent and accurate assessments of progress to help to protect our clients' interests prior to closeout and handover.

delay?
expert?
analysis method?

Purpose of a delay analysis

...and an expert's role in broad terms

- EoT claim preparation by way of
 - Presenting the **facts**
 - Establishing the events caused delay
 - Providing basis for recovery of prolongation costs
- **Independent** assessment of EOT and cost claims for Employer or Contractor/Supplier
- The integrated approach to dealing with time and money using separate quantum and time experts to avoid **interface problems**
- Delay analysis expert work in connection with simple to complex disputes in
 - Presentations to DAB's
 - Arbitration
 - Litigation
- Appointing a delay expert allow application of different approaches and methods of analysis

Selecting an analysis method

One size fit all?

- Approach to determination of **critical path** will vary according to the project type (Building v Power Plant) or method of construction or scope of work.

“A delay to progress of any activity on the critical path will, without acceleration or re-sequencing, cause the overall project duration to be extended and is therefore referred to as ‘critical delay’.”

– Society of Construction Law Delay and Disruption Protocol, 2nd Edition, February 2017, Appendix A

- The type of the project **does not** dictate the **method of delay analysis**.
 - Selection of method generally depends on the contract requirements(i.e. NEC), document availability (programming and as-built), lawyer’s instructions (dispute matter) and expert’s personal preference.

Delay analysis methodologies

as set out in the SCL protocol 2nd edition, 2017

Method of analysis	Analysis type	Critical path determined	Delay impact determined	Requires	The question it answers
Impacted as-planned analysis	Cause & effect	Prospectively	Prospectively	Logic linked baseline programme A selection of delay events to be modelled	What was the likely effect of this event on the completion date assuming everything else went exactly as planned?
Time impact analysis	Cause & effect	Contemporaneously	Prospectively	Logic linked baseline programme Updated programmes or progress information with which to update the baseline A selection of delay events to be modelled	What was the likely effect of this event on the completion date adjudged from the point in time when it was instructed or arose?
Time slice windows analysis	Effect & cause	Contemporaneously	Retrospectively	Logic linked baseline programme Updated programmes or progress information with which to update the baseline	What was the contemporaneous or actual critical path to completion throughout the works as shown in the programmes updates and what were the causes of delay thereto?
As-planned versus as-built windows analysis	Effect & cause	Contemporaneously	Retrospectively	Baseline programme As-built data	What was the contemporaneous or actual critical path to completion throughout the works and what were the causes of delay thereto?
Longest path analysis	Effect & cause	Retrospectively	Retrospectively	Baseline programme As-built data	What was the as-built critical path to completion, viewed retrospectively, and what were the causes of delay thereto?
Collapsed as-built analysis	Cause & effect	Retrospectively	Retrospectively	Logic linked as-built programme A selection of delay events to be modelled	But for the events in question, when would the completion date have been achieved?

different projects, similar problems?

What is common in construction projects?

- It is a cliché. Construction is project based and generally complex.
- Project environment could be challenging rather than an operation business as:
 - Unlike manufacturing, a construction project is typically a prototype
 - It has a finite life
 - It has a purpose
 - It aims to deliver an output
 - And when it is finished it is finished. (or not)
- Really driven by the right **quality**, at the right **price** and the right **time**.
 - So trial and error is generally not an appropriate supply chain management tool
- Requires a robust contract addressing all of the above characteristics,
- Also the supply chain resilience (by multi sourcing, inventory buffer etc.) are not easy to implement, particularly in case of complex engineering project

Types of construction projects

Determination of the critical path

- Different projects may require different approaches to critical path determination.
 - A project consisting of several interrelated trades progressing at the same time (i.e., buildings);
 - A project consisting of a linear sequence of activities (i.e., barge construction, tunneling works, pipelines, rail etc.);



Types of construction projects

Determination of the critical path

- Different projects may require different approaches to critical path determination.
 - A project consisting of the construction of separate but identical items which all can't be built at the same time (i.e., fabrication of offshore wind foundation jackets).
 - A single larger project consisting of several smaller sub-projects progressing in isolation with one completion date (i.e., power plant);

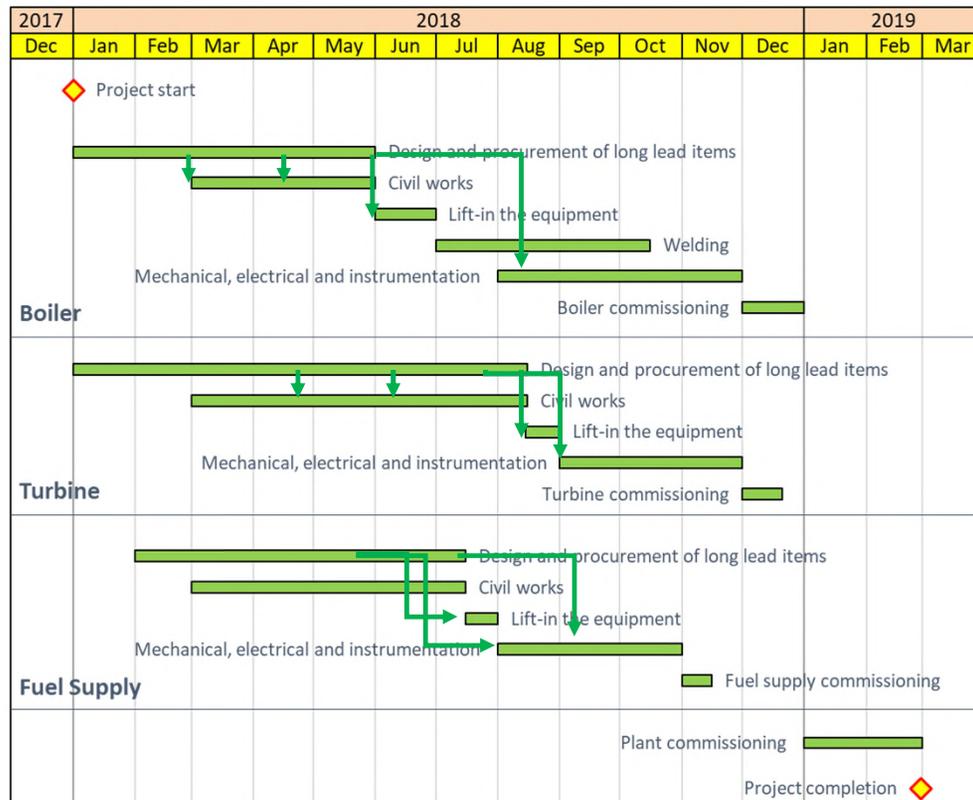


Complex engineering projects

- Particularly complex and specialty engineering and operation requirements
- Integrated/interwoven design and engineering process
- Globally fragmented supply chain of services, equipment and materials
- Due to the geographic spread and transport network is important
- High costs compared to a typical building construction site
- Challenging environments and construction methods
- Usually involve governmental/large corporation initiatives

Complex engineering projects

The programme and interfaces



Complex engineering projects

From a main contractor's point of view

Challenges

- Interfaces (internal and external to the project)
- Delivery of supply chain management could be problematic if the responsibilities are not clearly set
- Limited room for building in redundancy and flexibility due to engineering requirements and supplier qualification requirements
 - Main focus is “*How do we keep the project running*”, **ad-hoc** problem solving

Dispute matters (main relating to supply)

- Defects / Fit for purpose
- Insurance
- Variations in scope and costs
- Variations in design requirements
- Time related damages (either performance related, or consequential like loss of profit)

What causes disputes?

- Poor contract drafting
 - Poor **scope definition** / incomplete, unclear or inconsistent or missing specifications and / or inconsistent drawings
 - Lack of clarity over **design responsibility**
 - Bespoke **amendments to standard forms** that create ambiguities
 - Inconsistencies between the **specification / bills of quantities** and main contract terms (QS/Engineer amendments)
 - Lack of clarity over **priority** of documents and consequences of inconsistencies
 - Lack of clarity about constraints relating to buildability, completion and warranty of the works (including interim milestones)
- Failure to work together to solve problems
- Failure to communicate

Key points

- A delay analysis as good as the records available (i.e. as-built progress and correspondences, contractual information etc.)
- Understanding and identifying the scope of contract (within the greater scheme of the project requirements) is key
- Accordingly defining interfaces and establishing communication among different trades
- *If possible*, contingency plans for supply and procurement channels to mitigate affects of unpredictable events (such as Icelandic ash cloud, Covid-19 and other natural phenomenon)

Thank You



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About Kroll

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