DIGEST

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Welcome to issue 29 of the Diales Digest

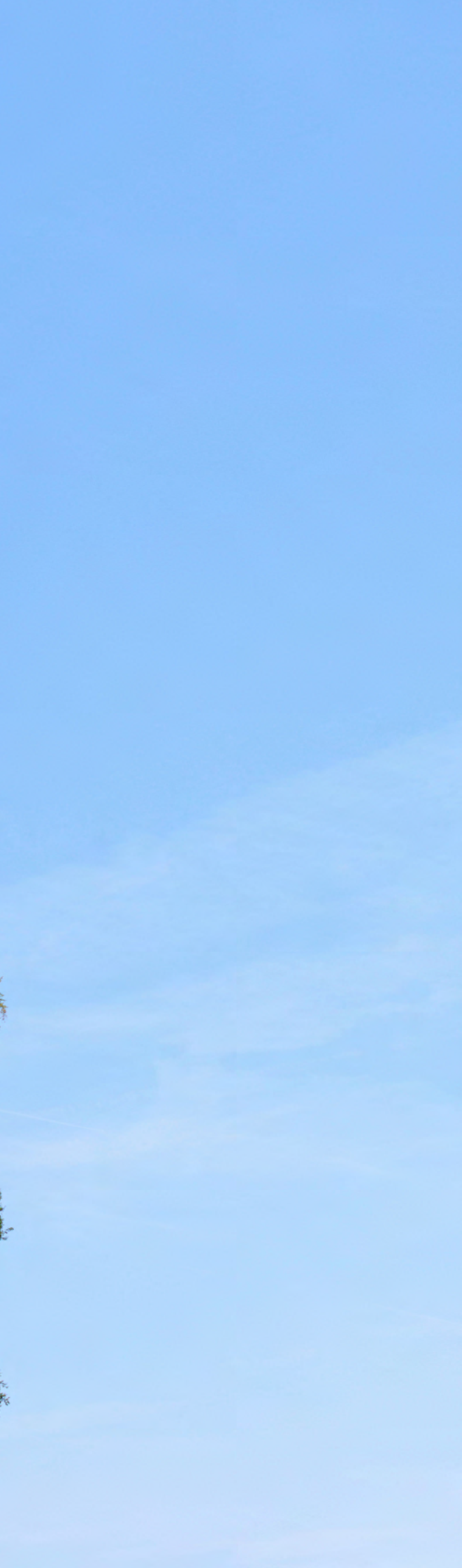
In this edition, you'll find an eclectic collection of articles from colleagues across our global network of offices. The contributions cover not only delay, technical, and contractual topics and issues, but also explore some of the softer and more nuanced aspects of what we do in our industry, elements that perhaps we can all take a moment to reflect on from time to time.

For example, David Brown, one of our Quantum Experts, discusses logical reasoning and the phenomenon of the "fallacy of affirming the consequent" in his article on page 6.

We are also grateful to Paul Woodward of Tiefenthaler Attorneys for his insightful article examining the challenges of enforcing arbitration awards in Africa, and outlining what contracting parties can do to mitigate those risks.

I hope this edition of the Digest provides you with interesting and thought-provoking industry insights. I certainly enjoyed serving as this edition's Technical Editor.

Peter Banathy
Regional Director and Quantum Expert



Diales

معظم النار من مستصغر الشرر

A Little Neglect May Breed Great Mischief

Khalid Yousri, Regional Operations Director
Middle East

In Arabic, we say 'معظم النار من مستصغر الشرر' - which in English translates as 'the largest fires start from the smallest sparks'. In searching for English language quotes with similar meaning, I came across the phrase 'A little neglect may breed great mischief[1]'.

In this article, I consider in my opinion, the relevance of this phrase to the dispute resolution process in construction and engineering, and how easier the lives of construction professionals would be if we address and attempt to resolve issues as we go, to avoid a much bigger issue, aka a 'fire', further down the line. I also refer to a further relevant Arabic phrase of 'لا تؤجل عمل اليوم الى الغد' which translates into English as 'don't postpone today's work until tomorrow'.

1. Benjamin Franklin - Poor Richard's Almanack, 1758

I can relate, especially given my experience of construction projects and dispute resolution in the Middle East, that the majority of the disputes initially start from relatively small matters which could have been discussed and dealt with at that the time when they arose. However, postponing the resolution of these matters, or at the very least agreeing on a way forward or solution, typically makes it much more complicated and difficult to deal with in the future. Before you know it, the matter remains unresolved many years later with little evidence available and or people still around with knowledge of the issues to tell the story as it actually was, never mind assisting in resolving the issue or issues.

Let's consider an example which I hope you can relate to, an employer / engineer requests the contractor to change the electrical distribution board ("DB") in a meeting room of a commercial building (note I have not said how the instruction came about or how it was transmitted to the contractor...). Thereafter, further change was instructed to change the walls in the same room, and then again later, further changes were instructed to change the false ceiling, the raised floors and during that same period the contractor experienced inclement weather conditions, and some days of labour strikes.

If the changes arising from the first instruction, in relation to the changes to the DB were not dealt with separately when they arose, it will be much more difficult at a later time to identify the exact impact of the DB changes, especially when additional events subsequently impacted the same area.

To achieve success on a project, every aspect of project management and administration ought to be monitored and managed efficiently. In my view it is often key to change the culture of the project parties and the supply chain so as to deal with the issues as and when they arise and avoid postponing the discussions and therefore the solutions. Despite our musings of not letting the mischief grow, in the Middle East generally the approach of 'let's wait to the end, and sort it all out together' is adopted.

However, in my experience more often than not, things do not all get resolved amicably at the end of the project. Many promises made either by the employer or by the contractor related to resolving all the matters at the end fall apart when the project is completed. The worst outcome for the parties that I frequently see is that when the promises that were made that all disagreements would be resolved at the end of the project, and that does not happen, then the parties very quickly commence formal dispute resolution proceedings.

> ***'لا تؤجل عمل اليوم الى الغد' which translates into English as 'don't postpone today's work until tomorrow'.***

When parties escalate their disputes in this manner it is usually the case that a different and possibly new team deals with the case. This can sometimes involve external consultants, experts, and lawyers.
If this occurs, then it seems to me that the missed opportunity of addressing and resolving the issue or issues at the time they arose directly results in the parties incurring significant additional costs to now resolve those issues which have usually become more complex to deal with. The other common issue is that by now with the dispute being more complicated and involving larger sums of money it probably requires higher levels of decision makers to deal with it than otherwise would have been needed had it been addressed at the time.

The principle of early resolution of issues on a project is dealt with to some degree by the SCL protocol, 2nd edition for delay and disruption, 2017, which in core principle number 4 recommends "Do not 'wait and see' regarding impact of delay events (contemporaneous analysis)". Despite this referring to issues of delay and assessment of their impacts on the project, I cannot see why this would not equally apply to disputes in general.

In conclusion, I am sure that this topic warrants much more attention in the Middle East, including convincing the parties to construction or engineering contracts to consider and deal with emerging issues at the earliest opportunity to help avoid where possible embarking on later protracted and costly formal dispute resolution processes.

There is an inherent fear in the Middle East construction market, although this could be said to be more far reaching than that, that construction professionals dealing with projects worry that relationships can be ruined by exercising contractual rights and administering contracts correctly and timeously. I would suggest that they ought to bear in mind that the contract is there to help them to manage and regulate the relationship and at the end, any 'difference of opinion should not spoil the relationship' - 'الاختلاف في الرأي لا يفسد للود قضية'.

The fallacy of affirming the consequent

A logical pitfall with implications in construction

David Brown, Quantum Expert, UK

Introduction:

Logical reasoning is a form of thinking in which premises and relations between premises are used to infer conclusions that are caused (or implied) by the premises. Fallacies are mistakes in logical reasoning that can lead to flawed conclusions. One such example is the 'affirming the consequent' fallacy.

The 'affirming the consequent' fallacy can occur within expert testimony when a subject matter expert erroneously concludes that a statement is true simply because its consequence is true. I explore the particulars of this logical error with a specific focus on the implications in expert opinion. I also draw upon my experience of proffering opinion evidence in formal dispute resolution proceedings and cite examples of fallacies in logical thinking that I have encountered.

Understanding affirming the consequent fallacy:

The 'affirming the consequent' fallacy is a common misconception that is categorised as a deductive reasoning error. The reasoning is flawed, which often leads to invalid conclusions, for example:

Example one:

1. If it rains, my hair gets wet (the premise).
2. Now, my hair is wet.
3. Therefore, it must be raining.

This fallacious reasoning becomes apparent when we realise that there could be multiple reasons why my hair is wet, and asserting that it must be raining is an oversimplification.

Examples of fallacious reasoning in opinion evidence

Another example of this fallacy relevant to construction and engineering might be:

Example two:

1. If there is inadequate project management, then cost overruns will occur.
2. Cost overruns have occurred.
3. Therefore, inadequate project management was in place.

In the above example, concluding that inadequate project management occurred based solely on the observation of a cost overrun is an oversimplification of the situation. Cost overruns on construction projects can occur, and often do, for a myriad of reasons.

Affirming the consequence in this way, by asserting that inadequate project management must have caused cost overruns, overlooks alternative explanations and results in an inaccurate opinion.

Consider a further example of an expert witness proffering opinion related to cost overruns:

Example three:

1. If the Quantity Surveyor provides an under-assessed cost plan, then cost overruns will occur.
2. Cost overruns have occurred.
3. Therefore, an under-assessed cost plan was provided.

Where a construction project has suffered cost overruns, several contributory causes can be to blame; examples may include unforeseen ground conditions, changes to project specifications and design, or external macroeconomic factors. A subject matter expert witness must avoid the temptation to affirm the consequent in this manner and must consider alternative explanations.

Conclusion:

Recognising and understanding the 'affirming the consequent' fallacy is crucial for any subject matter expert offering opinion evidence, particularly in formal resolution proceedings. Experts providing opinions on cost-related matters must be cautious not to succumb to this fallacy, as it will likely result in invalid conclusions and compromise the integrity of the expert opinion evidence.

More broadly, by understanding its structure and recognising instances where this fallacy may occur, construction professionals can improve critical thinking skills and become more open to consideration of alternative reasons why projects have become constrained. As the construction and engineering industry grapples with the complexities of disputes, being vigilant against logical fallacies can help avoid incorrect and often costly conclusions.

The critical role of programme updates in Extension of Time (EOT) claims

Addressing challenges and solutions

This article explores the vital role that accurate and consistent programme updates play in the context of preparing extension of time (EOT) claims and discusses common issues that arise and proposes some practical solutions to help ensure the production of effective delay analysis.

Rupesh Jedhe, Senior Consultant
Dubai, UAE

Introduction

Within EOT claims, programme updates are the foundation of the delay analysis. The updates record the real-time progress of a project, account for any unforeseen changes and serve as the basis on which to evaluate delay upon the critical path of a project.

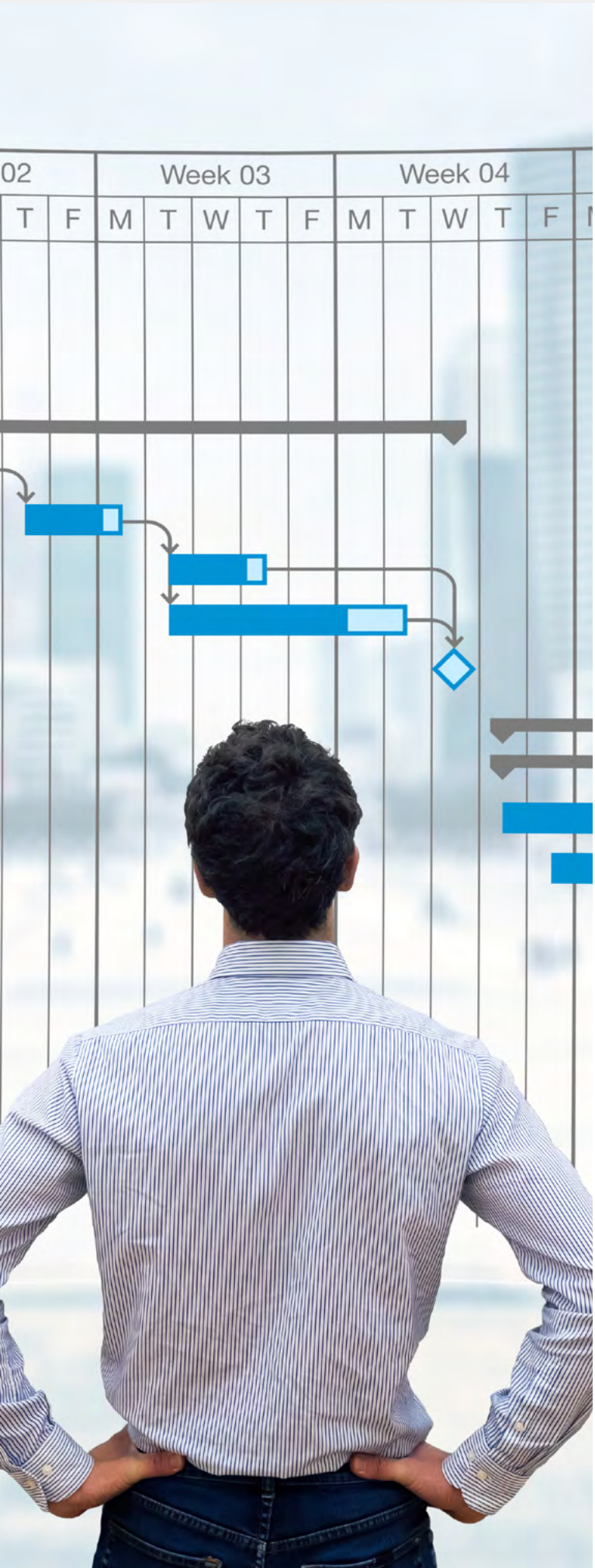
Accurate and logical updates, as emphasised by the Society of Construction Law (SCL) Delay and Disruption Protocol 2nd Edition are essential for any credible delay analysis. The Association for the Advancement of Cost Engineering (AACE) International Recommended Practices 29R-03 and 53R-06, further highlight the importance of maintaining an up-to-date programme to ensure credible delay analysis so that realistic EOT claims can be generated. Incorrect programme updates can undermine delay analysis leading to flawed assessments, claims and thereafter, potential disputes if they are not addressed and corrected carefully.

The importance of programme updates in delay analysis

Properly maintained programme updates are essential when conducting delay analysis. Both the SCL Protocol and the AACE Recommended Practices stress that accurate updates allow stakeholders to:

- **Capture the actual progress:** Compare actual progress against the as-planned programme accurately identifying any deviation. The SCL Protocol in particular, emphasises that as-built records are critical to performing delay analysis.[1]
- **Assess impacts:** Reflect the impacts of delay events such as, variations or unforeseen events upon the critical path and project completion. This aligns with AACE 29R-03, which recommends regular updates to assess the evolving critical path.[2]
- **Enhance collaboration:** Facilitate informed decision-making and transparency among stakeholders to avoid disputes.

1. SCL Delay and Disruption Protocol, 2nd Edition (February 2017), Core Principle 1: Programme and Records
2. AACE Recommended Practice No. 29R-03: Forensic Schedule Analysis (2011), Section 2.3: Schedule Updates: Validation, Rectification, and Reconstruction (SVP2.3)



> ***Incorrect programme updates can undermine delay analysis, leading to flawed assessments, claims, and potential disputes if they are not addressed and corrected carefully.***

Common issues in programme updates and potential implications

1. **Incorrect progress data:** Actual start/finish dates and progress percentages sometimes fail to reflect site conditions.
   - *Implication:* Inconsistent or incorrect data distorts critical path calculations, resulting in unreliable delay attribution and flawed delay analysis.
   - *Solution:* AACE 53R-06 sets out the importance of rigorous validation protocols, thus ensuring accuracy in actual dates and completion percentages while updating programmes.[3] The SCL Protocol recommends cross-referencing updates with contemporaneous project records such as daily reports, inspection requests, procurement logs and transmittal logs to enhance accuracy and reliability.[4]

2. **Activity Status Fluctuations:** Frequent changes, such as switching between "in progress" and "not started".
   - *Implication:* Reduces programme reliability and complicates delay attribution and mitigation efforts.
   - *Solution:* Establish a comprehensive programme update review system and an automated process of identifying changes from programme export in spreadsheets, as recommended in AACE 53R-06, to be aware of changes and to prevent inconsistent status updates.[5]

3. AACE Recommended Practice No. 53R-06: Schedule Update Review – As Applied in Engineering, Procurement, and Construction (August 2008). Sections: Schedule Update Review
4. SCL Delay and Disruption Protocol, 2nd Edition (February 2017), Appendix B- Record types and examples, Section 1.4(e)
5. AACE Recommended Practice No. 53R-06: Schedule Update Review – As Applied in Engineering, Procurement, and Construction (August 2008). Sections: Schedule Update Review

3. **Arbitrary changes to accepted programme:** Undocumented modifications to logic, activities, durations, calendars and activity type.
   - *Implication:* Undermines the programme's reliability, compromises the integrity of the critical path and obscures causation, which hinders the outcome of an otherwise credible EOT claim.
   - *Solution:* The SCL Protocol stresses the importance of documenting all updates with a clear narrative of the changes made to enhance accountability and traceability.[6] AACE 53R-06 further supports this by recommending a systematic approach to maintaining a change log for programme updates.[7]

4. **Unrealistic forecasting:** Updates fail to reflect project realities.
   - *Implication:* Produces unrealistic forecasts, reducing stakeholder trust and may undermine any delay assessment and mitigation efforts.
   - *Solution:* Audit programme updates' logic rigorously to ensure realistic sequences and durations. The SCL Protocol advocates the correction of unreasonable logic and durations. Ensure that programme updates remain dynamic and reflect evolving project realities to maintain accurate critical paths and realistic forecasts.[8]

5. **Use of outdated working programmes:** Often, programme revisions are accepted as part of ongoing project updates yet older programme versions are sometimes updated instead of the latest accepted working programmes.
   - *Implication:* May breach contract requirements for maintaining and submitting accurate and accepted programme updates, creates data gaps and risks delay analysis being based on a non compliant baseline, thereby weakening EOT claims.
   - *Solution:* The SCL Protocol recommends maintaining updates to the latest accepted programme in line with contractual provisions, alongside prior versions as required to reflect actual progress and realistic forecasts.[9]

6. **Loss of historical integrity:** Overwriting prior updates' progress data.
   - *Implication:* Prevents tracing the evolution of delays and therefore weakening claims.
   - *Solution:* The SCL Protocol emphasises maintaining version-controlled updates to preserve historical integrity.[10] AACE 53R-06 further reinforces this by recommending a structured review process to avoid data overwrites.[11]

Conclusion

Consistent and accurate programme updates are critical to enable robust delay analysis to be undertaken and for successful outcomes of EOT claim submissions.

Addressing these common issues with rigorous validation, logic consistency and comprehensive documentation enhances reliability and robustness of any delay analysis underpinning an EOT claim. By applying best practices and leveraging standards such as the SCL Protocol 2nd Edition and AACE Recommended Practices, construction professionals can help lessen the occurrence of disputes but if disputes occur, can assist in resolving them.

6. SCL Delay and Disruption Protocol, 2nd Edition (February 2017), Core Principle 1: Programme and Records, Requirements for updating and saving the Accepted Programme/Updated Programme
7. AACE Recommended Practice No. 53R-06: Schedule Update Review – As Applied in Engineering, Procurement, and Construction (August 2008). Section: Schedule Update Submittal, Schedule Narrative
8. SCL Delay and Disruption Protocol, 2nd Edition (February 2017), Core Principle 4: Do not 'wait and see' regarding impact of delay events (contemporaneous analysis)
9. SCL Delay and Disruption Protocol, 2nd Edition (February 2017), Core Principle 1: Programme and Records, Requirements for updating and saving the Accepted Programme/Updated Programme
10. SCL Delay and Disruption Protocol, 2nd Edition (February 2017), Core Principle 1: Programme and Records, Requirements for updating and saving the Accepted Programme/Updated Programme
11. AACE Recommended Practice No. 53R-06: Schedule Update Review – As Applied in Engineering, Procurement, and Construction (August 2008). Sections: Schedule Update Review

Diales

Enforcement of arbitration awards in Africa

Paul Woodward
Chief Executive Officer, Johannesburg
Tiefenthaler Legal

Africa represents an immense growth opportunity for companies in the mining and construction sectors. Throughout Africa, there are currently over $500 billion worth of infrastructure projects underway, with a mining market estimated to be worth $248 trillion. Across the continent, arbitration has become an increasingly popular key tool for resolving disputes. Events like UNCITRAL Days in Africa (2022–2023) have helped enhance the attractiveness of arbitration, engaging universities, practitioners, and policymakers across many African countries.

Most African countries derive their regulatory frameworks from the *New York Convention* and this system continues to evolve through the creation of regimes like the Organisation for the Harmonisation of Business Law in Africa ("OHADA")[1] . These frameworks aim to regulate each country's arbitration system while making the region more attractive to investors, governments, developers, mining houses and international contractors, all of whom look for the certainty associated with fair process, swift outcomes, and enforceability of parties' contractual rights and arbitration decisions.

1. OHADA - Uniform Act on arbitration (www.droit-afrique.com)

In *The Transformation of Arbitration in Africa*[2], Emilia Onyema argues that the continent's arbitration frameworks are still heavily shaped by Western legal traditions. Onyema's central hypothesis is that, while arbitration is gaining traction in Africa, its true transformation depends on the rise and credibility of African arbitral institutions, which must evolve beyond mere replication of foreign models to reflect local realities and needs. It is also critical for investment into the continent that the enforcement of contractual rights, Arbitral awards and the procedures for such enforcement are fair, transparent and robust.

This evolution is already underway. Regional regimes like the OHADA have created unified arbitration laws across 17 member states. OHADA's framework has been lauded in the 2024 *Alternative Dispute Resolution Journal* for enhancing enforcement certainty and reducing jurisdictional fragmentation.

However, navigating Africa's legal terrain remains complex. As highlighted in the CIArb Kenya Journal[3], national courts still play a critical role in enforcement, and their interpretations of public policy and procedural fairness vary widely. The journal also underscores the tension between formal arbitration and traditional dispute resolution mechanisms, especially in East Africa, where community-based approaches continue to influence legal culture.

2. E Onyema (2016) The Transformation of Arbitration in Africa: The Role of Arbitral Institutions. Kluwer Law International B.V. Netherlands.
3. Chartered Institute of Arbitrators (Kenya Branch) (2019) Alternative Dispute Resolution Volume 7 Number 2

OHADA comprises mainly 17 Francophone states which provides the continent's most extensive legal harmonisation project. Within OHADA, two systems govern arbitration:

- The Uniform Act on Arbitration (UAA), which applies directly in member states and reflects international best practices. It aims to safe-guard party autonomy, fair procedures, and the competence of arbitral tribunals.
- The Common Court of Justice and Arbitration (CCJA), based in Abidjan, Ivory Coast, which functions both as a judiciary and an arbitral institution. Awards rendered under CCJA auspices benefit from streamlined enforcement across all OHADA countries.

The greatest strength of this system is its enforcement power. An arbitral award made under OHADA does not need to go through lengthy national court processes. Instead, it is immediately enforceable across all 17 member states, giving businesses and investors' confidence that decisions will be complied with across borders.

Within OHADA member states, parties enjoy considerable freedom when choosing the law that will govern their contracts. If they cannot reach an agreement, the arbitral tribunal applies established conflict of law rules to decide which law should apply. Procedurally, parties may opt for CCJA rules or tailor the process via the UAA, provided that minimal standards, such as equal treatment of parties and observance of due process, are safeguarded. This not only protects fairness but also promotes neutrality and efficiency, making it easier to handle complex situations or managing parallel proceedings.

Not all African countries fall under the OHADA system. Across the rest of the continent, approaches to arbitration vary, but many states are moving closer to international best practice:

- **South Africa:** The International Arbitration Act brings South African law in line with the UNCITRAL Model Law. Courts generally uphold arbitral awards and only interferes where there are concerns about due process or violations of public policy.
- **Nigeria:** Nigeria's courts recognise and enforce arbitral awards. However, enforcement can still be challenged on grounds such as fraud, incapacity of a party, or public policy objections.
- **Anglophone Africa (e.g. Kenya, Ghana):** These countries have modernised their arbitration laws and are parties to the New York Convention, which makes cross-border enforcement easier.
- **North Africa (Egypt, Morocco):** Both countries maintain robust, modern arbitration frameworks and support enforcement under the New York Convention, though unpredictable court intervention may occur.

Most OHADA states and leading African commercial economies are signatories to the New York Convention, which compels courts in member states to recognise and enforce arbitral awards made in the territory of another contracting state, subject only to limited defences such as incapacity, improper notice, excess of authority, procedural irregularity, finality, and public policy breaches.

Notwithstanding this, practical obstacles, such as court delays and procedural challenges remain risks in enforcement. Accordingly, while arbitration provides a tested framework for resolving disputes, enforcing arbitral awards in Africa can still be challenging. Some of the main issues commonly encountered include:

- Uneven judicial experience: In certain jurisdictions, judges may be unfamiliar with arbitration principles. This can lead to courts unnecessarily re-examining the merits of a case or applying the "public policy" exception too broadly.
- Political risk and state immunity: If the award is against a government or a state-owned entity, enforcement may require special waivers or government approvals, making the process politically sensitive.
- Procedural hurdles: Local court rules, bureaucratic delays, or high costs can frustrate or prolong enforcement even where international treaties apply.

To reduce the risk of enforcement problems, parties are encouraged to build protective measures into their contracts, including:

- Choosing the right seat of arbitration, by selecting a country where the framework for the enforcement of arbitration awards is well established.
- Securing sufficient financial safeguards, such as guarantees issued from first class international institutions and, where risk is anticipated, guarantees that are enforceable in established jurisdictions.
- Drafting clear arbitration clauses to ensure that awards are binding not just on the immediate contracting party, but also on parent companies and affiliates, if appropriate.

The employment of appropriate safeguards can help ensure that both local and international stakeholders are able to capitalise on the lucrative and burgeoning African construction and mining landscape while limiting the risks associated with identified uncertainty.

Concurrent delay and Schindler vs Walsh: alignment in Canada

Andrew Palmer, Senior Consultant, Calgary, Canada

In construction claims and disputes related to multi-party delays, the apportionment of liability is a crucial task for a consultant and/or expert and one that is complex enough at the best of times. Throw in the concept of concurrent delay, which has multiple definitions depending on the governing jurisdiction and industry guideline utilised, and that complexity increases exponentially. However, the ruling in *Schindler Elevator Corporation v Walsh Construction Company of Canada (2021 ONSC 283)* has provided clarity in Canada on definitions of concurrent delay and guidance on the application of apportionment of liability. While not providing precedence in other jurisdictions, the case does however reflect a more nuanced evaluation of concurrent delays, which may provide guidance for fair analysis in other jurisdictions.

In *Schindler,* Walsh Construction was contracted in 2010 to redevelop the Women's College Hospital in Toronto, Ontario. Schindler Elevator Corporation was subcontracted by Walsh to fabricate, deliver, and install all the elevators for the new building.

At the completion of the project, Schindler alleged that Walsh had not paid for certain services and materials provided by Schindler. Walsh countered that Schindler had caused a delay to the project and thereby caused Walsh to incur losses. The accompanying delay analysis submitted by Walsh showed concurrent delay caused by multiple subcontractors. Walsh thusly claimed that Schindler was liable for an equitable proportion of damages.

Schindler's defence went to the heart of the principle of concurrent delay. The subcontractor claimed that for a delay to be considered concurrent, the delay had to start at the same time and end at the same time, a concept commonly referred to as True Concurrency.

It was this defence that compelled the court to acknowledge the rareness of True Concurrency and that it was only a fair and equitable expectation that concurrent delays *"are more commonly experienced as overlapping events"*.

Ultimately, the Court found that Schindler was in delay and had consequently delayed interrelated successor activities. Walsh was accordingly granted set-off damages. However, Walsh was also found to have not sufficiently substantiated that Schindler caused delay and so the majority of Walsh's claimed damages were found to be not proven. The decision was a true validation of the complexity inherent in establishing concurrent delay. Essentially, each individual event must be proven to have been a determinative cause of a critical path delay.

As a result of *Schindler*, there is now a certain degree of alignment in Canada, that the definition of concurrent delay that requires the delay to exhibit True Concurrency is too narrow to be practically applied with any sense of fairness. A more flexible approach to the definition of concurrent delay is required. The implication of only considering True Concurrency in any analysis is that only one party would be held liable for the delay, which may not be a fair reflection of actual events. In essence, the court has acknowledged the complexity of concurrent delays.

How concurrent delay is defined and apportioned varies around the globe, but all delay analysts ought to consider the lessons of *Schindler* and its illustration of the complexity of concurrent delay analysis, as well as the value of rigorous project record-keeping in proving any such analysis.

The Women's College Hospital and medical centre, Toronto, Canada

Managing offshore weather downtime

Jeremy Peirani, Associate Director, Paris, France
With assistance of the Dutch office

Rough seas near the Block Island Wind Farm offshore Rhode Island. (Image: Dennis Schroeder / NREL)

Introduction

You can't change the weather, but you can adjust the plan…

When vessels or marine tools are unable or unsafe to operate due to adverse weather conditions, their standby can generate significant additional costs (sometimes exceeding hundreds of thousands of euros or dollars per day). On top, any resulting delay to the project's critical path may expose the parties to an offshore construction contract to substantial financial damages or delay penalties.

Therefore, all parties face significant pressure to accurately estimate adverse weather days and carefully consider those in the project programme, defining and managing the allocation of the cost and time impacts in the contract, and effectively settling contractual issues and disputes, as expanded on below.

What is adverse weather?

Some legal systems provide definitions of adverse weather: for instance, the U.S. Code of Federal Regulations Title 33 CF 155.1020 states that *"factors to consider include, but are not limited to, significant wave height, ice, temperature, weather-related visibility, and currents within the Captain of the Port (COTP) zone in which the systems or equipment are intended to function"*[1].

For offshore works, adverse weather is usually defined by the workability criteria. The contractor sets the criteria based on the safety of the vessel or tool (e.g. a lifting crane, a dredger, etc.) and the concerned works (for instance, precision dredging may require more stringent criteria than bulk dredging). The most obvious criteria relate to the state of the sea: the significant wave height (Hs), the wave peak period, and current speed or direction. Also, wind criteria should be considered: the windspeed, gusts, and direction. These parameters may significantly vary depending on the region and time of the year.

The marine warranty surveyor, typically employed by the client as a third party, also plays an essential role in managing marine risks. The marine warranty surveyor ensures that operations remain safe and compliant with the requirements of the insurance policy usually taken out by the client. The marine warranty surveyor will cross-check the defined workability criteria against industry standards for safe marine operations.

Other considerations may be relevant depending on the specific site conditions, such as the potential exposure to (tropical) storms, extreme heat or cold, spring

1. https://www.ecfr.gov/current/title-33/chapter-I/subchapter-O/part-155/subpart-D/section-155.1020

tides, visibility, and turbidity. In addition to terrestrial weather conditions, solar eruptions may also disrupt communication and navigation tools.

Climate change potentially adds a further layer of complexity to anticipating weather-related risks: for instance, the rising ocean temperatures and atmospheric carbon dioxide content increase the risk of algal blooms, which can impact subsea installation and monitoring activities performed by divers, remotely operated vehicles, and trenching systems.

How to consider adverse weather when creating your project programme?

It is industry practice to estimate the adverse weather days based on the workability limits and (at least) 10 years of historic weather data. In this context, "P50" and "P90" values are often used: P50 means that, 50% of the time, the weather downtime will not exceed the calculated duration; P90 provides 90% certainty that this duration will not be exceeded. Generally, programmes are based on P50 values and the P90 values give an idea of the likely contingency budget that should be considered.

The best way to integrate workability into the programme is to give each vessel its own specific calendar in which, for each month of the year, the anticipated downtime is set as non-workable. This approach allows assessment of the impact of changes, such as variations in start date or execution method later on. The programme should also include periods during which work is fully prohibited because of adverse weather (e.g. periods of ice in the Arctic area).

During the execution of the works, parties will look for workable weather windows i.e., the duration (e.g. 6 hours) when conditions are below a set threshold (e.g. significant wave height Hs lower than 1.5m) to allow the performance of an operation (e.g. subsea cable protection work). When no window is available, adverse weather downtime will be logged.

How is adverse weather addressed in the contract?

Anticipated weather downtime scenarios and allocation of financial impacts should be estimated as much as possible, then negotiated and expressly agreed upon in the contract.

Depending on the definition of force majeure in the contract or in the applicable law, adverse weather conditions may fall within this definition. However, parties should remember that a successful force majeure claim would usually entitle a contractor to an extension of time only. This principle is consistent with the 2017 edition of the SCL Delay and Disruption Protocol, which states that adverse weather conditions are the most common example of delay events where the contractor may receive a time extension but without financial compensation[2].

Ultimately, parties are free to agree on whether the contractor is entitled to an extension of time and/or financial compensation; in some contracts, the contractor can choose the financial compensation mechanism between a lump sum and the application of daily rates.

To avoid any disputes over how weather should be forecast and monitored during execution, the contract usually stipulates that the parties should agree beforehand on a reliable weather forecasting service and the weather recording tools to be used (usually a weather buoy).

For obvious safety reasons, the vessel master has the final word to decide whether it is safe or not to work, even if the weather conditions fall within the workability limits; the contracting parties must then agree which party is responsible for the commercial impacts.

Parties should also consider the allocation of responsibilities in the event of concurrent issues; for instance, parties generally agree that the contractor is not entitled to an extension of time or financial compensation during weather downtime when the vessel or marine tool is in mechanical breakdown.

However, sometimes due to the complexity of the works changes may still occur, such as changes in the work scope, methodology, or season. For instance:

- If a so-called walk-to-work vessel is used but was not foreseen in the initial scope (e.g. crew transfers initially planned by helicopters or boats) and no workability limit is defined in the contract, which party is then responsible for the standby costs and/or delays when the actual wind conditions are too dangerous for using its gangway?
- If a contract provides for two vessels, (a) a dredger and (b) a barge, with respective Hs(a) and Hs(b) which were supposed to work on different scopes, what Hs shall apply if vessels (a) and (b) actually work jointly? The easy answer could be: the lowest Hs - say Hs(a); however, in some instances one could argue that this approach is too stringent because vessel (b) actually stabilises vessel (a) when they are in each other's vicinity. Or, on the contrary, such interference may create instability and additional risks, so even considering Hs(a) may be unsafe.

2. Society of Construction Law Delay and Disruption Protocol, 2nd edition of February 2017, paragraph 12.2.

- Which party is responsible for the standby costs and/or delays when a combination of weather parameters becomes critical, even where each of them remains within itheir workability limit?
- If the parties have agreed acceleration measures and bonus schemes to secure offshore construction works right before a weather window during which work is forbidden (e.g. the winter period in the Caspian Sea), but the target is missed due to exceptionally adverse weather, what compensation is the contractor entitled to?

Accordingly, some cases might lead to arguments and disputes. How to get best prepared then?

Commercial and contract management, dispute avoidance, and resolution

One common issue for contractors is the transfer of conditions relating to weather downtime from the main contract to subcontractors: a back-to-back arrangement would limit the contractor's exposure. However, specialist subcontractors may either reject the proposed conditions or significantly increase their prices to accept them. This can end up in difficult situations for the contractor: for instance, if the contractor is compensated via a lump sum but its subcontractor only accepts to be compensated on a day rate basis, then the subcontractor may not be as motivated as the contractor to expedite progress.

To help assist the efficient settlement of contractual issues and disputes, the execution of the works should be well documented. In particular, weather forecasts, actual conditions, weather standby time, and any other relevant information (e.g. vessel maintenance or breakdown) should be recorded in daily progress reports signed by the relevant parties. For rapidly changing/unreliable weather predictions, parties should organise specific meetings and sign the minutes to avoid subsequent arguments or misunderstandings.

Ideally, adverse weather delays and their impact on the works should be reviewed by the parties on a monthly basis to ensure transparent discussions between the employer and contractor and to assist with the quick resolution of potential disputes.

Conclusion

Offshore construction contracts need to address various adverse weather risks and set out how to deal with such risks. Parties should be aware that they may face unforeseen scenarios due to complex combinations of events. In any case, the parties ought to be prepared to expect the unexpected and to settle each issue promptly after occurrence. As always, the golden rule for contract management and dispute avoidance or resolution will apply: records, records, records!

The magic of 4-pipe fan coils

Kevin Edge, Technical Director, Coventry, UK

Setting the scene

MEP services are foundational to modern buildings ensuring functionality, safety, and efficiency. Historically rooted in the industrial revolution's technological advancements, MEP has evolved to integrate complex HVAC, electrical, and plumbing systems. Dubbed the "dark art" by many, MEP services can easily account for around 15% to 30% or more of a project's value and are generally considered one of the most complex parts of any building project.

The discipline may often be viewed as ancillary to architectural design. For example, if you consider the MEP requirements of a typical commercial project, such as an office development, when under pressure to provide maximum net lettable or saleable floor area, architects and clients are likely to view this valuable commodity as one of the driving factors behind form, in order to maximise their return on investment. In taking this stance, it can often reduce the available space for MEP plant, risers, and distribution.

It is sometimes viewed as an easy win for architects in the space battle but can result in adversarial debate among designers and contractors as it adds constraints to the functionality, to the point where the MEP design can become compromised. Once this happens, the skill and ingenuity of MEP design engineers is tested due to pressures to incorporate all necessary plant and the associated distribution systems into spaces smaller than they intrinsically need.

Fan Coil Units (FCUs)

FCUs provide localised heating and cooling solutions to enhance comfort, improve energy efficiency, and offer flexibility in design and application. They are an integral part of MEP systems in certain types of buildings. Consider an office development as an example, where a base build or CAT A[1] design is undertaken. The MEP design for each floor is sized to accommodate a speculative occupancy profile typically of one person per 10m², or one person per 8m² if high density occupation is required, usually in the United Kingdom based on the British Standard for Offices (BCO) specification which sets benchmark criteria for design.

Under a CAT A fit out, the building is usually equipped with a primary mechanical ventilation system which provides preconditioned outside air for the speculative occupancy level at a minimum 12l/s/person according to the BCO, with an allowance of 10% spare capacity to each floor, which would more than satisfy compliance with Building Regulation requirements that typically require 10l/s/person.

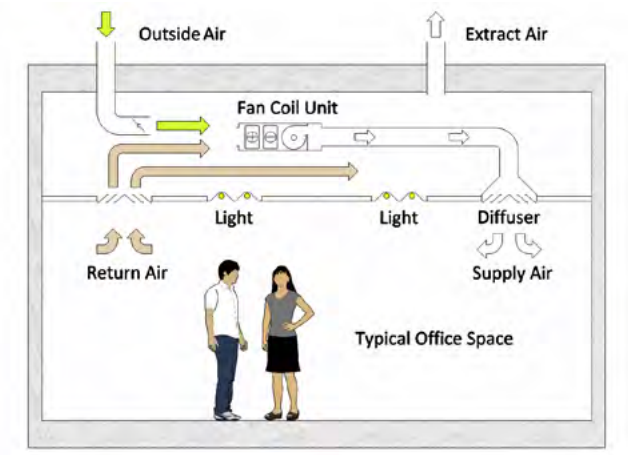
The speculative heating and cooling loads are met by either a variable refrigerant flow (VRF) type comfort heating and cooling system, which incorporates a multitude of indoor FCUs linked via refrigeration pipework to externally mounted condensing units, or more often than not, office buildings utilise 4-pipe FCUs in lieu of VRF based systems. This requires central plant in the form of boilers for low temperature hot water which may also incorporate Combined Heat and Power (CHP) plant and chillers, which provide chilled water.

4-pipe FCUs come in various configurations and designs based on them being either water side or air side units. Water side FCUs are common in the United Kingdom and work by controlling their heating and cooling output by adjusting the water side flowrates passing through the heat exchange coils. Air side units work by adjusting the flowrate of air passing over the heat exchange coils.

FCUs usually reside within the ceiling void spaces to ensure floor space is kept clear. FCUs are effectively metal boxes which incorporate filters, water-based heat exchange coils and an internal forward faced centrifugal fan, with associated inbuilt control connectivity.

1. CAT A Fit Out – MEP fit out of an office space based on speculative occupancy and heating and cooling loads.

A typical FCU strategy is shown in the diagram below:



FCUs are usually sized based on cooling demand for commercial developments. The demand is derived from the calculation of heat gains from speculative occupancy, lighting, small power, IT equipment, and solar gains. FCUs can also provide heating where needed. The heat exchange coils are connected to both the low temperature hot water (LTHW) and chilled water distribution network.

FCUs work on the recirculation of air by drawing in air from the selected space (return air intake) to be either heated or cooled via the heat exchange coils. After being filtered, heated or cooled, the air is discharged back into the selected space as secondary supply air to control the temperature.

Primary ventilation is discharged into the ceiling void in close proximity to the return air intake of FCUs, which allows mixing with the return air. The temperature of this return air is sensed by the FCU controls and used to determine if there is a heating or cooling requirement, which in turn controls the water side control valves and hence flowrates. This is why the primary ventilation flowrate taken to FCUs is limited to circa 10% to 15% of the FCU air handling capability.

The supply air discharged from the FCU is distributed by secondary ductwork directly connected to the FCU. The internal fan within the FCU usually has a limited external pressure capability of circa 30Pa set by the characteristics of the fan, meaning that any secondary ductwork connected has to be sized to accommodate the required discharge velocity, usually a maximum of 3m/s, advised by the FCU manufacturer, against 30Pa.

Now come the headaches

There are various issues that can be experienced when using 4-pipe FCUs for both air side and water side units. If the secondary ductwork is sized too small, the air velocity at the FCU discharge flowrate will exceed 3m/s within the ductwork with a corresponding increase in pressure drop, resulting in the FCU not achieving the air handling requirements needed to provide the required cooling duty for the space.

Similar issues can arise where excessive lengths of flexible ductwork are used between the FCU connections and ceiling mounted supply air terminals, which is a common problem due to contractors seeking cheap installation methods and materials. It is standard practice to utilise flexible ductwork to some degree; however, there is a UK specification called DW/144 *"Specification for Sheet Metal Ductwork"* which suggests that lengths of flexible ducts be limited to six times the duct diameter. Also, the Chartered Institution of Building Services Engineers (CIBSE) Guide C recommends that where flexible ductwork is used, it should be kept as short as possible and be almost fully extended, suggesting that if it is installed at circa 70% of the extended length then the pressure drop can be greater by a factor of four.

When considering the secondary ductwork design for FCUs, it is essential to ensure that the fan speed setting and corresponding air volume flowrate, to achieve the cooling duty required, are known and that ductwork is sized to ensure air velocities remain below 3m/s at this design air volume. Flexible ductwork lengths should be limited and installed fully extended so that when the pressure drop associated with the supply diffuser is considered, it remains within the limitations of the FCU fan.

These considerations clearly impact spatial planning, in particular ceiling void depths and consequently the height of the false ceilings when coordinating with the primary ventilation ductwork layout, positioning of all required FCUs and associated secondary ductwork along with pipework, primary electrical containment, and ceiling mounted equipment such as lighting, grilles and diffusers and other ceiling mounted fittings.

In some instances, the effect of these coordination issues is negated by the use of long lengths of flexible ductwork connected to FCU connections, which are sometimes left strewn across ceilings with inadequate support, being potentially squashed at pinch points before their final connection to a grille box. The result of this scenario is that the pressure drop far exceeds 30Pa, resulting in reduced air flow and the cooling requirement not being achievable, ultimately leaving the FCUs to suffer premature fan deck failures and the occupied space to overheat.

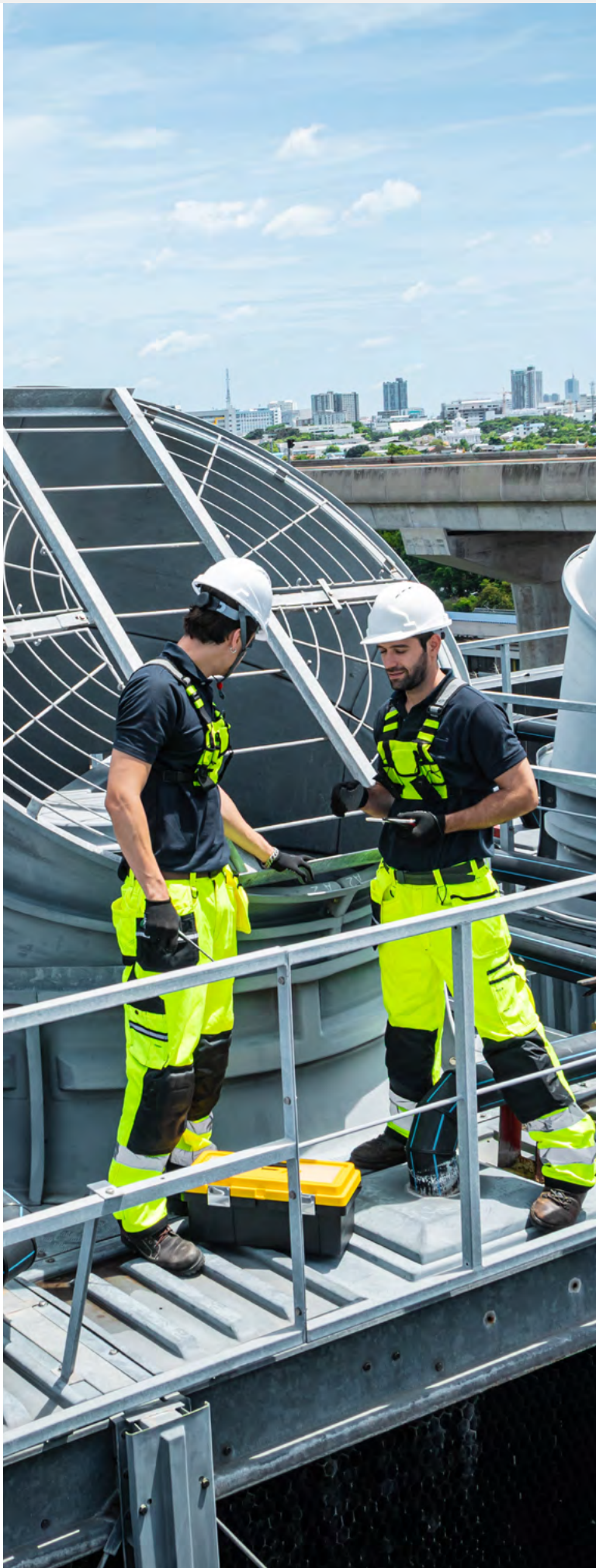
CAT A versus CAT B

If a CAT B[2] tenant's fit out is factored into the equation, then a whole number of other problems can arise if the process is not managed. It is not uncommon for a landlord to provide a lease agreement to prospective tenants which advises its allowances for primary ventilation, chilled water, and LTHW, derived from the CAT A design for the floor they want to lease. These allowances may include a percentage margin over the commissioned state of the CAT A speculative floors which gives tenants some additional capacity for their CAT B fit out without causing issues on other floors. Furthermore, it is not uncommon for the lease agreement to describe how tenants are to accommodate any additional requirements they may have for ventilation, heating, or cooling above the speculative CAT A design, but this is not always the case. In some instances, leases can be silent on this aspect.

Where the lease agreement is silent on how the prospective tenant accommodates its CAT B requirements, a scenario may play out where a tenant installs additional FCUs, relocates others to suit new office layouts and then attempts to rebalance its floor to take higher flowrates than the CAT A allowed. This effectively leaves other floors starved of the primary ventilation, chilled and low temperature hot water commodities they should have. This leaves them in an unbalanced state incapable of accommodating the CAT A design. It is therefore paramount that the CAT A design specifications make spatial allowance for any additional plant, equipment, and distribution that any prospective CAT B tenant may require and that lease agreements provide a contractual basis and specification for how a prospective tenant is to accommodate the potential for higher capacity requirements.

Conclusion

MEP services are integral to efficient, adaptable, and comfortable building environments. Systems such as FCUs play a central role in temperature control and air distribution, especially in both CAT A and CAT B fit outs, where specific customisation levels vary. This highlights MEP's critical contributions to modern building performance, energy efficiency, and occupant comfort, and the importance of providing adequate spatial provision for MEP installations.



2. CAT B Fit Out – MEP fit out that updates the CAT A fit out to suit the tenant's requirements for increased occupancy and heating and cooling loads.

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+1 403-830-9619

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GERMANY
+49 (0) 89 5419 8931

IRELAND
+44 (0)7974 705 546

SPAIN
+34 (91) 915 7351

THE NETHERLANDS
Goes
+31 113 246 400

Rotterdam
+31 10 307 04 08

UNITED KINGDOM
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AFRICA

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AUSTRALIA
Perth
+61 8 6557 8690

Sydney
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SOUTH KOREA
+82 (0)1091289592

SINGAPORE
+65 6226 4317

MIDDLE EAST

KINGDOM OF SAUDI ARABIA
+966 11 834 3640

QATAR
+974 4 435 8663

UNITED ARAB EMIRATES
Abu Dhabi
+971 2 4410 112

Dubai
+971 4 453 9031