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ROLE OF EXPERTS IN INTERNATIONAL CONSTRUCTION ARBITRATION

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By

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I. Introduction

International arbitration is still the preferred method of resolving cross-border disputes. In the survey carried out by Queen Mary University of London, 97% of respondents indicate that international arbitration is their preferred method of dispute resolution, either on a stand-alone basis (48%) or in conjunction with ADR (49%)[1] Disputes in international arbitration relating to construction and engineering have been on the rise in recent years. The 2012 Statistical Report of the ICC Dispute Resolution Bulletin 1/2013 shows that construction & engineering related disputes accounted for 16.9% of the total disputes in 2012.[2] Construction and engineering rose to 23% of all new cases in 2017 in ICC (186 new cases filed).[3] The rise in construction related disputes can be attributed to the complexities involved in a construction project and to the fact that every construction project is unique. PM Book defines "project" as "*a temporary endeavour undertaken to create a unique product, service, or result.*"[4]

Construction projects also almost invariably raise technical engineering and programming issues, requiring detailed analysis of a sometimes-colossal volume of data, usually including daily, weekly and monthly progress reports, programme updates, minutes of meetings, drawings, specifications, correspondence, etc. As a result, construction claims typically require detailed factual input and experts in engineering, delay and quantum evidence. A survey carried out by the School of International Arbitration Queen Mary College London shows that the two most defining characteristics in international arbitration in construction sectors are (i) factual and technical complexity and (ii) the large amount of evidence involved.[5] The role of experts in addressing these two characteristics can be crucial. This paper will therefore focus on discussing various roles / types of expert witnesses, how experts are perceived by various institutes, discussion on party appointed experts and the roles and duties of an expert witness especially in construction industry disputes. The paper is structured to provide some

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1 2018 International Arbitration Survey: The Evolution of International Arbitration. School of International Arbitration Queen Mary College London, p.5.

2 2012 Statistical Report, ICC Dispute Resolution Bulletin 1/2013

3 ICC Dispute Resolution Bulletin 2/2018, p.61.

4 A Guide to the Project Management Body of Knowledge 6th edition of Project Management Institute (PMI) Global Standard.

5 International Arbitration Survey – Driving efficiency in International Construction Disputes. School of International Arbitration Queen Mary College London November 2019, p.10.

basic information for readers with legal backgrounds and some information for non-lawyers.

II. Type of Construction Contracts

Construction projects, which frequently span over a number of years, often involve a multi-level contractual framework, sometimes in a multi-jurisdictional environment, with multiple parties which can include the employer, the main contractor, subcontractors, suppliers, lenders, management consultants, engineers and / or architects etc.[1] In addition there are a number of delivery methods and contract types which make matters more complicated. Various commonly used type of construction contracts and project delivery methods are listed below:

Type of contracts.[2]

- Lump-sum or fixed price contracts

  This is the most traditional form of contract and requires the contractor to bid for a fixed sum based on a precise scope defined in contract documents.

- Unit-price or re-measurable contracts

  This type of contract requires a contractor to perform specific units of work at a pre-determined price of the unit or units of work. The unit price generally includes direct and indirect cost as well as overhead and profit.

- Negotiated or cost-plus contracts

  In this type of contract owner and contractor agree on a pricing formula for the work to be performed which generally requires the contractor being paid for actual expense of performing the work plus a fixed percentage fee for contractor overhead and profit.

Common project delivery methods.[3]

- General Contracting or Design-Bid-Build (often abbreviated as DBB)
- Design-Build (often abbreviated as DB) including Engineer-Procure-Construct (EPC)
- Construction Management (often abbreviated as CM)
- *Multiple-Prime Contracts*, Partnering and Alliancing as separate delivery methods are sometimes found as well.

Particular delivery methods differ mainly in respect of the following:

- Responsibility for engineering / design;

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[1] I bid.

[2] BREKOULAKIS STAVROS / THOMAS DAVID BRYNMOR. Guide to Construction Arbitration. Published in the United Kingdom by Law Business Research Ltd, London in 2017, p.12.

[3] KLEE LUKAS. International Construction Contract Law Publisher Wiley Blackwel West Susex United Kingdom 2015, p.51.

- contract price determination (fixed price or re-measurable);
- contract administration approach; and
- risk allocation and entitlement of claims.[1]

The success of construction projects among other factors is also dependent on the combination of the delivery method and type of contract used for delivering a project. E.g. in a design build / EPC delivery method lump sum or fixed price contracts are mostly used.

III. Type of Disputes in Construction Industry

The construction industry is a fertile breeding ground for disputes. Not all the construction disputes land in arbitration due to the high cost as well as other strategic considerations. The reasons for disputes among other things can be due to, design faults, defective work or materials, the cost of variations may cause disagreement, wrongful holding of invoices, loss and expense for delay and prolongation, or extensions of time to defend against liquidated damages for late completion, etc.[2] Claims may be divided into claims by owner or employer against contractors, and the reverse situation where the contractor claims against the employer or owner. The list below broadly notes the reasons of contractual claims in the construction industry.[3]

- Defective work by contractor
- Delays and liquidated damages
- Damages for repudiation
- Extension of time
- Direct losses
- Prolongation costs
- Disruption expenses
- Design changes by employer

'Claim' may be defined as *the seeking of consideration or change by one of the parties involved in the construction process*. Claims occur frequently in the construction industry. Once a claim is presented, it may result in a negotiation between the parties, in turn resulting in a change order or amicable settlement. It may also result in a contract dispute, which may then be litigated, arbitrated or mediated.[4]

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1 Ibid, p.52.

2 AKRAM SALEEM / CAVALLINI CRISTINA / DIZDAR ALTAN. Project no. 2010-1-PL1-LEO05-11469 titled "Strengthening of European Union funds absorption capacity for infrastructure construction projects. MANUAL "DELAY AND DISRUPTION IN CONSTRUCTION PROJECTS", p.10.

3 RENOLDS MICHAEL P. The Expert Witness in Construction Disputes, Black Science London United Kingdom 2002, p.26, ff., p.27, f.,28.

4 ARDITI DAVID / BHUPENDRA K PATEL. International Journal of Project Management. Volume 7, Issue 3, August 1989, p.141, ff., p.142, ff., p.143, ff., p.144, ff., p.145.

IV. Experts in International Arbitration

Expert witnesses assist the courts and many other tribunals in a variety of contexts, including criminal trials, civil trials, tribunals, copyright disputes, as well as in areas of construction and engineering hearings.[1]

Expert witnesses can be party appointed, or court / tribunal appointed. There is some divide between the common law and the civil law approach to expert evidence. It is a common law tradition for parties to present "their" expert witness. Civil lawyers however have historically been more skeptical about the benefits and costs of party appointed expert witnesses. Interestingly, national arbitration laws do not exactly reflect this divide in the approach to expert evidence. Most national arbitration laws, from both common law and civil law countries, primarily deal with tribunal appointed experts, and only secondarily with party-appointed experts. However, there is a clear trend in international arbitration these days to rely on the evidence / opinion of party appointed experts, with tribunal-appointed experts being rarely used.[2]

The 1985 UNCITRAL Model Law - the mother of most modern arbitration laws - deals in Article 26 only with experts appointed by the tribunal. Party appointed experts are only mentioned for the parties' right to put questions to the tribunal appointed expert during evidentiary hearings. However, there is no doubt that evidence by means of party-appointed experts is admissible under the UNCITRAL Model Law. Under Article 23 (I) of the Model Law parties have the right to submit their own evidence. It includes the right to present expert evidence from their own party appointed experts. It can therefore be said that national arbitration laws permit both types of expert evidence i.e. tribunal appointed and or party appointed.[3]

Most of the institutional rules are specific about tribunal appointed experts. Article 29 of the UNCITRAL Arbitration Rules specifically refers to tribunal appointed experts. Article 27(2) of UNCITRAL Rules also refers to party appointed experts.[4] Article 21 of the LCIA Arbitration Rules also refers to tribunal appointed experts.[5] Article 24 of Arbitration Rules of the Arbitration Institute of the Stockholm Chamber of Commerce (SCC) provides for tribunal appointed experts. However, it can be argued that Article 33(1) of the SCC Rules refers to party appointed experts.[6] DIS Rules Article 28 also deals with tribunal appointed experts.[7] Similarly Article 23 of the VIAC Rules[8] and Article 27 of the SCAI Rules refer tribunal appointed experts. It can however be argued that Article 25 of the

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1 GAITSKELL ROBERT, Experts – In Litigation, Arbitration and Adjudication published by Society of Construction Law UK, 2006 p.1. https://www.scl.org.uk/papers accessed on 7 Feb 2020

2 SACHS KLAUS / NILS SCHMIDT-AHRENDTS, ICCA conference Rio de Janerio 2010. Experts: Neutrals or Advocates, p.3

3 Ibid.

4 Article 29, Article 27(2) UNCITRAL Arbitration Rules 2014.

5 Article 21 LCIA Arbitration Rules effective 1 October 2014.

6 Article 33(1) Arbitration Rules of the Arbitration Institute of the Stockholm Chamber of Commerce effective 1 January 2017

7 Article 28 German Arbitration Institute (DIS) Arbitration Rules 2018.

8 Article 23 Vienna International Arbitral Center (VIAC) Rules of Arbitration and Mediation 2013.

SCAI Rules also refer to party appointed experts. [1]The ICC Rules however broadly but distinctly provide a mechanism for party appointed and tribunal appointed expert(s). Article 25(3) of the ICC Rules deals with party appointed experts and Article 25(4) deals with tribunal appointed experts.[2] Article 25 of the ICC Rules pertains to "*Establishing the the Facts of the Case*".

The IBA Rules provide more detailed procedures for party appointed and tribunal appointed experts. Article 5 of the IBA Rules confirms that a party can rely on party appointed experts as a means of evidence. Article 5 of the IBA Rules further sets out the required contents of an expert report, the general obligation of an expert during evidentiary hearing and the possibility of a tribunal to order party appointed experts to meet and discuss and reach agreements on issues.[3] Article 6 of the IBA Rules specifies the tribunal's right to appoint its own independent expert. Article 6 further illustrates the requirement of a tribunal to consult the parties before selecting an expert and establishing the expert's terms of reference. Article 6 further states that a tribunal appointed expert has the authority to request any relevant material information directly from the parties. Article 6 also makes clear that tribunal-appointed expert reports may be commented by opposite parties. A tribunal appointed expert can be questioned by the parties and their representatives on the issues raised in his or her expert report.[4] The IBA Rules on the appointment of experts have been supplemented by the Chartered Institute of Arbitrators Guidelines titled "Party-appointed and Tribunal-appointed Experts."[5] The IBA Rules though bridged the gap between common law and civil law traditions of taking evidence, although they are still considered closer to common law traditions. The Prague Rules have been developed by practitioners from Europe and other civil law countries.[6] Article 6 of the Prague Rules deals with tribunal appointed experts, however under Article 6.5 of the Prague Rules an "*appointment of experts by the Tribunal does not preclude a Party from submitting its own expert report*".[7]

It can be seen from the above illustrations that both tribunal appointed experts and party appointed experts can be used in an international arbitration. Although the national laws of many countries and institution's procedures articulate more on tribunal appointed experts, party appointed experts are frequently used and relied upon as witnesses in cases of international arbitration.

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1 Article 25 Swiss Chambers' Arbitration Institution (SCAI) Swiss Rules of International Arbitration, 2012.

2 Article 25 (3), Article 25(4) of ICC Arbitration Rules 2017.

3 Article 5 International Bar Association (IBA) Rules on the taking of evidence in International Arbitration adopted on 29 May 2010

4 Ibid., Article 6

5 Party-appointed and Tribunal-appointed Experts. Chartered Institute of Arbitrators UK. International Arbitration Practice Guide. https://www.ciarb.org/media/4200/guideline-7-party-appointed-and-tribunal-appointed-expert-witnesses-in-international-arbitration-2015.pdf accessed on 2 March 2020.

6 INQUISITORIAL RULES OF TAKING EVIDENCE IN INTERNATIONAL ARBITRATION (PRAGUE RULES) 14 Feb 2018. www.praguerules.com

7 Ibid., Article 6.

A. Expert Witness – Different Roles

Common variants on the role of the 'expert' are described and discussed as follows.

1. Expert advisor[1]

   In this case the expert advisor provides a party with expert advice on the claims before their preparation is completed and then also provides guidance and support through subsequent phases of the proceedings. Expert advisors are appointed very early, even before a notice of arbitration or claim is served, then their expertise can be used to guide the client and its claims team on the drafting of the claim. The expert advisor does not prepare any of the claims himself and remains independent of those claims but does provide guidance to the claims preparation team to ensure that the prepared claim can be defended by the expert.

   The advantages of this approach are obvious. The early involvement of the expert prevents parties preparing claims or pleading positions that the expert will not be able to honestly support when giving evidence to the tribunal. This is particularly helpful in areas of construction disputes where there are numerous alternative approaches that can be taken when dealing with the same facts. Particular examples are claims for extensions of time and the financial evaluation of disruption; but there are many more.[2]

2. Shadow Expert

   A shadow expert works behind the scene and gives advice to the party. A shadow expert is party appointed and may or may not be directly involved in the preparation of claims. Such experts are sometimes referred to colloquially as "shadow" or "dirty" experts because they are essentially an extension of the party itself, as opposed to a "clean" expert whose responsibility is to present impartial expert evidence to the tribunal. Behind-the-scenes experts ensure that technical details are not confusing or misrepresented in claims or defenses and may prevent an unsupported or immature claim from being submitted in the first place. Such experts also often help to set parameters for the engagement of an expert witness who will ultimately provide evidence to the tribunal.

   Experts who advise behind the scenes are rarely visible to other participants in an arbitration. It is therefore important that when these experts perform other roles, in particular when they act as arbitrators, they take care of possible conflict issues due to any behind the scenes advice they have given in the past. [3]

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1 HORNE ROBERT / MULLEN JOHN. The Expert Witness in Construction, First Edition Published by John Wiley & Sons, Susex United Kingdom 2013, p.51, ff., p.52, ff., p.53, ff.p.54.

2 The Delay and Disruption Protocol of the UK Society of Construction Law 2nd Edition February 2017 provides various approaches and techniques to analysis of delay and disruption on construction programs.

3 London Court of International Arbitration website. https://www.lcia.org/News/experts-in-international-arbitration.aspx accessed on 7 Feb 2020.

3. Party appointed expert witnesses

The primary approach in international arbitration is for each party to appoint its own experts to provide written expert reports to the arbitral tribunal including their opinions on specific issues.[1] Regardless of which party or parties appoint them, party-appointed experts are witnesses but unlike fact witness or council they must be independent. They have a duty to the tribunal, and the arbitral tribunal should expect and require that a party-appointed expert tell the truth when he or she testifies. *The expert's duty to testify truthfully overrides any other duty that an expert might believe that he or she owes to a party.* [2]The arbitral tribunal will normally control the extent of any expert evidence in an arbitration. Article 5 of the IBA Rules, for example, allows the tribunal to control the timing of expert reports and to order the experts to meet. Whenever expert evidence is required, there are a number of mechanisms commonly used in construction arbitrations that are designed to identify and narrow the areas of agreement and disagreement. The most obvious is for the tribunal to order that there be a meeting of experts followed by a joint statement identifying areas of agreement and disagreement (see Article 5(4) of the IBA Rules). The tribunal may also seek to identify and resolve issues in dispute by ordering that experts in similar disciplines give evidence at the same time. This technique (known as 'hot-tubbing') may lead to valuable debate that may develop an agreement on the issues in dispute quickly but may depend on tribunals having enough understanding of the underlying issues.[3]

However, in any case the arbitral tribunal remains responsible for giving whatever weight it deems appropriate to an expert witness's testimony, just as the tribunal would for any other witness in the arbitration. When weighing an expert's testimony, the arbitral tribunal should consider factors such as:[4]

- the factual and legal issues presented in the arbitration;
- the expert's qualifications and experience;
- the care and attention that the expert used when formulating his or her opinions;
- whether the expert is biased towards a party or conclusion;
- whether the expert's opinions were derived based on a methodology recognized by other experts in the field;

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1 GIRSBERGER DANIEL / VOSER NATHALIE. International Arbitration – Comparative and Swiss perspectives. 3rd Edition, para 1012

2 ICC digital library. https://library.iccwbo.org/content/dr/COMMISSION_REPORTS/CR_0041.htm?l1=Commission+Reports accessed on 9 Feb 2020.

3 Global Arbitration Review Chapter 1175377. https://globalarbitrationreview.com/chapter/1175377/organisation-of-the-proceedings-in-construction-arbitrations accessed on 9 Feb 2020

4 Op.cit footnote 33 above.

- whether the expert reached unreasonable or irrelevant findings;
- whether the expert's answers to questions from opposing counsel or the tribunal reduce the value of the expert's opinions;
- the expert's overall credibility while testifying; and
- other factors that the arbitral tribunal deems relevant.

4. Tribunal appointed expert

An arbitral tribunal's power to appoint experts can be found in the arbitration agreements or mostly in the arbitration rules referred to in a contract of the parties.[1] Tribunal appointed experts under various national laws and major institutional rules are discussed under paragraphs 14 and 15 above.

In general, the arbitral tribunal may appoint an expert for two reasons: [2]

- to provide evidence regarding disputed facts that require technical expertise or other specialized knowledge to understand or explain (evidentiary function);
- to advise the arbitral tribunal and to illustrate and explain issues that are difficult to understand (although not necessarily disputed) and to prepare the tribunal to hear evidence from the parties, including any party-appointed experts (advisory function).

An arbitral tribunal may at its own request or the request of a party require tribunal appointed experts or party appointed experts to inspect a job site, property or machinery. This can be very useful particularly for construction projects related disputes. Article 7 of the IBA Rules in this connection states "[...], *the Arbitral Tribunal may, at the request of a Party or on its own motion, inspect or require the inspection by a Tribunal-Appointed Expert or a Part-Appointed Expert of any site, property, machinery, or any other goods, samples, systems, processes or Documents, as it deems appropriate.*"[3]

5. Single joint expert

A hybrid of tribunal appointed expert and party appointed expert is for a single expert to be jointly appointed by both parties. Single joint experts can be appointed because the parties agree to such an approach; or if the arbitration clause in the contract agreement expressly so provides; or because the tribunal so orders. The difference between party appointed expert and single joint expert is that the later appointment is jointly made between both parties. However, the duty of the single joint expert remains the same, which is a duty to the tribunal and to provide it with objective and professional opinions. A single joint expert

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1 Op.cit footnote 32 above, para 1014.

2 Op.cit footnote 33 above

3 Article 7 of the International Bar Association (IBA) Rules on the Taking of Evidence in International Arbitration adopted on 29 May 2010.

may be appointed either instead of or (less commonly) in addition to the parties' respective experts.[1]

The Civil Justice Council (CJC) document titled "*Guidance for the instruction of experts in civil claims*" recommends the appointment of a single joint expert at early stages of a dispute, when investigations, tests, site inspections, photographs, plans or other similar preliminary expert tasks are required.[2]

On the benefits of appointing single joint experts, Mr. Justice Jackson in his judgment in *Quarmby Electrical Ltd v Trant (t/a Trant Construction*) made the following statement in an obiter dictum regarding the single joint experts:[3]

> *"The present action is the second case which I have decided in the space of a few days concerning a sub-contractors final account. In both of these cases the sums involved are relatively small (though important to the parties) and legal costs are liable to exceed the amount at stake. In the present case his Honour Judge Grenfell made the extremely sensible order that a single joint expert should be appointed to deal with what may loosely be described as the technical issues. Both parties very sensibly accepted the expert's findings in respect of defects and the valuation of variations. This has achieved a very substantial saving of court time and legal costs.*
>
> *I fully accept that in the larger construction cases the device of a single joint expert is generally reserved for subordinate issues or relatively uncontroversial matters. However, in the smaller cases, such as this one, if expert assistance is required, it is difficult to see any alternative to the use of a single joint expert in respect of the technical issues. If adversarial experts had been instructed to prepare reports and then give oral evidence in the present case, I do not see how there could have been a trial at all. The respective experts' fees and the trial costs would have become prohibitive. In lower value cases such as this one, I commend the use of single joint experts. The judge, of course, remains the decider of the case. He is not bound by everything which the single joint expert may say. However, the judge is able to perform his functions within more sensible costs parameters".*

I agree with Mr. Justice Jackson that often in construction related claims the sums are small but are important for the parties nevertheless. Arbitration costs of deciding such disputes can be higher than the amount in dispute. Due to this

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1 Op.cit footnote 28 above, p.62.

2 Article 35 of Civil Justice Council (CJC) document Guidance for the instruction of experts in civil claims; 2014. https://www.judiciary.uk/wp-content/uploads/2014/08/experts-guidance-cjc-aug-2014-amended-dec-8.pdf accessed on 11 Feb 2020

3 Op.cit footnote 28 above, p.65.

reason parties often refrain from taking these disputes to international arbitration. How to deal with such situations by using single joint experts will be discussed below (see paras 74 et seq.).

B. Practical Example

The use of expert witnesses started with a dispute involving construction and engineering. It is the case of Folkes v. Chadd that is considered to have laid down the first rules on the admissibility of opinion evidence in common law. This case is also known as the Wells Harbour Case. It was a judgement of Lord Mansfield. The case was first heard in 1782, though a written report of the proceedings was not produced until 1831, well after Mansfield's death.[1]

In this case different experts had been heard about whether the position of an artificial embankment had caused the silting up of the harbor at Wells by the Sea, a town in Norfolk, England, and thus constituted a nuisance. Plaintiffs were objecting to the cutting / removal of the embankments while defendants wanted to remove the artificial embankment alleging that the embankments made by plaintiffs to protect their farmlands was causing silting up of the harbor.

In this case experts (civil engineers) were employed by both plaintiffs and defendants. Plaintiffs engaged famous civil engineer Mr. Smeaton while defendants engaged a team of three civil engineers. The litigation began on July 25, 1782, before Henry Gould, chief justice of the Royal Court of Common Pleas, and a special jury. The reports of the experts on both sides were made available to the jury a week before the trial.

However, when the trial began counsel of the defendants chose not to call upon his experts to give oral testimony and be cross examined. Instead, he summoned a long line of eyewitnesses to testify to the rapid deterioration of their harbor. Plaintiff counsel, on the other hand, planned to summon his famous scientific expert Smeaton to the witness stand to persuade the jury that the embankment was not responsible for the harbor troubles. However, when plaintiff counsel tried to do so, defendant counsel objected. The illustrious Smeaton, he contended, should not be permitted to speak to the jury because his testimony concerning the hidden causes of nature was matter of opinion, which could be no foundation for the verdict of the jury, which was to be built entirely on facts, and not on opinions.

The requirement of Common Law to limit oral testimony to that of witnesses who possessed personal knowledge based on factual perception was very old and had its roots in medieval law that demanded that witnesses speak only "what they see and hear." The 72-year-old Chief Justice Gould was known for the strictness of his approach to the law. Chief Justice Gould accepted defendant's argument that Smeaton's evidence could not be a foundation for the verdict of the jury and did not permit Smeaton to address the jury from the witness stand. With Smeaton and his science out of the way, the jury gave its verdict in favor of

1 GOLAN T. Laws of men and laws of nature: the history of scientific evidence expert testimony in England and America. Cambridge (MA): Harvard University Press; 2004, p.7, to ff.,p40.

the defense. Claimants immediately asked for a new trial on the grounds that their expert had been improperly silenced.

On November 21, 1782, when Lord Mansfield, probably the most influential judicial figure of the eighteenth century, delivered the King's Bench's judgment concerning the new appeal in the Wells Harbor litigation, he was delivering more than a mere opinion on whether the expert opinion given by John Smeaton was proper evidence or not. His decision is worthy of a lengthy quotation which stated:

"It is objected that Mr. Smeaton is going to speak not to facts, but to opinion. That opinion, however is deduced from facts which are not disputed – the situation of banks, the course of tides and of winds, and the shifting of sands. His opinion, deduced from all the facts is, that mathematically speaking, the bank may contribute to the mischief, but not sensibly. Mr. Smeaton understands the construction of harbours, the causes of their destruction and how remedied. In matters of science no other witnesses can be called. An instance frequently occurs in actions for unskill-fully navigating ships. The question depends on the evidence of those who understand such matters; and when such questions come before me, I always send for some of the brethren of the Trinity House. I cannot believe that where the question is whether a defect arises from natural or an artificial cause, the opinions of men of science are not to be received. Handwriting is proved every day by opinion, and for false evidence on such questions a man by be indicted for perjury. Many nice questions may arise as to forgery and as to the impression of seal, whether the impression was made from the seal itself or from an impression in wax. In such cases I cannot say that the opinion of seal-makers is not taken. I have myself received the opinion of Mr. Smeaton respecting wills, as a matter of science. The cause of the decay of the harbour is also a matter of science, and still more so, whether the removal of the bank can be beneficial. Of this, men such as Mr. Smeaton alone can judge. Therefore we are of the opinion that his judgment, formed on facts was very proper evidence."

Lord Mansfield's ruling is quite logical as for scientific issues facts have to be combined with science to reach the truth. Lord Mansfield thus laid down the rules for opinion evidence that have influenced common law jurisdictions since.

The following – second – example is a simplified account of a recently concluded international institutional arbitration the documentation of which was accessible to the author of this article. An owner of a large oil and gas facility in the Middle East contracts (EPC contract) with a foreign company "X" (Contractor) for engineering, procurement construction (EPC) for extension to its existing facility. EPC contract is a multidiscipline job. Company X subcontracts the mechanical construction works to Company "Y". (Subcontractor).

The contract between Contractor and Subcontractor contained a clause requiring Subcontractor to notify to Contractor of any event that may result in a claim within 21 days of the event occurrence. The clause further states that if the Subcontractor fails to give notice of a claim 21 days, Subcontractor shall not be

entitled to an extension of time (EOT) or additional payment. The contract was governed, amongst other laws, by the Shariah / Islamic Laws.

Construction works executed by Subcontractor as well as the overall EPC works were substantially delayed. Subcontractor submitted a request for EOT as well as additional payment claims to Contractor alleging the delay events were due to Contractor. All claims were rejected by Contractor.

Subcontractor files for Arbitration. Both parties presented fact as well as expert witnesses to support their contentions. Both parties relied on delay experts and quantum experts. Counsel of the parties were assisted by legal counsel. Contractor (the Defendant) as a first argument contended that Subcontractor failed on the contractual requirement of providing 21 days' notice therefore the claim must fail. Counsel of Subcontractor (the Claimant) argued that under applicable laws a claim remains valid for 15 years. Therefore the "time limit" clause of claims is invalid under applicable law. Defendant legal counsel presented another provision from the applicable law that stated that the agreement between parties is the law of the parties and has to be complied with. Defendant counsel further argued that a similar clause also exists in FIDIC contracts terms and conditions which are widely used in governmental contracts in the Middle East. A government entity will not use an illegal clause in their agreements. Claimant fact witness admitted that the use of such "time limit clauses" is not abnormal and that FIDIC contracts are regularly used by government agencies.

After lengthy deliberations, the arbitral tribunal rejected Claimant's claims on the main reasoning that the applicable law's Civil Code (cited by Defendants) stated that the contract is the law of the parties. This rule confirms the laws of most jurisdictions in the world which are based on the principle of *pacta sunt servanda*. Having failed on the entitlement, tribunal felt it unnecessary to assess up to what extent the claims were justified and to the evaluation of extension of time and costs.

Both parties relied on delay and quantum experts but used legal counsel, instead of legal expert witnesses. In my opinion if the Claimant had used legal expert witnesses, Claimant's approach to the claim may have been different. The reason is that a counsel would normally plead as per the instructions of its client, whereas an expert is supposed to be independent and has a duty to the tribunal. Therefore, engaging a legal expert witness (who can be an advisor to start with) can also be very important with respect to the outcome of the dispute. Although the trend these days is to use legal experts as counsel, I think legal expert witnesses (considering independence and duty to tribunal) would be better in getting the right opinion and facilitate the client's strategy accordingly. The tribunal may also give more weightage to legal expert witness in comparison to counsel.

C. Party appointed experts in construction disputes

There can be a number of different experts required in construction related disputes such as engineers, architects, surveyors, delay analysts, accountants as well as legal experts. However, time analysis and quantum experts feature in most of the construction related arbitrations and are therefore discussed below in more detail.

1. Time analysis expert

A construction contract places an obligation on the contractor to provide an asset defined in terms of quality and costs (i.e., the contractual price) within a specified time. Time for completion is of essence for both the employer, as late delivery of the asset may entail loss of profit, and for the contractor, since an extended construction period usually entails additional costs and lower margins. Delay and disruption are common in construction projects, significantly increasing overall costs and giving rise to numerous disputes including arbitrations.

All construction contracts entail contractor risk events and employer risk events. Then there are risk events of "force majeure". Such risk events when they impact time are called delay events. Delay events which are attributable to the contractor are called culpable delays and as per the conditions agreed in the contract, the contractor may have to pay damages for such delays. The delay events which are not attributable to contractor (but attributable to employer or force majeure) are called excusable delay events. Excusable delay events can be further categorized as compensable and non-compensable. Such delay events entitle contractor for an extension in completion time as well as additional costs.[1]

Delay events, which may be due to contractor, employer or force majeure, can occur concurrently or in parallel. These delay events can run into hundreds. Analyzing "effect-and-cause" of these delay events on complex project schedules, where activities can be in thousands, and fixing responsibility and entitlement require certain special expertise. This is why time analysis experts are very important in a construction dispute.

The 'effect-and-cause' method of delay is the most reliable analysis. Computer software (often Primavera project planner or equivalent) is mostly used for scheduling and analysis. Guidance for its implementation can be found in two documents:

- the Society of Construction Law UK (SCL) Delay and Disruption Protocol 2017 mostly used in Europe; and
- the Association for the Advancement of Cost Engineering (AACE) Recommended Practice No. 29R-03 for Forensic Schedule Analysis – 2011, mostly used in the United States.

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[1] Associated General Contractors of America. Contract Documents and Construction Law; 2002, p.9-4, ff., p.9-5.

Above documents may or may not be referred in the contract between owner and contractor but are widely respected and used in construction industry.

When determining what method to use, the delay expert will need to keep in mind:

- *the choice of a specific method will be based primarily on the contract provisions. If the contract specifies a specific schedule delay analysis method, the delay analyst will have to comply with the contract and apply it;*
- *if there is no method imposed in the contract, the delay expert ought to identify the events that occurred and consider if certain issues (such as concurrent delays, pacing delays, delay mitigation, acceleration, etc.) are relevant and may have led to concurrent delays;*
- *if concurrent delay is an issue, the chosen method ought to enable the separate identification and analysis of each delay;*
- *the choice of method will also be largely conditioned by the availability of reliable data.*[1]

Delay in a construction project can be caused by an excusable delay event having an impact on the execution of the works without causing the contract completion date to be missed. This delay is therefore non-critical, but the risk event may nevertheless translate into additional costs for the contractor. If the responsibility of this risk event is attributable to the employer under the contract, then the contractor may be entitled to financial compensation under the contract or applicable law. A time analysis expert may also have to capture such events in his or her analysis.

Through his or her technical analysis, the delay expert will provide the financial / quantum expert with a detailed assessment of the different nature of delay events and a quantification of their impact, in relevant units, which the quantum expert can then use to value and determine the costs or damages.

2. Quantum analysis expert

Quantum analysis experts are required for but not limited to claims for change orders, disruption, delay and prolongation, delay damages, descoping or unlawful de-scoping, financing and interest, measurement and payment mechanisms, rates coverage, lack of access, acceleration, loss of opportunity, counterclaims etc. Quantum experts may also be useful in settlement negotiations. Quantum analysis experts in construction must have knowledge of quantity surveying, construction process and interpretation of contract documents. He or she is also expected to have adequate knowledge of

[1] Global Arbitration Review Chapter 1175330 https://globalarbitrationreview.com/chapter/1175330/delay-and-quantum-the-role-of-delay-analysis-programmes-and-financial-methods-for-the-computation-of-costs-and-damages-in-construction-arbitration accessed on 11 Feb 2020.

construction law, economics and accountancy. A quantum analyst has to also take into account the work carried out by the delay analyst in terms of excusable and compensable delays and physical units (additional hours spent, tons of concrete poured, etc.)

Proper allocation of cost is the key to success in a construction claim. The quantum expert is expected to accurately assign cost to the following items or conditions to support a construction claim:

i. Acceleration
ii. Ambiguity in design drawings
iii. Bidding errors
iv. Breach of contract
v. Calling of bank guarantees
vi. Cardinal changes
vii. Changed conditions at site
viii. Change in quantity or details
ix. Defaults
x. Defective specifications
xi. Delays
xii. Differing site conditions
xiii. Disruption
xiv. Employer furnished materials
xv. Errors and omissions
xvi. Excessive inspection
xvii. Excessive management
xviii. Excessive testing
xix. Extra works
xx. Failure to perform
xxi. Failure to provide access
xxii. Force majeure
xxiii. Hold harmless clauses
xxiv. Impracticability

xxv. Improper rejection
xxvi. Interference
xxvii. Latent defects
xxviii. Liquidated damages
xxix. Misinterpretation
xxx. Negligence
xxxi. Quality considerations
xxxii. Refusal of change orders
xxxiii. Substantial completion
xxxiv. Supervision by third party
xxxv. Warranty provisions

Damages to be accessed by a Quantum expert in above claims may include:

i. Labor costs
ii. Productivity loss
iii. Idle / standby manpower
iv. Material costs
v. Taxes and insurances cost
vi. Escalation cost
vii. Unit prices
viii. Acceleration / additional resources deployment costs
ix. Temporary site facilities cost
x. Testing costs
xi. Home office overheads
xii. Remobilization costs
xiii. Cost of money
xiv. Cost of collecting money
xv. Financial charges
xvi. Rework
xvii. Equipment and plant cost

xviii. Idle / standby equipment

xix. Tool & plant cost Depreciation costs

The quantum analysis expert therefore plays an important role in deciding the financial part of the arbitral award.

The role of time and quantum analysis experts should however not undermine the important role which a legal expert of applicable law can play as the arbitral tribunal will first look at the claim entitlement as per the terms of the contract and applicable law. A more common approach these days in international arbitration is for counsel to make submissions on the applicable law after receiving input from local / applicable law lawyers.

D. What is an expert witness for?

In 2002 Dame Elizabeth Butler-Sloss of the English Court of Appeal described expert witnesses as: *"..... a crucial resource. Without them, we could not do our job".*[1]

The fundamental function of the expert therefore is to assist the court or arbitral tribunal by explaining technical/scientific matters so that the court / tribunal can fully understand the essential facts and technical matters in issue. Independence of expert witnesses is therefore of vital importance. This aspect and why experts can have diverging opinions is discussed below.

1. The importance of being independent

An allegation often heard is that expert witnesses are just 'hired guns' paid to say what their paymasters want to hear. Experts are however expected to remain independent of the party that appointed them, they are, of course, paid by that party and will to some extent support 'their' party's point of view.

In Whitehouse v. Jordan (1981) Lord Wilberforce said:

It is necessary that expert evidence presented to the court should be, and should be seen to be, the independent product of the expert, uninfluenced as to form or content by the exigencies of litigation. To the extent that it is not, the evidence is likely to be not only incorrect but self defeating. [2]

If inaccuracies in expert witness testimony or suspicion of being partisan is found, the tribunal may derive serious negative inference from this. It may even exclude the testimony, at least in certain jurisdictions and under certain rules Fundamentally an expert should not be perceived as counsel or advocate. In the case *London Underground Ltd V Kenchington Ford Plc*, Judge Wilcox QC criticized the lack of independence of one of the witnesses. The judge said that "he signally ignored his duty to both the court and his fellow experts" and "continued to assume the role of advocate of his client's cause". The judge

1 BUTLER-SLOSS ELIZABETH, Expert Witness, courts and the law 2002.

2 Op.cit footnote 11 above, p.3.

therefore concluded that the evidence was invalid and unscientific.[1] An expert witness should therefore be mindful of the following:

i. The evidence and the expert report must be independent.

ii. The opinion must be unbiased and within the ambit of his expertise.

iii. The report and opinion must state the facts and assumptions on which his opinion is based.

iv. If, after an exchange of expert reports and listening to other party, he changes his opinion, the expert report should be revised and communicated to the tribunal.

2. Why experts have different opinions

As discussed above experts are supposed to be independent and should state their honest opinion in their reports and arbitral hearings. However often this is not the case. There are a number of factors responsible for this difference. A party appointed expert is paid by the party therefore in some instances the expert opinion may be biased. Then the experts prepare their reports as per the terms of reference and information provided by the appointing party. The expert has to remain within the terms of reference and to address the questions / issues. The expert is paid to address specific questions or elements of the dispute which the appointing party wants to be clarified, whereas the other party would prepare the terms of reference for the expert as per its own interest. Therefore, it may not be abnormal for expert reports having different opinions.

Then it should also be recognized that there are always differences in approach and professional opinion which do not amount to bias on the part of experts. Below is a quote from a recent joint statement of quantum experts in which the agreed conclusion was a range of possible opinions.[2]

We consider it inevitable that that two Quantity Surveyors attempting separately to price any building works, particularly where the proposed reconstructed building is to a large extent hypothetical, where basic design details are lacking, and where many assumptions have had to be made, will always result in a substantial difference between respective estimates....We consider that the remaining differences....does not mean that either of us is necessarily wrong, or has made an error, and instead we consider that that this s not an abnormal spread between two quantity surveyors estimates.

Differences in expert opinions can be narrowed down by an involvement of the tribunal which may ask the parties to agree on issues to be addressed by experts. Another method could be to have witness conferencing or "hot tubbing".

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1 GAITSKELL ROBERT. Article published in February 2006 by UK Society of Construction Law. https://www.scl.org.uk/papers accessed on 7 Feb 2020.

2 ENNIS CHRISTOPH. Article published in August 2012 by UK Society of Construction Law. https://www.scl.org.uk/papers accessed on 7 Feb 2020.

During witness conferencing the expert witnesses themselves may have to respond to their counterpart's views. This should normally result in differences to be presented, clarified and tested on the spot. This side-by-side presentation of evidence makes it easier to compare the witnesses' different views and facilitates the tribunal in formulating a correct opinion of the issue.

E. Effect of culture on the performance of experts

The effect of culture on the appointment of experts is already discussed under paragraph 12 above: There is a certain divide between the common law and the civil law approach to expert evidence. Common law prefers party appointed experts while civil law tends to incline towards tribunal appointed experts. However even the common law tradition does not restrict party appointed experts to be chosen.

Expert witnesses can be influenced by training, motivation, organization and cultural background. The style of the other side's counsel can also affect expert witness. For example, US lawyers are considered more adversarial than others and a applying a different questioning style than in traditionally more reserved cultures.

F. Expert duty to the tribunal

In the well-known case of *Ikarian Reefer*, Mr Justice Cresswell set out what is regarded as the classic statement of the duties and responsibilities of expert witnesses. These are:[1]

1. *Expert evidence presented to the court should be, and should be seen to be, the independent product of the expert uninfluenced as to form or content by the exigencies of litigation.*
2. *An expert witness should provide independent assistance to the court by way of objective unbiased opinion in relation to matters within his/her expertise. An expert witness in the High Court should never assume the role of an advocate.*
3. *An expert witness should state the facts or assumptions upon which his/her opinion is based. He/she should not omit to consider material facts which could detract from his/her concluded opinion.*
4. *An expert witness should make it clear when a particular question or issue falls outside his expertise.*
5. *If an expert's opinion is not properly researched because insufficient data are available, then this must be stated with an indication that the opinion is no more than provisional.*

[1] Op.cit. footnote 28 above, p.16, ff., p.17.

6. *If, after exchange of reports, an expert witness changes his view on a material matter having read the other side's expert's report or for any other reason, such a change of view should be communicated (through legal representatives) to the other side without delay and when appropriate to the court.*

7. *Where expert evidence refers to photographs, plans, calculations, analyses, measurements, survey reports or other similar documents, these must be provided to the opposite party at the same time as the exchange of reports.*

Above principals are also endorsed by the Civil Procedural Laws of UK Part 35 Article 35.3 that provides the essential features of / requirements for an expert witness. It states:[1]

"Experts—overriding duty to the court

35.3—(1) It is the duty of an expert to help the court on the matters within his expertise.

(2) This duty overrides any obligation to the person from whom he has received instructions or by whom he is paid."

In summary the overriding duty of the expert witness is simply to the court / arbitral tribunal.

V. Evaluation and Recommendation

Construction related disputes are often complex. There are technicalities involved in construction disputes which require the opinion of subject matter experts to facilitate the tribunal to understand the case. In construction related disputes mostly time and quantum experts or technical expert witnesses are employed. Engaging a legal expert witness for the applicable law (who can be an advisor to start with) can also be very important with respect to the entitlement as the first thing to be considered by the arbitral tribunal will the entitlement under the contract and applicable law. Though the trend these days is to use the applicable law legal expert as a counsel, but looking at example in paragraphs 39 to 43 above, I think to engage a legal expert witness (considering independence and the duty to tribunal) could be better in getting the right opinion and to devise strategy accordingly.

There are a lot of disputes in construction where the amount in dispute is small. Going into arbitration of disputes where the amount in dispute is small does usually not make economic sense. Contractors often give up their entitlement under the contract agreement due to this reason. In particular construction contractors (as compared to EPC contractors) suffer more due to this reason. To mitigate this unfairness, it may be advisable to agree in advance on a single joint

[1] Part 35 UK Civil Procedural Rules of 1998. available at website https://www.legislation.gov.uk/uksi/1998/3132/article/35.3/made accessed on 20 Feb 2020.

expert for construction contract agreements (or a dispute board). For this purpose, the requirement of having a single joint expert can be spelled out in the arbitration clause in a contract between the parties but with institutional arbitration for enforceability and with the seat of arbitration in an arbitration friendly country. E.g. after the arbitration clause the following clause can be added:

"In order to facilitate the tribunal or sole arbitrator on technical matters including time related and quantum issues, the Parties agree to appoint a single joint expert. If the Parties fail to agree on a single joint expert within a reasonable time, the same can then be appointed by the tribunal or sole arbitrator. The cost of the single joint expert shall initially be shared equally by both Parties. The final responsibility of sharing the single joint expert's cost shall be decided by the tribunal or sole arbitrator."

VI. Concluding Remarks

The role of expert witnesses is very important in facilitating the arbitral tribunal in deciding the matter. It can even be decisive. One should however be mindful that the role of an expert is to provide his or her opinion. The authority to decide the case rests with the tribunal. Party appointed experts are instructed by the respective parties and therefore often their opinions differ. Tribunals also have a role to play by getting to grips with expert evidence and may if required ask parties to agree on the issues to be addressed by the experts.

In construction disputes, appointing the right experts at the right time, preferably at an early stage, can be helpful for both claimant and defendant to gauge the strength of their case and in deciding on the strategy and approach to be adopted during arbitral proceedings.

Note: *This research paper was written to obtain the Certificate of Advanced Studies (CAS) in Arbitration of the Universities of Lucerne and Neuchâtel in co-operation with SAA (Swiss Arbitration Academy) under the supervision of Prof. Dr. Daniel Girsberger.*

DESCRIPTION OF TERMINOLOGIES USED IN PAPER

ADR

ADR stands for "Alternate Dispute Resolution"

PM Book

PM Book or "PMBOK" is guideline of best practices in project management. It is a publication of Project Management Institute (PMI) of USA.

https://www.pmi.org/pmbok-guide-standards/foundational/PMBOK

Uncitral Model Law

The UNCITRAL Model Law on International Commercial Arbitration is a model law prepared by UNCITRAL, and adopted by the United Nations Commission onInternational Trade Law on 21 June 1985. UNCITRAL stands for"United Nations Commission on International Trade Law ".https://uncitral.un.org/en/texts/arbitration/modellaw/commercial_arbitration

DIS Rules

DIS Rules are the International Arbitration Rules set out byGerman Arbitration Institute. https://www.disarb.org/en/tools-for-dis-proceedings/dis-rules

VIAC Rules

VIAC Rules are the rules of International Arbitration of Vienna International Arbitral Centre.https://www.viac.eu/en/arbitration-rules

DB

DB is abbreviation of "Design Build" project delivery method.

EPC

EPC is abbreviation of "Engineering Procurement and Construction" project delivery method.

IBA Rules

IBA Rules or International Bar Association Rules set out international best practice for the taking of evidence in international arbitration proceedings. https://www.ibanet.org/resources

Chartered Institute of Arbitrators

Chartered Institute of Arbitrators is an international centre of excellence for the practice and profession of alternative dispute resolution (ADR).

https://www.ciarb.org/about-us/

Prague Rules

Prague Rules are rules for the taking of evidence in international arbitration proceedings. https://praguerules.com/prague_rules/

Hot Tubbing

Expert "hot-tubbing" (or witness conferencing), is the practice of expert witnesses providing evidence concurrently, so that they might engage in discussion and address questions in parallel (instead of being cross-examined individually by counsel)

Civil Justice Council (CJC)

The Civil Justice Council is a UK non-departmental public body that advises the Lord Chancellor on civil justice and civil procedure in England and Wales.

https://www.judiciary.uk/related-offices-and-bodies/advisory-bodies/cjc/

Obiter Ductum

It refers to a judge's comments or observations, in passing, on a matter arising in acase before him which does not require a decision. Obiter remarks are not essential to a decision and do not create binding precedent.

FIDICContracts

FIDIC Contracts are standard Forms of Contracts in relation to the project delivery methods. FIDIC is the International Federation of Consulting Engineers. https://fidic.org/

Pacta stunt servanda

Pacta sunt servanda is Latin for "agreements must be kept". This Latin phrase describes a significant general principle of international law—one that underlies the entire system of treaty-based relations between sovereign states.