College of Commercial Arbitrators

Arbitrating Engineering Disputes: Best Designed Practices

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Businesses that find themselves embroiled in disputes involving highly sophisticated equipment and designs, or which employ advanced engineering techniques or technology in the performance or delivery of their products or services, will find significant advantages in using ADR rather than litigation to resolve these disputes. Mediation is increasingly being used as a mutually preferred form of dispute resolution. However, when mediation fails the parties often prefer and would generally greatly benefit by the use of arbitration to resolve such intractable disputes. Why this is so requires an examination of why arbitration is uniquely suited for the resolution of these "engineering disputes".

Let's start our examination with a definition of "engineering disputes." Engineering disputes are those dependent on the resolution of issues relating to design, function, operation, failure, and/or compliance with specifications of devices, materials, software, systems, processes, etc. Resolution of these issues requires an understanding of scientific principals and scientific terms, and some comfort with the related mathematics. Also required is an understanding of how scientists and engineers approach issues and solve problems.

Engineering issues may arise in contract or tort cases. The presence of these issues places an additional demand on advocates and arbitrators beyond merely presenting testimony and having arbitrators determine facts and who is telling the truth, the meaning of a contract, what parties intended, and/or did the parties act reasonably or with due care or perform in accordance with their contract. Engineering cases additionally require that advocates and arbitrators understand the particular technologies and scientific principles involved in the controversy. Advocates need to be skilled at presenting and rendering those technologies and scientific principles in a clear and understandable manner and in a less formal, but still adversarial, environment. The arbitrators and advocates also need to be skilled in applying the law, proficient in honoring dispute resolution principles and knowledgeable of the applicable technology and science that are involved in the particular dispute.

Arbitration is a particularly well-suited process to accommodate the demands of engineering disputes. This is true for several reasons. Parties can select finders of fact who have an understanding of engineering analysis and the underlying

scientific principles, thereby limiting the amount of time counsel needs to spend educating the tribunal.

Aside from the technical subject matter issues there are other aspects and characteristics of engineering disputes that make them particularly attractive for an arbitration resolution scheme. These disputes can often involve exceedingly complex technologies, complex intellectual property rights issues, regulatory schemes, and/or ownership rights, which cut across many domestic and international jurisdictions. They can implicate fast paced competitive markets, involve large amounts of money, and implicate many civil, criminal and regulatory considerations.

Nevertheless, the defining distinction of the "engineering dispute" is its data base orientation. Viable conclusions drawn from that data must be based on sufficient and relevant data and subjected to testing and replication. An engineering savvy arbitration panel is far better able than a randomly chosen judge or jury to receive and review data and question the witnesses to assure a full understanding of the testimony. Arbitration encourages creative ways of receiving expert testimony that are not available in a court trial. Parties to technical disputes tend to be more comfortable and efficient in presenting their case to engineering knowledgeable arbitrators. They often report that it is easier to present to these arbitrators than to a judge or jury who possess little knowledge, experience or patience to enable them to discern good science and rigorous engineering analysis from well-presented and skillfully argued scientific nonsense or analysis unsupported by sufficient data.

Given that arbitration is a better process for the resolution of engineering disputes, when negotiating a contract where likely disputes would focus on engineering issues, transactional counsel should give serious thought to the structure of the dispute resolution clause (i. e. the "ADR" clause). Of course, counsel should set a resolution scheme that includes provisions in the clause relating to pre-arbitration mutual resolution (e.g. negotiation, mediation etc.), scope and form of claims, discovery and protection of intellectual property, interim/emergency relief, site and governing law and conduct of hearings. However, in engineering cases, the clause describing the appointment, qualifications and powers of the arbitrators is of special importance.

Based on the case and the preferences of the parties, there can be a single arbitrator, or a three member panel. While a three member panel offers the advantage of having a deliberative process with three skilled minds, the size of the amount in dispute may not merit the cost of three arbitrators. Whether the panel is created with each party appointing one arbitrator and the two selected arbitrators then selecting the third (who will also serve as the chair of the panel), or whether all three are selected from lists provided by an administering organization such as the AAA, ICDR or CPR, their background and substantive qualifications are of key significance in addition to their arbitration experience, skills, and training.
Consequently, the arbitration clause should describe specific qualifications for the arbitrator(s). For example, it can require that one or all panelists have a background in the specific industry or technology, i.e. software, polymers, biotechnology, geotech,

structures, materials, electronics, etc. or just general scientific or engineering education or experience. Also, the powers of the panel should be stated as broadly as possible, with provisions for self-determination of jurisdiction, providing emergency relief and the ability to protect intellectual property rights. If the clause references the AAA, ICDR, or CPR Rules, examples, the issue of arbitrator(s) powers are incorporated by the reference.

The following are examples of cases where engineering issues are the focus and the parties and process would benefit from arbitrators with knowledge of engineering and science:

- The cause of fogging of infrared optical filters bonded using a polymer glue, to the polycarbonate body for a periscope used in military vehicles. (Engineering issues focused on the reaction of the metal oxide coating with the polymer glue and a catalyst.)
- The development of porcine heart valve and vascular implants. (Biotech issues related to stripping of cells and developing structure for porcine implants.)
- The design and cause of alleged failure of pipeline testing devices. (Multiple engineering issue as to the design and operation of sensors traveling internally in the pipe, their sensitivity to surface and structural irregularities and the design operation of the transmission device to send the data to an external receiving device.)
- The design and cause of failure of remote natural gas meter reading devices. (Engineering issues included the design and function of the sensors and method of transmission and reception of data on mobile devices.)
- Failure of waterproof polymer roofing material. (Engineering issues focused on composition and failure modes of the polymer materials used in the coating and the effects of light, temperature, and other atmospheric conditions on the elasticity and adhesive qualities of the coating once cured.)
- Cause of a fire in a complex computer control system. (The engineering issue ultimately focused on a fuse and a determination of whether or not the fuse failed or the fire resulted from another cause. The fuse did not fail. Rather careful microscopic analysis demonstrated that it was damaged in the original expert's testing testing, not in service.)
- Design and cause of failure of a steel coil pickling system. (The engineering issues include the sizing of the control motors and the adequacy of the controls and feedback look to maintain proper tension to assure a sufficient catenary in the steel to assure it spends sufficient time in the acid bath.)
- Cause of the failure of a coal mine roof support system. (The engineering issue focused on the strength and sufficiency of embossed roof plates to maintain the necessary roof load, and an understanding that the ultimate cause of failure was stress corrosion cracking caused by the high sulfur atmosphere affecting steel under stress, not plate design.)
- Failure of a building foundation. (Engineering issues included the bearing strength and compacting of soil, means of removing water from the area of the foundation, and the strength of the wall design.)
- Failure of implantation of an enterprise software system that controlled the ordering, inventory, production, and invoicing or a manufacturing

company. (Engineering issues relate to adequacy of architecture of the software and hardware to perform the required tasks and with appropriate response times.)

- Compliance with specifications of a mined mineral material used in manufacture of coatings. (Engineering issues focused on the adequacy of the specifications to describe particle size and chemistry and the types of testing to assure that the materials, in fact, could be certified to comply with the specifications.)
- Cause of catastrophic failure of an aircraft engine in flight. (Engineering issue related to understanding what could and did cause the failure and whether it was an external material that entered the engine or the engine itself suffered a component failure. It turned out that due to the unique design of the aircraft, blue ice from the toilet waste was able to form and escape, because the exterior fill cap was not properly locked during the last service.)
- Failure of underground tunnel boring equipment. (Engineering issues included failure to use intermediate jacking stations resulting in exceeding the thrust force capability of the tunnel boring machine.)

In preparing for an engineering arbitration, counsel should assess the background of the arbitrator(s) to determine how much and what type of background information needs to be presented to assure that the tribunal is fully able to understand the evidence and arguments. Next, counsel should consider how they can best prepare and present evidence and testimony. Engineering evidence is different from general fact evidence. It is not just a guess of which witness is telling the truth, as in most cases, it is possible to run tests and develop data to support the testimony. Consequently, if possible, counsel and the parties should consider recording by video or otherwise, the tests that were performed to support their positions.

Prehearing briefs should be more than mere arguments, and should provide technical background and supporting data, drawings, graphs, plots, photos, etc. In that way the tribunal will come to the hearing having been educated on much of the technical background.

Parties should also consider how they want to present expert testimony. It is likely that the tribunal will have questions and will want to discuss issues with the experts to refine their understanding. There are many ways of presenting expert testimony. Examples are witness statements for direct, with live cross, standard live direct and cross examination, addressing each issue one at a time with one side presenting its expert on one issue, and then the opposing side presents its expert on that issue, and "hot tubing." "Hot tubbing" has all of the experts on a particular issue in the room at the same time. Each testifies on that issue. Then each can respond to the other expert(s)' testimony and if so structured, ask each other questions. Generally the tribunal will also ask questions. It is essentially a conversation or seminar on the issues. "Hot tubbing" will focus the areas of disagreement, clarify the reasons for disagreement, hopefully narrow the issues of disagreement, and possibly even result in the experts agreeing on issues. "Hot tubbing" is becoming more and more popular and is particularly well suited to engineering issues.

Witnesses should only testify to facts and engineering issues that they truly understand. Assuming that the parties have selected a tribunal with a background in

the engineering issues, the tribunal will quickly detect when a witness either does not understand the subject matter or has insufficient data to support the fact or opinion testimony being rendered.

In presenting engineering issues, counsel should focus on clear testimony and rigorous analysis. Showmanship and flamboyant style may be effective with a jury, particularly where the issue is truthfulness. However, in engineering cases, such conduct is distracting and does not help. Arbitrators, like engineers, want to know the facts, see the data, understand the governing principles, and see the analysis used to support a party's position. Anything else is just "noise."

The ultimate end product of arbitration is an enforceable award that will withstand challenge. In making their presentations, the parties should consider what the tribunal would need in order to ultimately draft that award. In this regard, we strongly urge you to present a proposed award (presumably one favorable to your client) to your arbitration panel which addresses and resolves all of the issues and claims raised in the arbitration with supporting finding of facts (especially the engineering and technical ones) and conclusions of law. Such a proposed award will be appreciated by your panel and will ensure that the engineering issues in your case are squarely before the panel in an easily assessable and client favorable context.

CONCLUSION

Engineering disputes are often complex matters requiring professional levels of scientific and technical knowledge. Thus, resolution of these cases before finders of fact with the requisite skill sets is paramount to their fair resolution. For the reasons discussed above, it is submitted that arbitration is the best mode or process for resolution of engineering disputes where negotiation and/or mediation fails.

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