



# INTERNATIONAL ARBITRATION

## OVERVIEW

Construction and energy sector disputes in international arbitration (IA) are among the largest and most challenging in the world. Parties often include governments; leading international design, construction, and EPC firms; oil majors; and other industry leaders in their respective sectors from different countries.

IA cases demand that experts render the utmost in objective and rigorous service to the arbitral tribunal. This is in keeping with the multi-faceted challenges of IA cases: uncovering vital insights from very large case files; assessing a broad range of facilities, sometimes in remote locations and inhospitable environments; evaluating site-specific design specifications and operational practices; and credibly communicating nuanced conclusions during cross-examination.

## Introducing ESi

Engineering Systems Inc. (ESi) is a premier engineering and scientific investigation and analysis firm committed to providing clear answers to the most challenging technical questions. Our technical expertise, practical experience, technological resources, and extensive diagnostic, analytical, and physical testing capabilities enable us to develop comprehensive and efficient solutions across dozens of industries. Since its founding in 1987, our employee-owned company has enjoyed constant growth of our team and reputation.

Today, ESi is as a multi-disciplinary forensic scientific and engineering firm with nearly 400 employees focused on technical causation for the most challenging investigations our clients face. Our team's range of educational qualifications, experience and training allow us to deploy engagement teams that best fit project needs. ESi has investigated and educated various panels and triers of fact in the following industries:

### Oil & Gas

- Petroleum Facilities
- Processing and Refining Facilities (Downstream)
- Gathering and Transportation Pipelines (Midstream)
- Offshore and Onshore Hydrocarbon Extraction (Upstream)

### Construction

- Building Systems
- Structural Engineering
- Geotechnical Engineering

### Chemical

- Chemical Plants
- Process Design and Safety
- Chemical Engineering

### Mining

- Heavy Machinery
- Processing

### Power Generation

- Turbomachinery and Generation Equipment
- Electrical Transmission
- Renewable Energy

### Manufacturing

- Machine Design and Performance
- Continuous Process
- Consumer Products

### Aviation

- Accident Reconstruction
- Flight Performance
- Operation and Maintenance

## Why ESi?

Rigorous objectivity is our *sine qua non*. We fully understand and honor our obligations to the Tribunal. Additionally, we are:

- Recognized as trusted advisors both during the investigative and hearing phases
- Known for technical acumen and effective communication of opinions to counsel and non-technical triers of fact
- Seasoned testers with experience at the most prominent arbitral venues: LCIA, SIAC, ICC, HKIAC and others
- Set up to coordinate the entire expert team including third-party quantum surveyors, schedule delay experts and forensic accounting firms
- Fully resourced to manage investigations of any size economically and efficiently, from smaller matters up through "megaprojects" (\$1.5B+)
- Employee-owned, allowing for prompt decisions and allocation of staff resources



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## TECHNICAL EXPERTISE

### Mechanical Engineering

- Power system design and performance
- Machine design, performance, and failure analysis
- Building systems (HVAC, refrigeration, plumbing, fire protection, building management systems)

### Materials Science

- Metallurgy
- Polymer science
- Construction materials
- Material chemistry

### Chemical Engineering

- Process system design and performance
- Process hazard management (PHA, MOC, root cause analysis, technical audits)
- Failure analysis and reliability engineering

### Fire and Explosion Investigation

- Origin and cause
- Suppression system failure analysis
- Fire science and modeling
- Electrical and electronics engineering
- Electrical codes and standards
- Controls and software
- Power and energy

### Construction

- Construction defect inspection and analysis
- Design standard-of-care
- Change orders: cause and allocation of responsibility

### Civil, Structural and Environmental

- Building and facility structures
- Hydraulic structures
- Infrastructure
- Geology and geotechnical engineering

### Architecture

- Building envelope investigation
- Code compliance
- Water intrusion and mold investigation

## In-House Supporting Capabilities

ESi supports this expertise with a balanced in-house staff of technicians, engineers, scientists, statisticians, and project coordinators, who operate in dedicated facilities to support testing (offshore and onshore), data gathering, engineering analysis, simulation, and visualization. Supporting capabilities include:

- Computational center of excellence focused on computational fluid dynamics (CFD), finite element analysis (FEA) and big data analysis
- Engineering analysis in design, fracture mechanics, explosion, combustion, and structures
- Material testing and analysis
- Material chemistry and elemental laboratory analysis
- Multiparty inspections
- Manufacturing and 3D printing
- Visualization (graphics, 3D animations, virtual reality)
- Court-admissible simulations rigorously coupled to the underlying science.
- Site documentation (drone, laser scanning, photo and video documentation)
- Remote inspection and remote multiparty inspection – ESi LIVE
- Statistical analysis and design of experiments
- Fault tree and event analysis
- Recall decision analysis
- Safety analysis



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## Contact ESi

To get in touch with the ESi International Arbitration Team contact:

Alfred M. Pettinger, Ph.D., P.E.  
at [ampettinger@engsys.com](mailto:ampettinger@engsys.com)

Amy E. Gray, Ph.D., P.E., CFEI  
at [aegray@engsys.com](mailto:aegray@engsys.com)

William R. Broz, P.E., MBA, LEED AP  
at [wrbroz@engsys.com](mailto:wrbroz@engsys.com)

Matthew T. Kenner, P.E.  
at [mtkenner@engsys.com](mailto:mtkenner@engsys.com)



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