

ARBITRATION – SELECTED EXPERIENCE

Oil & Gas

Piping and Process Equipment Claims – Large Scale Failure Investigation

Investigated piping failure claims totaling USD 480M for an integrated petrochemical processing facility in the Middle East. Issues included piping failures in over 200 separate process systems due to accelerated corrosion; defective installation of piping and process equipment; non-compliant testing and quality control for process piping; and lack of contractually required oversight by EPC contractor. The matter has been arbitrated by an LCIA (London Court of International Arbitration) tribunal.

Pipe Recall at Gas Processing Facility – Investigation and Testing, Pipes and Processes

Evaluated recall decision to replace seamless nickel alloy pipe in a Middle East gas processing facility, transporting hazardous sour gas downstream of the "Christmas tree." Investigation involved detailed review and analysis of pipe processing records, metallurgical analysis of piping, and additional testing and analysis to evaluate the pipe recall decision. ESi visually and ultrasonically inspected pipe, destructively tested removed pipe, and substantiated the need to recall pipe material. The ESi investigation of the manufacturing process revealed the intentional violation of required processes, controls, and governing technical specifications. ESi produced a detailed report and rebuttal report for the arbitral panel. The matter was adjudicated pursuant to the rules of the International Centre for Dispute Resolution (ICDR), the international division of the American Arbitration Association (AAA).

Pipeline Explosion after Landslide – Root Cause Investigation

A newly constructed natural gas pipeline located in the Appalachian Mountains failed catastrophically after rainfall triggered a landslide along its mid-slope alignment. The explosion gave rise to multiple legal disputes involving affiliates of both the upstream exploration and production company and the midstream entity responsible for construction and operation of the pipeline and gas processing plant. These disputes were pursued through litigation in U.S. courts and arbitration under the AAA's International Centre for Dispute Resolution. Engineering Systems Inc. (ESi) was retained as an expert in all three proceedings, with Dr. Alfred Pettinger and Dr. Phil Shaller providing technical analyses and testimony. Their work addressed geotechnical factors, failure mechanisms, and construction oversight, and was extensively cited by both the Court and the Arbitration Panel.



Energy

Steam Turbine Blade Failure & Fire – Failure Investigation and Testing

Investigated steam turbine failure and fire during commissioning of a new powerplant. A dispute between the power company and turbine manufacturer centered on design of a new, first-of-its-kind, 50 inch-long last-stage turbine blade manufactured with precipitation hardened stainless steel. The alloy had previously been used in a shorter blade application, and its material strength was beneficial to the longer blade, which experienced higher centrifugal stresses. Failure analysis of the broken blade and an evaluation of design and test data showed that the blade's alloy was susceptible to environmentally assisted cracking in service and lacked adequate fracture toughness to prevent rapid failures prior to crack detection during regular maintenance inspections.

Power Plant Equipment Performance – Technical (Fit-for-Purpose) Evaluation

Evaluated technical aspects of force majeure claims, including one party's inability to consume landfill gas at a renewable power plant (a contract requirement). Equipment of interest included stainless steel tanks, piping, heat exchangers, and turbines. Testified at the AAA arbitral hearing.

Underwater Culvert Construction for a Combined Cycle Gas Turbine (CCGT) Power Plant

Investigation of construction defects and alleged design defects for the concrete inlet and outflow culverts to support a CCGT power plant in Southeast Asia. Analyzed construction drawings, construction inspection reports, and underwater surveys of the culverts. The claimants alleged that movement of the culvert sections after construction, resulting in ingestion of sand and gravel into the power plant cooling system, was the result of one or more design flaws as opposed to defects in the placement of the sections during construction. Claims and counterclaims exceeded USD 50M. Provided expert evidence to and testified in front of a Singapore International Arbitration Centre (SIAC) tribunal in Singapore.

Manufacturing

Water Heater Explosion – Failure Investigation and Analysis

Investigated fatality accident at a manufacturing facility for conveyor system components, including those made from ultra-high molecular weight (UHMW) polyethylene. A water heater used for heating a paraffin wax mixture had its automatic controls bypassed, which ultimately led to an explosion resulting in several fatalities and injuries. ESi performed root cause analyses and testing of the water heater and provided evidence at the Chamber of National and International Arbitration of Milan.



Commercial Equipment Performance – Technical Analysis of Equipment & Documentation

Investigated performance of an almond pasteurizing machine for a commercial equipment dispute. Expert report included analysis of engineering contract documents for steam and other supporting systems for the pasteurizer, specifically for errors and omissions in the piping and instrumentation diagrams (P&IDs). Findings were provided to the ICC (International Chamber of Commerce) Court of Arbitration in Paris.

Building Design & Construction

Commercial Fire Suppression System – Design Analysis, Code & Standards Compliance

Led multidisciplinary team in investigating causation for "extra works" and remediations at a multibillion USD hospitality and gaming complex in Macau. Analyzed extra works against local fire code, as well as internationally adopted standards such as those of the National Fire Protection Association (NFPA). Investigated relative responsibilities of the parties for execution of detailed wet pipe sprinkler system design and layout. Produced expert report to the arbitral tribunal and attended merits hearing at Hong Kong International Arbitration Centre.

Buildings and Building System Design Defects – Multiple Building & System Investigation

Investigated design defects in buildings and site utilities at new college campus in Malaysia. Dispute submitted to international arbitration court in Kuala Lumpur (settled prior to merits hearing). Systems included central heat, ventilation and air conditioning (HVAC) plant; campus hydronic distribution; wet sprinkler systems; parking garage exhaust; natural gas distribution; and water and sewer reticulation systems. Opined on lifecycle cost analysis of hybrid chiller versus variable refrigerant flow HVAC systems, results of which were under dispute.

Mining & Process

Mine Processing Facility Claims – Design and Construction Investigation

Led multidisciplinary consulting teams in investigating three major claims and one counterclaim, as part of a multi-billion international arbitration of design and construction issues at a mine processing facility in Western Australia. Gave evidence at merits hearing at the Singapore International Arbitration Court (SIAC).

Performance Issues at Chemical Process Plant – Contractual Compliance Analysis

Analyzed contractual compliance by EPC contractor for final project documentation at a \$500 million+ chemical process plant in Western Australia. Issue was tied to performance bond call representing a significant portion of the construction cost. Produced expert report to arbitral tribunal and appeared at the London Court of International Arbitration (LCIA) merits hearing.



Aviation

Airline Jet Engine Failure – Fatigue Failure Investigation

Retained by Australian law firm representing an airline, to investigate high temperature fatigue failure of a jet engine. Investigation revealed that an independent maintenance facility had inadvertently plugged a majority of the cooling passageways in the affected component. Gave evidence at merits hearing in Singapore.

Commercial Jet Turbine Engine Failure – Investigation and Root Cause Analysis

Investigation of turbine engine failure on a commercial jet operated in Central America. ESi performed failure analysis of fractured high-pressure turbine blade and studied damage in other portions of the engine. Blade was manufactured from a nickel-based superalloy. Visual and microscopic examinations of blade fracture revealed cracking that originated from leading edge of foreign object damage (FOD), disrupting normal internal blade cooling. Microscopic examinations of the blade internal condition and protective thermal surface coating revealed overheating of alloy, and conditions consistent with creep-stress rupture that contributed to blade failure. Finding confirmed by comparative analysis of another blade, operated under the same conditions and duration. Gave evidence at arbitral hearing.

Marine

Cruise Ship Pier Design and Construction Failures – Inspection and Testing of Pier

Inspection and testing for dispute between general contractor and owner on a project involving the design and construction of a cruise ship pier. Excessive concrete cracking was noted throughout the exposed portions of the pier. Claims totaled USD 75M, included: 1) newly constructed pier not fit for purpose due to improper dredging of the sea basin; and 2) improper seismic design of the substructure (pilings) and superstructure (bents, dolphins, and moorings). ESi inspected the 1,700 LF pier, removed concrete specimens from the pier deck and stringer beams, and obtained steel coupons from the pilings for petrographical and metallurgical testing. Gave evidence of findings at LCIA arbitration.

Containership Terminal – Alleged Interference from Fishing Vessels

Investigation and simulation of vessel maneuvering in and around a shipping container terminal in South America, where the concessionaire claimed that artisanal fishing boats were interfering with the operation of container vessels at the terminal. Specifically, the claimants alleged that the presence of these fishing boats prevented their effective use of all available area of a 390-m pier. Claims totaled USD 91M, including environmental remediation, loss of earnings caused by delays in construction, loss of earnings caused by presence of the fishing boats, and construction cost overruns. Investigation included a visit to the terminal to observe vessel operations, analysis of several years' worth of terminal utilization data, analysis of the original and updated design studies for the pier, and simulation of multiple vessel scenarios for operation of the pier. Provided expert evidence to and testified in front of an International Centre for Settlement of Investment Disputes (ICSID) tribunal in Washington, DC.