

Mamoon Alyah, Principal Engineer

Chartered Engineer (CEng), Professional Engineer (PE), IRMCert, MIET



Over 35 years of experience acting as an expert on matters involving electromechanical equipment and power systems (generation, transmission and distribution) in industrial and energy applications including thermal, geothermal, wind (onshore and offshore), solar (PV and CSP) and hydro power in addition to petrochemical and heavy industrial applications (steel, aluminium, cement, plastic, fertilizers, carbon black)

Investigated hundreds of incidents (mechanical breakdown, fire, explosion, corrosion, structural collapse, electrical faults ...etc) power generation and industrial plants. Acted as an expert preparing numerous expert reports and giving evidence in arbitration proceedings and jury trials involving disputes related to the construction and operation of power plants, transmission and distribution substations in addition to power equipment in industrial and commercial properties.

Also carried out risk surveys and condition assessments of critical properties and equipment providing expert opinions on operational condition of equipment, effectiveness of inspection and maintenance programmes and benchmarking.

Experience

CEERISK Consulting Limited – London, UK

Managing Director / Principal Engineer

- Investigate the root cause and liability following catastrophic failure incidents such as fires, explosions, machinery breakdown, natural catastrophes and human error.
 - Inspect the site of different incidents and examine relevant evidence
 - Design and perform forensic testing and examination of evidence
 - Gather data related to design, specifications and operational parameters of different types of equipment
 - Host meetings and engineering discussions on different systems
- Analyse design, specifications, drawings, tests and installations of various types of energy systems in different applications as part of a comprehensive RCA (Root Cause Analysis).
- Analyse performance and efficiency of different types of equipment (turbines, PV modules, battery cells, boilers, HRSGs and others) to opine on fitness for purpose and compliance with specifications, including analysis of operational parameters, trends, SCADA records, DCS data and other types of technical information
- Determine root cause and contributing factors of deterioration of efficiency of different systems including PV modules, turbines and other types of equipment
- Analyse cause of serial failures in renewable energy systems (wind and solar)
- Prepare expert reports (CPR 35 compliant) in relation to disputes involving the use and application of energy systems including conventional and renewable resources (thermal, wind, solar, hydro, and geothermal).
- Give evidence in different types of legal proceedings and ADR in compliance with rules of evidence in different jurisdictions (UK, USA, Australia, DIFC – Dubai, including ICC Arbitration).
- Provide engineering consultation on loss mitigation and prevention to utilities (public and private), contractors, manufacturers, large corporation and government agencies and municipalities in matters related to engineering risks.
- Carry out risk surveys and assessment of electromechanical equipment in large in critical infrastructure sites including power generation (thermal power, wind farms, utility-scale PV, CSP, combined-cycle) and heavy industrial plants (steel, cement, aluminium ...etc) and petrochemicals.
- Provide training to risk engineers, underwriters and claim handlers of international, regional and local insurance companies on methodologies and techniques of risk assessment and incident investigations

Qualifications

- **Bachelor of Science in Electrical Engineering**
KWT University, September 1986
- **Fire Inspector/Investigator**
Hennepin Technical College
Minneapolis, MN, USA – 1996
- **Master of Business Administration (MBA)**
Lake Forest Graduate School of Business, IL, USA – 2008
- **Chartered Engineer (Registration No. 593908)**, Engineering Council, UK
- **Professional Engineer (Registration No. 26809)**, Board of Architecture, State of Minnesota, USA in addition to registration in multiple states
- **Into Court Training Course** – The Academy of Experts, London, United Kingdom February 2010
- **Expert Witness Courses**, Bond Solon Wimington Legal – UK
 - Excellence in Report Writing – July 2011
 - Excellence in Report Writing - Written Evidence – July 2011
 - Courtroom Skills Training – January 2012
 - Civil Law & Procedure – September 2012
 - Cross Examination - January 2013
- **International Certificate in Enterprise Risk Management**, IRM – London, UK 2016

Professional Associations

- Member – IEEE PES (Power and Energy Society)
- Member IET – Institute of Engineering Technology,
- Sr Member – National Academy of Forensic Engineers (NAFE), USA
- Member – International Association of Arson Investigators (IAAI), USA
- Member – UK Association of Fire Investigators, UK
- Member – Energy Institute, UK
- Corporate Member – The Association for Renewable Energy and Clean Technology, UK
- Corporate Member – Solar Energy UK
- Member – IMIA (International Association of Engineering Insurers)

Sample Forensic and Expert Witness Instructions

- Acted as an expert witness in **ICC arbitration proceeding in DIFC courts** concerning a construction dispute involving the design, accreditation and installation of switchgear and MCC assemblies at a district cooling plant.
- Prepared an expert report related to the installation of **earthing system in a large PV utility-scale** power plant in Egypt in the Middle East.
- Investigated a **fire at a wind turbine** in rural Jordan. The investigation led to a successful identification of a workmanship defect that led to ignition of cables inside a control panel at the bottom of a WTG.
- Investigated wind damage to a large PV power plant in Mafraq, Jordan providing expert opinions on installation and manufacturing defects that contributed to the extent of damage.
- Prepared an expert report dealing with the **power performance of PV panels** installed north of Manchester, UK. The claim involved analysis of the orientation, tilt angle and shading projected on a number of PV strings installed on the roof of a large house.
- Investigated a **thermal energy storage system failure in a Solar CSP plant** in Morocco which involved review and analysis of the design, construction and fabrication of the thermal system at the plant.
- Acted as an expert witness testifying in jury trial regarding the failure of an **underground cable joint in Minnesota, USA**.
- Investigated fire and explosion in a **374-MVA power transformer in a transmission substation in California, USA**. The investigation involved forensic testing and examination of HV bushing in Germany and tear down of the transformer in San Diego, California, USA.
- Investigated an **explosion in a 345-kV (EHV) bushing** in a generation substation in Connecticut, USA. Following a 2-year investigation of damaged components, prepared an expert report and testified in deposition for over two days, presenting opinions related to the incident. Case was litigated in **Superior Court – State of Hartford, USA**
- Investigated the root cause of a fire in a **VAR-Compensator** used at a **PV solar power plant** in south Jordan to improve power quality before connection to the EHV transmission substation. The investigation involved performing inspections, design review and analysis of power output of the PV plant and the connection to the grid.
- Prepared an expert report and scheduled to give evidence in litigation involving the supply and installation of **LV electrical cables and systems inside wind turbine generation tower in West Australia**.
- Instructed an expert to investigate serial failures of **converters inside offshore wind turbine generation in the Irish sea**. This included full analysis of failure rates in different systems, failure modes and mechanisms, environment factors impacting operation of the wind turbines.
- Investigated and prepared an expert report with opinions related to **cable ducting defects in wind turbine towers** in Scotland, UK. This included verification of adequacy of design specifications, installation methods, impact of variations on various electrical systems in addition to a number of other issues.
- Investigated damage to underground oil-filled cables in **Portsmouth, UK**.
- Prepared expert report on serial failures in **LV connection boxes in offshore wind farm** in the UK. This included comprehensive analysis of RCA reports from different parties, analysis of operational history, design specifications and applicable international standards.
- Prepared expert report and provided expert testimony at an arbitration matter in Singapore which involved the design of **junction boxes in thousands (182,000+) of PV modules** that were installed in different locations throughout the USA. The dispute involved claims of design defect and the impact of partial shading on the different PV modules.
- Investigated **fire origin, cause and spread in a plastic recycling industrial plant** in Cheshire, UK that caused extensive damage to three large industrial structures and continued to burn for over 28 days. Prepared an expert report on the root cause of the fire and the factors that led to the aggressive and rapid fire spread <https://www.bbc.co.uk/news/uk-england-merseyside-20025006>
- Investigated large **chemical fire in a roofing product company** in Littleborough, UK which was caused by failure to implement and enforce HSE safety requirements while working with highly volatile chemicals. The company was prosecuted and sentenced for injuries to an employee caused by HSE violations <https://www.itv.com/news/granada/2014-02-14/company-fined-after-worker-was-injured-in-blaze>
- Testified in arbitration proceedings by **American Arbitration Association (AAA) in the US State of Illinois** in matter involving the failure of electrical switchgear assemblies and cable installations.
- Investigated total loss at a **utility-scale PV plant in north Jordan** that was damaged as a result of windstorm. The investigation led to conclusions that dealt with defects of design of the PV panel tracker systems and PV modules which were litigated in a European court

Examples of Investigation of Turbine Failures

- Investigated and prepared expert reports regarding turbine failures at several power plants around the world:
 - Corrosion and erosion of blades caused by steam contamination in steam turbine at plant in **Wolverhampton, UK**
 - Overspeed in an Ansaldo steam turbine at geothermal power plant in **Jakarta, Indonesia**.
 - Blade liberation in an Alstom steam turbine at thermal power plant in Helwan, **Egypt**
 - Thrust bearing failure in MAN S-Series GT Type 3 gas turbine at co-generation power plant in **Slovakia**
 - Blade failure at a GE IDF (Induced Draft Fan) at a power plant under construction in **Yanbu, KSA**
 - Turbine blade fractures in gas turbine in a power plant in **KSA (Eastern Province)**
 - Combustor failure in dual fuel gas turbine in a power plant in **KSA (Eastern Province)**
 - Compressor Blade failure in multiple gas turbines at a power plant in **KSA (Eastern Province)**
 - High vibration and damage to turbine section of GT at a power plant in **Sandbach; UK**

Examples of condition and failure assessments

- Helwan Fertilizer – Helwan, Egypt
- CEGCO Aqaba Power Plant– Aqaba, Jordan
- Suez Steel – Suez, Egypt
- Alexandria Carbon Black, Alexandria, Egypt
- Afia Oil processing Plant, Jeddah, KSA
- Gulf Fluor – Abu Dhabi, UAE
- Wastewater infrastructure – Multiple Sites, Qatar
- Etlik Medical Campus construction site – Ankara, Turkey
- Izmir Medical Campus – Izmir, Turkey
- Galataport cruise ship terminal – Istanbul, Turkey

Professional Activities

- Presented webinars on different topics related to power systems and equipment including:
 - Investigating insurance claims in utility-scale solar power plants, CEERISK Webinar series- 2019
 - Investigation of Renewable Energy Claims, CEERISK Webinar series – 2019
 - Solar Energy Plants (PV and CSP), CEERISK Webinar Series – 2020
 - Investigating Turbine Failures, CEERISK Webinar Series – 2020
 - Thermal Power Plants, CEERISK Webinar Series – 2020
 - Insuring Renewable Energy, CEERISK Webinar Series – 2021
 - Energy Storage Systems, CEERISK Webinar Series – 2021
 - Turbine Blade Failures, CEERISK Webinar Series – 2021
 - Investigating Power Transformer Failures, CEERISK Webinar Series – 2021
 - Green Hydrogen, CEERISK Webinar Series – 2022
 - Rapid Transition to Renewable Energy, CEERISK Webinar Series – 2022
 - Subsea Cable Claims, CEERISK Webinar Series – 2022
- Contributed and chaired a number of working groups at IMIA (International Association of Engineering Insurers) on different topics related to power energy systems, including:
 - Chaired workgroup on the design, installation and engineering risks at Combined Cycle Power Plants, IMIA Annual Conference, Merida, Mexico 2015
 - Contributed to workgroup on Solar Thermal Power Plants, IMIA Conference 2014
 - Contributed to workgroup on Biomass Power Plants, IMIA Conference 2014
 - Chaired workgroup on Electrical Failures, IMIA Conference 2018
- Speaking engagements at different events in USA, UK, UAE and other locations on topics related to energy, power and insurance, including:
 - Root Cause Investigation of Engineering Claims, Xchanging, London, UK – June 2013
 - Investigating Gas Turbine Losses, Construction, Engineering and Energy SIG – CILA; Lloyd's, London, UK – April 2012
 - Investigating Power Line Incidents, Edison Electric Institute – Claims Conference, Alabama, USA 2008
 - Investigating Stray Voltage Claims, Natural Gas Claims & Litigation Association Conference, San Diego, CA – March 26-29, 2006
 - Engineering Losses, CILA Construction Energy and Engineering Special Interest Group, UK, October 2014
 - Challenges of Investigating Turbine Losses, CILA Annual Claims Conference, UK – September 2013
 - Root Cause Investigation of Transformer Failures, CEERISK Consulting Engineering Webinars, London, UK
 - Electrical Failures not related to Weather Conditions, IMIA Annual Conference, Singapore 2018 – Chaired working group on investigation and risk assessment of electrical failures.
 - Investigating Renewable Energy Claims in Remote Locations, Onshore Energy Conference, London, 2018
 - Renewable Energy in the MENA Region, Dubai International Financial Centre, Dubai, UAE March 2019
 - Location, Location' Location: Does it Matter – Sitting of Power Plants, Onshore Energy Conference, London, UK 2016
- Authored articles on different topics including:
 - Challenges of offshore wind disputes – My Expert Witness Magazine – Summer Issue number 62
 - Insuring New renewable Technologies in Remote Locations – Middle East Insurance Review
 - Assessing Risk of Failure in Ageing Electrical Equipment – CEERISK Newsletter