



AVIATION AND AIRCRAFT ACCIDENT LITIGATION SUPPORT



Engineering Systems Inc.
Engineering Consulting and Forensic Investigation

www.engsys.com

INTRODUCTIONS



Timothy P. Jung, Ph.D., P.E.

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Dr. Jung is an aeronautical engineer who joined ESI following a 25-year career in the U.S. Air Force where he served as a pilot and engineer. At ESI, he utilizes these diverse skills to investigate aircraft accidents.



Ellen E. Wright, Ph.D., P.E.

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Dr. Ellen Wright is a metallurgical and materials engineer with experience investigating failures of aircraft and satellite components. Her Ph.D. research was on aluminum alloy extrusions used in aviation.



Matthew T. Kenner, P.E.

Principal
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Matt Kenner's work has spanned many industries. As an aeronautical engineer and flight instructor, he brings extensive expertise to the investigation and reconstruction of aircraft accidents.



Charles A. Fox, Ph.D.

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Dr. Chuck Fox leads the ESI visualization team in producing groundbreaking visualizations and animations used to demonstrate highly technical and difficult-to-understand concepts in high stakes litigation, where scientific accuracy is paramount.



Randall R. Knuteson

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Randy Knuteson is a recognized expert in the aviation accident investigation industry and has reconstructed over 200 aviation accidents, incidents, and design evaluations. He has aided the NTSB in investigating various aviation related accidents.

ABOUT ESi

ESi is an engineering consulting and forensic investigation firm with an experienced network of technical consultants that cover almost every industry, discipline, and geography. ESi can provide rapid response to large, complex losses and high-profile investigations virtually anywhere in the world.

Collaborative Teamwork

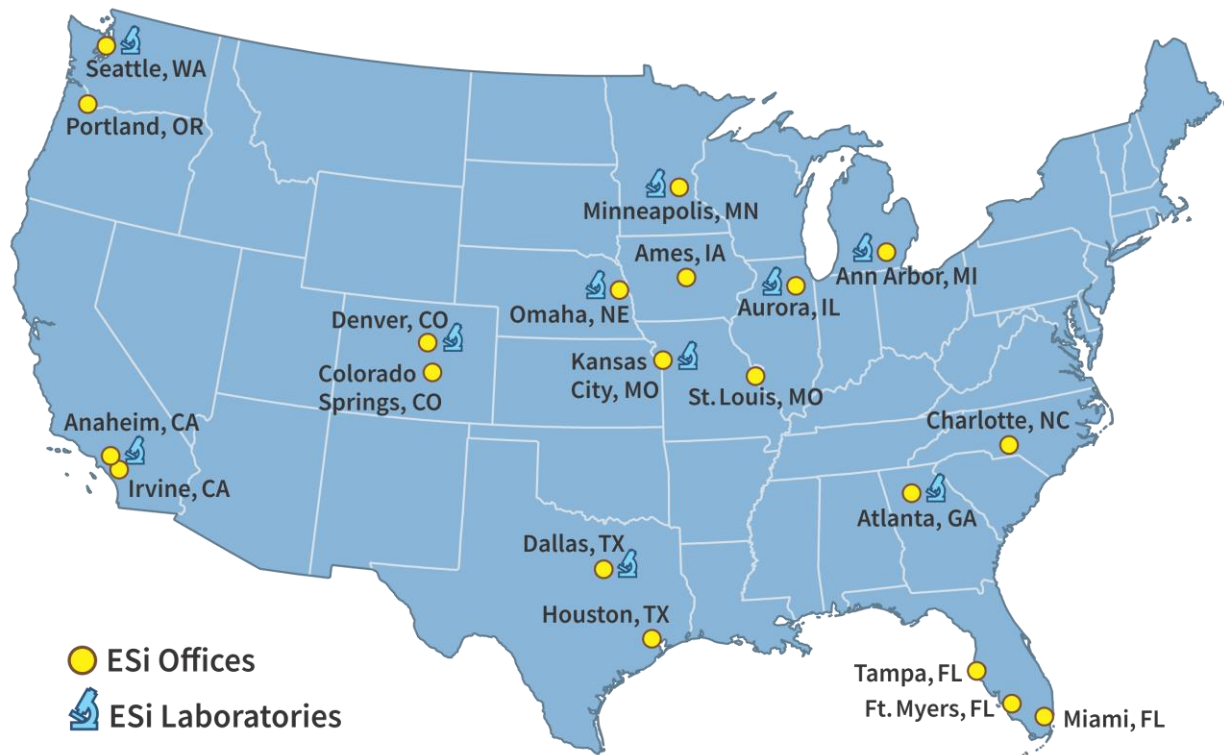
ESi applies a multidisciplinary approach that allows us to help with virtually any type of project, no matter how large or complex. We have engineers in almost every technical area.

ESi has over 350 in-house technical personnel, including licensed Professional Engineers (P.E.s) with advanced degrees (both M.S. and Ph.D.). Our consultants pair technical expertise with in-depth industry knowledge and litigation experience. ESi is uniquely positioned, both professionally and physically, to provide our clients with superior results.

ESi Locations

ESi locations have expanded over the past 35+ years to include 20 offices in 15 states across the country.

We announce our newest offices with labs in Kansas City, MO and Anaheim, CA.



AVIATION ACCIDENT LITIGATION SUPPORT



With over 35 years of experience, ESi is a leader in aviation consulting and aircraft accident litigation support. Conveniently located in offices across the country, ESi consultants serve clients both domestically and abroad, and can be readily deployed to sites around the globe.

Depth of Experience, Knowledge, and Skills

Our highly qualified and experienced professionals handle the full range of aviation issues and draw from an extensive national network of multidisciplinary resources.

ESi technical staff range in practice areas as diverse as aeronautical engineering, metallurgy, piloting, medical, and biomechanics, pairing the precise skills to serve you best. And our in-house visualization department offers the latest animation and virtual reality technologies for use at mediation and trials.

Aviation Services

- Fixed wing and helicopter accident reconstruction and failure analysis
- Piloting expertise
- Radar, DFDR, CVR, and on-board recorded data analysis
- High fidelity aircraft simulator model generation for use in accident scenario analysis
- Aircraft ice accretion and ice protection system analysis
- Airplane stability and control analysis
- Complex dynamic modeling
- Piston & turbine and piston engine performance and failure analysis
- Flight testing with multi-channel on-board data and video recording
- Sound spectrum analysis
- Medical aspects of pilot performance
- Aircraft maintenance
- Ground support equipment expertise



MATERIALS SCIENCE

ESi materials science and engineering experts analyze the reason a component failed. Their investigations can determine how the component was designed, the functional limits of the design and materials, how it was used, and how it reacted to real-world forces such as vibration, heat, fluid flow, and other physical effects.

Metals

Corrosion evaluation, fatigue and fracture mechanics, metallurgical failure analysis.

Polymers & Composites

Material characterization and analyzing atomic level chemical changes.

Glass, Ceramics & Concrete

Analyze products developed with refractories, earthenware, cement, or a composite of different materials.

Chemistry

Microanalysis for metallurgical and composition mapping, detection of degradation of components

MEDICAL INVESTIGATIONS

ESi board certified physicians and support staff are well-recognized in the fields of aerospace and have the expertise and experience to help clients navigate the complex maze of medical, regulatory, and transportation issues.

Major transportation accidents can involve a complex range of medical issues, including pathology, toxicology, perception, cognitive function, medication use, injury analysis, physical standards and pre-existing disease. To further complicate matters, some issues may be specific to certain modes of transportation. ESi's experienced medical staff has decades of experience assisting government, military, and private sector investigations in all modes of transportation.

ESi has on-staff physicians who have worked extensively on problems related to spatial disorientation, hypoxia, ejection and egress, and man-machine interface. Our medical staff has access to important multidisciplinary expertise not readily available in more traditional clinical settings, including transportation, pathology, forensic nursing, biomechanics, and regulatory and compliance.



ESi is often engaged early in a project to explore scientific facts long before a trial ever begins. In many cases, opposing counsel quickly understands their weakened position when visualizations are developed that capably communicate their client's liability.

Data Collection & Scene Preservation

Accurate data is critical to investigations. Our clients benefit from precision data collection and the critical insights they reveal.

- 3D Laser Scanning
- Unmanned Aerial Systems (Drones)
- CT Scanning
- Photography and Videography

Data Visualization

Data can be combined to produce accurate, dynamic depictions of events. 3D digital images can help make the nuances of the science in a case accessible to everyone on the legal team and allow the layperson and expert viewers alike to experience data-driven, scientifically constructed scenarios with the element of time included. ESi visualization products can be used in expert reports, deposition exhibits, mediation tools, and courtroom presentations.

3D Animation and Virtual Reality

- Expert 3D Animation – The most important tool used in most cases today, it is also one of the fastest growing, most valuable assets in the litigation world.
- Virtual Reality – Moving around in a factually accurate virtual environment, and interacting with data collected at a real scene, is both visually impactful and highly informative. We are pioneering new ways for virtual reality to be used in the litigation environment.

ESi LIVE

ESi LIVE is a technology-driven remote inspection service that delivers live inspections and post-inspection analysis sessions remotely using live streaming and advanced communication and visualization tools.



Failure to Deploy Aircraft Ice Prevention System Results in Deadly Crash

An ESi report to the NTSB finds that the airplane accident was due to failure to activate the ice protection system on final approach for landing.

Learn more:

<https://www.engsys.com/media/1044-esi-case-study-aircraft-ice-prevention.pdf>



Meticulous Metallography Helps Crack the Case

ESi has expertise in high temperature turbine blade superalloys. We routinely diagnose blade issues such as metallic creep, fatigue cracking, and sulfidation corrosion.

Learn more:

<https://www.engsys.com/media/1044-esi-case-study-meticulous-metallography.pdf>

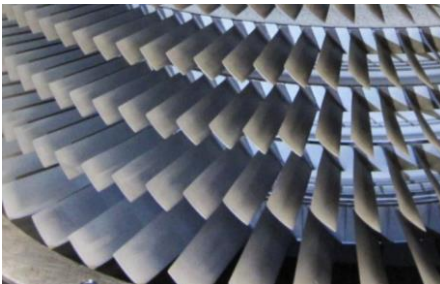


Mid-Air Collision in Uncontrolled Airspace

An ESi accident reconstruction with visualizations helps investigators uncover which pilot was at fault in an investigation where there were no witnesses to the accident.

Learn more:

<https://www.engsys.com/media/1043-esi-case-study-aviation-mid-air-collision.pdf>



Failure Analysis of a Robust Turbine Engine

ESi investigated an issue involving the performance of the high temperature superalloy used in the turbine blades of a commercial aircraft engine. Our findings confirmed the engine was not at fault but rather, a foreign object entered the engine causing it to ultimately fail.

Learn more:

<https://www.engsys.com/media/1044-esi-case-study-airplane-engine-failure.pdf>



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