



CONSUMER PRODUCTS LITIGATION & EVALUATION SUPPORT



Engineering Systems Inc.
Engineering Consulting and Forensic Investigation

INTRODUCTIONS



Adam Bovie, P.E., IAAI-FIT

ESi Senior Staff Consultant

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Mr. Bovie is an electrical engineer with extensive experience in failure analysis and forensic investigation of electrical and electronic systems. He has performed numerous investigations of Lithium-ion battery failures, including work on CPSC actions related to consumer Li-ion packs. Mr. Bovie has been retained on projects ranging from consumer Internet-of-Things (IoT) smart device incidents and cybersecurity risk assessments to first-responder safety system failures in renewable power generation.



Perry A. Hopkins, P.E., CFEI

ESi Senior Managing Consultant, Electrical Director

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Mr. Hopkins is an electrical engineer with over 15 years of experience in electrical and electronic systems design and analysis, electrical accident reconstruction, and electrical equipment failure analysis. He has conducted complex, multidisciplinary failure investigations pertaining to industrial and consumer products, medical devices, and utility distribution equipment. He has provided testimony in matters pending before both state and federal courts.



Joe Mohorovic, CPSM

ESi Senior Managing Consultant

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Joe Mohorovic specializes in adverse event analysis, regulatory compliance counseling, expert testimony, and dispute resolution. Mr. Mohorovic has a background as an executive and public servant, operating at the intersection of business and government, culminating in his service as a Commissioner on the U.S. Consumer Product Safety Commission (CPSC).

ABOUT ESi

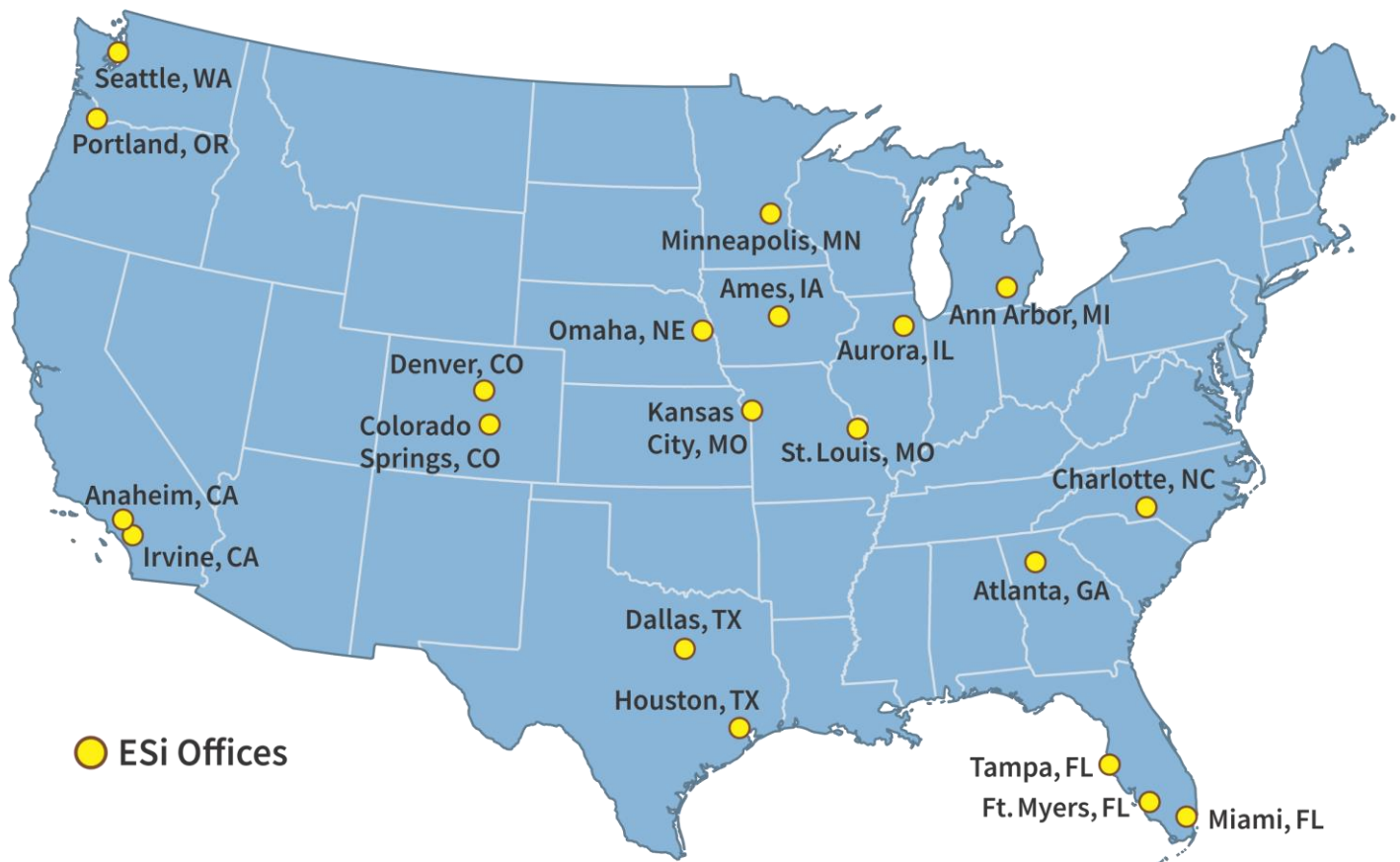
ESi (Engineering Systems Inc.) is an engineering consulting and forensic investigation firm with experienced technical consultants who cover almost every industry, discipline, and geography. We can provide rapid response to large, complex losses and high-profile investigations virtually anywhere in the 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 including: Aeronautical, automotive, biomechanical, chemical, electrical, civil, marine, materials, mechanical, metallurgical, and structural engineering. We also have experienced fire and explosion investigators and environmental scientists. Our consultants pair technical expertise with in-depth industry knowledge and litigation experience.

ESi Locations

ESi locations have expanded over the past 35 years to include 20 offices in 14 states across the country. ESi has over 400 in-house technical personnel, including licensed Professional Engineers (P.E.s) with advanced degrees (both M.S. and Ph.D.). ESi is uniquely positioned, both professionally and physically, to provide our clients with superior results.



PRODUCT LIABILITY CAPABILITIES



ESi brings its breadth of engineering specialties to product development and product liability issues. Our team provides technical consulting and analysis related to alleged user injuries, product design, materials selection, technical and safety manuals, and on-product labels.

Assisting Manufacturers in Safety Analysis

ESi engineers, scientists, and technical professionals can reconstruct and test accident scenarios and assist manufacturers in safety analysis and pre-release product testing.

When unexpected product performance issues arise, ESi applies its expertise to finding root causes and recommended solutions. We have experience with the Consumer Products Safety Commission and assist clients making recall, back fit, or notification decisions.

State-of-the-Art Laboratories

ESi has state-of-the-art laboratories, test facilities, and analysis tools enabling us to conduct multidisciplinary investigations on most consumer products.

Materials and Product Testing

ESi conducts a wide range of materials and product testing. And can create both digital and physical demonstratives. ESi can facilitate complete investigations from inception to litigation.

Areas of Specialization

- Children's Products
- Heavy Equipment
- Statistical & Reliability Methods
- Consumer Products
- Recreational Products
- Sports & Exercise Equipment
- New Product Development & Manufacturing Support
- Industrial Products
- Medical Devices

For more information visit: www.engsys.com/areas-of-expertise/products

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REGULATORY EXPERTISE



Product safety begins with understanding all phases of the product lifecycle, from material selection and design to manufacture, sale, use, and in some cases, failure. ESi has a reputation for technical excellence across all these areas. Our work in product safety is grounded in providing clients with solutions that can help their business provide safer, better products.

Our expertise in product safety includes CPSC compliance and product recall evaluations combined with firsthand knowledge of government and regulatory affairs. ESi can be a great asset to clients navigating the uncertain regulatory environment and evaluating questions on product safety and reporting.

ESi can work effectively with diverse stakeholder groups, including consumer product manufacturers, retailers, industry associations, nongovernmental organizations, and key members of the federal executive and legislative branches.

Regulatory Expertise

- CPSC mandatory reporting obligation
- “Substantial product hazard” analysis
- Time-of-sale duty: analysis
- Analysis of post-sale duties including: Duty to warn, general duty of reasonable care, duty to investigate, duty to recall, duty to inform of safety improvements
- Reasonableness/negligence of corrective action plans (recalls): evaluation of design and execution
- Absence/utilization of consumer product safety management best practices
- Compliance with mandatory process/certification requirements for children’s products and other products subject to mandatory rules, regulations, standards and bans (16 CFR §1107)
- Lawful/improper reliance upon upstream certifications or testing (16 CFR §1109)
- “Unreasonable risks of serious injury or death” analysis

Legal Support Services

- Expert Analysis and Testimony
- Product Safety Management

BATTERY CAPABILITIES



ESi battery experts have a broad range of hands-on experience in the design, construction, testing, safety assessment, and failure analysis of batteries and battery-powered consumer products. We also possess the expertise to analyze how a battery's internal chemistry can contribute to a fire event or other failure. Our experts can help resolve whether a battery, or battery-powered device, was an ignition source.

No amount of design, testing, or careful manufacturing can prevent attorneys, insurance personnel, and investigators from implicating a battery as the cause of a fire, even if the battery was not at fault. ESi can scientifically evaluate these claims thanks to our expertise in fire investigation, failure analysis, and testing. Even after a fire, our advanced laboratory capabilities can help identify the battery model and signs of failure in the evidentiary remains.

When batteries are falsely accused, we can provide an evidence-based defense. When design or manufacturing issues arise, we can propose corrective action and if needed, help guide the recall.

Battery Management System Testing & Evaluation

- Prevent over-charging, over-discharging, and short circuits
- Evaluate circuit design and component selection
- Provide guidance on fault condition handling
- Test performance during fault conditions

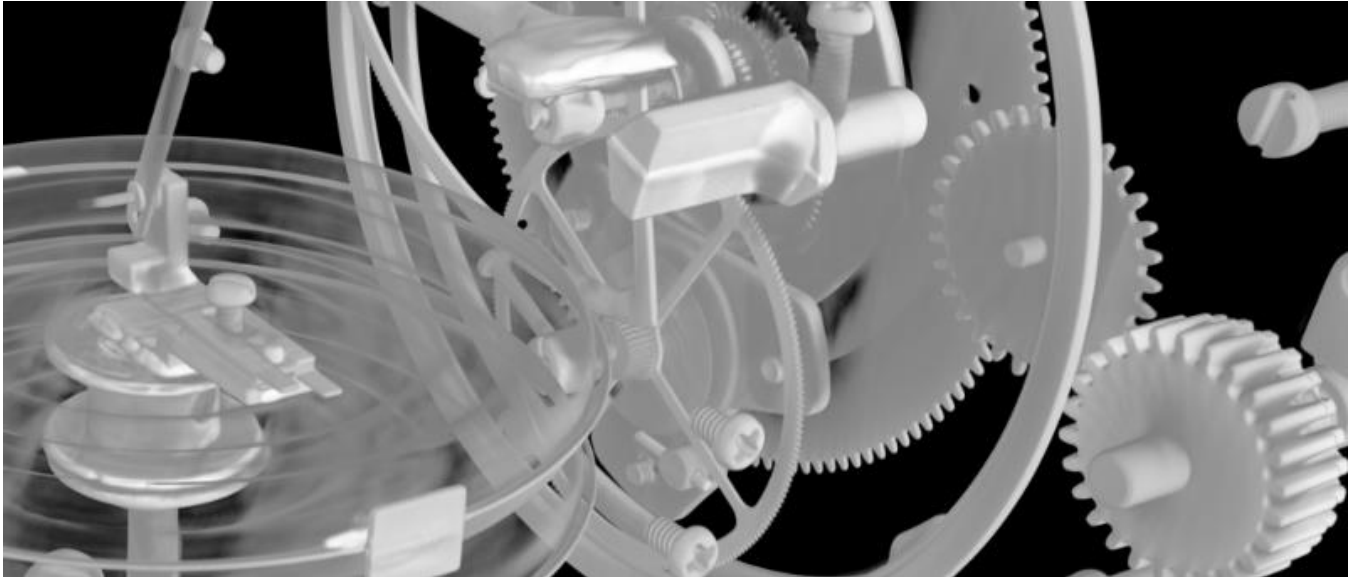
Product Charge & Discharge Evaluation

- Review safety features of charge circuitry
- Analyze charging technique and discharge controls
- Recommend methods to improve battery life

Battery Design & Manufacturing Methodology

- Evaluate battery cell design and construction
- Review manufacturing process methodology
- Audit manufacturing facility
- Test mechanical and electronic safety features

CT SCANNING & VISUALIZATION



Radiographic Investigation

Computed tomography (CT) imaging is a nondestructive method to quickly identify internal material flaws or failed components. CT imaging provides high resolution 3D images of an object and its internal structures. These images can be viewed from any angle, manipulated, and graphically deconstructed and reconstructed layer-by-layer. A CT scan creates a virtual copy that preserves the internal and external features of an object and is dimensionally accurate, permanent, and a complete record.

Visualization

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.

ESi has a unique blend of scientific and artistic expertise that is the creative force behind compelling and technically accurate images in the courtroom. Our scientific experience and visualization methods have proven useful in exploring the technical details of a case in preparation for litigation.

Data collected from laser and CT scanners can be combined with data from a wide array of other sources to produce accurate, dynamic depictions of events. By providing a 3D digital vision of a mechanical device or still graphics that expose the details of a plaintiff's injuries, 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.

- Data Collection & Scene Preservation
- Technical Illustrations & Drawings
- Drone Services
- Trial Exhibit Preparation
- Digital Video Editing
- Virtual Reality
- Graphic Design Services
- Scale Models

ESi now offers ESi LIVE, 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. For more information visit: <https://www.engsys.com/esi-live>



www.engsys.com

Case Study

Gas Grill Plastic Nut Failure

ESi conducts a complex multi-disciplinary product analysis to determine the root cause of a failure leading to the ignition of a fire.

Learn more:

<https://www.engsys.com/media/1049-esi-case-study-fire-explosion-gas-grill-plastic-nut-failure.pdf>

Whitepaper

Residential Bunk Bed Child Entrapment Safety Test Methods

Accident reconstruction conducted to analyze a residential consumer bunk bed death involving a two-year-old boy.

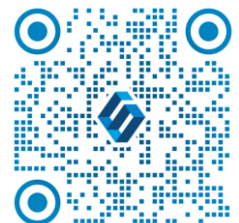
Learn more:

<https://www.iso.es.info/conferences/2023/papers/brickman.pdf>

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