



**CRIMINAL INVESTIGATION
LITIGATION SUPPORT**



Engineering Systems Inc.

Engineering Consulting and Forensic Investigation

WACDL Annual Conference

June 12-14, 2025

Chelan, WA

www.engsys.com

INTRODUCTIONS



Dale C. Mann, CFI, CFEI, D-ABC

Senior Managing Consultant

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Mr. Dale Mann is an ABC certified Forensic Chemist with over 40 years of experience performing a wide variety of forensic analyses in support of criminal and civil investigations. He spent over 18 years with the Washington State Patrol Crime Laboratory system prior to joining ESI.



Jennifer Nara, D.O.

Senior Consultant

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Dr. Nara has over 16 years of experience in forensic pathology, including more than a decade working as a medical examiner for local governments and four years working as the Chief Forensic Pathologist for law enforcement.



Martha Burt, M.D.

Senior Consultant

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Dr. Martha Burt is a physician board-certified in Anatomic, Clinical, and Forensic Pathology. She has investigated and certified thousands of deaths and has developed a particular expertise in deaths resulting from drugs and toxins, firearms, environmental exposure, and interpersonal violence.



André Loyd, Ph.D.

Senior Consultant

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Dr. André Loyd is an experienced biomechanical specialist with over 17 years of experience in the field. He provides injury reconstruction analysis for child injury/abuse cases, stabbings, assaults, self-defense cases, slip and fall incidents, industrial accidents and vehicle accidents. He has been an expert witness in criminal and civil cases across the U.S.



ESi provides laboratory testing, research, and analysis in a variety of criminal investigations.

ESi has assisted in many criminal investigations, including:

- Fires and bombings
- Controlled substances and clandestine drug manufacturing
- Poisonings and chemical assaults
- Assaults and homicides
- Property crimes
- Vehicular incidents
- Firearms incidents
- Cause of death questions

State-of-the-Art Laboratories

ESi offers testing services including chemical composition, mechanical and metallurgical analysis, non-destructive testing using specialized test design, and performance evaluation.

ESi has trace evidence examination capabilities including optical microscopy, scanning electron microscopy, and a variety of analytical capabilities. Also available are optical, infrared, vapor, noise, vibration monitors and recorders, high speed photography, digital enhancements, testing chambers for fires, explosions, firearms, toxics, and more.

Controlled Substances License

ESi is licensed by both the DEA and Washington State Department of Health to receive, handle, analyze, and store all classes of controlled substances. ESi has been performing drug analysis for over twenty-five years.

Firearms Analysis

- Residue analysis and pattern evaluation
- Muzzle velocity
- Trajectory analysis
- Chamber pressures
- Firearm and ammunition defects
- Gunpowder identification and comparison
- Contributor to NCFS gunpowder database

Case Review, Consultation and Expert Witness Qualified

ESi has reviewed hundreds of criminal investigations in which our experts have provided case review, consultation, and testimony. ESi can provide the criminal defense attorney with everything from a single drug sample reanalysis to complete file review and scenario testing including animation.

FORENSIC MEDICAL INVESTIGATIONS



Forensic Pathologists, Physicians and Forensic Nurses

ESi has physicians, forensic pathologists, and forensic nurses for analysis and investigation of medical matters. They can develop injury diagrams, review autopsy reports and cause of death determinations, and deliver medical-legal exhibits used as evidence in legal proceedings.

Our medical staff can prepare summaries that outline critical information such as pertinent medical history, current or pre-existing conditions or injuries, diagnoses, physical injuries, lifestyle factors, subjective evidence, medications, and missing medical documents.

Biomechanics

ESi biomechanical experts conduct investigations and recreate incidents pertaining to the mechanism and causation of injury in criminal cases that involve:

- Assault
- Child Abuse
- Murder
- Police Brutality
- Shootings
- Stabbings
- Traumatic Brain Injury
- Vehicular Accidents

■ **Dr. Jennifer Nara** specializes in forensic pathology and is one of only 500 board certified Forensic Pathologists in the country. Dr. Nara has over 16 years of experience and has performed over 3,500 autopsies as a forensic pathologist. Her experience includes both criminal and civil litigation and testimony, working with law enforcement, legal counsel, and clinical teams to determine the cause and manner of death in support of investigations involving vehicle accidents, workplace injuries, firearms, burns, child abuse, drug and alcohol usage, toxic gases, and homicides.

- [A&E Series: Tell Me How I Died S1 | E5 Over the Edge](#)
- [CBS Series: 48 Hours S37 | E4 The Bathtub Murder of Kendy Howard](#)

■ **Dr. Martha Burt** is a physician board-certified in Anatomic, Clinical, and Forensic Pathology. Throughout her 20+ year career, Dr. Burt has investigated and certified thousands of deaths resulting from a broad spectrum of processes and has developed a particular expertise in deaths resulting from drugs and toxins, firearms, environmental exposure, and interpersonal violence. She is skilled in medical records reviews, critical analysis of death investigations and autopsy reports, trial and deposition testimony, and implementation of forensic pathology practice standards.

FIRES AND EXPLOSIONS



ESi fire and explosion experts reconstruct and analyze incidents in detail to help uncover the circumstances of a criminal event.

Scene Inspections & Replication

ESi applies an abundance of resources from 3D scans, sample collection, and sample measurement with more detail and sophistication than a typical public agency. We can recreate site scenarios after a crime and deliver documentation and analytical results for the scene and the associated evidence. Our 3D scanning provides a detailed rendering of the scene.

Fire Investigation

ESi can identify the origin and cause of the fire responsible for the damage, deaths or injuries. ESi has a wealth of experience evaluating issues related to ignition, fire growth, flame spread and material fire performance and can perform 3D modeling of the fire development.

Bombings

ESi can evaluate the post-blast residues to identify the original bomb components, the veracity of the device and the potential damage effects. ESi has the ability to measure the important physical parameters such as pressure, forces and thermal output of the hypothesized device.

CASE STUDY

Pipe Bomb Mailings

ESi reviewed FBI case files and opined on the nature of 16 pipe bombs sent to a past U.S. president, vice-president, senators and celebrities. The devices were determined to be hoaxes and not viable IEDs.

Learn more: <https://www.engsys.com/work/pipe-bomb-mailings-net-20-year-conviction/>

SCENE RECONSTRUCTION



ESi visualization products can be used in expert reports, exhibits for depositions, mediation tools, and courtroom presentations.

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)
- Light Detection and Ranging (LIDAR)

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 viewers to experience data-driven, scientifically constructed scenarios with the element of time included.

3D Animation and Virtual Reality

Expert 3D Animation – An important tool used in most cases today and a valuable asset in the litigation world.

Virtual Reality – Moving around in a factually accurate virtual environment and interacting with data collected from the scene.

ESi visualization products can be used in expert reports, deposition exhibits, mediation tools, and courtroom presentations.

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

SELECT CASE STUDIES

HOMICIDES

■ **Anthony Todt Murder Trial**

Anthony Todt was found guilty on four counts of first-degree murder in the deaths of his wife and three children. With the testimony of Dr. Jennifer Nara, he was sentenced to life in prison without the possibility of parole.

Learn more: <https://www.youtube.com/watch?v=xPLIHSjmNqA>

■ **Nicole Montalvo Murder Trial**

Christopher Otero-Rivera and his father Angel Rivera were found guilty of second-degree murder, abuse of a dead human body, and tampering with physical evidence in the death of Nicole Montalvo. Dr. Jennifer Nara, testified and the two men were sentenced to life in prison.

Learn more: <https://www.youtube.com/watch?v=dPUMMRoPI4E>

BOMBINGS

■ **Pipe Bomb Mailings**

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■ **Molotov Cocktail Used in Seattle Riots**

The investigation and reports produced by ATF were reviewed. The confiscated device was evaluated and recreated. The device as assembled was determined to not be a functional device. The case was dismissed.

POLICE SHOOTING

■ **Self-defense or Police Brutality?**

Using poor quality dash cam video, digital enhancement, 3D scanning of the incident site and subject vehicle, laboratory examination of evidence from the site, and digital rendering, ESi accurately recreated the incident and determined the relative positioning of the active players at the beginning of the encounter. The issue was resolved after the ESi report was issued.

ARSON

■ **Review of an Investigative File with the Scene no Longer Available**

The local police and fire investigative file was reviewed, revealing no qualified fire investigator was at the scene, the evidence chain was violated, interviews misrepresented, and final conclusions were unsupported. The case was dismissed.

■ **Port Angeles Fire O&C Hypothesis Disproven**

A large fire destroyed a quarter city block in Port Angeles. The hypothesis regarding the origin and cause of the fire outlined in the BATF report was falsified by work performed by ESi. Based on trial testimony, the jury acquitted the defendant.



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ESi Criminal Investigation & Litigation Support

Forensic Laboratories
Pathology
Crime Lab Review
Biomechanics & Human Factors
Fire Sciences
Scene Preservation

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Learn more



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