

PROFILE

Ms. Melissa Simpson is a Senior Project Engineer with over 15 years of experience as a Mechanical Engineer with a background in design, manufacturing, quality, and forensics. She is knowledgeable about the manufacture, usage and quality issues related to most materials, including elastomers, alloys, and specialty steels. Melissa is experienced with the investigation of safety incidents, including those that involve machine guarding and personal injury. At Envista, Melissa applies her expertise to consult with clients regarding the scope or cause of damage and determination of reparability after a reported incident. Key strengths include the following:

- ▶ Metals (Carbon & Alloy Steels)
- ▶ Metallurgy
- ▶ Fracture Analysis
- ▶ Fabrication Equipment
- ▶ Manufacturing Equipment
- ▶ Machinery
- ▶ Machine Guarding
- ▶ Heavy Equipment
- ▶ Industrial Process Equipment
- ▶ Appliances
- ▶ HVAC System Equipment
- ▶ Piping
- ▶ Valves & Regulators
- ▶ Plumbing & Fixtures
- ▶ Seals & Gaskets
- ▶ Fire Sprinkler Systems
- ▶ Woodworking Tools & Equipment
- ▶ Safety Risk Assessments

▶ *Industries:* Residential, Municipal, Commercial, Industrial, Manufacturing, Construction, Inland Marine

▶ *Computer Skills:* Windows, Android, MS Office, Adobe Photoshop

EDUCATION

Bachelor of Science, Mechanical Engineering, 2006

Texas A&M – College Station, Texas

LICENSES

Professional Engineer (PE):

- ▶ Colorado
- ▶ Florida
- ▶ Louisiana
- ▶ Missouri
- ▶ Oklahoma
- ▶ Pennsylvania
- ▶ New Mexico
- ▶ Texas

CERTIFICATIONS

CMSE® - Certified Machinery Safety Expert (TÜV Nord, 2021)

OSHA 30 Hour Outreach Training Program – General Industry (360 Training, 2022)

Certified Six Sigma Greenbelt (Cameron, 2012)

National Council of Examiners for Engineering and Surveying (NCEES) Record Holder

OFFICE

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CONTACT

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CORPORATE OFFICE

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WEBSITE

www.envistaforensics.com

CONTINUING EDUCATION

- ▶ "Principles of Failure Analysis," ASM International
- ▶ "Fitness for Service API 579-1/ASME FFS-1," Stress Engineering Services, Inc.
- ▶ "OSHA Permit-Required Confined Space Entry," eTraining, Inc.
- ▶ Respirator, Ladder, Hearing Conservation, and Heat Stress Safety, Envista Forensics
- ▶ Building Envelope Assessment, Envista Forensics

PROFESSIONAL AFFILIATIONS

- ▶ American Society of Mechanical Engineers (ASME)

PROFESSIONAL BACKGROUND

July 2022 – Present: Envista Forensics – Houston, Texas
Senior Project Engineer

October 2018 – July 2022: Envista Forensics – Houston, Texas
Project Engineer

March 2017 – October 2018: Engineering & Testing Corp. – Houston, Texas
Consulting Engineer

August 2016 – November 2016: Sep-Pro Systems, Inc. – Houston, Texas
Technical Sales Engineer

March 2010 – February 2016: Cameron International – Houston, Texas
Manufacturing Engineer

January 2007 – January 2010: Fluor Corporation – Sugar Land, Texas
Design Engineer

January 2006 – May 2006: Texas A&M University – College Station, Texas
Teaching Assistant

January 2004 – August 2004; January 2005 – May 2005: Stewart and Stevenson, TVS/LP – Sealy, Texas
Quality Engineering Co-Op

PUBLICATIONS

“Designed to Fail: Controlling How Machinery and Systems React When Failure Happens,” Envista Forensics, April 2021

“The Call After the Storm,” The Stress Point Magazine, July 2018

“Every Failure Has a Story... Even in the Oil & Gas Industry,” The Stress Point Blog, March 2018

REPRESENTATIVE PROJECT EXPERIENCE

Piping, Plumbing Fixtures, and Appliances

Envista Forensics – Houston, TX

- ▶ Investigated the cause of failure of underground piping, including municipal, commercial, and residential water main, sanitary sewer, and drain piping.
- ▶ Evaluated the scope of damage and claimed costs to repair piping and equipment at industrial facilities after fire, freeze, and flood incidents.
- ▶ Investigated the cause of failure in fire sprinkler piping located in a high-rise residential building and buried sewer piping under a residence.
- ▶ Investigated the failures of hot water heaters, expansion tanks, residential dishwashers, and hoses as well as metal and plastic plumbing components.

Engineering Design & Testing Corp. – Houston, TX

- ▶ Investigated the reported failure of a thermostatic shower valve in a group living facility and the failure of a quarter-turn shutoff valve located under the sink of a high-rise residential building.

Heating, Ventilation, & Air Conditioning (HVAC) Equipment

Envista Forensics – Houston, TX

- ▶ Investigated the cause of failure and reparability of HVAC equipment after the Texas Winter Storm in 2021
- ▶ Investigated the cause of failure in hot water piping, hot water expansion tanks, rooftop units, chillers, cooling towers, boilers, and residential split systems.
- ▶ Analyzed the relationship between excess moisture within residential buildings and the sizing, installation, and performance of the installed HVAC equipment.

Engineering Design & Testing Corp. – Houston, TX

- ▶ Performed damage assessments to identify the scope of flood related damage to HVAC system equipment and determined the reparability of the damaged equipment.

Manufacturing

Envista Forensics – Houston, TX

- ▶ Investigated the cause of a fire incident that happened during the transfer of a flammable liquid between two storage totes.
- ▶ Determined the extent of damage, evaluated repair and replacement options, and determined the cost to return manufacturing equipment to pre-loss condition after damage due to fire or water related incidents.

Cameron International – Houston, TX

- ▶ Investigated the failures of directional valves, regulators, relief valves, & solenoid valves during manufacture and after installation. Evaluated the design, operation, and component quality of valves and regulators.

Machinery & Equipment

Envista Forensics – Houston, TX

- ▶ Performed macroscopic examinations of fracture surfaces on the gears of a gearbox to evaluate the metallurgy and characteristics of the failure to identify the cause and progression of failure.
- ▶ Investigated the failures a Zenith three-knife trimmer and water extraction press.
- ▶ Investigated the scope of damage and repairability of industrial, commercial, and agricultural equipment that were damaged as the result of fire, freeze, and flood incidents.
- ▶ Investigated the cause of damage to water well equipment and evaluated the claimed costs of repair.

Engineering Design & Testing Corp. – Houston, TX

- ▶ Investigated the scope of flood related damage to process equipment at a catalyst recycling plant and determined the reparability of damaged equipment. Calculated the cost to repair or replace damaged piping, pumps, pressure vessels, tanks, and other equipment.

Heavy Equipment

Envista Forensics – Houston, TX

- ▶ Investigated the catastrophic failure of a lift truck during rough terrain testing, a folding grain drill, and the circumferential weld on a crane turntable.
- ▶ Investigated the scope of damage and repairability of agricultural equipment that were damaged as the result of fire incidents.
- ▶ Evaluated laboratory test results of diesel fuel for indications of damage due to contamination.
- ▶ Investigated claimed damage to a hydraulic hammer used in shallow water.

Personal Injury

Envista Forensics – Houston, TX

- ▶ Analyzed the manufacturing process, machinery, and equipment used for a hot-dip galvanizing operation after a workplace fatality.
- ▶ Performed a safety risk assessment of concrete batching machine and adjunct processes after a workplace fatality.

Engineering Design & Testing Corp. – Houston, TX

- ▶ Investigated the cause of personal injury during the operation of a miter saw.
- ▶ Performed a safety risk assessment of a plastic film recycling machine and adjunct processes after a workplace fatality.

Technical Sales of Heat Transfer Equipment

Sep-Pro Systems, Inc. – Houston, TX

- ▶ Perform the preliminary design calculations and project cost estimation for heat transfer systems and related equipment. Prepared quotations for heat exchangers, gas-oil separators, and direct-fired heaters.

Project Management

Envista Forensics – Houston, TX

- ▶ Managed multi-disciplinary scope of damage investigations alongside electrical and structural engineers, building consultants, etc. for large loss incidents.
- ▶ Managed subcontractors required for specialized services, such as testing or destructive metallurgical analysis.
- ▶ Managed projects that involve specialized consultants through Envista's Expert Alliance, including industrial hygienists and a horticulturist.

Cameron International – Houston, TX

- ▶ Managed capital purchases and Lean Manufacturing initiatives including the review and improvement of material handling equipment. Provided engineering analysis of safety incidents that involve assembly and testing equipment. Directed a \$600K parking lot expansion.

Piping Materials Design for Refinery

Fluor Corporation – Sugar Land, TX

- ▶ Responsible for piping materials design work for a 100,000-BPD Gas-Oil Hydrotreater that included specification of piping components, such as pipe, valves, fittings, and flanges. Also managed piping and instrument diagrams and developed hydrostatic testing diagrams.



Melissa A. Simpson, P.E., CMSE®
Senior Project Engineer