

# William R. Caruso

RESUME

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## SUMMARY OF QUALIFICATION

Versatile engineer with 9 years of professional experience in power systems & alt. energy product development.

- **Mechanical Engineer** with expertise in mechanical design, 3D modeling, manufacturing development, fluid mechanics, thermodynamics, testing and QA, and renewable energy systems.
- **R&D Program Management** leading technical product development for dynamic emerging markets.
- **Project Management** organizing multi-disciplinary teams in a fast paced and demanding environment.
- **Product design** from concept to field implementation focused on value by harmonizing sound engineering practice, customer needs, and available resources.
- Dedicated team player finding true satisfaction in collaboration and sharing a unifying vision.
- Effective and experienced writer and presenter with a wide spectrum of audiences and work scopes.
- Passionate about developing innovative and elegant solutions to society's most challenging energy problems.

## PROFESSIONAL ROLES & RESPONSIBILITIES

**R&D Program Manager**, Brayton Energy, LLC | Hampton, NH | *08.2015 – present*

- **Technical Direction:** Program leadership and mentoring, IP development, market analysis, forming strategic relationships, and technical reporting and presentation.
- **Project Management:** Resource management, and budget and schedule development.

**Sr. Mechanical Engineer**, Brayton Energy, LLC | Hampton, NH | *06.2015 – present*

**Mechanical Engineer**, Brayton Energy, LLC | Hampton, NH | *03.2010 – 08.2015*

- **Mechanical Design:** 3D Modeling, Structural FEA, Tolerance analysis, Design for Manufacture (DFM), FMEA, electro-mechanical tooling design and commissioning, material research and recommendation.
- **Heat Exchanger Design:** Thermal fluid modeling, structural and lifing analysis, DFM, test, and commissioning.
- **Test Engineer:** Design of experiments, mechanical design for testing, component specification, instrumentation specification, test execution, data reduction, and presentation.
- **Manufacturing Specification:** Vacuum furnace brazing, PAW/TIG welding, stamping/forming, casting, CNC machining, EDM, Laser Weld/Cut.
- **Manufacturing Optimization:** Cost projection analysis, market and manufacturing research, and cost reduction strategies.
- **Code Implementation:** ASME Boiler Pressure Vessel Code VIII, IX; Power Piping B31.1, B31.3; ASCE SEI 7.

**Mechanical/Systems Engineer**, Feed Resource Recovery Inc. | Boston, MA | *02.2008 – 2.2009*

- **Process Engineer:** Bio-reactor process design (5000 gal.), P&ID development, EPC support, and commissioning.
- **Test Engineer:** Bio-reactor process design (500 gal. & lab), specify and procure hardware, automate process equipment, and demonstrate & scale automation strategy.

**Design Engineer**, Design Communications LLC | Boston, MA | *08.2007 – 2.2008*

- **Staff engineer:** Provide AutoCAD 2D/3D shop drawings with attention to design for fabrication and installation; and meeting local structural safety, UL, and NEC codes.

## EDUCATION

**Worcester Polytechnic Institute**, Worcester, MA | *2003-2007*

BS in Mechanical Engineering, Concentration in Mechanical Design – *Graduated with Distinction*

## SOFTWARE | CERTIFICATIONS

Engineer-in-Training NCEES Fundamentals of Engineering Exam | Boston, MA | *4.2009*

Software [yrs.]: SolidWorks and Simulation FEA [10], Excel & VBA [8], MS Project [2], LabView [2], FlowWorks [1]

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## KEY PROJECTS

### **Commercialization of a Flexible Pipe Coupler for Molten Salt, Brayton Energy, LLC | 09.2015 – present**

Principal Investigator for a \$1.5M DOE program directing a team of engineers, fabricators, suppliers, and consultants to develop and deliver an enabling technology critical for the advancement of concentrating solar power systems.

#### Key Achievements:

- Conducted full product performance demonstration in laboratory setting at full operating conditions.
- Empirically validated numerical models with fully instrumented test article for temperature, pressure, and strain measurement.
- Defended 30% OPEX reduction over current state-of-the-art technology through rigorous technical performance comparison and market study.
- Established and maintained strategic relationships with industry end users, technical resources, and suppliers.
- Developing molten nitrate salt test loop for final product demonstration.

### **Heat Exchanger Development Lead, Brayton Energy, LLC | 01.2012 – present**

Oversee design, build, and test of high temperature heat exchangers (HEX) for gas turbine based vehicles and stationary power generation.

#### Key Achievements:

- Delivered over 15 unique contract HEX systems, totaling over \$3M, which met performance metrics.
- Commissioned an industry first gas turbine powered hybrid-electric Class 8 truck partnering with a leading heavy truck manufacturer.
- Realized 20% process cost reduction over previous product generation through implementing pivotal product architecture advancement.
- Developed elevated temperature flow test to tease out dimensionless parameters of HEX extended surfaces.
- Designed and implemented electromechanical production tooling and processes, including automated welding system with demonstrated 3x throughput improvement over existing system.
- Drive equipment purchases and process improvement through data driven cost analyses and supplier relations.

### **HEX Pilot Production Facility, Brayton Energy, LLC | 08.2014 – 8.2015**

Developed prototypical HEX into commercial product through streamlining design, advancing manufacturing methods, and organizing supply chain.

#### Key Achievements:

- Delivered first 10 units demonstrating 50% production cost reduction using recommended architecture and advanced manufacturing practices.
- Established relationships with suppliers and managed development of critical processing techniques including sheet metal forming, fin gear rolling, vacuum furnace brazing, EDM, and CNC machining.
- Supported technology transfer to client and managed continued support through product launch.

### **Food Waste Anaerobic Digestion System, Feed Resource Recovery, Inc. | 02.2008 – 09.2008**

Developed automated anaerobic digestion system to process 250 kg/day food waste to produce biogas and fertilizer.

#### Key Achievements:

- Upheld contract to process all food waste of a major regional supermarket with first demonstration unit.
- Helped secure critical funding after demonstrating sustained biogas to electric conversion to key investors.
- Designed and implemented high reliability systems for material handling and process monitoring available for 24/7 remote operation.
- Process and technology developed implemented in the Kroger Recovery System in Los Angeles, CA.