Taylor Kunke

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Experience

- **NuScale Power** — Corvallis, Oregon

  Mechanical Engineer II/III — *July 2020 - Present*

  - Designed and procured a 1:10 scale model of a novel microreactor concept designed to utilize liquid metal working fluid with sodium-cooled heat pipes. Supported manufacturing efforts to ensure a high quality product for use in investor presentations.
  - Led comprehensive, preliminary design review of the NuScale Power Module which incorporated multi-disciplinary assessment of design readiness and missing scope identification
  - Redesigned the decay heat removal condenser to mitigate fabricability, inspection, and analysis/qualfication concerns.
  - Performed initial ANSYS modeling and analysis of redesigned decay heat removal condenser for deadweight, seismic, and thermal loadings.
  - Prepared ASME BPVC Section III design specification for decay heat removal condenser and assisted with review of the NuScale Pipe Rupture Hazards Analysis report.
  - Spearheaded engineering involvement with NX CAD modeling to invoke ownership of designs. Organized training and developed NXCustom configuration to interface with PLM integration tool.
  - Collaborated with multi-disciplinary subject matter experts to develop BOM-centric configuration control strategy focused on efficiency, ease-of-use, and productivity
  - Performed ASME Section III piping analysis for Class 3 piping systems. Iterated design drawings and external inputs to the calculations to demonstrate design acceptability per code rules.
  - Supported the licensing organization with incorporation of equipment specifications and design details into NuScale SDA, which resulted in an on-time and on-budget submittal to the Nuclear Regulatory Commission.

  Summer Intern — *May - August, 2012, 2013, 2015*

  - Analyzed proprietary testing data to assess NuScale helical coil steam generator hydraulic performance.
  - Developed an ANSYS substructure vibrational model of NuScale customized helical coil steam generator.
  - Simulated ANSYS reactor building response to seismic excitation. Quantitatively analyzed various techniques to further improve seismic robustness against postulated earthquake loads.

- **Space Exploration Technologies** — Hawthorne, California

  Test Automation Engineer I/II — *August 2017 - July 2020*

  - Responsible for the design, integration, and validation of multi-disciplinary component testing hardware for flight-like acceptance, development, and qualification testing programs.
  - Designed and constructed high flow, thermally conditioned pressurized helium test facility for state-of-the-art rocket stage vent valves, enabling cost savings of over $500,000 annually.
  - Collaborated with external suppliers to procure high quality COTS solutions to ground support testing equipment.
  - Investigated Dragon 2 in-flight abort static fire anomaly, leading a team of technicians towards the rapid diagnosis of system-related design flaw which guided efforts in system redesign.
  - Analytically and experimentally evaluated heat transfer performance in heating and cooling applications, utilizing liquid nitrogen and thermal oil heat transfer fluids.
  - Supported ground hardware teams with analysis and design of systems to meet strict flight requirements for testing while ensuring development programs could advance at the required pace.
  - Designed and commissioned a fully-automated, 20 ksi pressure system to safely and efficiently test Raptor and Starship flight hardware with goal of Starship orbital flights in 2020.

- **Georgia Institute of Technology - Sustainable Thermal Systems Lab** Atlanta, Georgia
  Graduate Research Assistant *August 2015 - July 2017*
  - Designed an air-coupled condenser wind tunnel test facility to study the impacts of dynamically unstable oscillating reeds on air-side heat transfer performance.
  - Procured air-coupled condenser representative test section and generated testing procedures to evaluate heat transfer enhancement and pressure drop penalty associated with novel reed design.
  - Wrote a bespoke heat transfer/pressure drop analysis code to assess overall power plant efficiency improvement. Incorporated empirical data from test facility into the code for the purposes of economic and environmental implications.

  Undergraduate Research Assistant *May 2014 - August 2014*
  - Designed and constructed pin-fin heat exchanger test facility to study effects of pin geometry on pressure drop and mass transfer for implementation in absorption refrigeration systems.
  - Investigated flow regime development in pin-fin geometry using high-speed visualization equipment and MATLAB video tools.
  - Developed segmented air-cooled condenser coupled heat transfer, fluid mechanics, and thermodynamics design code in Engineering Equation Solver (EES).

Education

- **Georgia Institute of Technology** Atlanta, Georgia
  Master of Science in Mechanical Engineering *August 2015 – July 2017*
  - 3.71 GPA. Presidential Fellowship recipient.
- **Gonzaga University** Spokane, Washington
  Bachelor of Science in Mechanical Engineering, Summa Cum Laude *August 2011 – May 2015*
  - GPA: 3.93. President's List recognition for eight semesters. Presidential Scholarship recipient. Tau Beta Pi member.

Core Competencies

- **Certifications**: EIT (Washington)
- **Mechanical Design**: NX, SolidWorks, DesignModeler, SpaceClaim
- **Mechanical Analysis**: ANSYS Workbench/Mechanical, AutoPIPE, EES
- **Programming**: NXOpen, git, APDL, Python, Matlab, MathCAD, LabView
- **Industrial Code Experience**: ASME BPVC, Section III (2017), ASME Y14.5 (2018), USAF TO 00-25-223 (2017)

Publications

Taylor Kunke. "Experimental investigation of air-cooled condensers". In: *Georgia Tech Theses and Dissertations* (2017).

Jennifer Lin et al. "Improving air-side heat transfer performance in air-cooled power plant condensers". In: *Applied Thermal Engineering* 170 (2020), p. 114913. ISSN: 1359-4311.

Allison J. Mahvi et al. "Enhanced power plant air-cooled condensers using auto-fluttering reeds". In: *Applied Thermal Engineering* 193 (2021), p. 116956. ISSN: 1359-4311.