



## Senior Researcher

The Equity Engineering Group, Inc. (E<sup>2</sup>G) is an employee-owned consulting company that provides specialty engineering services for the asset-integrity of aging infrastructure. E<sup>2</sup>G develops technologies that improve reliability and profitability by managing risk, maximizing equipment availability, and controlling costs. The E<sup>2</sup>G approach supplies plant managers and operators with the tools and guidance they need to achieve optimal Life Cycle Management (LCM) of their facilities and operations.

E<sup>2</sup>G pioneered the development of Fitness-for-Service (FFS) and Risk-Based Inspection (RBI) standards, the two most essential elements of LCM, for the refining, petrochemical, and chemical industries. E<sup>2</sup>G's flagship software product, PlantManager, is the de facto enterprise-level implementation of this technology, and for nearly ten years, PlantManager has been deployed worldwide at many of the most successful corporations and facilities in these industries.

The Applied Research and Development Team (ARDT) at E<sup>2</sup>G is principally responsible for ensuring that the engineering methods and technology behind E<sup>2</sup>G's consulting services and software products are always the best in our industry. This requires ongoing research and development of new and improved methods for predicting the degradation of equipment from all possible damage mechanisms such as cracking, corrosion, fatigue and creep, to name just a few. ARDT then turns this research into reality by creating professional software products that our clients use to solve their most difficult problems.

Innovations in internet technology are for the first time allowing complex engineering calculations that were previously tied to desktop computers or compute clusters to be accessible from any laptop, tablet or mobile phone out in the field. The Equity Engineering Cloud (EEC) is a recent initiative by E<sup>2</sup>G to deliver our unique engineering calculations to our clients more conveniently in this way by taking advantage of these recent advances. This is achieved by integrating recent advances in cloud computing (MS Azure, AWS, Google Cloud) with the latest interactive user interfaces that modern web browsers support (React, Angular 2). The ARDT team brought this technology from conception to reality in just over a year and is continuing to add new functionality and tools to this environment every day.

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Due to the rapid expansion of this effort, the ARDT at E<sup>2</sup>G is seeking another **Senior Researcher** to join our team. This new team member will be responsible not only for researching and developing new techniques and methods for solving the most difficult engineering problems but also for turning these solutions into usable software products delivered through the EEC.

A successful candidate should demonstrate past success at solving complex problems, both independently and in a team environment, and have:

- An advanced degree (PhD or Masters) in engineering, science, applied mathematics, computer science or related fields
- Experience with scientific computing and mathematical model development, including knowledge of standard algorithms for numerical analysis
- Demonstrated mathematical and computational problem solving ability, including the development of custom software solutions
- Scientific programming experience in languages such as Python, FORTRAN, C++, C#, etc.
- Web development skills using React, Node.js, Angular, Javascript, HTML, CSS, etc.
- Strong communication skills, including prior teaching experience of complex technical subject matter
- Strong technical writing skills and experience writing journal quality publications
- Project management skills involving the development, management and documentation of complex projects
- A proven ability to analyze and solve problems critically and creatively
- A willingness to travel (including international destinations)

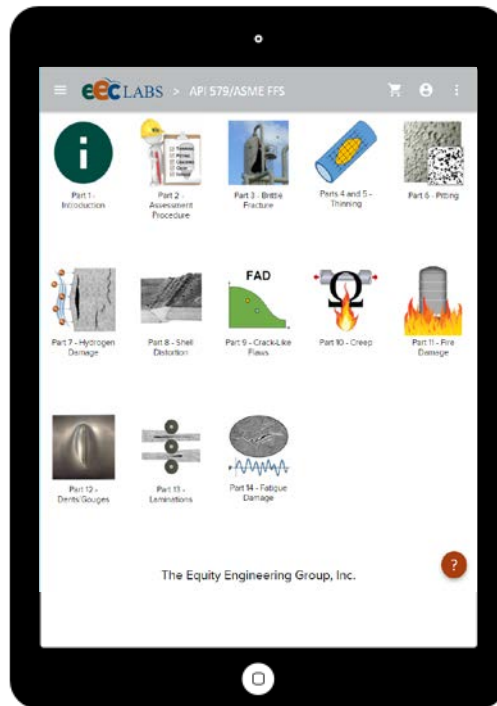
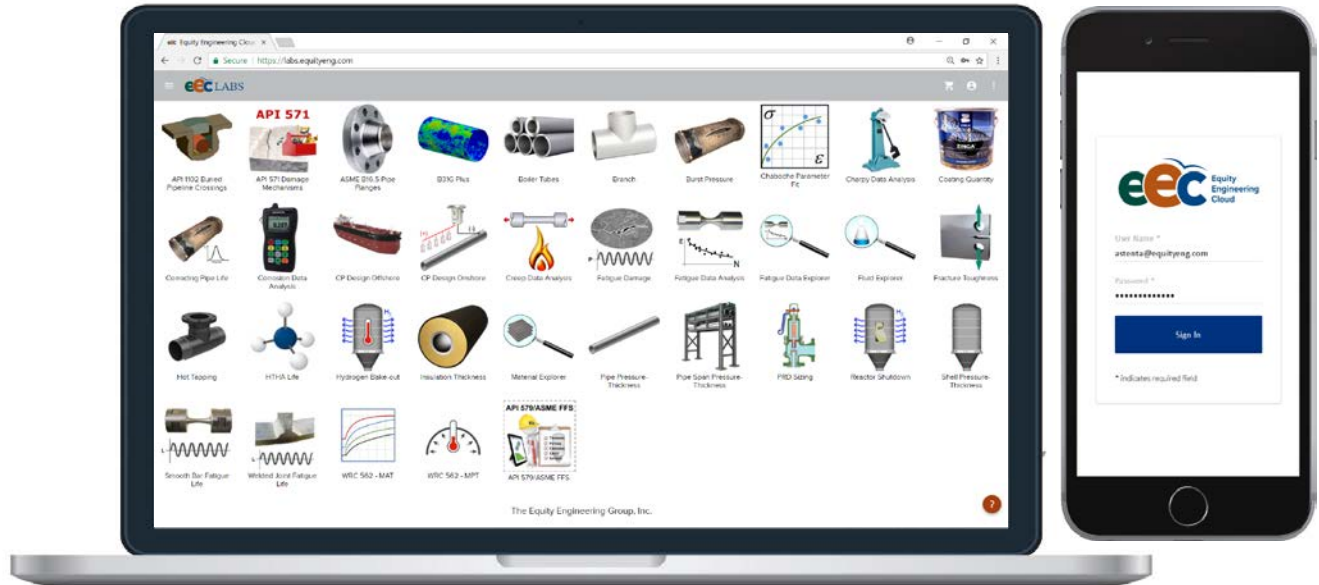
A familiarity with the following is also helpful, but any gaps will be filled by on the job training.

- Damage mechanisms such as fracture, fatigue, corrosion, creep and creep-fatigue – physical foundations as well as mathematical models for predicting their evolution
- Metallurgy and corrosion
- Finite Element Analysis (FEA), Boundary Element Methods (BEM) and other large scale numerical methods for solving time-dependent, nonlinear partial differential equations
- Nonlinear stress analysis and nonlinear material modeling, particularly for the purpose of predicting damage evolution and failure
- Stochastic solution methods such as Bayes Networks, Monte-Carlo simulation, Markov Chain modeling, inverse analysis, etc.

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- ABAQUS, ANSYS or equivalent solid mechanics software packages
- Heat transfer and fluid mechanics including numerical solution methods such as Computational Fluid Dynamics (CFD)



**The Equity Engineering Cloud (EEC) running on a laptop, tablet and mobile phone**