Megen F. Maginot, Ph.D.

Senior Consultant

Dr. Megen Maginot is a Senior Consultant in the Metallurgy practice at Engineering Systems Inc. (ESi).

Dr. Maginot specializes in oil and gas systems maintenance, integrity, and regulatory compliance with a background in developing field testing and sampling protocols, component failure analysis, material fatigue, root cause analysis, in-line-inspections (ILI), metallurgical materials selection, and oil and gas production chemistry.

Dr. Maginot has expertise in oil and gas operations including onshore shale wells and well pads, pumping and compression stations, pipelines, refineries, and tank farms. Notable projects have included the qualification of novel production chemistries, water and sediment handling systems, release incident investigations, development of integrity plans, design and construction of pigging facilities, well pad drilling and regulatory design consideration, and refinery turnaround support.

Dr. Maginot has demonstrated commitment to the broader scientific community throughout her career. Her research has been published in peer-reviewed scientific journals and presented at prestigious technical conferences. In addition to her research contributions, Dr. Maginot is an active member of the Society of Women Engineers and the Association for Materials Protection and Performance.

Education

- Ph.D., Materials Science and Engineering, University of Texas-Arlington, 2014
- B.S., Chemical Engineering, Rose-Hulman Institute of Technology, 2010Xxx

Contact Information

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ESi Aurora

4215 Campus Drive
Aurora, IL 60504

Areas of Specialization

- Failure Analysis
- Oil and Gas Pipelines
- Corrosion Engineering
- Process Evaluation
- Root Cause Analysis
- Fracture Characterization
- Regulatory Compliance
- Integrity Management

Licenses & Certifications

- Cathodic Protection Technician/CP2, Association for Materials Protection and Performance, 2024
- Latent Cause Analysis, Petroskills, 2014
- Relief Valve Selection and Sizing, Pentair, 2015

Positions Held

- **Engineering Systems Inc.,** Aurora, Illinois
  Senior Consultant, 2024 - Present
- **BP America, Inc., Chicago, Illinois**
  Pipeline Maintenance Engineer, 2022-2024
- **Conoco Phillips, Inc., Houston, Texas**
  Optimization Engineer, 2017-2018
  Corrosion Engineer, 2015-2017
  Field Project Engineer, 2014-2015
- **University of Texas-Arlington, Arlington, Texas**
  Graduate Research Assistant, 2010-2014
  Graduate Teaching Assistant, 2012-2014
- **Baylor College of Dentistry, Dallas, Texas**
  Graduate Research Assistant, Summer 2012

Professional Affiliations/Honors

- **Society of Women Engineers (SWE)**
  Member
- **The Association for Materials Protection and Performance (AMPP)**
  Member

Project Experience

Investigations

Oil and Gas Assets – Upstream, Downstream, and Midstream

- Root cause analysis and material testing of mis-stamped 316L/304 needle valves in NACE MR0175 service
- Unplanned release investigation for a shale well due to overpressure event involving pilot check valve and hydrate formation
- 3rd party damage/line strike and ASME B31.4 compliant repair

- Offset hydraulic fracturing and associated production loss and equipment failure

Economic Analysis

- API 653 tank inspection repair scope cost analysis for a carbon steel above ground storage tank
- ILI dig and repair cost analysis for pipelines subject to 49 CFR Part 192 and 49 CFR Part 195
- Preventative maintenance program optimization for sweetening units and dehydrators
- Predictive cash flow system for 11 onshore rig drilling program

Metallurgical Assessments

- Failure analysis of naval brass C46500 ball valves used in residential and light industrial plumbing
- Analysis of material properties for carburized aviation components
- ASTM G59 corrosion rate and EIS analyses

Design and Operational Experience

- Design of ASME B31.3 pump stations and pigging facilities as well as 40 CFR 60 Subpart OOOO compliant well sites
- Cathodic protection system for 1970-fabricated carbon steel pipeline
- Pneumatic pump and dispersion tip fouling redesigns for chemical delivery system
- Conducted various asset lifecycle compliance processes including Process Hazard Analyses (PHA), Management of Change (MOC), Job Safety Analyses (JSA), Pre-Startup Safety Reviews (PSSR)

Publications

- **"Amorphous Silicon Oxide, Amorphous Silicon Oxynitride, and Amorphous Silicon Nitride Thin Films and Uses Thereof"**
  V.G. Varanasi, P.B. Aswath, M. F. Maginot, and N.V. Lavrik, Patent No. US20210138120A1 (2020)
- **"Role of hydrogen and nitrogen on the surface chemical structure of bioactive amorphous silicon oxynitride films"**
  V. G. Varanasi, A. Ilyas, M. F. Velten, M. F., A. Shah, W.A. Lanford, and P.B. Aswath, *The Journal of Physical Chemistry B*, 121(38), 8991-9005 (2017)
- **"The in vivo role of DMP-1 and serum phosphate on bone mineral composition"**
  M. Maginot, S. Lin, Y. Liu, B. Yuan, J. Q. Feng, and P.B. Aswath, Bone, 81, 602-613 (2015)
- **"Human periosteum cell osteogenic differentiation enhanced by ionic silicon release from porous amorphous silica fibrous scaffolds"**
  T. Odatsu, T. Azimaie, M. F. Velten, M. Vu, M. B. Lyles, H. K. Kim, ... & V. G. Varanasi, *Journal of Biomedical Materials Research Part A*, 103(8), 2797-2806 (2015)

- **“Combinatorial effect of Si4+, Ca2+, and Mg2+ released from bioactive glasses on osteoblast osteocalcin expression and biomineralization”**
  N. S. Tousi, M. F. Velten, T. J. Bishop, K. K. Leong, N. S. Barkhordar, G. W. Marshall, ... and V. G. Varanasi, Materials Science and Engineering: C, 33(5), 2757-2765 (2013)

Presentations

- **“Aging Assets, Including Wells and Renewables”**
  M. Maginot, Panelist, Energy Insurance Americas Conference, Houston, TX, November 11, 2025.
- **“Chemical Changes in DMP1-null Murine Bone & Silica Based PECVD Coatings for Titanium Implant Osseoapplications”**
  M. Maginot, doctoral dissertation presented at U. of Texas-Arlington (2014)
- **“PECVD SiOx Accelerates Hydroxyapatite Surface Formation for Enhanced Early Osteogenic Differentiation”**
  M. Velten, T. Odatsu, P. B. Aswath, N. Kamiya, V. G. Varanasi, presented at Materials Science and Technology ’13 Conference Proceedings 2013
- **“XANES Analysis of Mineralized Tissue in DMP1 Knockout Model”**
  M. F. Velten, P. B. Aswath, P.C. Dechow, J. Q. Feng, presented at the IADR/AADR/CADR General Session, Seattle, Washington 2013
- **“Combinatorial and Synergistic Influence of Materials on Biological Processes”**
  M. Velten, N. Saffarian-Tousi, V. G. Varanasi, presented at Biomaterials Interest Group, Arlington, TX, 2012