

PROFESSIONAL SUMMARY

Energy systems risk and reliability leader with 16+ years of experience managing, leading, and developing analytics, decision-support tools, and risk assessment methodologies for power grids and complex energy infrastructure. Current Pacific Gas & Electric Company (PG&E) risk and analytics analyst (Principal); previously served as Senior Advisor at Southern California Edison (SCE) and Director of the Energy System Resilience Group at Garrick Institute for Risk Sciences, University of California, Los Angeles (GIRS-UCLA).

Expertise in asset health and lifecycle risk modeling, integrating degradation analysis, failure probability, and consequence assessment to support risk-informed maintenance and capital investment strategies. Proven application of probabilistic risk assessment, Failure mode and effect analysis (FMEA), and predictive analytics to quantify safety, reliability, and outage risks. Experienced in prognostic health monitoring, remaining useful life prediction, and condition-based maintenance to optimize asset performance and intervention timing. Strong background in wildfire and climate resilience modeling, incorporating environmental risk drivers into infrastructure planning. Skilled in developing data-driven analytics and decision-support tools that enhance investment prioritization, portfolio risk visibility, and long-term grid resilience.

Proven ability to lead multidisciplinary teams, translate complex risk insights into practical priorities, and represent technical work through Risk Management Society (RIMS), Reliability & Maintainability Symposium (RAMS), European Safety & Reliability (ESREL), ASME, and other industry forums.

PROFESSIONAL EXPERIENCE

Pacific Gas & Electric Company | Oakland, CA

Risk Modeling and Analytics, Principal, Risk and Compliance | 2026 - Present

- Leading substation risk assessment taskforce

Southern California Edison | Los Angeles, CA

Senior Advisor, Enterprise Risk Management | 2023 - 2026

- Supported cross-functional risk initiatives by translating complex technical findings into clear recommendations for infrastructure planning, risk reduction, and stakeholder decision-making.
- Connected utility-sector priorities with applied research and industry practices in grid resilience, safety, asset condition, risk-informed planning, and technical stakeholder communication.
- Supported Risk Assessment and Mitigation Plan (RAMP) filing activities, including risk assessment, technical documentation, and regulatory response support.
- Reviewed third-party models for asset failure, ignition, and consequence quantification for transmission and distribution lines.
- Developed Python code for a wildfire consequence model that was reviewed by third parties and adopted for wildfire-related decision-making.
- Co-developed multiple white papers in response to California Public Utilities Commission (CPUC) requests and supported responses to CPUC data requests across multiple proceedings and calls.
- Performed annual risk assessments for 15+ operational units, including transmission and distribution, generation, supply chain management, cybersecurity, public safety, contractor safety, and wildfire risk.

Garrick Institute for Risk Sciences, University of California, Los Angeles | Los Angeles, CA

Director, Energy System Resilience | 2019 – 2023

- Led and managed the budget for a 10+ member team focused on wildfire evacuation planning.
- Led a team of 10+ researchers and software developers to develop wildfire risk and resilience assessment methodologies and software tools for California power grid applications.

- Led a 20+ member team, including subcontractors and internal team members, for a \$9M California Energy Commission-funded project evaluating system-level safety and integrity risks associated with targeted hydrogen blending in gas infrastructure.
- Led a 5+ member team, including professors and researchers from multiple universities, in reviewing California power grid risk models developed by a power utility and providing technical feedback.
- Led development of online risk management and decision-support engines to support risk-informed planning, prioritization, and resilience improvement for complex energy infrastructure.

Norwegian Centre for Research-based Innovation | Trondheim, Norway

Postdoctoral Fellow; International Collaborator | 2018 - 2022

- Developed dynamic probabilistic risk assessment methods and accident dynamics simulation tools to support risk-informed decision-making for complex systems.
- Performed FMEA of dynamic positioning systems across reference, computer, propulsion, control, and power components, linking component-level failure mechanisms to system-level risk.
- Reviewed and developed data-driven and principle-based degradation models supporting health monitoring, failure likelihood assessment, and lifecycle decision support.

Sharif Energy Research Institute | Tehran, Iran

Technical Lead; Energy Systems Resilience Team | 2012 - 2018

- Led and managed the budget for a \$4M project focused on prognostic health monitoring, asset health modeling, and lifecycle risk assessment for complex energy systems.
- Supervised and led the development of analytical tools for power plants, heating systems, batteries, solar panels, and fuel cells supporting health monitoring, operation optimization, and degradation-based maintenance planning.
- Supervised graduate work on machine learning for predictive analysis, optimal maintenance scheduling, fault detection and diagnosis, and remaining useful life prediction for industrial and building energy systems.

Middle East Industrial Gas Turbines Company | Tehran, Iran

Design Engineer; Energy Recovery Team | 2010 - 2012

- Designed and developed heat recovery steam generator systems for power plant applications.
- Developed remaining useful life models for components in gas-fired power plants.
- Advanced condition-based maintenance, fault detection, degradation analysis, failure likelihood modeling, consequence assessment, uncertainty quantification, and remaining useful life prediction methods to optimize asset performance and intervention timing.

ACADEMIC EXPERIENCE

University of California, Los Angeles (UCLA) | Los Angeles, CA

Adjunct Professor; Lecturer | 2021 – Present

Coconino Community College | Coconino County, AZ

Assistant Professor | 2020 - 2021

Norwegian University of Science and Technology | Tehran, Iran

Guest Lecturer | 2018 – 2020

Amirkabir University of Technology | Tehran, Iran

Assistant Professor | 2017 - 2018

EDUCATION

Ph.D., **Energy Systems Engineering** - Sharif University of Technology, Tehran, Iran, 2017

M.S., **Energy Systems Engineering** - Sharif University of Technology, Tehran, Iran, 2012

B.S., **Mechanical Engineering** - K.N. Toosi University of Technology, Tehran, Iran, 2010

TECHNICAL TOOLS

Programming: Python, R, SQL, MATLAB, GAMS, EES, SQL

Applications: CAFTA, @Risk, HCL, RapidMiner, SPSS, The Unscrambler, SAPPHIRE, GeNIe, Trilith

PROFESSIONAL LEADERSHIP & INDUSTRY ENGAGEMENT

- Council Member, Standards and Practices Council, The Risk Management Society (RIMS), USA, 2019–Present
- Management Committee Member, Reliability and Maintainability Symposium (RAMS), 2022–Present
- Society Member, Society for Risk Analysis (SRA), 2024–Present
- Fundraising Committee Member, Women in Energy & Environmental Leadership (CWEEL), 2021–2024
- Mentor, Women of Renewable Industries and Sustainable Energy (WRISE), 2019–2020
- Society Member, The Scientific Research Honor Society, Sigma Xi, 2024–Present

SELECTED PUBLICATIONS & PRESENTATIONS

Guest Editor

- “Risk Assessment and Management in Complex Marine Systems”, **Journal of Marine Science and Engineering**, 2022.

Books

- **T. Parhizkar**, T. Stewart, L. Huang, A. Mosleh. (2023) Degradation and Failure Mechanisms of Complex Systems: Principles. In: Garg, H. (eds) *Advances in Reliability, Failure and Risk Analysis*. Springer, Singapore.
- **T. Parhizkar**, J. E. Vinnem, I. B. Utne, “Online Risk Assessment of Complex Automated Maritime Systems, Principles, Modelling and Applications”, Springer, ISBN 987-3-030-88098-9, 2022.
- **T. Parhizkar**, “Long Term Degradation Based Modeling and Optimization Framework”, Book Chapter, IGI Global Publisher, 2017.

Selected Journal Papers

1. F. J. Groen, C. Wang, A. Mosleh, **T. Parhizkar**. (2025). The Hybrid Causal Logic Methodology for Risk Assessment: Quantification Algorithm, **Reliability Engineering & System Safety**, 111519.
2. G. Pierce, L. Dunlap, V. Espinoza, S. Yang, H. Myint, A. Chen, ... C. Thackeray. (2025). Innovation Opportunities for a Resilient LA, self-published.
3. N. Tamascelli, A. Campari, **T. Parhizkar**, N. Paltrinieri. (2024). Artificial Intelligence for Safety and Reliability: A Descriptive, Bibliometric and Interpretative Review on Machine Learning, **Journal of Loss Prevention in the Process Industries**, 90, 105343.
4. T. Parhizkar, M. Brito. (2024). Proceedings of the 1st International Workshop on Energy Transition to Net Zero Energy Reliability, Risk, and Resilience (ETZE R3).
5. R.G. Maidana., **T. Parhizkar**, G. Martin; I. B. Utne. (2023). Dynamic Probabilistic Risk Assessment Scenario Generation with K-Shortest-Paths Planning, **Reliability Engineering & System Safety**, 109725.
6. P. Najafi., O. Kohneipooshi., A. Hedayatnasab., & T. Parhizkar. (2023). Fire-resistance behavior of concrete columns produced with recycled ceramic and silica aggregates: An experimental and numerical approach. **Construction and Building Materials**, 390, 131774.
7. H. Ahrafi, **T. Parhizkar**. (2023). Electricity Sector Resilience in Response to Extreme Weather and Climate-Related Events: Tools and Datasets, **The Electricity Journal**, 36(6), 107290.

8. R.G. Maidana., **T. Parhizkar**, A. Gomola, I.B. Utne, & A. Mosleh. (2022). Supervised dynamic probabilistic risk assessment: Review and comparison of methods. **Reliability Engineering & System Safety**, 108889.
9. H. Nejad, **T. Parhizkar**, A. Mosleh, Automatic Generation of Event Sequence Diagrams for Guiding Simulation Based Dynamic Probabilistic Risk Assessment (SIMPRA) of Complex Systems, **Reliability Engineering and System Safety**, 2021.
10. Y. Hu, **T. Parhizkar**, A. Mosleh, Guided Simulation for Dynamic Probabilistic Risk Assessment of Complex Systems: Concept, Method, and Application, **Reliability Engineering and System Safety**, 2021, 108047.
11. **T. Parhizkar**, J. E. Vinnem, I. B. Utne, A. Mosleh, "Dynamic Probabilistic Risk Assessment of Decision-Making in Emergencies for Complex Systems Case Study: Dynamic Positioning Drilling Unit", **Ocean Engineering**, 2021, 237.
12. S. Hongenboom, **T. Parhizkar**, J. E. Vinnem, "Temporal Decision-Making Factors in Risk Analyses of Dynamic Positioning Operations", **Reliability Engineering and System Safety**, 2021, 207.
13. **T. Parhizkar**, E. Rafieapour, A. Parhizkar, "Evaluation and Improvement of Energy Consumption Prediction Models Using Principal Component Analysis (PCA)-Based Feature Reduction", **Journal of Cleaner Production**, 2021, 279.
14. **T. Parhizkar**, J. E. Vinnem, I. B. Utne, A. Mosleh, "Supervised Dynamic Probabilistic Risk Assessment of Complex Systems, Part 1: General Overview", **Reliability Engineering and System Safety**, 2020, 208.
15. **T. Parhizkar**, J. E. Vinnem, I. B. Utne, A. Mosleh, "Supervised Probabilistic Risk Assessment of Complex Systems, Part 2: Application to Risk-Informed Decision Making, Practice and Results", **Reliability Engineering and System Safety**, 2020, 208.
16. **T. Parhizkar**, J. E. Vinnem, I. B. Utne, "Data Driven Approach to Risk Management and Decision Support for Dynamic Positioning Systems", **Reliability Engineering and System Safety**, 2020, 201.
17. **T. Parhizkar**, F. Aramoun, "Efficient Health Monitoring of Buildings Using Failure Modes and Effects Analysis (FMEA), Case Study: Air Handling Unit (AHU) System", **Journal of Building Engineering**, 2020, 29, 101113.
18. **T. Parhizkar**, F. Aramoun, S. Esbati, Y. Saboohi, "Efficient Performance Monitoring of Building Central Heating System Using Bayesian Network Method", **Journal of Building Engineering**, 2019, 100835.
19. A. F. Sotoodeh, **T. Parhizkar**, M. Mehrgoo, M. Ghazi, M. Amidpour, "Aging Based Design and Operation Optimization of Organic Rankine Cycle Systems", **Energy Conversion and Management**, 2019, 199, 111892.
20. **T. Parhizkar**, S. Balali, A. Mosleh, "An Entropy based Bayesian Network Framework for System Health Monitoring", **Entropy**, 2018, Volume 20, pp. 416.
21. **T. Parhizkar**, S. Hafeznezami, "Degradation based Operational Optimization Model to Improve the Productivity of Energy Systems, Case Study: Solid Oxide Fuel Cell Stacks", **Energy Conversion and Management**, 2018, Volume 158, pp. 81-91.
22. S. Hafeznezami, ..., **T. Parhizkar** & J. Jay, "Remediation of Groundwater Contaminated with Arsenic Through Enhanced Natural Attenuation: Batch and Column Studies", **Water Research**, 2017, 122, 545-556.
23. **T. Parhizkar**, R. Roshandel, A. Mosleh, "Aging based Optimal Scheduling Framework for Power Plants using Equivalent Operating Hour Approach", **Applied Energy**, 2017, Volume 205, pp. 1345-1363.
24. **T. Parhizkar**, R. Roshandel, "Long Term Performance Degradation Analysis and Optimization of Anode Supported Solid Oxide Fuel Cell Stacks", **Energy Conversion and Management**, 2017, Volume 133, pp. 20-30.
25. R. Roshandel, **T. Parhizkar**, "Degradation based Optimization Framework for Long Term Applications of Energy Systems - Case Study: Solid Oxide Fuel Cell Stacks", **Energy**, 2016, Volume 107, pp. 172-181.

26. P. Hanafizadeh, **T. Parhizkar**, A. Nouri Gheimasi, "Analysis of Micro Recuperators in Small Sized Gas Turbines Regarding Manufacturing Potential of Iran", **Energy Equipment and Systems**, 2015, Volume 3, Issue 1.
27. E. Ezzatneshana, M. Arami, **T. Parhizkar**, A. H. Kordkheili, S. Sattari, "Evaluation of Optimum Performance and Economic Analysis of Micro CHP Systems in Different Sectors in Iran", **International Journal of Energy & Technology**, 2014, Volume 6, Issue 4, pp 1-10.
28. **T. Parhizkar**, R. Roshandel, A. Hosseini, "Degradation Impact on Optimal Conditions of PEM Fuel Cell", **Iranian Chemical Engineering Journal**, 2014, Volume 12, 17-28.
29. R. Roshandel, **T. Parhizkar**, "A New Approach to Optimize the Operating Conditions of a Polymer Electrolyte Membrane Fuel Cell Based on Degradation Mechanisms", **Energy Systems**, 2013, Volume 4, Issue 3, pp 219-237.
30. **T. Parhizkar**, R. Roshandel, A. Tahmasebi, "The Impact of Operational Conditions on Degradation Mechanisms in Polymer Electrolyte Membrane Fuel Cells", **Iranian Journal of Energy**, Volume 15, 2012.
31. **T. Parhizkar**, H. Jafarian, Y. Kialashaki, Y. Saboohi, "The Optimum Design of Motorized PV Shade and Its Impact on Energy Flow of a Case Study", **Iranian Journal of Energy**, Volume 15, 2012.

Selected Conferences

1. M. Bavandpour, K. Shamsaei, H. Ebrahimian, **T. Parhizkar**, N. Elhami Khorasani. (2024, December). A Probabilistic Framework for Uncertainty Propagation in Wildfire Risk Assessment, AGU Fall Meeting Abstracts, Vol. 2024, No. 2225, pp. NH21C-2225.
2. F. Di Maio, V. Casucci, **T. Parhizkar**, E. Zio. (2024, November). Simulation-Based Probabilistic Risk Assessment (SIMPRA) of Integrated Road-Power Infrastructures Travelled by EVs and ICVs, 2024 **8th International Conference on System Reliability and Safety (ICSRS)**, pp. 114–119. IEEE.
3. J. B. Arnheim., T. Mortlock., H. Fathima., P. Pataranutaporn., Ahmed, N., A. Tbaileh., & **T. Parhizkar**. (2023, July). Developing a Disaster-Ready Power Grid Agent Through Geophysically-Informed Fault Event Scenarios. In 2023 IEEE Power & Energy Society General Meeting (PESGM) (pp. 1-5). IEEE.
4. G.S.M. Silva., **T. Parhizkar**., H.T. Nguyen., & E.L. Droguett. (2023, January). Quantum-Enhanced Reliability Assessment of Power Networks in Response to Wildfire Events. **2023 Annual Reliability and Maintainability Symposium (RAMS)** (pp. 1-7). IEEE.
5. R. Shirvani, **T. Parhizkar**, A Framework for Resilience Assessment of Electricity Systems, **32nd European Safety and Reliability Conference**, August 2022.
6. F. Fakour, **T. Parhizkar**, R. Ramezani, A. Mosleh, Uncertainty Quantification for Risk and Reliability Analysis: Application in Building Energy Consumption, **The 68th Annual Reliability and Maintainability Symposium**, January 2022.
7. **T. Parhizkar**, A. Mosleh, Guided Probabilistic Simulation of Complex Systems Toward Rare and Extreme Events, **The 68th Annual Reliability and Maintainability Symposium**, January 2022.
8. R. Maidana, **T. Parhizkar**, I. Utne, A. Mosleh, Towards Risk-based Autonomous Decision-making with Accident Dynamic Simulation, **31st European Safety and Reliability Conference**, September 2021.
9. H. Hosseini, **T. Parhizkar**, A. Mosleh, Simulation Based Probabilistic Risk Assessment (SIMPRA): Risk Based Design, **31st European Safety and Reliability Conference**, September 2021.
10. **T. Parhizkar**, R. Roshandel, A. Mosleh, M. Khoshtinat, "Operation Scheduling Optimization Framework for Gas Turbines Based on System Degradation", The American Society of Mechanical Engineers (ASME) Turbo Expo Conference, Charlotte, NC, USA, 2017.
11. P. Hanafizadeh, **T. Parhizkar**, K. Ghorbanian, "Thermoeconomic Approach for Optimal Design of Gas Turbine Heat Recovery Steam Generator", Proceeding of the 26th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems, ECOS, 2013.
12. E. Ezzatneshan, **T. Parhizkar**, M. Arami, "Techno-Economic Assessment of Micro-CHP in Residential and Commercial Buildings in Tehran", Iranian Society of Mechanical Engineers, 2013.