



Sandia National Laboratories

Sociotechnical Systems Analysis and Design



Enhancing Collaboration Between People and Technology

The Sociotechnical Systems Group understands successful systems rely on analyzing and designing for the interplay between people, organizations, regulations, and technology. Our mission is to optimize both the social and technical aspects of systems to ensure they work effectively in their intended environments.

Key Components of Our Approach

Our work is grounded in a balanced understanding of five essential elements:

1. **Tools and Technologies:** The technical resources that shape how tasks are performed.
2. **Tasks and Activities:** The work processes that arise from using these tools and technologies.
3. **People:** The individuals who interact with the system and each other.
4. **Organizations and Norms:** The rules and structures that govern social interactions and influence how technology is used.
5. **Environmental Factors:** The external conditions that affect how the system operates

How We Can Help

Our expertise can be applied in various ways to support your organization:

- **Strategic Planning and Decision Support:** We help identify key components of your systems and their interactions to guide implementation decisions.
- **Trend and Media Analysis:** Using artificial intelligence and other tools and methods, we analyze social trends/discourse/stakeholder perceptions/public sentiment at scale and create insightful models that inform your strategies.
- **Stakeholder Analysis and Engagement:** We identify potential customers and their needs to ensure your solutions align with market demands.
- **Use-Case Development:** We capture the expectations and requirements necessary for successful technology deployment.
- **Risk Management and Safety:** We identify gaps in knowledge and systems to help mitigate risks.
- **Techno-Economic Analysis:** We evaluate the interplay between technology and economics to provide actionable insights to support decision-making.

Benefits of Working with Us

By partnering with the Sociotechnical Systems Group, you can expect to:

- **Design systems** that consider social factors from the outset.
- **Enhance the validation process** for systems and products.
- **Create efficient and effective research and development** project lifecycles.
- **Improve human interactions and planning** to facilitate technology readiness and adoption.

Let us help you bring technology and people together for a better and more efficient enterprises. Contact us today to learn how we can support your organization.

We work in areas critical to abundant energy production, sustainability, and security

Nuclear Fuel Cycle: Implementing collaboration-based siting, a flexible and adaptive method to improve public understanding and process design for critical infrastructure, such as spent nuclear fuel storage and power plants. We assist the Department of



Energy's (DOE) Office of Collaboration Based Siting in developing a robust metrics program by collaborating with leadership to define and operationalize key programmatic metrics. Our efforts include evaluating existing information needs, identifying gaps, and proposing new data reporting methods, ultimately collecting and reporting metrics from five national laboratories and the DOE to enhance strategic planning and data-driven decision-making

Advanced Reactors: Shaping Sandia's Holistic Advanced Reactor Capabilities Center (SHARCC). SHARCC represents the core capabilities and nuclear energy/facility related work of three Sandia programs: Nuclear Energy Fuel Cycle, Nuclear Energy Safety Technologies, and Global Engineered Security Systems. Together, these three programs support a broad range of sponsors and their involvement in SHARCC allows for coordinated leadership of a body of work to more effectively meet national needs.

Grid Modernization: Identifying and engaging the market for emerging decision support technology for microgrid hardening. We are collaborating with technology developers and grid experts to create a microgrid resilience planning tool that helps decision-makers harden microgrids against environmental hazards by identifying and prioritizing risk mitigation alternatives. Our efforts involve analyzing stakeholder networks across various geographies and hazard scenarios to understand their information needs and decision-making processes, ensuring the tool effectively addresses the unique challenges stakeholders encounter in different contexts

Oil and Gas Infrastructure: As partners in the Consortium Advancing Technology for Assessment of Lost Oil and Gas Wells (CATALOG), we are surveying programs that leverage technology to empower non-experts in collecting environmental data, identifying key features that contribute to their success. Our work includes analyzing recruitment and training strategies, uncovering technical and non-technical barriers to technology adoption, and developing actionable recommendations and best practices to enhance CATALOG efforts and ensure that our solutions effectively address stakeholder needs and challenges using technology for identifying lost oil and gas infrastructure.

Knowledge Management: Optimize organizational efficiency, innovation, and decision-making by leveraging the collective knowledge and expertise of the workforce. Our team utilizes workshops, deep dives, critical knowledge mapping, and taxonomy and repository design to capture, retain, and transfer critical knowledge across DOE-NE.

Safety and Security: Assisting expert teams in identifying critical knowledge gaps associated with retaining and developing workforce in R&D in deep geologic repository science and engineering.



Contact

To contact a member of the NEFC Sociotechnical Systems team at Sandia, please email cmmende@sandia.gov.

To learn more about our diverse nuclear energy capabilities and programs, scan the QR code.