TRANSMISSION LINE SITING AND PERMITTING

ISSUE STATEMENT
Transmission line siting is complex and it involves many departments within a utility. A comprehensive understanding of the siting process and issues is essential to acquiring permits in a timely manner. An application for a new line may trigger Federal Energy Regulatory Commission (FERC) or North American Electric Reliability Corporation (NERC) regulations, in addition to state standards and guidelines. The applicant must therefore be aware of all these requirements and demonstrate due diligence in justifying a new line as the best choice when compared to alternatives, such as upgrading or up rating existing lines. Research is needed to address the major challenges involved in the process of siting new lines, and to identify the range of mitigating measures to alleviate potential impacts that may be caused by the new lines.

DRIVERS
New rules, regulations, and public perception issues are driving the need for research on transmission line siting. The public, in particular, has become a more sophisticated stakeholder in the permitting process. Utilities need more information and tools to address regulations and stakeholder concerns to assure the reliability of the transmission system is not jeopardized from the delay of the siting approval process.

Public Perception Drivers
• Public opposition to the siting of new transmission lines: The public is becoming increasingly vocal and sophisticated in the permitting process. So the permitting process is rather one of engaging the public through meetings and education to develop siting consensus.
• Public pressure on federal agencies and state legislatures: Public citizen organizations lobby federal agencies and state legislatures to develop regulations to guide transmission line siting.

Regulatory Drivers
• FERC and NERC: To support the siting of new transmission lines and the upgrading of existing lines, FERC and NERC continue to develop new electrical standards and guidelines requiring strict adherence.

Non-Regulatory Drivers
• Transmission system reliability: Utilities must assure the reliability of the transmission system, including the need to develop additional capacity in a cost and environmentally effective and expeditious manner.

RESULTS IMPLEMENTATION
A comprehensive plan has been developed to address the near- and longer-term research needs to assist utilities in siting new transmission lines and upgrading existing transmission lines.
• Research results are available to participants to help prioritize their options in a cost effective and expeditious manner, and to make objective scientific information available to their customers on a timely basis.
• Results are available to other stakeholders, including federal and state regulatory agencies, to inform the appropriate rule-making activities; information also is available to nongovernmental agencies as well as to the public.

A body of scientific research is being transferred to industry and the public in several forms:
• EPRI approaches and case studies are used by utility companies to aid in the siting of new transmission lines and upgrade existing transmission lines, such as the EPRI-GTC Siting Manual.
• Workshops are conducted to gain an understanding of research needs and transfer information.
• EPRI’s transfer of knowledge emphasizes cross departmental coordination within a power utility to assure that all factors (electrical, engineering and environmental) are shared and addressed adequately.

PLAN
Over the next 5 years, transmission line siting research will focus on addressing the needs presented by evolving regulations and continuing input from public citizen organizations. Regulators and the public must be satisfied that a proposed transmission line or upgrade to an existing line is required, that concerns have been addressed and impacts have been mitigated. Research includes the following:

**New Transmission Line Siting**
• Explain the technical basis for current various regulatory requirements that must be met in justifying and siting new transmission lines and provide outreach to various stakeholders.
• Keep abreast of regulatory developments and provide comments on proposed regulations, as appropriate, based on EPRI research.

**Alternatives to New Transmission Line Siting**
• Evaluate alternatives to new transmission line siting, such as operating voltage/current capacity, new circuits and use of underground cables will be undertaken to support decision-making.
• For alternatives, provide an objective and clear evaluation of capital investment and costs, electrical losses and maintenance, reliability, environmental effects, etc. to support decision-making.

**New Methodologies/Technologies as Related to Regulatory Requirements**
• There are new methodologies developed through EPRI research that can be applied to exiting power systems to increase transmission capacities instead of building a new line. These methodologies require evaluation in order to justify an up rating of a transmission line and satisfy regulatory requirements.

**Case Studies**
• Present and evaluate utility case studies at workshops as a learning tool.

**Reporting**
• A guide for successfully siting new lines will be prepared. The guide will provide information on transmission line siting requirements and process; methodologies that are used to evaluate options in justifying new lines and, a siting manual that can be shared among various departments within a power company providing insight into the complete transmission line siting process. Lessons learned from past siting cases will be incorporated into the guide.
• A guide or technical report on new methodologies/technologies for up rating existing transmission line to assist utilities in addressing technical and regulatory issues.

**RISK**
As the U.S. population shifts geographically and continues to grow and remote renewable generation (such as wind) is built, an expansion of the transmission system is needed to satisfy demand and assure system reliability. Continued objective and independent research is necessary to support development of the transmission system to preclude failure. Regulatory oversight at the federal and state levels and continuing public pressure require an all inclusive process to assure developmental success. Any transmission siting decision must be based on minimizing societal and environmental impacts, while also being cost-effective from an engineering and electrical standpoint.
The risk of not having this research is delays in acquiring right-of-ways for new lines or upgrading existing lines. The consequences are lowering the reliability of power systems and increasing power interruptions to customers.
Transmission Siting and Permitting Roadmap

**2013**
- Evolving FERC and NERC transmission siting requirements (continuous - no projected end)
- Evolving public service commissions requirements (continuous - no projected end)
- Developing state regulations requiring public involvement in the transmission siting process (continuous - no projected end)
- Environmental groups concerns about the potential environmental impact of new transmission development, particularly for listed species (continuous - no projected end)
- Pressure from community groups and individuals to make the transmission siting process more transparent (continuous - no projected end)
- Regulatory: Keep abreast of regulatory developments
- New Transmission Siting: Provide technical support to utility to facilitate siting
- Alternatives to New Transmission Line Siting: Provide information and evaluate alternatives to new line siting, such as operating voltage/current capacity and new circuits
- Case Studies: Use case studies of transmission siting and upgrading as an educational tool

**2014**
- Utility response to federal and state requirements (continuous - no projected end)