

# Technology Innovation Project



Project Brief

## TIP 417: CEATI – Power System Planning and Operations (PSPO)

### Context

The electrical industry is facing unprecedented challenges on many different fronts, from the push for penetration of renewables to the effective planning and operations of the electrical grid with variable energy resources. The fast-paced implementation of smart grid technologies also present challenges for the analysis and effective management of big data.

### Topics & Issues

1. Advances in Power System Modelling and Analysis
2. The Use of New Technologies and Tools in the Power System
3. Expanding the Role of HVDC Transmission
4. Integrating Renewable Generation Sources and Storage Technologies

### Focus Areas

#### *Planning and Operations Practices*

- Planning for Short Circuit Contributions from Wind and Solar
- Effective Planning Techniques for Evolving Smart Grid and Renewables Integration
- Peak Shaving Techniques and Practices
- HVDC Planning Solutions
- Smart Grid for Transmission - Planning and Implications

#### *Means to Increase Capacity and Security*

- Effective Use of Energy Storage Devices
- Dynamic Loading of Transmission Lines
- Exploration of Means to Reduce Line Outages due to Short Circuits
- System Adequacy
- Investigation of the Impacts and Mitigation Techniques Relating to Geomagnetic Disturbances

#### *Modern Tools and Techniques*

- Effective Utilization of Demand-Response Resources
- Tools and Techniques for Increased Uncertainty in Load Generation Patterns
- Wide System Monitoring to Enhance System Behaviour Tracking
- Power Flow Controllers: Economic Impacts

#### *Market Operations*

- Restructuring and Competitive Environments
- Price Elasticity of Power Demand

### Annual Activities

- Annual Conference or Workshop
- 2 Face-to-Face Meetings
- Training Webinars
- Conference Calls
- On-Demand Information Exchange
- Collaborative Project Development

### Why It Matters

Membership provides a forum to network with industry peers and share of common concerns related to the Topics and Issues outlined in this interest group.

By comparing best practices and sharing problem solving methods with the membership, BPA develops an independent perspective of its performance and enables a culture of continuous improvement.

Finally, collaboration leverages BPA's investment by providing access to results from many large projects that BPA could not support alone.

### Goals and Objectives

BPA's goal for CEATI PSPO membership is to leverage member's power system expertise, tools, and leading edge technology through collaboration across a wide community of knowledgeable participants including utilities, independent power producers, government and other agencies.

### About CEATI

The Centre for Energy Advancement through Technological Innovation (CEATI) is a user-driven organization committed to providing technology solutions to its electrical utility participants. Together, they collaborate and act jointly to advance the industry through sharing and developing practical and applicable knowledge.

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**Project Start Date:** January 2020  
**Project End Date:** December 2020

### Links

[www.ceati.com/PSPO](http://www.ceati.com/PSPO)

### Current PSPO Projects

#### **T203700 3140 Converting an AC Transmission Line to DC**

This project summarizes the technical and other considerations that must be considered when developing a project to convert an existing high voltage AC transmission line to HVDC.

#### **T193700 3139 Energy Storage as a Transmission Asset**

This project investigates the feasibility of utilizing technologies primarily installed to provide energy storage to address other transmission needs such as congestion through a flowgate, reverse power flow through a transformer, voltage regulation, etc.

#### **T193700 3138 Planning and Operations with a Large Percentage of Renewable Generation**

This project will review and update the work carried out in the 2007-08 timeframe on planning and operating power systems with a large percentage of renewable generation on-line.

### Leverage

BPA's contributions are leveraged at a ratio of 7:1. This annual membership provides BPA access to reports and results of PSPO projects.

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