

# Technology Innovation Project



Project Brief

## TIP 429: CEATI – Protection and Control Program (PCP)

### Context

Protective relays and their associated systems are devices deployed throughout the power system for the purpose of sensing abnormal electrical or system components operating conditions and isolating, usually in conjunction with circuit breakers, any abnormal conditions resulting from natural events, physical accidents, equipment failure or operation due to human error. A reliable, selective and high-speed isolation is necessary to mitigate damage to vital and expensive system equipment, reduce the risk of serious danger to humans and to maintain power system stability and acceptable power quality. These stringent requirements, with high potential consequences, make it imperative that protection systems be designed and maintained to perform their functions with a very high degree of dependability and security.

### Focus Areas

The core mission of the Protection and Control Program is to support participating member utilities with their protection and control (P&C) needs and assist them in solving their P&C challenges. The following areas have been identified as important to PCP's mission:

- P&C Management: Assets, Strategies, Planning, Training and Processes
- Testing, Maintenance and Commissioning
- Designs, Standards, Philosophies and Good Utility Practices
- Automation/Digital stations/Smart systems
- New and Emerging protection Technologies
- P&C Compliance, Cyber Security and Case Studies

BPA intends to participate in the PCP's Digital Substation Working Group (DSWG). Digital transformation is taking place in the industry as P&C systems for substations are migrating from standalone to integrated systems via digital communication media. This is a highly complex discipline and the transformation from a legacy to a digital approach is addressed through this working group. Relevant aspects include:

- Training and knowledge transfer of IEC 61850 standards and digital station design

### Why It Matters

While many existing utility assets, including P&C systems, are approaching their end of life and must be replaced, more effective monitoring and maintenance techniques are essential to ensure the reliability of supply, sustainability of operations and affordability of electric service for customers is not compromised.

BPA's interests in the PCP Program include the training and learning for P&C engineers in commissioning and design, as described in PCP projects 3906 and 3907 (see below).

### Goals and Objectives

The main objective of the Protection & Control Program is to bring industry professionals together to identify, discuss, and develop solutions to common as well as new and emerging issues by creating a networking opportunity for utilities concerned with the application, optimization, and innovative use of protection and control technologies in their power systems.

The PCP also serves as a forum for identifying knowledge gaps and providing guidance on future research and technology development initiatives as well as provides a platform for collaborative research projects.

### Deliverables

Project 3906 listed below develops guidance to support compliance with mandatory NERC CIP standards. Specifically, this guide addresses processes, as well as direction, to comply with CIP-007 R2.1-2.3. Project 3907 will produce a Protection self-training module that facilitates knowledge transfer via the use of a structured set of self-study program. Membership in the DSWG also provides training and knowledge transfer through participation, seminars and interaction with other industry members.



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**Project Start Date:** January, 2020

**Project End Date:** December, 2021

### Links

[CEATI Protection & Control](#)

### Leverage

BPA's contributions are leveraged at a ratio of 8:1. This annual membership provides BPA access to reports and results of CEATI projects.

### For More Information Contact:

**Technology Innovation Program Manager:**

Cynthia Polsky  
[chpolsky@bpa.gov](mailto:chpolsky@bpa.gov)

**BPA Technical Representative:**

Aaron Martin, Electrical Engineer  
[akmartin@bpa.gov](mailto:akmartin@bpa.gov)

**CEATI Program Contact**

Lorie Ghazarian  
[lorie.ghazarian@ceati.com](mailto:lorie.ghazarian@ceati.com)

### CEATI PCP Program Research Portfolio - 2021

The following projects will likely provide value to BPA:

**Project T203700-3906: Development of a Protection Standards Framework Guide**

Development of a generic guide that is intended to be used by project sponsors as an aid in developing their own company specific set of protection standards.

The project will produce a guide for their development of such standards and, will contain what and why information that a typical protection application standard should contain.

**Project T203700-3907: Development of Protection Self-Training Modules**

Development of the first of several self-training protection modules, this one specifically being for a Protection Fundamentals Module. This module as well as future developed self-training modules will facilitate the knowledge transfer via the use of a structured set of self-study program.