



## Thematic Grouping of T&D Projects

Febraury 2017

### **A) Condition Monitoring**

- T-1: Assessing Deterioration of ADSS Fiber Optic Cables Due to Corona Discharge
- T-2: Development of a Graphic User Interface for an Overhead Conductor Sag Instrument
- T-3: Simulation of Top-Oil Temperature for Transformers
- T-4: Electric Transmission Line Insulator Flashover Prediction System
- T-5: Intelligent Transformer Monitoring System Utilizing Neuro-Fuzzy Technique Approach
- T-6: Condition Monitoring and Maintenance Strategies for In-Service Nonceramic Insulators (NCI), Underground Cables and Transformers
- T-15: Differential GPS Measurement of Overhead Conductor Sag: Software Implementation
- T-19: Automated Circuit Breaker Monitoring
- T-20: Intelligent Transformer Monitoring System Utilizing Neuro-Fuzzy Technique Approach
- T-26G: Prediction of Flashover Voltage of Insulators Using Low Voltage Surface Resistance Measurement

### **B) Transmission and Distribution Assets**

- T-14: Evaluation of Critical Components of Nonceramic Insulators (NCI) In-Service: Role of Defective Interfaces
- T-23: A Novel Approach for Prioritizing Maintenance of Underground Cables
- T-25: Transformer Overloading and Assessment of Loss-of-Life for Liquid-Filled Transformers
- T-33: Characterization of Composite Cores for High Temperature-Low Sag (HTLS) Conductors
- T-42: Evaluation of Epoxy Nanocomposites for High Voltage Insulation
- T-46G: Evaluation of Station Post Porcelain Insulators with Room Temperature Vulcanized (RTV) Silicone Rubber Coatings
- T-47: Making the Economic Case for Innovative HTLS Overhead Conductors

### **C) Asset Management, Fault and Outage Detection and Reliability Centered Maintenance**

- T-10: Accurate Fault Location in Transmission Networks Using Modeling, Simulation and Limited Field Recorded Data
- T-11: Wireless Communications in Substations (Part I)
- T-11: Mobile Agent Applications for Power Apparatus Monitoring and Maintenance (Part II)

T-17: Enhanced Reliability of Power System Operation Using Advanced Algorithms and IEDs (Part II): Detecting Circuit Breaker Status Errors in Substations  
T-17: Enhanced Reliability of Power System Operation Using Advanced Algorithms and IEDs (Part I): Substation Automation  
T-24: Risk-Based Maintenance Allocation and Scheduling for Bulk Transmission System Equipment  
T-27: Reliability Based Vegetation Management Through Intelligent System Monitoring  
T-28: Satellite Imagery for the Identification of Interference with Overhead Power Lines  
T-32: Optimized Fault Location  
T-36: Integration of Asset and Outage Management Tasks for Distribution Application  
T-41, Part 3: Restoration, State Estimation and Reliability Enhancement  
T-57HI: Life-cycle Management of Mission-Critical Systems through Certification, Commissioning, In-Service Maintenance, Remote Testing, and Risk Assessment  
T-58: Power Electronics to Improve the Performance of Modern Power Systems: Case Study on Partially Rated Solid-State Transformers

### **D) Power Quality**

T-7: Analysis and Design of Power Acceptability Curves for Industrial Loads  
T-12: Distribution System Electromagnetic Modeling and Design for Enhanced Power Quality  
T-16: Voltage Dip Effect on Loads in Electric Power System

### **E) Protection**

T-22: Performance Assessment of Advanced Digital Measurement and Protection Systems (Part 1&2)  
T-29: Digital Protection System Using Optical Instrument Transformers and Digital Relays Interconnected by an IEC 61850-9-2 Digital Process Bus  
T-30: Transient Testing of Protective Relays: Study of Benefits and Methodology  
T-49G: Setting-less Protection  
T-52G: Setting-less Protection: Laboratory Testing  
T-55G: Setting-less Protection (2014 Plan Part I): Centralized Substation Protection  
T-56G: Setting-less Protection (2014 Plan Part II): Field Demonstrations  
T-59G: RTE DSE-Protection Demonstration

### **F) Renewable Resources, Electrical Vehicles, and Storage**

T-8: Investigation of Fuel Cell System Performance and Operation: A Fuel Cell as a Practical Distributed Generator  
T-21: Evaluation of Distributed Electric Energy Storage and Generation  
T-34: Power System Level Impacts of Plug-In Hybrid Vehicles  
T-40: PHEVs as Dynamically Configurable Dispersed Energy Storage  
T-41, Part 2: Impact of Plug-In Hybrid Electric Vehicles on Distribution System Demand Response  
T-44: Distribution System Analysis Tools for Studying High Penetration of PV with Grid Support Features  
T-48: The Economic Case for Bulk Energy Storage in Transmission Systems with High Percentages of Renewable Resources

T-60: Framework to Analyze Interactions between Transmission and Distribution (T&D) Systems with High Distributed Energy Resource (DER) Penetrations

### **G) Sensors**

T-20: Optical Sensor for Transformer Monitoring

T-31: Massively Deployed Sensors

T-35: Comparative Characterization of Parallel Distribution Sensors Under Field Conditions

T-43: Verifying Interoperability and Application Performance of PMUs and PMU-enabled IEDs at the Device and System Level

### **H) Substation Design**

T-37: The 21st Century Substation Design

T-38: Substation of the Future: A Feasibility Study

T-39: Communication Requirements and Integration Options for Smart Grid Deployment

T-41, Part 4: Implications of the Smart Grid Initiative on Distribution Engineering

T-41, Part 1: Characteristics of a Smart Distribution System and Design of Islanded Distributed Resources

### **I) Microgrids**

T-18: Control and Design of Microgrid Components

### **J) Energy Management Systems**

T-45: The Next Generation Energy Management System Design

T-51: Systematic Integration of Large Data Sets for Improved Decision-Making

T-54G: Establishing a Software-Based Real-Time Simulation Platform for a Controls Laboratory for Training, Research and Development, and Experimentation

### **K) Interdependent Infrastructure Systems**

T-50G: The Electricity and Transportation Infrastructure Convergence Infrastructure Convergence

T-53: Reliability Assessment and Modeling of Cyber Enabled Power Systems with Renewable Sources and Energy Storage