



# NEW STRIDES IN ENERGY INNOVATION

through public power's only research and development program

Summer 2018  
Current & Completed Projects



American Public Power Association



# DEED FUNDING OPPORTUNITIES

**T**he American Public Power Association's Demonstration of Energy & Efficiency Developments (DEED) is the only research and demonstration program funded by and for public power utilities. Established in 1980, DEED supports and demonstrates research, funding, and education to improve the operations and services of public power utilities

DEED members may apply for grants up to \$125,000 in funding for innovative utility projects. Grants can be used to improve utilities by increasing efficiency, reducing costs, investigating new technologies, seroffering new services, and improving processes an dpractices to better serve customers. Grant applications are accepted in the spring (deadline Feb 15) and

fall (deadline Aug 15). DEED members may apply for \$4,000 in student internship funding to hire an intern from a local college or university. Student internship application deadlines are Feb 15 and Oct. 15 annually. Learn more and apply at [www.PublicPower.org/DEED](http://www.PublicPower.org/DEED) (look under Funding).

Questions? Contact DEED Program Staff at 202/467-2942 or [DEED@PublicPower.org](mailto:DEED@PublicPower.org).

In this brochure, you'll get an overview of DEED grants and scholarships awarded to help public power utilities increase efficiency, reduce costs, investigate new technologies, offer new services, and improve processes and practices to better serve customers.



# CURRENT PROJECTS

Brief summaries of all DEED current projects are provided here. DEED grantees submit quarterly reports to keep DEED members and staff up to date on their projects. DEED members are invited to review these periodic updates to track the progress of projects and make use of resources that are shared as a project moves toward completion. Information from both current and completed DEED supported projects are posted on the DEED Project Database. Access the DPD from the APPA website at [www.PublicPower.org/DEED](http://www.PublicPower.org/DEED). Questions? Contact [DEED@publicpower.org](mailto:DEED@publicpower.org) or 202-467-2942.

## CYBERSECURITY

### CG-2090

#### **Deployment of Cybersecurity Solutions American Public Power Association, VA; Grant \$50,000**

The American Public Power Association is partnering with Energetics Incorporated to develop and deploy tools for enhancing cybersecurity at member utilities. This project will assist in the deployment and adoption of managed security services and solutions including real-time network monitoring, endpoint security, and vulnerability assessments. This project leverages funding from DEED as well as through a DOE Cooperative Agreement. A Cybersecurity Scorecard is currently available on the Association's website as well as other resources. Final deliverables and reports are expected November 30, 2018.

## TRANSMISSION & DISTRIBUTION; RELIABILITY, THERMAL MICROGRID

### CG-2093

#### **Leveraging Experience from Stanford and EDF to Develop Information and Tools for Thermal Microgrid Feasibility Assessments City of Palo Alto Utilities, CA; Grant \$54,000**

The city of Palo Alto Utilities, in collaboration with Stanford University and EDF Innovation Lab, is using information and tools to support municipal utilities in evaluating the feasibility of deploying thermal microgrids. A thermal microgrid is a district energy system that combines system-level optimized thermal services, distributed generation, heat recovery, and electric power management through smart and distributed communications and control technologies. A white paper on the technology, visual diagram, draft study, and the most recent quarterly report are available on the DEED project database. A final report, toolkit, and final case studies are expected December 31st, 2018.

## TRANSMISSION & DISTRIBUTION, RELIABILITY

### CG-2095

#### **Non-Communicating Automatic Feeder Restoration Kerrville Public Utility Board, TX; Grant \$15,000**

Kerrville Public Utility Board is piloting the implementation of a non-communicating, automatic feeder sectionalizing and restoration scheme based on fault direction, and fault delay. The system is designed to mitigate the delay in restoring power by reducing the number of customers dependent on qualified personnel taking time to travel to the location of the outage. The results of this project will be particularly applicable in both dense service areas with high traffic congestion and remote utilities with service areas far from the headquarter office. The final deliverables and reports are expected June 15th, 2018.

## ENERGY EFFICIENCY & CONSERVATION, ENERGY SERVICES, KEY ACCOUNTS

### CG-2096

#### **Multi-Family Energy Efficiency Pilot Project Lincoln Electric System, NE; Grant \$11,712**

Lincoln Electric System's Multi-Family Energy Efficiency Pilot is measuring the energy savings of installing LED bulbs, low flow faucets, aerators, and shower heads in multi-family apartment dwellings. They have selected two apartment complexes totaling six buildings, two of which are being used as a control group, two for device installation, and two for both device installation and savings tips and education/behavior training. Results will be compared to find out whether the installations and training were effective in increasing energy efficiency and reducing load. View the DPD for the most recent quarterly report and presentation slides. The final deliverables & reports are expected July 1st, 2018.

## PHYSICAL SECURITY

**CG-2097**

### **Substation Security; A Covert Perimeter/Area Monitoring System New York Power Authority, NY; Grant \$65,000**

New York Power Authority and Quantum Technology Sciences are installing a covert perimeter/area monitoring system that will supplement existing physical security provisions at a Substation in Delhi, New York. The system will rely on seismic-acoustic sensing technology that can detect small ground vibrations which it will analyze and categorize as possible security threats. Examples of detectable vibrations are human footsteps, vehicle movement, and gunshot activity. The final deliverables and reports are expected March 1st, 2019.

## WORKFORCE

**CG-2099**

### **Power Career Workshop 101 University of North Carolina, Charlotte, NC; Grant \$41,070**

ElectriCities of North Carolina and Stanly Community College are creating a professional development workshop to provide general information on the energy industry, identify industry jobs that need to be filled, and provide regional educational and training resources to prepare workers to fill those jobs. The workshop will educate, excite, and build confidence in diverse audiences, to foster interest in energy and power careers. The most recent quarterly report is available on the DEED Project Database, along with the Power Career Workshop 101 schedule. The final deliverables and reports are expected December 31st, 2018.

## ENERGY EFFICIENCY, ENERGY SERVICES; KEY ACCOUNTS

**CG-2125**

### **High Efficiency Recycled Water Indirect Evaporative Cooling System Burbank Water and Power, CA; Grant \$50,000**

Burbank Water and Power is teaming up with Bayer HVAC to replace an existing evaporative cooling system, colloquially known as "swamp" cooling, with a new high-volume indirect evaporative cooling system. The system is a Climate Wizard model CW-80 and is capable of supplying air at 14,000 CFM, with a nominal cooling capacity of 22.7 tons. The technology is expected to provide public power sys-

tems with another option to reduce costs and impacts on the environment by reusing system water. The final deliverables and reports are expected February 28th, 2020.

## DISTRIBUTION, RELIABILITY, COMMUNICATIONS AND CONTROL, SCADA

**CG-2126**

### **SEL Fault and Load Transmitter and Receiver System Cuyahoga Falls Electric System, OH; Grant \$125,000**

Cuyahoga Falls Electric System is installing 384 SEL fault and load transmitters on 37 distribution feeders and installing two SEL fault and load receivers on their SCADA Room. The purpose of this project is to read fault and load information from the field and have it displayed on their SCADA system without the need to run wires to the transmitters. The result of this project will be an evaluation on the benefit of the technology and whether it is effective in narrowing the possible range for where a fault is located. The final deliverables and reports are expected October 31st, 2019. A webinar is planned for 2019.

## COMMUNICATIONS AND CUSTOMER CARE, CONSERVATION, LOAD CONTROL

**CG-2127**

### **Peak Load Notification Pilot Fort Collins Utilities, CO; Grant \$18,500**

Fort Collins Utilities is using innovative technology, tools, and outreach to educate and notify customers about how to save on their bills during peak hours. Traditional methods such as email, regular mail, and website postings fall short of the customized communications planned that are hoped to achieve more cost savings for customers. The program will be designed to help customers reduce their energy usage during peak hours, thereby improving utility reliability and customer satisfaction. The new system they are working on utilizes an IFTT (If This Then That) channel to allow end users to easily create custom conditional programs to automate actions and responses based on utility-defined triggers. The final deliverables and reports are expected December 31st, 2019.

## ASSET MANAGEMENT

### CG-2128

#### **Small System Maintenance Manager Massena Electric Department, NY; Grant \$9,900**

Massena Electric Department and Connected Land Inc. are collaborating to create a database that will track assets of utilities and the preventative maintenance routines associated with those assets. The tracker will be divided into three asset categories: substations, vehicles, and building facilities. The system will have the capability to generate work orders to alert management of upcoming or overdue maintenance. Once maintenance is completed and data is entered, reports will be easily generated and retrieved, enabling a variety of reporting types, including maintenance history and total cost of ownership. The Small System Maintenance Manager is expected to be available for utility use by the end of 2018.

## POWER SOURCES, SMART ENERGY USE, GEOTHERMAL

### CG-2129

#### **Downtown Moorhead Community Geothermal System Pilot Project Moorhead Public Service, MN; Grant \$125,000**

Moorhead Public Service is teaming up with Terra Labs, LLC and local businesses to pilot a Community Geothermal System (CGS) as part of Moorhead's downtown revitalization project. The goal of this "efficient electrification" is to reduce CO2 emission levels and collect valuable load data. Currently, geothermal is an underutilized source of clean energy. With this new pilot service, Moorhead will be able to make it affordable for customers to install ground source heat pumps, ultimately saving them money on utility services. The final deliverables and reports are expected July 15th, 2019.

## STORAGE, STRATEGIC PLANNING

### CG-2130

#### **Analytics Using StorageVET New York Power Authority, NY; Grant \$125,000**

New York Power Authority (NYPA) is partnering with Electric Power Research Institute to use the public domain software StorageVET to identify and analyze locations for the integration of energy storage. They will conduct site evaluations to define beneficial facility, business and location types with the greatest energy storage potential. They will also provide steps to utilities to consider in developing an energy storage

project and provide instructions for StorageVET for demonstrating facility value propositions to adopt energy storage. The final deliverables and reports are expected November 16th, 2018.

## COMMUNICATIONS AND CUSTOMER CARE, ENERGY EFFICIENCY & CONSERVATION, KEY ACCOUNTS

### CG-2131

#### **Landlord Connection Series River Falls Municipal Utilities, WI; Grant \$4,000**

River Falls Municipal Utilities is piloting their Landlord Connection Series, an outreach program that invites area landlords to participate in quarterly, free seminars. These seminars provide discussion topics of interest for these customers. The landlords learn about energy efficiency options pertaining directly to multi-family and rental units, helping them better protect their interests through lease agreements. They learn how to work more effectively with the utility, city, and state agencies. The final deliverables and reports are expected December 31st, 2018.

## RELIABILITY

### CG-2132

#### **Discovering Ferroresonance in Your Utility Tillamook People's Utility District, OR; Grant \$48,000**

Tillamook People's Utility District is creating a screening process for public power utilities to model and simulate various combinations of transformers, system configurations, and loading to identify and alert utility staff to factors that could indicate a high potential of ferroresonance. Ferroresonance creates outages by causing transformers, lightning arresters, and service meters to fail, and is often difficult to identify. Tillamook would like to change that by creating this screening process. The final deliverables and reports are expected December 31st, 2018.

## COMMUNICATIONS & CONTROL, SCADA

### CG-2133

#### **Reaching Remote Equipment for SCADA Communications Tillamook People's Utility District, OR; Grant \$85,284**

Tillamook People's Utility District will deploy three different wireless radio systems, SEL, Motorola, and U/VHF, to determine which conditions are best suited for each type of system. The project will include a test feeder that represents

the different typologies found in a service territory. The end goal of the study is to achieve a balance of bandwidth, latency, and reliability for each type of condition and SCADA system. The project will be conducted over 18 months to capture data in as many weather conditions as possible. The final deliverables and reports are expected May 31st, 2019.

COMMUNITY SOLAR, RENEWABLE ENERGY  
**CG-2135**

**Increasing Low-to-Moderate Income Household's  
Access to the Benefits of Rural Public Power  
Community Solar Programs  
WPPI Energy, WI; Grant \$63,377**

WPPI Energy, Michigan Technological University, and Western Upper Peninsula Planning & Development Region are teaming up to find collaborative ways to bring community solar programs to low-to-moderate income households, using the Upper Peninsula of Michigan as a test market. The purpose of the project is to help rural public power utilities design economically feasible programs and find out how low/no cost demand-side energy efficiency strategies can be integrated into those programs. The research will utilize qualitative interviews, focus groups, and a survey to evaluate community interest and participation rates. The results will be used to determine a cost-effective community solar project scope and program design for low-to-moderate income communities. The final deliverables and reports are expected September 31st, 2019.



# COMPLETED PROJECTS

Brief summaries of all DEED projects completed in the past year are provided below. Be sure to visit the DEED Project Database to search easily by project number to access the final report, abstract, and deliverables for all projects. Listed. Information from both current and completed DEED supported projects are posted on the DEED Project Database. Access the DPD from the APPA website at [www.PublicPower.org/DEED](http://www.PublicPower.org/DEED). Questions? Contact [DEED@publicpower.org](mailto:DEED@publicpower.org) or 202-467-2942.

## TRANSMISSION & DISTRIBUTION, ENGINEERING & OPERATIONS, GENERATION – WIND ENERGY G-350

### **Development of a Wind Turbine/Plant Operating Practices Guidebook Nebraska Public Power District, NE; Grant \$25,000**

Nebraska Public Power District partnered with Utility Variable Integration Group – UVIG’s (now Energy Systems Integration Group – ESIG) Operations & Maintenance user group to develop a principle-based guidebook on wind turbine operating practices. Unique to previous guidebooks developed by the U.S. Department of Energy and the American Wind Energy Association, this publication taps into the vast knowledge of the O&M user group and represents a watershed effort to collect and collate the group’s experience, serving as an invaluable training resource. The guidebook covers staffing and training, maintenance practices, on-site operations management & coordination, and more. The guidebook is available to DEED members in the DEED Project Database and in the Association product store. A webinar was held in 2017 and is also available in the Association Store and the DEED Project Database.

## ENERGY EFFICIENCY, ENERGY SERVICES G-351

### **Fort Collins Utilities as a Service Provider Pilot Fort Collins Utilities, CO; Grant \$125,000**

Fort Collins Utilities, along with partners Platte River Power Authority (PRPA) and CLEAResult, launched the Efficiency Works – Neighborhoods (EW-N) Pilot. The program is designed to eliminate the problems of a home performance contracting approach and mitigate customer barriers to project implementation that are inherent in a traditional

energy audit program. The pilot tested ways to increase customer program participation by tackling barriers such as distrust of contractors, lack of time, and complex decision-making. The abstract and final report are available in the DEED Project Database, and the 2017 webinar is available on the DEED website.

## COMMUNICATIONS AND CUSTOMER CARE, BILLS AND RATES

### G-352

### **Weather Database for Public Power Utilities Oklahoma Municipal Power Agency, OK; Grant \$25,000**

Oklahoma Municipal Power Agency sought the assistance of HyphenTech, LLC to create a fully customizable weather database and workbook that can be used when speaking with customers about their high-bill complaints. The program generates a report for any billing cycle, as opposed to calendar month periods, and compares average weather data for the period and how it may affect energy usage. Resources available on the DEED project database include the application itself, as well as a user manual and webinar for training customer service personnel on the use of weather data when speaking to customers.

## WORKFORCE, EDUCATION & TRAINING G-353

### **Development of a Power System Educational Program Memphis Gas, Light, and Water, TN; Grant \$52,303**

Memphis Gas, Light, and Water (MLGW), in partnership with the University of Memphis, developed a full technical training curriculum for new engineers to teach them the behavior of power flows in a power network. The curriculum is designed to provide on-the-job training to existing engineers at MLGW, but is highly transferable to other utilities and public power systems. The full curriculum including presentation slides, videos, and handouts is available on the DEED project database. You can also access the final report, abstract, and 2017 webinar.

DISTRIBUTED ENERGY RESOURCES,  
DISTRIBUTED GENERATION

**G-354**

**Maintaining Distribution Relay Protection Coordination by Using Bridge Type Fault Current Limiter  
Memphis Light, Gas, and Water, TN; Grant \$52,303**

Memphis Light, Gas, and Water (MLGW) conducted this project to maintain coordination of their distribution relay system protection devices with the presence of distributed generators by using a bridge type fault current limiter (BFCL). The advantage of the BFCL is that it does not require any superconductivity characteristics, like the commonly used superconducting fault current limiter does. This helps utility systems reduce cost. This report on the BFCL is the first available on its application to relay protection coordination maintenance. The report and presentation are available on the DEED Project Database.

REGULATORY COMPLIANCE

**G-355**

**Complying with OSHA 29 CFR Parts 1910.269 and 1926 Subpart V Guidebook  
American Public Power Association; Grant \$40,000**

Through this grant, the American Public Power Association developed the publication Understanding OSHA Changes. It serves as a reference guide with checklists to help utilities comply with recent amendments to the federal regulations 29 CFR 1910.137 and 29 CFR 1910.269. It contains an overview of the requirements, an appendix with definitions, and applicable tables and charts. It also features numerous checklists and forms. The publication is available for sale in the Association's product store. It is available electronically in the DPD.

ENERGY SERVICES

**G-356**

**Guidebook Revision of "Evaluating Your Utility's Energy Services Program"  
Lansing Board of Water & Light, MI; Grant \$37,515.00**

Lansing Board of Water & Light, in partnership with DNV-GL Energy, reviewed the former 2009 edition of the Evaluating Your Utility's Energy Services Program and prepared appropriate updates to the existing content, as well as outlined a second case study DSM program. The updated guidebook is available in the Association's product store. It presents comprehensive step-by-step plans for evaluating energy efficiency and demand response programs, focusing on small utilities with limited staff and resources.

ELECTRIC VEHICLES

**G-357**

**Field Measurement of Plug-In Electric Vehicle (PEV) Grid Impacts  
Sacramento Municipal Utility District, CA; Grant \$75,000**

Sacramento Municipal Utility District conducted a study in which they recruited participants to monitor the power quality effects caused by residential electric vehicle charging. Power quality affects the operational longevity of end user devices connected to the grid. This study monitored home PEV charging stations to determine whether they had any deleterious effects on power quality with respect to EV charging. The final report on this study is available to DEED members on the DEED Project Database.

TRANSMISSION & DISTRIBUTION

**G-358 DSTAR Program 14 – Project 14-4**

**Surge Protection of Electronically-Controlled Devices Installed in Distribution Systems  
GE Energy – DSTAR**

DSTAR, GE Energy's utility research consortium, used pole installation diagrams of capacitor bank controllers provided by utility members to simulate the Alternate Transients Program (ATP). As the number of controller installations has increased at utilities, several utilities are experiencing more controller failures than expected. In particular, overhead feeder capacitor controllers were identified for study in this project and focused on controller failures attributed to lightning. Local lightning strikes were simulated to determine the factors which affect the transient voltages at the controller. The final report is available on the DEED Project Database.

GENERATION & FUELS

**G-359**

**Biopower Project Assessment and Decision Making Best Practices  
Florida Municipal Electric Association, FL; Grant \$48,000**

Florida Municipal Electric Association partnered with the Legal Environment Assistance Foundation, Inc. and Shared Solutions, to create a comprehensive guide for public power utilities to use to build public support for sustainable biopower projects. Emotional public opposition and inaccurate information have often lead to the stalling of biopower projects, which are largely environmentally friendly,

fuel mix diversifying, and job generating. The publication, Collaborative Biopower Decision Making, is available in the Association's product store. A 2017 webinar recording on the project is also available.

## SOLAR ENERGY

### G-360

#### **Solar-Powered Heat Pump Pilot Project Pasadena Water and Power, CA; Grant \$25,000**

Pasadena Water & Power, Pasadena Unified School District, Securus Air, Alternative Energy Systems Consulting (AESC), and Hot Spot Energy, Inc. collaborated to pilot a new technology combining alternate current and direct current power heat pump air conditioning systems. The units were tested in commercial applications to determine the effectiveness and to measure the product's potential to significantly reduce energy usage from heating and cooling, providing an innovative alternative to traditional HVAC. The final report is available on the DEED Project Database along with a 2017 webinar on the DEED website.

## DRONES, MAINTENANCE AND REPAIR

### G-361

#### **Building a Business Case for UAS Use in Public Power Operations North Carolina State University, NC; Grant \$75,000**

North Carolina State University and Electricities of North Carolina, Inc. explored the value proposition of using UAS (unmanned aircraft systems), commonly referred to as drones, to support the operation and maintenance of municipal power distribution systems. Utilities are increasingly using drones to survey transmission lines and distribution towers, assess damage to grid assets, and even conduct minor repairs. This study takes a deep dive into the needs of utilities that could be addressed, the cost-savings and efficiency benefits that can be realized, and the advancements needed to maximize this technology's advantages in public power distribution systems. The final report is available in the DEED Project Database. A 2017 webinar recording is available on the DEED website.

## WORKFORCE, EDUCATION AND TRAINING

### G-362

#### **Pathways to a Technical Future Nebraska Public Power District, NE; Grant \$30,000**

The Nebraska Public Power District (NPPD) developed the online application Pathways to a Technical Future, to be a one-stop online tool to provide with students the opportunity to achieve knowledge, practical skills, expertise, and literacies equipping them to be successful in the emerging STEM workforce. The program features teacher professional development, curriculum resources, and local partnerships. The program is designed as an easily replicable model for other public power utilities to collaborate to connect workforce skills with educational opportunities, helping to develop the next generation of public power utility professionals. The software is open-source and available on the DEED Project Database along with the application user guide. A 2018 webinar is available on the DEED website.

## WORKFORCE

### G-363

#### **Colorado State Science & Engineering Fair 2014–2017 Platte River Power Authority, CO; Grant \$1,000**

Platte River Power Authority developed a special DEED awards program at the Colorado State Science & Engineering Festival in an effort to support research in the areas of energy efficiency and innovation among the state's next generation of public power employees. The program was designed to foster enthusiasm in students about STEM subjects and reward them for taking steps to develop their education and critical thinking skills. The final report is available on the DEED Project Database. A 2018 webinar featuring this project is also available on the DEED website.

## ENERGY EFFICIENCY, APPLIANCES

### G-364

#### **Field demonstration and Performance Validation for a CO<sub>2</sub> Heat Pump Water Heater/ Space Heat Combination System Silicon Valley Power, CA; Grant \$125,000**

Silicon Valley Power and Pacific Northwest National Laboratory collaborated to perform a field test on the CO<sub>2</sub> Heat Pump Water Heater/ Space Heat Combination System to evaluate the cost-savings, energy efficiency, and reduced climate impact resulting from this new technology. Historically, there is considerable uncertainty surrounding new products introduced to the market place. If your utility is

considering efforts to facilitate the adoption of this product, don't recreate the wheel. Read the final report for this project in the DEED Project Database and view a 2018 webinar on the DEED website. A fact sheet and installation guide for the combination system are also available on the DEED Project Database

## GENERATION & FUELS, ENVIRONMENTAL, EMISSIONS

### G-365

#### **Diesel Emissions Monitoring at Waverly Utilities South Plant Waverly Utilities, IO; Grant \$1,286.00**

Waverly Utilities and GenAcc, LLC installed a new emissions monitoring system at their South Plant to monitor the exhaust temperature at the catalyst and the differential pressure across the catalyst, in accordance with the Environmental Protection Agency's RICE-NESHAP rule. In the project, Waverly used a Schweitzer Engineering Laboratories 2411 Programmable Automation Controller and their existing SCADA system to create a new emissions monitoring system. If your utility owns diesel generation assets, you will likely need to replace your emissions monitoring system. Learn how to replicate Waverly's success by viewing the final report in the DEED Project Database and view a 2018 webinar on the DEED Website.

## ENERGY EFFICIENCY, APPLIANCES, LIGHTING

### G-366

#### **Tunable Lighting in Schools; Energy Savings and an Improved Learning Environment Stoughton Utilities, WI; Grant \$10,000**

Stoughton Utilities, in collaboration with Midwest Lighting Institute, Energy Performance Lighting, and the Stoughton Area School District, performed a study to evaluate the effect of tunable lighting systems on student learning in schools and its energy savings impacts. LED technology is rapidly advancing and allowing for users to experiment with manipulating lighting color temperature to affect individuals' performance within a space. The research team retrofitted three classrooms at a local elementary school and two classrooms at a local high school to compare students' and teachers' performance when using the tunable lighting, compared to traditional fluorescent light. The final report for the project is available on the DEED Project Database, as well as a 2017 webinar on the DEED website.

## ENERGY EFFICIENCY, SMART ENERGY USE, BUILDING MANAGEMENT

### G-367

#### **SmartStruxure Lite™ Collaborative Pilot Omaha Public Power District, NE; Grant \$117,052.01**

Omaha Public Power District launched a pilot to test the cost-saving and energy efficient effects of a newly developed Building Management System software for small to mid-sized business customers called SmartStruxure™ Lite. The technology is designed to maximize building efficiency and reduce operating costs across the lifecycle of the facility. They tested the merits of this new system across ten different utilities covering all the major US climate zones, collecting robust data and reaping valuable insights. The results of this project will help public power utilities stay ahead of the curve on knowledge of this technology and put it to use in programs developed. The final report is available on the DEED Project Database, and a 2017 webinar is available on the DEED website.

## NUCLEAR, GENERATION & FUELS

### G-368

#### **Preparation of a Combined Construction and Operating License Application to the U.S. Nuclear Regulatory Commission for a Small Modular Reactor Project Utah Associated Municipal Power Systems, UT; Grant \$125,000**

Utah Associated Municipal Power System designed a small modular nuclear reactor (SMR) project to provide stable, safe, carbon-free baseload electric supply to its customers, replacing aging coal plants nearing the end of their lifecycles. The project used NuScale Power technology. SMRs are uniquely suited to public power because, despite the growth of renewable energy and increased emphasis on conservation and the environment, most utilities will still need emission-free baseload supply. View the final report on the DEED Project Database and a webinar featuring the project manager and participants on the DEED website.

## TRANSMISSION & DISTRIBUTION

**G-369**

### **DSTAR Program 15 – Project 15-8: Impulse Testing of Electronic Controllers GE Energy – DSTAR**

In this project field impulse testing was performed at Alabama Power's test facility to verify the simulation findings from project 14-4 Surge Protection of Electronically-Controlled Devices Installed in Distribution Systems. Field tests were also performed on other electronic equipment, distribution equipment, and other common configurations. A presentation on impulse testing is available in the DEED Project Database.

## SAFETY, TRANSMISSION & DISTRIBUTION

**G-370**

### **DSTAR Program 14 – Project 14-5: Cable Pulling Assistant Updates GE Energy – DSTAR**

DSTAR conducted this project to make relevant updates to the existing Cable Pulling Assistant Software. Updates included modifying the existing 3D visualization to show manholes and allowing the user to choose different types of conduit for each section. Changes to the interface and some minor updates improving user experience were also implemented. Log onto the DEED Project Database to download the most recent version of the software, the user manual, and a custom data workbook.

## SCADA, UTILITY TECHNOLOGY, SOFTWARE APPLICATIONS

**G-371**

### **DSTAR Program 14 - Project 14-6: Best Practices for Integration of Utility Applications GE Energy – DSTAR**

This project from DSTAR focuses on the evolution from an environment where a utility communications system was hard coupled to the supported application and data source is coupled to the data consumer to one where all of these elements may evolve independently. While there are many applications that are utilized within utilities today, this effort was focused on those which support the operation of a power system, such as Power System Protection, Distribution Automation (DA), or Substation Automation (SA). The final report, available in the DEED Project Database, outlines best practices for integrating applications such as these in utility operations.

## PHYSICAL SECURITY

**G-372**

### **DSTAR Program 14 – Project 14-7: Survey of Best Practices for Copper Theft Deterrence GE Energy – DSTAR**

This report from DSTAR summarizes industry best practices to deter copper theft. It includes economic, reliability-related, and other consequences of copper theft on utility systems. The report also identifies several countermeasures available and implemented by utilities for theft deterrence. The practices detailed are based on information assembled from a review of relevant research publications and reports, as well as a survey of member organizations and utilities. The report, Survey of Best Practices for Copper Theft Deterrence, is available on the DEED Project Database.

## SMART ENERGY, TRANSMISSION & DISTRIBUTION

**G-373**

### **DSTAR Program 14 – Project 14-8: Motor Problems Resolution and Avoidance GE Energy – DSTAR**

This project is an update of the 1994 NRECA Cooperative Research Network (CRN) publication. The updated report is scoped to identify and revise the contents of the manual according to the latest industry standards, practices, and guidelines. Revisions and additions include updates based on new equipment and changes to existing equipment and technology since the report was first published. It includes information on the impact of new applications such as CVR and smart technologies, low voltage issues, and unbalanced voltage issues. The report is available on the DEED Project Database.

## ENGINEERING SERVICES, ENGINEERING & OPERATIONS, MOBILE TECHNOLOGY

**G-374**

### **DSTAR Program 15 – Project 15-4 & 15-9: Development of Engineering Mobile Apps GE Energy – DSTAR**

As mobile technology has become ubiquitous over the last decade, since the initial advent, opportunities now exist to update the e-Handbook resource for use in mobile devices. This project migrated several popular e-Handbook calculators from Adobe Reader PDF forms to mobile apps. So, instead of performing calculations by hand using instructions in these PDFs, you can now find instructions to download several apps that will perform these calculations on your

mobile device. Visit the DEED Project Database to find a user guide with instructions to acquire and use these apps on your smartphone or mobile device.

## SOLAR ENERGY, GENERATION

### G-375

#### **DSTAR Program 15 – Project 15-6: Impact and Practical Limits of PV Penetration on Distribution Feeders GE Energy – DSTAR**

DSTAR performed this project with the goal of helping utilities answer questions such as: how much photovoltaic (PV) is too much, or what can be done to accommodate more PV? To answer these questions, simulations were run on real distribution feeders with increasing levels of PV generation and various steady-state dynamic voltage conditions. This study resulted in a comprehensive report that describes the modeling process and prescribes rules-of-thumb for PV penetration level. The report and a presentation on PV impacts is available in the DEED Project Database.

## ENERGY EFFICIENCY

### G-376

#### **DSTAR Program 15 – Project 15-7: LED Street Lighting GE Energy – DSTAR**

DSTAR has identified a need to address the challenges faced by utilities in assessing available test data and characteristics of LED street lighting systems relative to deployment-specific conditions. As the range of potential products is large, the analysis focuses on sodium replacement applications. The intention was to develop and use processes that are replicable and easily adapted for use in analyzing a broader range of products of interest to utilities in the future. The final report outlines two faces: LED lighting lifecycle cost analysis, and LED lighting technical metrics analysis and recommendations for product selection. The final report, as well as a lighting calculator and presentation, are available in the DEED Project Database.





Powering Strong Communities

American Public Power Association  
2451 Crystal Drive  
Suite 1000  
Arlington, Virginia 22202-4804

[www.PublicPower.org](http://www.PublicPower.org)  
202.467.2996