

National Geospatial Advisory Committee

Public-Private Partnership Use Case:

CALIFORNIA PUBLIC SAFETY POWER SHUTOFF PARTNERSHIP



An Innovative Partnership Supporting Communication, Coordination and Collaboration Between Electric Utilities and Community Stakeholders

Background

As of the end of the summer of 2020, there were over 100 major wildfires burning in the U.S. Of these, 30% were in California. 2018 saw the deadliest and most costly wildfire in the state's history, the Camp Fire. It burned over 150,000 acres. An electrical transmission equipment malfunction was blamed for the fire. High winds fanned the fire. Acres of dry vegetation fueled it. Low humidity heightened its intensity. These conditions normally confined to fire season are now happening almost year-round. High temperatures exacerbate the potential for larger and more destructive wildfires and the frequency and severity of wildfires is expected to grow.

Utilities design their networks to withstand high winds. Yet, winds can cause trees and limbs to fall on the lines and equipment, creating damage to the grid. Utilities also design the electric system to automatically de-energize the equipment when this happens. Despite these safeguards, sparks and heavy currents for short periods of time create the potential for igniting a fire. This situation is particularly troublesome in remote heavily forested areas, where fires can spread quickly.

Wildfires can be triggered in many ways. However, wildfires caused by electrical equipment can be better managed or avoided. One way is to de-energize portions of the network in vulnerable areas during conditions conducive to wildfires.

In 2012, San Diego Gas and Electric (SDG&E) requested the authority from the California Public Utility Commission (CPUC) to shut off power to selected circuits during high wind events to minimize wildfire risk. The CPUC regulates Investor-Owned Utilities (IOU) in the state. This process is called the Public Safety Power Shutoff (PSPS). The CPUC agreed.

In 2018 California expanded their PSPS agreement to all IOU's operating in California and in 2020, the CPUC strengthened the regulations to add additional reporting, transparency measures, and consumer protection requirements. This led to a greater awareness by the utilities and the commission of the need for better data, collaboration, communication and coordination among the numerous partners before, during, and after a PSPS event.

Public Safety Power Shutoff (PSPS) - Requirements

Utilities must work to shorten the time of an PSPS. They must minimize the extent and apply technology to make smarter decisions. In addition, the level of communication to all stakeholders must be increased. GIS is critical to meet these requirements. All the factors, such as high fire risk extents, real-time weather, land features, at-risk populations, and properties are location dependent. GIS is the most effective tool to develop and communicate PSPS plans, but requires data from many different sources. It is also essential during a PSPS event to collaborate with the many stakeholders impacted by the power outage. It is also a key tool in assessing the results and effectiveness of the PSPS event after the fact.

Pacific Gas and Electric (PG&E), the largest of the IOU's, has enhanced their PSPS process to meet the new CPUC requirements. This included rethinking how they interact with partners, which resulted in new partnerships and creation of a portal for data sharing and stakeholder collaboration.

PSPS Partnership – What Does It Do?

The success of a PSPS is totally dependent on effective sharing of timely, reliable data, and the only way to achieve that was by forming a creative partnership for sharing information in an innovative way. The partners are private (the utility companies), and public (Federal, State, Tribal and local governments, their agencies and the public) and NGOs (charities). The primary goal of this partnership was to save lives through information sharing, and was not focused on the more traditional Public-Private Partnership (P3) framed around revenue sharing.

The CPUC did not specify exactly how information was to be shared but did detail steps that needed to be taken; convening informational community meetings and workshops in advance (inclusive of special needs customers), advance notification of plans to de-energize during high risk events, communication protocol requirements, and importance of quality data to form a justifiable data foundation to drive PSPS decisions and requests. Executing these requirements involved a new look at the types of data needed, parties who could supply those types of data, and a modern mechanism to efficiently and effectively communicate information in a timely, understandable way to a diverse range of stakeholders, from local authorities to critical businesses like hospitals and care facilities to local homeowners. All of this would be done under tense circumstances and in a rapidly changing environment.

The first step was to address the data challenges. Government and utilities have very defined responsibilities. As a result, silos of processes and data happen naturally. For example, California's wildfire agency, CALFIRE, is responsible for managing wildfires. They do not have or control data about electrical facilities. As another example, cities have data about property ownership. When it comes time to evacuate, cities rely on the California Department of Transportation (Caltrans) for information on roads and possible evacuation routes. None of this information is maintained by utilities. Yet, it would be extremely useful to them if it were easily accessible and could be incorporated into their planning.

In addition to utility infrastructure and operational data, utilities maintain unique information about specific customers that are dependent on electricity for their critical medical needs (respirators, iron lungs, hemodialysis machines, and many others). Utilities gather this information to provide a discount on eligible customers' utility rates. Yet, it is also vital information for other partners, such as first responders. This is one of the many data sources that utilities can share with partners if it can be done securely. Since this information is private, no participants can provide it to the general public.

Complementing the utility data holdings, partner organizations have a wealth of data useful to PSPS planning and execution. A well-structured, trusted partnership tapping into and integrating these data resources would benefit all.

- **Utility Company Data:**
 - Customers with critical medical needs;
 - High risk fire zones;
 - Electrical network data;
 - Critical electric customers / critical facilities;
 - Circuit switching stations;
 - Damaged facilities;
 - Utility and contractor locations;
 - Tree trimming activities;
 - Location of drone, helicopter and fixed wing assets; and
 - Estimated restoration time.

- **Partner Data:**
 - Damage to infrastructure;
 - Blocked roads;

- Evacuation routes;
- Status of evacuations;
- Shelter locations;
- Emergency vehicle locations;
- Wildfire cameras;
- Community resources;
- COVID-19 testing facilities;
- Demographics; and
- Public transit.

PSPS Partnership – How Does It Work?

None of the many public and private agencies have a complete picture of the situation during a PSPS. Conventional means of data sharing (pushing data to individual organizations) falls short during normal operations and are further challenged during a major event such as a wildfire or a PSPS. The problem with this type of data sharing is that downloaded data becomes out of date, is time consuming to produce, and is a one-way process.

Creating this data foundation to inform decision making brought critical data and many new partners together. The next challenge was how to organize and deliver the right information at the right time to the right people. This meant timely, up to date information needed to be easily accessible and understandable. Homeowners needed certain information delivered to their mobile phones, local first responders needed different information in emergency vehicles and in command centers, and critical facilities and disaster relief workers needed timely information.

To meet these needs, PG&E established the Public Safety Power Shutoff (PSPS) Portal for agencies to access planning and event-specific information to support emergency management efforts prior to and during a power shutoff. Access to the PSPS Portal is provided to Public Safety Partners, including Federal, State, Tribal, and local agencies, as well as critical facilities, telecommunications providers, water agencies, and publicly owned utilities and hospitals.

To streamline the partnership process, the Portal offers a self-service online application form, complete with drop down menus organized by categories of typical partners. From the start the partners are separated into categories for appropriate data access. By default, specific personal customer information is not shared with partners. However, the partnership application process includes a process for rapid review of applications not requesting access to sensitive data and a mechanism to further evaluate special requests for appropriate release of personal information to authorized emergency management officials. Once approved, partners can access up to date information in the Portal based on their approval status.

The Portal leverages ArcGIS Hub, a technology platform which provides many-to-many communication of spatial information among all partners in a controlled and secure process. The Portal provides mechanisms to assure the privacy of sensitive customers and critical infrastructure information. At the same time, it provides selective information to consumers directly impacted by the PSPS. The Portal streamlines notification of customers, fire departments, first responders, critical facilities, other potentially affected entities, and the CPUC of the potential action, before shutting off the power on a line. Here other stakeholders can access consistent information and visualize the extent of the proposed PSPS. Beyond sharing raw data, tailored information products are of particular value, like dynamic GIS based dashboards. These provide real-time maps of the situation on the ground, plus statistics of impacted populations, critical facilities and status of outages. Digital maps of critical facilities impacted are essential to allow stakeholders to make decisions based on up to the minute situations on the ground.

By implementing modern data sharing practices, specifically employing geospatial web services, data is up to date, consistent and the data remains with the source agency. Each partner has direct access to the data from every other partner at the same time. Taking a cue from social media, data communication happens immediately. This partnership process works due to:

- **Transparency.** Each partner is fully aware of changes as they happen.

- **Security.** Utility data is private and sensitive. This process provides safeguards to assure that public information is shared broadly while sensitive information such as specific utility customer information is scrupulously guarded.
- **Interoperability.** The partnership is inclusive, and the portal incorporates open standards to allow sharing of different data sources from multiple technology platforms
- **Expandability.** As new partners become involved in the process, they can be added simply.
- **Accountability.** The process provides for traceability of the information flow, so that after the fact, partners can assess the success or gaps in the process. This allows the process to be refined.

The Power of Partnerships

PSPS involves a tapestry of many partners, many with significantly different priorities. The mission of any power company is to continuously maintain power every minute of every day. Intentionally shutting off power is anathema to utility employees. However, under these perfect storm situations, it becomes necessary. The key to successfully doing this is communication. The challenge is that there are so many stakeholders in the process, from both the public and private sectors.

The challenge of any innovative partnership is to provide value to all participants. A traditional P3 involves revenue sharing, where each party provides a share of what the total partnership needs. In this case, it is information that is the true value. While that may seem simple, it is not.

What makes this work is simultaneous sharing of data. Most of that data is in the form of maps – location is the key. A modern GIS platform provides many-to-many sharing of data organized by location. This gives partners the ability to see patterns and relationships that are hidden from each partner separately. It provides a central portal of knowledge and action.

In 2020, in addition to the wildfire situation, we also have COVID-19 to contend with. This means that partners must model vulnerable populations and locations of COVID-19 treatment and testing. As widespread vaccine administration areas become known, additional data about the storage and distribution of vaccines will need to be shared. Each of those will also have to be factored into the planning and execution of PSPS events. The PSPS Portal provides a flexible platform to incorporate this additional information and makes it easier to adapt plans and response.

During a PSPS event, relationships are many-to-many. This complex arrangement requires technology that eases information flow among many parties. It must preserve the privacy of sensitive yet critical information, such as vulnerable citizens. It also must provide near real-time status to the general public. The PSPS Portal meets these requirements. However, PG&E is only one of six IOU's in the State. Overall, there are 46 public utilities and 4 electric cooperatives providing electricity in California. In fact, the Los Angeles Department of Water and Power (LADWP) is the largest public utility in the U.S. These utilities are not immune from the threat of wildfires.

The PSPS process is relatively new and these partnerships are in their infancy, but much has been learned. To increase collaboration statewide, this successful innovative partnership model should be expanded. It may be appropriate for State government (the Governor's office, IT office, emergency management agency, etc.) to serve as the central broker of the partnership, coordinating partnerships and various data hubs throughout the State, including those implemented at the utilities. In this way, all of the utilities (not just the IOU's) can participate and coordinate activities with the various partners. Hubs can communicate with other Hubs. This would provide utility to utility collaboration for resource and information sharing. In this way California can take a leadership position in the complex coordination of actions required during PSPS events, improving safety of its citizens.