CEO's Report for May 24, 2021
Board of Trustees Meeting

The following information will be covered in the CEO's Report for May 24, 2021:

- FY2022 Financial Plan Parts 3&4 Overview
- City of San Antonio (CoSA) Committee on Emergency Preparedness (CEP) Request for Information (RFI) Status Update
  - All 35 RFIs received by CPS Energy have been responded to.
- Resilience Landscape & Plan (see attached)

RESILIENCE LANDSCAPE & PLAN

Technology & *Resiliency* (T&R) Committee

CEO's Report for May 24, 2021

Board of Trustees Meeting

The following information is covered in this document:

- Electric Infrastructure (EI) ***Resiliency*** Landscape
- Structure of EI ***Resiliency*** Strategy
- Planning and Preparation Initiatives
- Absorption Through Infrastructure Hardening
- Adaptation to Severe Events
- Recovery from Severe Events

ELECTRIC INFRASTRUCTURE (EI) *RESILIENCY* LANDSCAPE:

This paper has been developed to facilitate discussion about current key initiatives in our strategy to drive ***Resilience*** in electric infrastructure that serves all our customers. While ***Resiliency*** of the electric infrastructure is one of our ***Value Pillars***, this critical aspect of our business received little attention from our customers until recent Winter Storm Uri. This storm experience has, therefore, driven our latest efforts to improve ***Resiliency*** planning and execution. We will identify both short- and longer-term initiatives aimed at building the ***Resilience*** of our infrastructure.

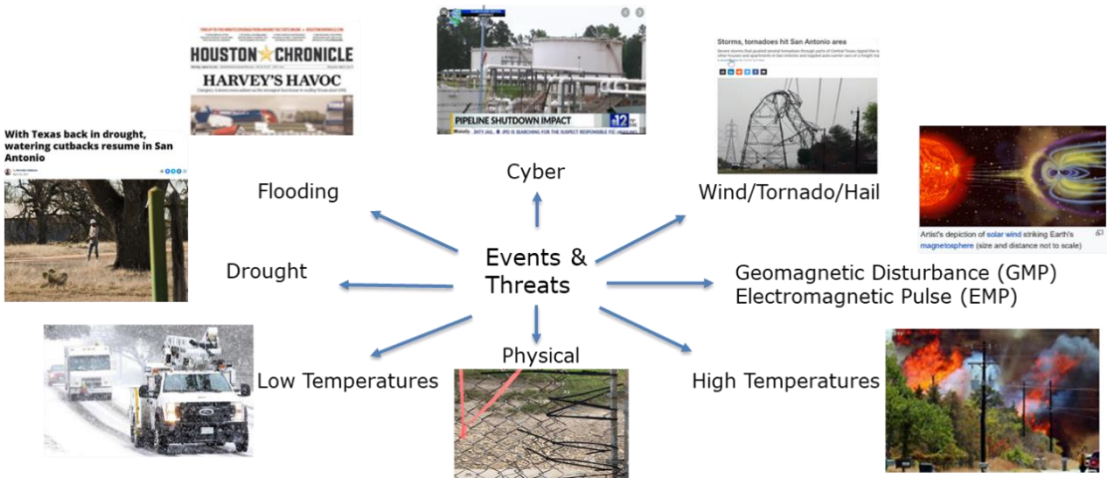
RESILIENCE LANDSCAPE & PLAN

Technology & *Resiliency* (T&R) Committee

CEO's Report for May 24, 2021

Board of Trustees Meeting

While much of the immediate attention is around winter event planning, there are numerous types of threats that we have experienced and consider in our ***Resiliency*** planning, as shown in the graphic below.



As we began to take a fresh look at our approach to ***Resiliency*** we have engaged with various partners and stakeholders in this effort. We have held working sessions with entities such as the **Power Subcommittee of the San Antonio Economic Development Foundation (SAEDF)**, which includes employers from across our community. They have begun providing a fresh perspective and partnership in developing and piloting new efforts.

STRUCTURE OF EI *RESILIENCY* STRATEGY:

As we look at our EI ***Resiliency*** Strategy, there are 2 key aspects of the strategy to consider:

- First is the interdependent nature of the infrastructure. The simple diagram below shows the interdependencies that became quite real in the recent winter storm. It also highlights the importance of consideration of events that can impact multiple elements of the value chain.

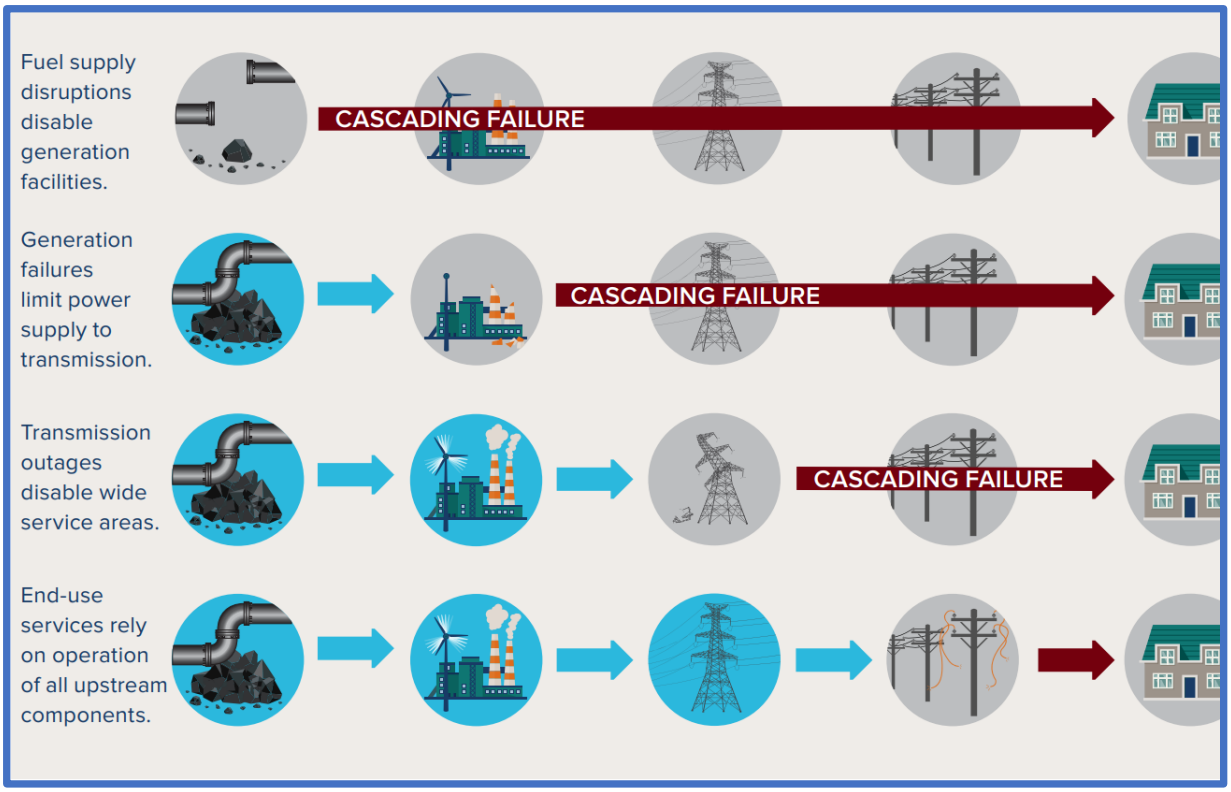


Image source ROCKY MOUNTAIN INSTITUTE

The second consideration is the methodology for creating *Resiliency*, which includes four basic capabilities of:

- **Anticipation** of disruptive events, including preplanning, and forecasting of events.
- **Absorption** of disruptive events, meaning the general ability to withstand severe impacts.
- **Adaptation** of disruptive events, which is the ability to adapt to the loss of service or other impacts of the event.
- **Recovery** from disruptive events in a reasonable timeframe.

The following initiatives each target one or more of the capabilities mentioned above to minimize the overall effects of high-impact, low-probability (HILP) events.

PLANNING AND PREPARATION INITIATIVES:

There are numerous programs already in place around **anticipation and planning for these disruptive events**. Strong preparation and planning are often the lowest cost, and most effective element of a ***Resiliency*** Strategy. These include:

- Emergency Operating Procedures;
- Training; and
- "Table-Top" Exercises – Participation in exercises ranges from: internal drills, to ERCOT-wide exercises such as "black-start," and nation-wide exercises such as GridEx.

While we have very comprehensive programs in place, we are pursuing improvements including:

- A core initiative to our EI ***Resiliency*** Strategy is a **reassessment of our planning methodologies** and how ***Resiliency*** risks are quantified and considered in the planning processes for both generation and technology and development. We have joined a project with the Electric Power Research Institute (EPRI) that will be specifically assessing models and processes for Resource Adequacy for a Decarbonized Future. While this is a 2-year program, we are incorporating elements now to help assess these risks and make appropriate plans.

- Active work with **SAWS to strengthen our interactions through a joint table-top exercise** of operational areas to identify opportunities for improved emergency coordination and provide staff exposure to each other's operations. The initial exercise is targeted for mid-June.

- Participation with the San Antonio Emergency Operations Center (**EOC)** in planning activities, such as an exercise planned for June 2, 2021. While we have had a Manager assigned to interface with the EOC in all emergency events, we are reviewing the tools and support we can put into place to further strengthen this capability.

- There are several additional efforts in progress in this area, such as: support of **Suburban Cities, coordination with the City of San Antonio (CoSA) on area shelters (cooling/warming centers)**, and improvements to our severe weather operating procedures.

ABSORPTION THROUGH INFRASTRUCTURE HARDENING:

This aspect of ***Resiliency*** planning is most aligned with ***Reliability*** improvements, with one key difference being that the hardening is targeting HILP events, or critical elements of the system. As with planning and preparation initiatives, there are several efforts in place around hardening of our infrastructure, but a few key efforts include:

- **Plant Weatherization** – Since 2011, we have invested over $21M to implement detailed, site-specific winter readiness procedures and improve plant winter weatherization. During Winter Storm Uri our plants experienced five weather-related events, including three forced shutdowns. Based on this recent experience we are reassessing weatherization design temperatures, wind speeds, and event duration as we look to further strengthen the ability of our generation fleet to withstand severe winter events, while not impacting our routine summer operations.

- **Electromagnetic Grid Disturbance** – A research project with Joint Base San Antonio (JBSA), the Department of Energy (DOE), Sandia National Labs, and EPRI to perform an assessment and recommendation on hardening grid assets against geomagnetic disturbances caused by solar eruption and electromagnetic pulses caused by a nuclear blast. This is a $1M DOE-funded project.

- **Strategic Electric Distribution Undergrounding** – This effort involves placing feeds to critical infrastructure underground which is far more ***Resilient*** to wind and storm damage. A recent example is undergrounding critical feeds to the San Antonio International Airport. This effort has a current budget of $20M/year.

- **Fuel Supply Assurance** – Various options are being evaluated to reduce the risk of loss of generation fuel supply. These include: alternative fuel options, fuel storage options, and procurement and transport flexibility.

- There are a few other initiatives around **hardening our infrastructure from severe weather and physical *Security* events,** such as on-going evaluation of design standards, redundant and mobile equipment, and substation ***Security*** hardening.

ADAPTATION TO SEVERE EVENTS:

As in the previous ***Resiliency*** capabilities, we have multiple initiatives that are designed to allow us and/or our customers to adapt to a scenario that has degraded the electric infrastructure performance. While degraded performance is not a generally acceptable situation, the reality is that it is an eventuality that must be considered as part of a ***Resiliency*** Strategy. The following are a few of our key initiatives in this area:

- **Improved Outage Management (Load Shed)** - By grid planning criteria, a load shed event will statistically occur once every 10 years, making this a rare but expected event. The challenge in the recent event was the size and duration. As a result of the recent performance, there are multiple tracks for this improvement:

    - Update of existing automated program and procedures to manage a similar event with current infrastructure. This is near completion.
    - Use of **Automated Metering Infrastructure (AMI)** for targeted load shed. We are currently working with Itron, our AMI vendor, to add capability and test this in a pilot program. This pilot would facilitate outages of load on a circuit, while maintaining critical customer(s) on that same circuit. The focus will be to ensure the system will be ***Reliable*** in an actual event.
    - **Distribution Automation (DA)** – A 10-year distribution system-wide program deployment of 144 electric switches to assist with

isolating outages and enabling grid automation. In addition, the Volt-Var optimization function of DA increases the load reduction capacity of demand response.

- **Customer *Resiliency* Services** -
  - Providing a service for customer-sited natural gas fired generation that will keep said customer energized in the event of an outage at their location. This program has been piloted with H-E-B and provided significant benefit to them during the recent winter event.
  - We are currently working to expand the use of this option with water utilities (**SAWS and Suburban Cities**). This is a good solution for some locations, but will not be ideal in all locations, as it depends on the availability of natural gas capacity in the area.

- **Expanded Customer *Resiliency* Services** - We are currently working towards issuing an RFI/RFP for a broader set of customer-focused ***Resiliency*** services that may include technologies, such as: battery storage, micro-grids, and other options in addition to the standard on-site generation.

- **Generation Fuel Supplies** – Evaluating new fuel supply options that will allow continued power generation during limited duration natural gas supply disruptions. This includes the potential installation of liquified natural gas conversion and storage facilities at combined cycle and combustion turbine sites to provide a multi-day, on-site source of natural gas. Another option under consideration is the conversion of remaining combustion turbines to dual-fuel operation, allowing operations on either natural gas or fuel-oil, including biodiesel, stored onsite. Additionally, we continue to evaluate developments in advanced geothermal and other technologies that may provide incremental flexibility beyond fuel supply hardening.

- **Review of *Flex*POWER Bundle℠ and *Flex*STEP℠ for *Resiliency* supporting opportunities -** Expansion of demand response through a Conservation Network, or through expanded direct load control, has significant potential for further reducing load during emergency or high price events in the system.

RECOVERY FROM SEVERE EVENTS:

The final capability we consider is the ability to rapidly recover from the damage of severe events. The following are initiatives in progress to strengthen this capability:

- **Recovery Procedures and Planning** - This effort includes an exercise to be held this month around utilization of Mutual Assistance in restoration of our distribution system. While we are active in supporting this program whereby utilities will provide linemen and equipment to utilities that have experienced significant damage, we have never called for support through this partnership. There are a multitude of coordination considerations in such an effort, and we are performing an exercise to better understand the process and address any gaps we may have.

- **Mobile equipment and spares programs** - We have a program for retaining spare equipment and materials in the event of failure of long-lead time replacements. We are currently reviewing those spare equipment levels considering recent events and current supplier shortages. We have four mobile power transformers to provide backup in the event of a substation power transformer failure. These are trailer-mounted, self-contained units. We are also adding a mobile switchgear to these units, which will provide similar capability in the event of loss of a substation switchgear.

CONCLUSION:

There are many areas of the company involved in this limited list of in-progress initiatives that target strengthening the ***Resiliency*** of our electric infrastructure. There are also additional elements of ***Resiliency*** in our supporting systems, including IT and our communications programs to be presented separately, but are critical to the overall ***Resiliency*** and our ability to serve our customers.

As the *Resiliency* Landscape evolves and our plan of initiatives develops, it will be updated and shared with the Committee and the Full Board of Trustees.