SOUTHERN CALIFORNIA EDISON COMPANY

Grid Modernization Progress Report

March 15, 2024

Executive Summary

Southern California Edison Company's (SCE's) vision is to transform its distribution grid into a secure, flexible, networked platform that adapts to changing needs driven by higher customer distributed energy resource (DER) adoption, optimizes DER value through advanced grid management, supports customer electrification needs, and ensures grid reliability and resiliency in the face of climate change. This vision requires the continued investment in five categories of technologies and functional capabilities: (1) Engineering and Planning (E&P) Software Tools, (2) Grid Management System (GMS), (3) Communications and Cybersecurity, (4) Automation, and (5) DER Hosting Capacity Reinforcement. SCE made substantial progress across these five areas between 2021 and 2023, and this report highlights the accomplishments, use cases, benefits, and challenges for the first three areas (E&P Software Tools, GMS, and Communications and Cybersecurity).

As capabilities are deployed, the GMS will work in concert with field devices to provide customers with a safe, reliable, and resilient grid that powers our customers' clean energy choices. The GMS will also help increase DER hosting capacity through its load and DER management capabilities. SCE's modern communications systems are replacing SCE's legacy technology with low latency, high bandwidth, secure communications to support modern grid capabilities. Over the next few years, SCE will continue to enhance the E&P Software Tools to continue advancing our system planning approach and support SCE's future integrated planning vision that will allow us to optimize our levels of investment needed to address various types of future grid needs under increasing levels of uncertainty, including the location and magnitude of load and DER growth.

Grid Modernization Progress Report

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I. Introduction

1. Background

California Assembly Bill (AB) 242 amended Section 916.6 of the Public Utilities Code to require that "On or before February 1, 2023, and biennially thereafter, the commission, in consultation with the Independent System Operator and the Energy Commission, shall report to the Legislature and the Governor on the progress made toward modernizing the state's distribution and transmission grid and the impacts of distributed energy resources on the state's distribution and transmission grid and ratepayers."[1]

SCE has prepared this Grid Modernization Progress Report to update the California Public Utilities Commission (Commission) on SCE's overall Grid Modernization vision and approach and its Grid Modernization efforts from 2021 to 2023 and provide an overview of its near-term Grid Modernization plans. The purpose of this report is to support the Commission in its preparation of the biennial update to the Legislature on the progress of modernizing SCE's electric distribution system.

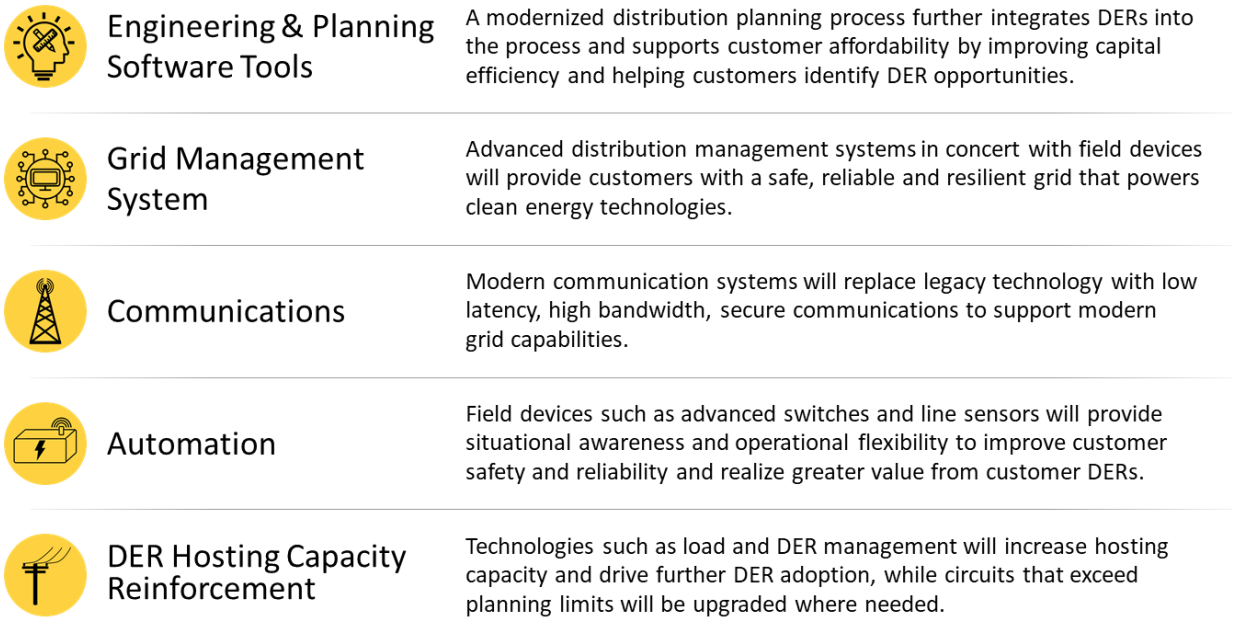
2. Grid Modernization Overview

A modern distribution grid is instrumental for addressing climate resiliency, enabling a path to carbon neutrality by 2045, facilitating customer adoption of electrified solutions in the transportation and building sectors, and more broadly, achieving California's climate and air quality goals. SCE's vision is to transform its distribution grid into a secure, flexible, networked platform that adapts to changing needs driven by higher customer DER adoption, optimizes DER value through advanced grid management, supports customer electrification needs, and ensures grid reliability and resiliency in the face of climate change. This vision requires the development of a portfolio of foundational capabilities that enable Advanced Grid Management, DER Optimization, and Customers as Grid Partners. Developing such a portfolio will require SCE to continue investing in the five categories of new technologies and functional capabilities outlined in SCE's Grid Modernization Plan (GMP).[2] Figure 1 summarizes these technologies and their necessity in realizing customer benefits.

[1] Public Utilities Code § 913.6 (a).

[2] Please refer to A.23-05-010, Test Year 2025 General Rate Case Application of Southern California Edison Company (U 338-E), SCE-02 Vol. 06 – Grid Modernization, Grid Technology, and Energy Storage, filed May 12, 2023.

Figure 1
Grid Modernization Technologies and Customer Benefits



II. Grid Modernization Activities from 2021 through 2023

This section summarizes the approach, status, use cases, and challenges of three aspects of Grid Modernization, which are: (1) Grid Management System (GMS), (2) Communications and Cybersecurity, and (3) Engineering and Planning (E&P) Software Tools. SCE has also made progress in Automation and DER Hosting Capacity Reinforcement, but the scope of this report follows guidance provided by the Commission and therefore does not cover these areas.

1. Grid Management System

A. Description

SCE's GMS is an advanced software platform that integrates multiple systems designed to monitor, manage, and optimize the performance of our increasingly dynamic electric grid characterized by high DER penetration. The GMS will provide SCE with the requisite capabilities to not only manage SCE's grid assets, but to also engage with customers and their DERs so that they become a core part of operating the grid. The GMS is being deployed over four Phases: (1) Advanced Distribution Management System (ADMS), (2) DER Management System (DERMS), (3) Advanced ADMS & DERMS, and (4) Grid Platform. In Phase 1, the ADMS is replacing SCE's legacy distribution management system (DMS) outage management system (OMS), such that the ADMS will provide the combined DMS/OMS functionality. In Phase 2, SCE will introduce additional DER management functions such as the short-term forecasting engine, optimization engine, and microgrid management, through the DERMS. In Phase 3, SCE will enhance the ADMS and DERMS functions implemented in Phases 1 and 2, such as by

expanding mobile grid operations for field personnel, augmenting outage metrics reporting functions, and enhancing operator training system and modeling capabilities to include advanced scenarios likely to arise from higher DER penetration and changing weather conditions. One example includes expanding mobile grid operations to allow further consolidation of field personnel work into the single ADMS platform. In Phase 4, SCE will initiate Grid Platform enhancements to improve SCE's capabilities in the areas of load management (including electrical vehicle (EV) charging), substation device management, and power quality management. Additional details on the functions and expected benefits are included in the Use Cases/Benefits section below. Each GMS release is supported by organizational change management (OCM) activities and employee training on the new capabilities.

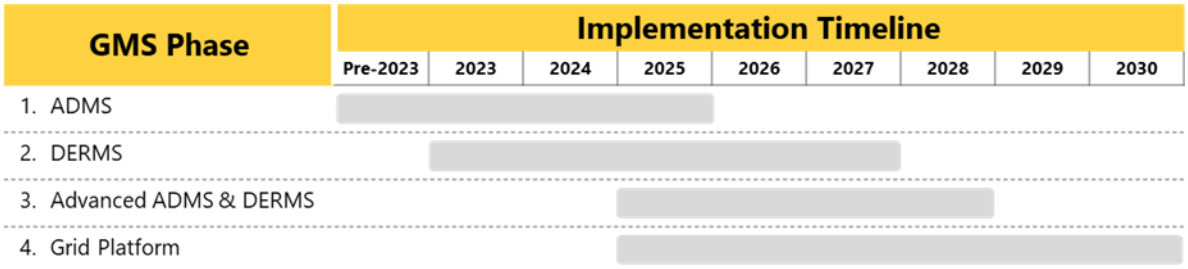
B. Status

In 2021, SCE completed deployment of the distribution SCADA platform, marking the successful achievement of a major GMS milestone for Phase 1. SCE also completed the build phase and initiated site acceptance testing (SAT) of the Phase 1 distribution management functions. Additionally, SCE initiated design activities for the Phase 2 DERMS platform.

In 2022, SCE successfully deployed the GMS data historian in the production environment, another key implementation. The data historian and distribution SCADA upgrades are highly resilient and scalable to meet SCE's future ADMS computational requirements. SCE also completed factory acceptance testing (FAT) of the ADMS distribution management and outage management functions. Figure 2 summarizes the timeline for completing the four GMS phases.

In 2023, SCE completed the SAT and technical implementation of the Phase 1 base DER management capabilities (or Base DERMS), which will allow SCE to monitor and dispatch DERs. SCE also continued its SAT activities for the DMS functions planned for deployment in 2024, which include distribution system state estimation (DSSE) and fault location, isolation and service restoration (FLISR).

Figure 2
GMS Phase Implementation Timeline



SCE is currently performing SAT of the ADMS and plans to deploy the ADMS to replace the DMS functions in 2024 (including several base DER-management capabilities). The OMS functions are planned for deployment in 2025.

C. Use Cases/Benefits

Grid management is essential to managing the grid safely and reliably. As grid operations continues to increase in complexity due to more frequent and extreme climate events and

higher amounts of DERs and electrification, Grid Modernization builds upon SCE's foundational grid management capabilities to improve resilience and enhance situational awareness and grid flexibility to address these challenges. SCE is implementing the four high-level capabilities for grid management identified in Table 1.

Table 1
GMS-enabled Capabilities

Capability Category	High-level Capabilities
Grid Management Enables grid operators to monitor grid conditions in real-time, control field devices remotely, manage and optimize use of load and DERs, and monitor and manage power quality	1. Core grid management functions 2. Advanced grid management and optimization 3. Load and DER management and optimization 4. Power quality management

In Phase 1, the ADMS will enable SCE system operators, operations engineers, and other users to receive and analyze real-time information on customer energy usage, system power flows, system outages and faults, and DER performance. The ADMS will also provide the necessary interfaces between the operations control centers and grid devices, thereby facilitating SCE's handling of grid events such as planned and unplanned outages and load transfers. Additional ADMS functions include distribution system state estimation (DSSE), load volt/VAR management, mobile grid operations, and fault location, isolation, and service restoration (FLISR). The ADMS also includes basic DER management functionality that enables DER program registration and enrollment, and DER monitoring and manual control via the IEEE 2030.5 communications protocol, which that will enable SCE to communicate with DER aggregators or other third parties in accordance with SCE's Tariff Electric Rule 21[3].

In Phase 2, the DERMS will improve SCE's ability to perform short-term DER forecasting to anticipate and manage potential grid issues and optimize DER dispatch decisions. SCE will also introduce ADMS enhancements such as Public Safety Power Shutoff (PSPS) automation, advanced red flag warnings, and automatic wire down detection and isolation—all which support SCE's wildfire mitigation efforts.

In Phase 3, enhancements to the ADMS and DERMS will expand mobile grid operations to allow further consolidation of field personnel work into the single ADMS platform; augment the outage metrics reporting functions; enhance operator training system to simulate advanced scenarios likely to arise from higher DER penetration; and enhance the modeling capabilities to include DER responses to changing weather conditions, microgrid islanding scenarios, storm condition simulations, and failed equipment scenarios. This phase will also introduce storm analytics to help optimize SCE's response to storm events with available resources to accelerate service restoration.

[3] Electric Rule 21 is a tariff that describes the interconnection, operating and metering requirements for generation facilities to be connected to a utility's distribution system. The tariff provides customers wishing to install generating or storage facilities on their premises with access to the electric grid while protecting the safety and reliability of the distribution and transmission systems at the local and system levels.

In Phase 4, Grid Platform enhancements will improve SCE's capabilities in the areas of load management, substation device management, and power quality management. The load management enhancements will enable SCE to continuously manage load, including load from EV charging. This capability will include indirect load control through aggregators or other third parties, direct load control, where appropriate, and it will also support customer demand flexibility through delivery of price signals to customer devices. The substation device management enhancements include deployment of software on the Common Substation Platform that enables remote management of applications and devices operating within substations. Finally, the power quality management platform will include a model of the entire grid (transmission and distribution) that consolidates power quality sensor data to enable robust visibility and situational awareness, enables diagnosis of historical power quality issues, and simulates distributed control and DER and customer behaviors.

As noted above, between 2021 and 2023, SCE upgraded the distribution SCADA platform and GMS data historian and completed the technical implementation of the base DER management functions. These are foundational to the GMS functionalities such as distribution and outage management, load and DER management, and power quality management enabled throughout the four GMS Phases. SCE anticipates these capabilities will provide future benefits in the areas of safety, reliability, climate resiliency, decarbonization, customer empowerment and economic efficiency.

D. Challenges

The schedule has been impacted by various challenges, including vendor product development delays caused by COVID-19, supply chain constraints, the conflict in Ukraine, and the need to address cyber-related concerns with the ADMS product. As a result, SCE was required to work with the vendor to revise the schedule for Phase 1 and Phase 2. Based on this revised schedule, SCE now expects to deploy the DMS, OMS and base DER management functions between 2024 and 2026, which represents an extension of the deployment timeline for Phase 2 from five years to seven years.

2. Communications and Cybersecurity Infrastructure

A. Description

SCE currently connects distribution substations and distribution automation devices using its legacy and aging mesh radio-based communications system known as NetComm. The new Field Area Network (FAN) will replace the NetComm system with a private wireless LTE/5G system capable of supporting the capacity, speed, and connectivity needs of current and future grid devices to support automation.

In addition to FAN, the Common Substation Platform (CSP) is a computing platform (hardware and software) that acts as the communication and control hub between the operations control center and substation equipment. The CSP is designed to enable remote data acquisition and automatic control over substation devices. In addition, the CSP will also include the software-based algorithms that optimize DER and grid device performance and will provide secure communications between the substation and back-office systems.

The Grid Modernization Cybersecurity program focuses on addressing the comprehensive security and data protection needs of all new infrastructure and application assets being added through SCE's Grid Modernization program, including the FAN and CSP communications, GMS, and the external facing Engineering and Planning Software Tools.

B. Status

The Federal Communications Commission (FCC) decision to auction the Citizens Band Radio Services (CBRS) Spectrum in 2020 offered a unique acquisition opportunity as the availability of affordable spectrum to pursue private LTE technology was previously very limited. Although unanticipated at the time of SCE's Track 1 forecast in the 2021 GRC, SCE's successful procurement of the CBRS licensed Spectrum channels allows SCE to move forward with a private LTE solution for FAN instead of the upgraded mesh radio solution that was previously planned. Following the CBRS spectrum acquisition in 2020, SCE conducted competitive industry solicitations in 2021 and 2022 for the FAN equipment and services. During 2021 and 2022 SCE also focused on developing the new private LTE solution design and execution plan. SCE began its eight-year FAN deployment in 2023 by deploying the network core and the first radio access network (RAN) site, which went "on air" and was used for SCE's first 5G call in a production environment in December of 2023.

For Grid Modernization cybersecurity, SCE completed the architecture assessment and cybersecurity tool designs based on the needs of the overall Grid Modernization program. SCE also implemented the first wave of core cybersecurity tools. In 2023, SCE completed implementation and go-live of the grid extranet at SCE's grid data center to help secure field area communications.

SCE is currently deploying a second wave of prioritized cyber tools and continuing to deploy the FAN by constructing additional RAN sites as well as deploying edge radios for the grid equipment (e.g., switches, capacitor banks, etc.). SCE is also continuing to deploy CSP at targeted substations.

C. Use Cases/Benefits

Communications is foundational to enabling various grid management functions, including real-time situational awareness, analyzing and resolving grid reliability issues, as well as integrating and managing DERs. These functions are enabled by the GMS communicating securely with DERs and field devices at a speed and bandwidth that support current and future monitoring and control requirements.

SCE's new FAN is a critical component of the Grid Modernization program, enabling real-time, cyber-secure communications between grid devices (including DERs, DER aggregators and other third parties), distribution substations, and SCE's operations control centers, which will support the use of DERs to provide reliability services to the distribution system. The FAN also contributes to mitigating the cybersecurity risk in the existing legacy field network, which was ranked as one of the top nine risks in SCE's 2018 and 2022 Risk Assessment Mitigation Phase (RAMP) filings. The FAN will be capable of connecting over 250,000 devices and reducing the real-time information transfer delays from a couple of minutes under the NetComm system to a few seconds with the new FAN system. The FAN

also incorporates modern cybersecurity capabilities, which will allow SCE to continue to protect data from cyber threats while supporting integration of 3rd party devices.

The CSP is a computing platform (hardware and software) that acts as the communication and control hub between the operations control center and substation equipment. The CSP is designed to enable remote data acquisition and automatic control over substation devices. In addition, the CSP will also include the software-based algorithms that optimize DER and grid device performance and will provide secure communications between the substation and back-office systems. The CSP workstream will deploy the new computing platform in distribution substations using virtualization technology to monitor, manage, control, and provide cybersecurity to substation equipment. The CSP will include redundant servers to mitigate potential server outages. SCE will manage the CSP remotely and can therefore deploy software packages remotely, including cybersecurity upgrades, from a central operations center.

The Grid Modernization Cybersecurity program focuses on addressing the comprehensive security and data protection needs of all new infrastructure and application assets being added through SCE's Grid Modernization program. This activity is necessary to prepare SCE's systems and operational processes to achieve California's 2045 net-zero carbon mandate and is focused on improving bulk power management, integration of grid and customer devices, integrated load management strategies, and customer electrification adoption and affordability.

As described above, between 2021 and 2023, SCE enabled the initial wave of cybersecurity tools and associated functionalities and implemented grid extranet at SCE's grid data center, all of which are foundational to SCE's communications and cybersecurity capabilities. SCE anticipates these capabilities will support the realization of future benefits in the areas of safety, reliability, decarbonization, customer empowerment and economic efficiency.

D. Challenges

For the Communications scope, SCE faced a significant challenge in planning and successfully participating in the FCC Spectrum Auction 105. As a result, the FAN implementation schedule had to be postponed by approximately 2 years. Secondly, the tasks of building the new FAN across 15 counties, migrating all existing 30,000+ devices, and decommissioning the legacy NetComm system are nothing short of monumental. Undoubtedly, one of the most challenging aspects for the FAN is the physical construction and commissioning of over 800 Radio Access Network (RAN) sites across the service territory over the next seven years. SCE will be maintaining different field communications environments during the transition from NetComm to FAN while prioritizing reliability and security during this changeover, which may result in new obstacles to overcome.

3. Engineering & Planning Software Tools

A. Description

SCE's E&P Software Tools will improve SCE's ability to identify DER opportunities, increase the economic efficiency of SCE's grid planning and project and portfolio management, and

enhance the customer interconnection request process. SCE's E&P tools include the Grid Connectivity Model (GCM), a software model of the electrical connectivity and hierarchy of SCE's entire electrical grid; the Grid Analytics Application (GAA), which performs analytics and visualization of historical load data; the Long-term Planning Tool and Short-term Planning Tool (LTPT-SMT), which performs the load and DER forecasting, load flow analysis, and project management; the Distribution Resources Plan External Portal (DRPEP), a portal for customer access to DRP reports; and the Grid Interconnection Processing Tool (GIPT), a tool that allows customers and SCE to connect electrical generation and load to the grid more quickly and efficiently. Each E&P tool is supported by organizational change management (OCM) activities and employee training on the new capabilities provided by the tools.

B. Status

During 2021 and 2022, SCE performed multiple enhancements to the E&P tools to improve the integration between the tools and augment their capabilities. The GCM included enhancements to the distribution connectivity model and further integrated the as-built connectivity modeling information with the GAA, LTPT-SMT, and DRPEP. The GCM also supported the Wildfire Mitigation program's aerial inspection efforts by providing transformer structure-to-feeder information.

SCE enhanced the GAA by automating the creation of 8,760 hourly load profiles and performing several load profile improvements, such as calculating daily peak kilowatt-hour (kWh) data, enhancing the user interface, performing backfill of historical Advanced Metering Infrastructure (AMI)/DER profile data for new nodes, and automating the interface with the GCM. The time-series based load and generation profiles prepared by GAA are foundational to enabling SCE's transition to profile-based planning.

SCE implemented several planning functions in LTPT-SMT, including the partial implementation of load flow analysis. SCE used this as part of its annual planning process beginning in 2022 for a limited part of its distribution system and plans to use it to support systemwide profile-based planning in 2025. SCE performed enhancements to improve weather station data accuracy and made other data cleansing and validation modifications, including integrating additional internal and external planning inputs into forecasting analysis, enabling profile-based power system analysis, and integrating ICA with forecasting analysis to inform system planning.

SCE performed DRPEP enhancements to continue publishing the DRP reports, GNA, DDOR, LNBA and ICA,[4] address new Commission requirements for publication, automate the 15/15 Rule,[5] and address additional capabilities consistent with the Commission decision on the ICA Working Group's (WG) Final ICA WG Long Term Refinements Report. Additional requirements included

[4] Grid Needs Assessment, Distribution Deferral Opportunity Report, Locational Net Benefits Analysis and Integration Capacity Analysis, respectively.

[5] The "15/15 Rule" requires that any aggregated information provided by SCE must be made up of at least 15 customers and a single customer's usage must not exceed 15% of the total usage of an assigned category. See, D.97-10-031.

identifying the location of all approved transmission projects, adding Fire Map layers, and implementing a microgrid portal using the DRPEP platform.

Finally, SCE implemented the Wholesale Distribution Access Tariff (WDAT) DER interconnection tariff process workflows into GIPT to support customer application submittal and review, and technical evaluation and contract development for WDAT applications.

In 2023, SCE continued to deliver additional planning capabilities, enhance those already enabled, and address challenges implementing system-wide load flow analysis. SCE enhanced the GCM services and connectivity modeling to support site acceptance testing of SCE's Advanced Distribution Management System (ADMS) and improved the integration of GCM with DRPEP.

SCE enhanced its ability to perform capacity analysis by making several improvements to load profile development. This included automating the syncs between the modules that provide the usage data and construct profiles, enhancing the GAA interface, and introducing the ability to aggregate user-sourced meter groupings to prepare load profiles.

To enhance the forecasting process, SCE also began the transition from circuit-level forecasting to transformer structure-level forecasting, which should improve the precision and efficiency of SCE's capacity planning and ICA processes. This also included developing an approach to aggregating transformer structure-level forecast to various other nodes upstream of the transformer in the planning hierarchy (e.g., circuits and substations). SCE also automated the processing and loading of weather data used for forecasting.

SCE performed upgrades to DRPEP and the microgrid portal, including adding new layers for distribution circuits and PSA locations, enabling customers to download ICA files in bulk, and other technical upgrades. SCE also added heat maps to DRPEP to allow customers to more easily identify potential locations for DER siting.

Finally, SCE enhanced GIPT to enable WDAT contract management and legacy project migration into GIPT and implemented the Transmission Owner Tariff (TOT) interconnection tariff application submittal and review processes. SCE also augmented the GIPT's DER data manager functionality, which provides DER information to GCM for inclusion in the grid connectivity modeling.

Over the next few years, SCE will continue to build upon the progress achieved to-date by delivering additional planning capabilities, enhancing those already enabled, and addressing challenges implementing system-wide load flow analysis. This will include completing SCE's transition to profile-based capacity planning by creating a dashboard that aggregates information from the various E&P software tools and enables system planners to evaluate the entire system and generate planning summaries. This will also enable SCE to perform end-to-end planning for multiple growth scenarios, accelerate the consideration of DERs as potential grid solutions upfront within the capacity planning process, and support SCE's future integrated planning approach that will allow us to optimize our levels of investment needed to address various types of future grid needs and drivers under increasing levels of uncertainty.

C. Use Cases/Benefits

As the demands placed on our grid continue to grow, including those from DER growth and climate-driven events, SCE needs to improve its ability to address these growing needs while maintaining customer affordability. SCE's E&P capabilities help to integrate DERs into SCE's electric system planning processes, consider multiple future load and DER growth scenarios to better identify grid needs, and determine no-regrets solutions to resolve the forecasted grid needs. This requires more granular DER and load forecasting, power flow modeling and analysis to identify grid needs and potential solutions at the sub-circuit level. This also necessitates streamlined interconnections of customer DERs and load. SCE is implementing the five high-level E&P capabilities identified in Table 2.

Table 2
E&P Software Tools-Supported Capabilities

Capability Category	High-level Capabilities
Engineering & Planning Integrates DERs into grid planning processes, increases precision of grid needs and solutions identification, enables scenario analysis, and supports optimal project and portfolio management	1. Electrical connectivity and hierarchy modeling 2. Time series-based capacity planning 3. Project and portfolio optimization and management 4. DER hosting capacity and deferral opportunity reporting 5. Customer interconnection request automation

Between 2021 and 2023, SCE focused on integrating the GCM with the other E&P tools to improve the efficiency of the overall planning process and reduce the need for manual processes and rework that can result from manual processes. SCE advanced the E&P tools to support SCE's migration to profile-based capacity planning by enhancing the performance of the tools (such as through weather data improvements and implementing functions to identify discrepancies between the tools; and transitioning to transformer-structure level forecasting), and partially implementing the load flow analysis engine. These functions have supported SCE's current hybrid approach to profile-based planning that uses profile-based load and DER forecasts to identify potential violations. In 2025, SCE plans to use load flow analysis to identify grid needs with much greater temporal and spatial precision. This should improve the economic efficiency of the annual capacity planning process while also improving the potential to identify opportunities to defer traditional infrastructure investments with DERs. In addition to the planning tool uses, SCE also began using GIPT to process WDAT interconnection requests in 2022 and completed the first phase of implementing TOT in 2023.

D. Challenges

Challenges with the load flow analysis tool have limited SCE's ability to perform systemwide load flow analysis. These challenges include (1) the limited scalability of the tool to handle SCE's approximately 4,500 distribution circuits, (2) its inability to analyze multi-voltage substations, (3) network configuration challenges (which equates to about 20% of SCE's distribution infrastructure), (4) tool instability, and (5) an inability to view and interact with the analysis results. SCE expects to overcome these challenges and complete its transition to profile-based planning within the next few years.

III. Conclusion

During 2021 and 2022, SCE made substantial progress with the GMS, Communications and Cybersecurity, and E&P Software Tools. For the GMS, SCE deployed the distribution SCADA platform and data historian, and completed the build phase of the ADMS distribution management functions. In 2023, SCE completed the SAT and technical implementation of the Phase 1 base DER management capabilities, which will allow SCE to monitor and dispatch DERs. SCE also continued its SAT activities for the DMS functions planned for deployment in 2024. SCE is currently performing site acceptance testing of the ADMS and plans to deploy it to replace the DMS functions in 2024 (including several base DER-management capabilities). The OMS functions are planned for deployment in 2025. As capabilities are deployed, the GMS will work in concert with field devices to provide customers with a safe, reliable, and resilient grid that powers our customers' clean energy choices.

In the area of Communications and Cybersecurity, during 2021 and 2022, SCE conducted competitive industry solicitations for the FAN equipment and services and developed the new private LTE solution design and execution plan. In terms of cybersecurity, SCE implemented the first wave of core cybersecurity tools and the grid extranet at SCE's grid data center. In 2023, SCE initiated its eight-year FAN deployment by deploying the network core components and constructing the first RAN site. SCE also completed implementation and go-live of the grid extranet at SCE's grid data center to help secure field area communications. SCE's modern communications systems, including the FAN and CSP, are replacing SCE's legacy technology with low latency, high bandwidth, secure communications to support modern grid capabilities.

The E&P Software Tools received multiple enhancements during 2021 and 2022 to increase the integration between the respective tools and to augment their capabilities. Such enhancements included improving the integration of the GCM with the other planning tools, partial implementation of the load flow analysis tool, and completion of WDAT in GIPT. In 2023, SCE continued to deliver additional planning capabilities, enhance those already enabled, and address challenges implementing system-wide load flow analysis. Over the next few years, SCE will continue to enhance the E&P Software Tools to further advance our system planning approach and support SCE's future integrated planning vision. This in turn will allow SCE to optimize the levels of investment needed to address various types of future grid needs under increasing levels of uncertainty, including the location and magnitude of load and DER growth.