Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2024 General Rate Case
Application: A.22-05-___
Exhibit: SDG&E-25

PREPARED DIRECT TESTIMONY OF

BEN W. GORDON

(CHAPTER 1: INFORMATION TECHNOLOGY POLICY)

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PREPARED DIRECT TESTIMONY OF

TIA L. BALLARD (O&M) AND

WILLIAM J. EXON (CAPITAL)

(CHAPTER 2: INFORMATION TECHNOLOGY)

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

May 2022

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APPENDICES

CHAPTER 1

DIRECT TESTIMONY OF BEN W. GORDON

(INFORMATION TECHNOLOGY MODERNIZATION POLICY)

PREPARED DIRECT TESTIMONY OF
BEN W. GORDON
(INFORMATION TECHNOLOGY MODERNIZATION POLICY)

I. INTRODUCTION

A. Summary of Testimony

The purpose of this testimony is to describe the transformation of San Diego Gas & Electric Company (SDG&E) and Southern California Gas Company (SoCalGas) (collectively, the Companies) information technology (IT) organization to a digital focused operating model, aligning to a Company goal of digitalization, which will enable faster, more resilient, and innovative technology solutions for SDG&E and its customers. Digital enablement is a focus for businesses across many sectors. According to Gartner, one of the world's leading information technology research and advisory companies, "digital technology initiatives were identified as the top business priority for 2022 and 2023 by 58% of responding companies."[1]

IT has developed a strategy to support the Company's mission of decarbonization and digitalization. Digitalization is central to SDG&E's decarbonization and Net Zero goals by improving operational service, efficiency, and safety, by providing real-time information and cutting-edge analytics, benefiting operations, and customers. The strategy consists of four key pillars that align with the activities described in the IT Testimony Chapter 2:

- Simplify and Standardize the infrastructure and applications to increase efficiency and performance of the systems.
- Proactively Manage Risk through the disciplined management of the lifecycle and cyber risk of infrastructure and applications.
- Transform How We Work to increase speed, embrace a culture of innovation and constant learning.
- Accelerate Digital by establishing a center of excellence that focuses on delivering innovative, digital business solutions and insights.

These pillars support SDG&E's sustainability goals through technology investments further described in the O&M testimony of Tia L. Ballard and Capital testimony of William J. Exon. These goals include climate mitigation, climate adaptation and grid transformation.

[1] Gartner: An Executive's Guide to Using Cloud for Business Enablement, Published November 10, 2021.

B. Implementing the Strategy

This IT initiative started in 2019 to transform the IT operations to provide technology solutions that meet the fast-paced energy transition and customer expectations through innovation and modern practices and technologies. To achieve this transformation, the IT organization developed a plan aligning projects and initiatives to the strategy pillars and tracked the progress towards these goals. These projects and their alignment to the strategy pillars are discussed further in Section VI (Chapter 2) and Appendix E.

The Simplify and Standardize pillar includes the implementation of a modern, converged infrastructure platform to drive data center and system consistency. A converged platform is an engineered infrastructure that includes compute, storage and network connectivity as a single solution that simplifies the environment. Basecamp, a program completed in 2021, included installation of the infrastructure, upgrade of applications and migration to the new platform, creating a foundation for the future. Applications were also rationalized resulting in some applications being decommissioned and others migrated to a Cloud platform.

Automation is also encompassed in Simplify and Standardize, which includes modern practices such as DevSecOps,[2] the automation of application implementation, and Infrastructure as Code,[3] the automation of building infrastructure environments. These tools standardize the application foundations and strive to simplify the technology environment, which can accelerate technology delivery.

The pillar, Proactively Manage Risk, focuses on continuing to manage the technology lifecycle, by replacing unsupported technologies, ensuring the resiliency and recovery of technology systems and patching identified vulnerabilities. Additional initiatives in this area can be found in the Cybersecurity testimony of Lance Mueller (Exhibit (Ex.) SDG&E-26 and Ex. SCG-22).

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[2] DevSecOps stands for development, security, and operations. It is an approach to culture, automation, and platform design that integrates security as a shared responsibility throughout the entire IT lifecycle.

[3] Infrastructure as Code (IaC) is the managing and provisioning of infrastructure through code instead of through manual processes. With IaC, configuration files are created that contain your infrastructure specifications, which makes it easier to edit and distribute configurations.

The Transform How We Work pillar builds stronger alignment and collaboration between business and technology teams through agile methods such as Scrum[4] and Kanban[5]. These modern practices create transparency and utilize continuous delivery, feedback, and prioritization to ensure business priorities are quickly incorporated into technology delivery.

"Agile"[6] practices are product-focused, meaning they look at groups of related applications and technologies that deliver related business functions. To develop, enhance and support these products, the organization is grouped into self-contained teams that bring together all the skills required to address the product requirements. Requirements are managed transparently with tools such as a Kanban board, that the technical team members and the business product owner manage together. This provides continuous visibility to requirements and their priority. Feedback is also provided continuously so that adjustments can be made as needed.

To facilitate this new methodology, the IT employees are transforming how they are organized, which has resulted in more than 60 agile teams launched across IT. The IT organization has a goal of 80% of IT teams to be agile by the end of 2022.

A new job framework was implemented that included refreshing 18 job groupings and more than 70 job profiles to include modern digital skills. IT employees were transitioned to the new job profiles in 2021. Modern skill development will be the focus in 2022 for employees to continue to develop future-oriented digital skills that enable the IT strategy.

The pillar, Transform How We Work, is a cultural change for the IT organization. Being more collaborative, having a growth mindset to always learn, continuously delivering and innovating are the new cultural norms for the IT organization. Communications, tools, and

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[4] Scrum is an agile project management methodology involving a small team led by a Scrum master, whose primary objective is to remove obstacles to getting work done. Work is done in short cycles called sprints, and the team meets daily to discuss current tasks and any roadblocks that need to be cleared.

[5] Kanban is a lean workflow management method for defining, managing, and improving services that deliver work. It helps visualize work, maximize efficiency, and improve continuously. Work is represented on Kanban boards, allowing you to optimize work delivery across multiple teams and handle even the most complex projects in a single environment.

[6] Agile software development refers to a group of software development methodologies based on iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams.

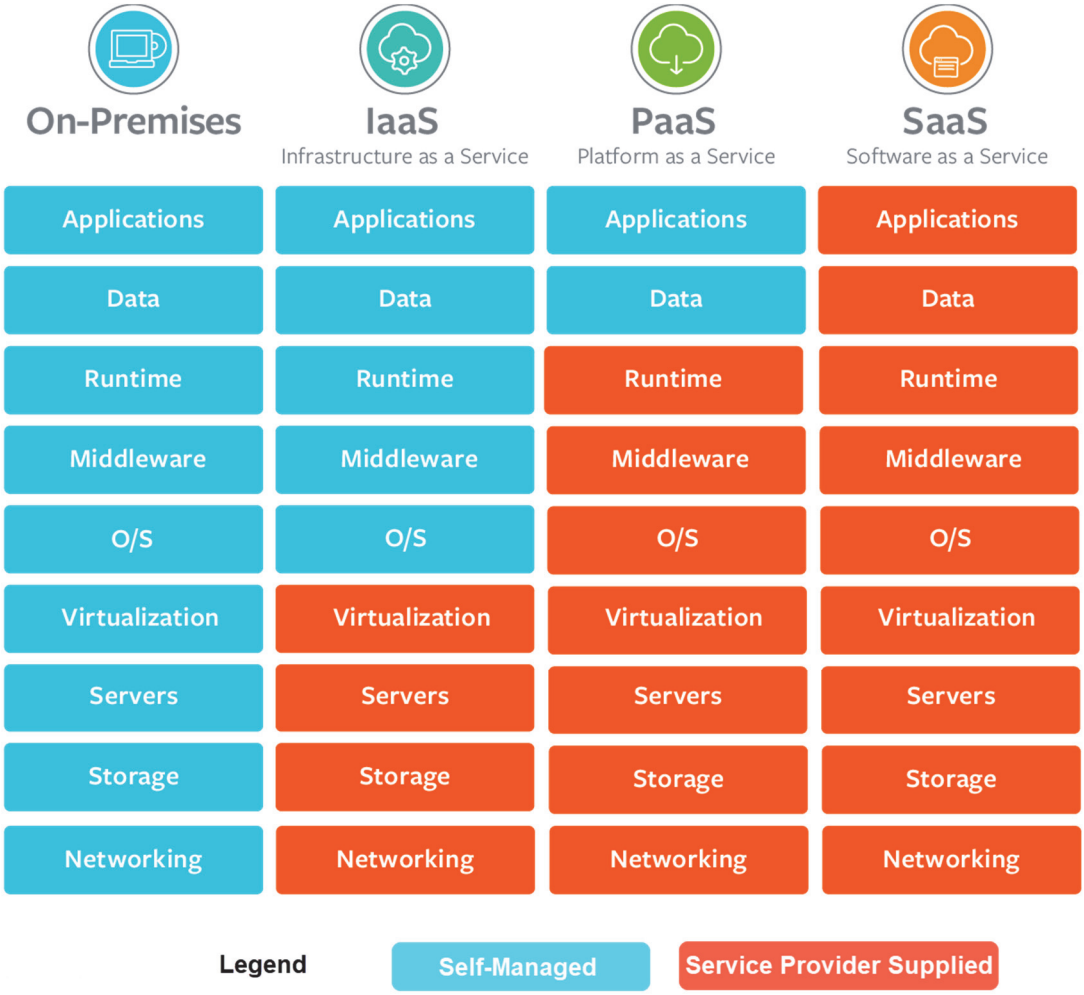
training are helping to drive these new ways of working that will prepare the IT culture for the future.

The Accelerate Digital pillar focuses on modernizing our technologies to prepare for the future, which requires innovation that is delivered rapidly driving business insights and decisions.

Innovation is enabled through modern technologies such as Cloud, Artificial Intelligence (AI) and Machine Learning (ML). These technologies drive faster business solutions with system mock-ups, pilots, enhancements, and implementations occurring in days and weeks rather than months and years. With the shortened timeframe, business ideas can be explored quickly to determine their viability.

Cloud technologies are a cornerstone for digital enablement. There are different Cloud service models available depending on the services needed from the Cloud provider. Infrastructure as a Service (IaaS) is one end of the spectrum where the servers, network, storage, and data center are acquired from the Cloud provider. At the other end of the spectrum is Software as a Service (SaaS) where the application is acquired and will require configuration, integration, and data to function, but all other components are provided on the Cloud. Figure TB/WE-1 below shows the various Cloud Service Models, identifying which services are provided by the Cloud provider and which are self-managed.

Figure TB/WE-1



As of 2021, 28% of the applications portfolio has moved to the Cloud. By the end of 2024, more than 50% of the portfolio is expected to be hosted on the Cloud. Chapter 2 on IT expenditures will discuss how various programs and projects use Software as a Service (SaaS), Infrastructure as a Service (IaaS), and Platform as a Service (PaaS) solutions.

Building solutions in the Cloud, whether IaaS or PaaS, provides the opportunity to quickly create new environments and remove them just as quickly. As a result, Cloud enables us to rapidly experiment, innovate and develop new solutions to meet our business and customers' needs. Cloud platforms also provide high levels of availability, resiliency, and reduced risks due to hardware and software versions remaining current. These characteristics make this an

attractive platform for solutions beyond innovation. Gartner estimates that 70% of enterprise workloads will be in the Cloud by 2024[7].

The IT industry is moving towards Cloud-based solutions with software vendors, such as Microsoft 365, Click, and SAP, now offering only Software as a Service (SaaS) solutions. This requires on-premise technology environments to have Cloud enablement and integration capabilities available. Service management skills are also needed to ensure that usage is managed and service levels from the vendor are met.

While digital and Cloud solutions will be accelerated, on-premise solutions will continue to be needed for systems with high-performance requirements. Investment in infrastructure, cybersecurity tools and software housed within the IT data centers will continue, however, it is expected to reduce over time.

Technology prepaid agreement costs such as Cloud Software as a Service (SaaS) license arrangements, reserved Cloud capacity, and new software and/or hardware maintenance costs associated with software and computer hardware are normally recorded as a prepaid expense.

Beginning in 2024, SDG&E is proposing to capitalize and amortize these costs for regulatory recovery as long as the agreements meet SDG&E's capitalization dollar thresholds. These services are integral to the successful operation of new hardware or software and should be considered an extension of the asset. The proposal is discussed in the Rate Base testimony of Steven P. Dais (Ex. SDG&E-35) and the Summary of Earnings testimony of Ryan Hom (Exhibit SDG&E-44).

The Foundational Technology Systems (FTS) Cross Functional Factor (CFF) chapter contained in 2021 Risk Assessment Mitigation Phase (RAMP) report highlights SDG&E's enterprise-wide technology framework necessary to mitigate several RAMP risks. The importance of FTS and related forecasts are discussed below in Section III of Chapter 2 and throughout the O&M testimony of Tia L. Ballard and Capital testimony of William J. Exon.

II. CONCLUSION

The IT transformation that is underway will enable faster, more resilient, and innovative technology solutions for SDG&E, customers, and the communities that we serve.

This concludes my prepared direct testimony.

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[7] Gartner: An Executive's Guide to Using Cloud for Business Enablement, Published November 10, 2021.

III. WITNESS QUALIFICATIONS - BEN W. GORDON

My name is Ben W. Gordon. My business address is 8330 Century Park Court, San Diego, CA 92123. I am employed by SDG&E as the Senior Vice President, Chief Information Officer, and Chief Digital Officer. In this role, I am responsible for applications, IT infrastructure, networks, cybersecurity and analytics. I have served in this capacity since 2020, and prior to this, I was the Vice President of IT Infrastructure and Operations from 2018-2020.

Prior to Joining SDG&E, I was the Vice President of Engineering at Molina Healthcare, a Fortune 500 company, from 2015-2018. In this capacity, I was in charge of IT infrastructure and operations, networks, cyber security, enterprise applications and analytics. I also served as the Chief Technology Officer for Three-Dimensional Resourcing from 2013-2014. In this capacity I was responsible for the technology and strategic consulting practice. I also served in various positions from 1999-2013 at the Apollo Education Group, with the final position of Vice President of Engineering from 2010-2013, and in that capacity had the responsibility of managing Cloud platforms, IT infrastructure, middleware, databases, student platforms, networks, and IT operations.

I have a Ph. D in chemistry from the University of Florida and an American Chemical Society certified Bachelor of Science from Northern Arizona University.

I have not previously testified before the California Public Utilities Commission.

CHAPTER 2

TIA L. BALLARD (O&M)

AND

WILLIAM J. EXON (CAPITAL)

(INFORMATION TECHNOLOGY)

SUMMARY

INFORMATION TECHNOLOGY (In 2021 $)			
O&M	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
Total Non-Shared Services	19,808	27,113	7,305
Total Shared Services (Incurred)	78,187	83,305	5,118
Total O&M	**97,995**	**110,418**	**12,423**

INFORMATION TECHNOLOGY (In 2021 $)			
Capital	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
Total CAPITAL	**220,012**	**208,793**	**214,186**

Summary of Requests

- Provide support services that directly contribute to SDG&E's ability to provide safe, secure, and reliable service at reasonable rates for our customers while maintaining a safe work environment for our employees.
- Respond and resolve technology operational incidents that require O&M and capital expenditures.
- Modernize applications by replacing, rearchitecting, refactoring, and transitioning to the Cloud, including lifecycle management to improve reliability, security, and performance.
- Position the Information Technology (IT) Division (IT Division or IT) to meet the continued growth in business demand.
- Support the transition to Cloud to provide high levels of availability, resiliency, scalability, and business continuity.
- Support digital innovation by implementing emerging technologies to drive faster business solutions and provide enhanced business capabilities that align with the Company's digital transformation and acceleration goals.

PREPARED DIRECT TESTIMONY OF TIA L. BALLARD (O&M) AND WILLIAM J. EXON (CAPITAL) (INFORMATION TECHNOLOGY)

I. INTRODUCTION

A. Summary of Information Technology Costs and Activities

San Diego Gas & Electric Company's (SDG&E or the Company) forecasted Test Year (TY) 2024 Operations & Maintenance (O&M) request for Information Technology (IT) is $110.418 million. The O&M request for non-shared services is $27.113 million and the O&M request for shared services is $83.305 million. The capital requests for years 2022, 2023, and 2024 are $220.012 million, $208.793 million, and $214.186 million, respectively.

The O&M testimony is sponsored by Tia L. Ballard and the Capital testimony is sponsored by William J. Exon. Table TB/WE-1 summarizes our sponsored costs.

TABLE TB/WE-1
TY 2024 Summary of Total Costs

INFORMATION TECHNOLOGY (In 2021 $)			
	2021 Adjusted-Recorded (000s)	**TY2024 Estimated (000s)**	**Change (000s)**
Total Non-Shared Services	19,808	27,113	7,305
Total Shared Services (Incurred)	78,187	83,305	5,118
Total O&M	**97,995**	**110,418**	**12,423**

INFORMATION TECHNOLOGY (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
Total CAPITAL	**220,012**	**208,793**	**214,186**

IT is responsible for many of the technology-related services and activities for SDG&E, SoCalGas, and Sempra Energy Corporate Center (Sempra or Corporate Center) (collectively, Companies). The services include supporting applications, hardware, and software, some of which are used for risk assessment and management across the Companies. Our business clients rely on IT to provide ongoing operational support as well as supporting transformation initiatives for numerous business functions to deliver safe and reliable service to our customers. The business functions include, but are not limited to, asset management, work management and measurement, fuel and power, outage management, gas and electric facilities, transportation,

procurement and settlement, financial management, accounting, customer field operations, meter reading, customer energy management, smart meter data management, routing, scheduling, dispatching, revenue cycle, customer assistance, customer contact functions, operational analytics, and process automation. This is accomplished through the IT Division's management of Cloud providers and operation of Company data centers that store and manage data, including those used for risk assessments and development of related mitigation plans, as well as foundational information security services to ensure security and privacy. The costs for these services and activities, excluding cybersecurity, are attributed to cost centers at SDG&E, which are described herein, as well as to cost centers at SoCalGas, which are described in the SoCalGas IT testimony (Ex. SCG-21, Ch.2). Testimony related to cybersecurity services within IT is sponsored by Lance Mueller (Ex. SDG&E-26 and Ex. SCG-22).

B. Support To and From Other Witnesses

Our testimony also references the testimony and workpapers of several other witnesses, either in support of their testimony or as referential support for ours. Those witnesses are Kenneth Deremer (Ex. SDG&E-31, Safety, Risk & Asset Management), R. Scott Pearson (Ex. SDG&E-03, RAMP to GRC Integration, Chapter 2), Gregory Flores (Ex. SCG-03, RAMP to GRC Integration, Chapter 2), L. Patrick Kinsella (Ex. SDG&E-04, Gas Distribution), Christopher Summers (Ex. SDG&E-10, Energy Procurement), Oliva Reyes (Ex. SDG&E-11, Electric Distribution - Capital), Tyson Swetek (Ex. SDG&E-12, Electric Distribution – O&M), Fernando Valero (Ex. SDG&E-15, Clean Energy Innovation), Jonathan Woldemariam (Ex. SDG&E-13, Electric Distribution – Wildfire Mitigation and Vegetation Management), Sandra Baule (Ex. SDG&E-18, Customer Services – Office Operations), David H. Thai (Ex. SDG&E-17, Customer Services – Field Operations), Sandra Baule (Ex. SDG&E-19, Customer Services – Information), Therese Sacco (Ex. SDG&E-16, CIS Replacement Policy), Arthur Alvarez (Ex. SDG&E-22, Fleet Services), Rajan Agarwal (Ex. SDG&E-33, Administrative and General), Paul Malin (Ex. SDG&E-34, Shared Services & Shared Assets Billing, Segmentation, & Capital Reassignments), Jennifer Reynolds (Ex. SDG&E-21, Clean Transportation), Steven P. Dais (Ex. SDG&E-35, Rate Base), Patrick Moersen (Ex. SCG-31), Estela de Llanos (Ex. SDG&E-02, Sustainability Policy), Lance Mueller (Ex. SDG&E-26 and Ex. SCG-22, Cybersecurity), and Ryan Hom (Ex. SDG&E-44, Summary of Earnings).

C. Organization of Testimony

The costs presented in the remainder of our testimony are specific to IT costs charged to SDG&E cost centers. Tia L. Ballard sponsors the TY 2024 forecasts for O&M costs for both non-shared and shared services for the estimated years 2022 and 2023, and TY 2024. William J. Exon sponsors the TY 2024 forecasts for capital costs for the estimated years 2022 and 2023, and TY 2024. Section II of our testimony details Risk Assessment Mitigation Phase (RAMP) controls and mitigation activities and addresses any changes from the RAMP report. Section III discusses SDG&E's sustainability and safety culture. Section IV provides non-shared O&M costs that are incurred, and activities performed solely for the benefit of SDG&E. Section V sets forth the shared O&M costs and activities that benefit SDG&E, SoCalGas, and/or Corporate Center. The O&M costs presented in our testimony have been categorized into three areas:

1. Applications – Applications support the development, implementation, and maintenance of computer software utilized by customers, employees, and/or vendor partners. The Cloud service model SaaS aligns with this category.
2. Infrastructure – IT Infrastructure supports the design, implementation, and operation of the Company's computing infrastructure, including both hardware (ranging from desktop computing systems and servers to storage systems) and software (including middleware, production control, operating systems, and other low-level software systems). The Cloud service model PaaS and IaaS align with this category.
3. IT Support – This category of costs includes labor and non-labor for cost centers that are not specifically aligned with the other IT areas described above. Examples would include officer costs, budget and planning activities, and our intern/associate program.

Section VI discusses IT capital costs. The IT Division is responsible for a variety of technology-related services and activities for SDG&E, SoCalGas, and Corporate Center. Section VII concludes with a recap of our requests. Section VIII sets forth our witness qualifications.

II. RISK ASSESSMENT MITIGATION PHASE INTEGRATION

Certain costs supported in our testimony are driven by activities described in SDG&E and SoCalGas's respective 2021 RAMP Reports (the 2021 RAMP Reports).[8] The 2021 RAMP Reports presented an assessment of the key safety risks for SDG&E and SoCalGas and proposed plans for mitigating those risks. As discussed in the testimony of the RAMP to GRC Integration witnesses R. Scott Pearson and Gregory S. Flores (Ex. SCG-03/SDG&E-03, Chapter 2), the costs of risk mitigation projects and programs were translated from the 2021 RAMP Reports into the individual witness areas.

In the course of preparing the Information Technology (IT) GRC forecasts, SDG&E continued to evaluate the scope, schedule, resource requirements, and synergies of RAMP-related projects and programs. Therefore, the final presentation of RAMP costs may differ from the ranges shown in the 2021 RAMP Reports. Table TB/WE-2 and TB/WE-3 provide summaries of the RAMP-related costs supported in our testimony.

TABLE TB/WE-2
Summary of RAMP O&M Costs*

INFORMATION TECHNOLOGY **Summary of RAMP O&M Costs (In 2021 $)**			
RAMP Cross Functional Factor (CFF) Chapter	**BY2021 Embedded Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY 2024 Estimated Incremental (000s)**
SDG&E-CFF-4 Foundational Technology Systems	29,118	30,309	1,191
Sub-total	29,118	30,309	1,191
Total RAMP O&M Costs	**29,118**	**30,309**	**1,191**

*CFF-related information in accordance with the March 30, 2022 Assigned Commissioner Ruling in A.21-05-011/-014 (cons.) is provided in the RAMP to GRC Integration testimony of R. Scott Pearson and Gregory S. Flores (Ex. SCG-03/SDG&E-03, Chapter 2).

[8] *See* Application (A.) 21-05-011/014 (cons.) (RAMP Proceeding). Please refer to the RAMP to GRC Integration testimony of R. Scott Pearson and Gregory S. Flores (Ex. SCG-03/SDG&E-03, Chapter 2) for more details regarding the 2021 RAMP Reports.

TABLE TB/WE-3
Summary of RAMP Capital Costs*

INFORMATION TECHNOLOGY **Summary of RAMP Capital Costs (In 2021 $)**				
RAMP Cross Functional Factor (CFF) Chapter	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**2022-2024 Estimated RAMP Total (000s)**
SDG&E-CFF-1 Asset Management	7,703	9,963	6,078	23,744
SDG&E-CFF-4 Foundational Technology Systems	84,798	70,914	64,104	219,816
Sub-total	92,501	80,877	70,182	243,560
Total RAMP Capital Costs	**92,501**	**80,877**	**70,182**	**243,560**
RAMP Risk Chapter				

*CFF-related information in accordance with the March 30, 2022 Assigned Commissioner Ruling in A.21-05-011/-014 (cons.) is provided in the RAMP to GRC Integration testimony of R. Scott Pearson and Gregory S. Flores (Ex. SCG-03/SDG&E-03, Chapter 2).

A. RAMP Risk and Cross Functional Factor Overview

As summarized in Table TB/WE-2 and Table TB/WE-3 above, our testimony includes costs to mitigate the safety-related risks and Cross Functional Factors included in the RAMP report. These risks and factors are further described in Table TB/WE-4 below:

TABLE TB/WE-4
RAMP CFF Chapter Description

SDG&E-CFF-1 Asset Management	An enterprise-wide framework that provides a standardized approach for managing risk and safety across assets and activities. The framework integrates people, processes, data, and technology to enable data-driven decision making through governance, strategy, data consolidation and analytics, and continuous improvement.
SDG&E-CFF-4 Foundational Technology Systems	Describes the need for developing and maintaining stable technology platforms. Foundational technology systems are used in every aspect of operations, customer engagement, and emergency response. Included are a significant portion of the Companies' software application systems, communication networks, monitoring systems, end-user systems, and hardware and software platforms hosted in the Companies' data centers and on internal and external Cloud platforms.

Cross Functional factors (CFF) refer to initiatives (drivers, consequences, and/or mitigations) that are associated with, but are not specific to, any specific RAMP risk. Foundational Technology Systems, one of the CFFs included in the 2021 RAMP filing, are necessary to provide safe and reliable service to the public. These systems are used in every aspect of operations, customer engagement, and emergency response. These systems include a significant portion of each Company's software application systems, communication networks, monitoring systems, end-user systems, and hardware and software platforms hosted in data centers and on internal and external Cloud platforms. The safety and reliability of operations depend on Foundational Technology Systems; thus, it is critical for these systems to be resilient and recoverable.

Three factors create a continuing need to invest in Foundational Technology Systems:

- Technology systems have become the foundation for operational, business, and customer engagement needs across the enterprise, where even the most routine tasks rely on an interdependent network of systems and services.
- Technology can quickly become obsolete and often requires lifecycle management activities such as maintenance, upgrades, and replacements to remain reliable and secure. Neglecting these activities may result in downstream impacts, performance issues, and/or security vulnerabilities.
- The industry is faced with constantly evolving threats from both domestic and foreign adversaries, as well as supply chain risks, third-party and insider threats, and natural hazards. Collectively, the dependency on technology systems, the pace of technology obsolescence, and the dynamic nature of technology threats, hazards, and risks requires that the Companies evaluate and leverage the latest solutions on the market and constantly adapt to provide services securely, safely, and reliably to the workforce and customers.

The initiatives associated with Foundational Technology Systems discussed in the chapter work to reduce the frequency and consequences of technology-related system outages. Technology outages can be caused by drivers such as ineffective processes, hardware malfunctions, legacy system infrastructure issues, natural disasters, power outages, software failures, or human error. A technology outage can have varied consequences to safety, business operations, customer service, and system reliability.

SDG&E and SoCalGas have identified three tenets – Resiliency, Recovery, and Lifecycle Management – that represent the Foundational Technology Systems initiatives outlined in this chapter, as described below:

- **Technology resiliency** includes architectures, technologies, and processes for applications and infrastructure that focus on being prepared for any type of disruption – planned or unplanned – to mitigate the risk of downtime.
- **IT disaster recovery** is the ability to quickly recover systems and data after a disruption. Resilient systems and recovery work in tandem because increased resiliency reduces potential impacts and diminishes recovery implications.
- **Lifecycle management** is the holistic approach to maintenance, upgrades and/or replacement, and the planning process to ensure systems continue to operate as intended or to transition or retire legacy systems.

In developing our request, priority was given to these key safety risks to assess which risk mitigation activities Information Technology currently performs and what incremental efforts are needed to further mitigate these risks. While developing the GRC forecasts, SDG&E evaluated the scope, schedule, resource requirement, and synergies of RAMP-related projects and programs to determine costs already covered in the base year and those that are incremental increases expected in the test year.

Messrs. Pearson and Flores (Ex. SCG-03/SDG&E-03, Chapter 2) discuss all of the risks and CFFs included in the 2021 RAMP Reports and the RAMP to GRC integration process.

B. GRC Risk and CFF Activities

Table TB/WE-5 below provides a narrative summary of the forecasted RAMP-related activities that we sponsor in our testimony.

TABLE TB/WE-5
Summary of RAMP CFF Activities

RAMP ID	Activity	Description
SDG&E-CFF-1-01	AIM (Gov, Strat, AIP)	The Asset Integrity Management (AIM) program advances the development and implementation of a comprehensive, sustainable and risk informed Asset Management System (AMS), which encompasses people, process, data, analytics, and technology. The Asset Investment Prioritization (AIP) project incorporates an enterprise-wide, multi-attribute value framework methodology and an enabling software solution to demonstrate appraisal of capital investments in a consistent, transparent, repeatable, and standardized manner through data-driven, quantitative risk-informed and safety-based lens with the appropriate committee reviews and approvals. It allows for risk mitigations prioritization; the calculation of capital investment RSEs through risk reduction benefits over cost; and aids to effectively select and implement the right mitigations and controls to address the operating unit risks. It utilizes the Company's strategic values and determines standardized value-based metrics to quantitatively compare various projects, and thereby enhance the Company's ability to cross-prioritize across portfolio and optimize capital spend and effective use of ratepayer funds.
SDG&E-CFF-1-2b	Asset Data Syst & Rec Mgt (Data Integration)	The project consolidates asset data across disparate Company systems, creates asset health and risk/impacts indices at an individual asset level, and develops dashboards for users to interact with the data. This is done by understanding current performance through the creation of consolidated data models, asset health and probability of failure (PoF) calculations as well as consequence of failure (CoF)/impact predictions at the individual asset level.
SDG&E-CFF-4-01	Data Center Modernization	Data Center Modernization activities enhance the data center infrastructure and applications to improve the recoverability, resiliency, and availability of the Companies' business systems.

RAMP ID	Activity	Description
SDG&E-CFF-4-02	Network and Voice System Resiliency	Network and Voice System Resiliency activities enhance network and voice systems through maintenance and improved functionality.
SDG&E-CFF-4-03	Monitoring Systems and Services	Monitoring Systems and Services activities enhance the IT system monitoring capabilities and dashboard software used to proactively identify potential issues and allow for early detection, which helps mitigate the risk of outages.
SDG&E-CFF-4-04	Electric Operations System Resiliency	Electric Operations System Resiliency activities upgrade electric system applications and enhance lifecycle management activities, allowing SDG&E to more effectively manage and operate the electric distribution and transmission grid.
SDG&E-CFF-4-05	Gas Operations System Resiliency	The SDG&E Gas Operations System Resiliency initiative enhances the resiliency of gas operations through application system upgrades and lifecycle management activities required for safe operations.
SDG&E-CFF-4-06	End User Access and Supporting Services	The End User Access and Supporting Services initiative enhances IT systems and software security by upgrading the tools and technology used for remote access.
SDG&E-CFF-4-07	IT Service Continuity	The IT Service Continuity initiative improves the ability of critical systems to recover from outages through better governance and new technology enhancements.
SDG&E-CFF-4-08	Cloud Resilience Services	The Cloud Resilience Services initiative enables the delivery of computing services through Cloud foundations with resiliency, recovery and, lifecycle management enhancements and upgrades.
SDG&E-CFF-4-09	Emergency Operations Center (EOC) Technology Resiliency	The EOC Technology Resiliency initiative allows for the improvement of IT services and systems needed for the EOC to continue functioning during an EOC activation.

These activities are discussed within the O&M and Capital sections below. For additional information and a roadmap, please refer to Appendix C and D, which contain a table identifying by workpaper the TY 2024 forecast dollars associated with activities in the 2021 RAMP Report that are discussed in this testimony.

The RAMP risk mitigation efforts are associated with specific actions, such as programs, projects, processes, and utilization of technology. For each of these mitigation efforts, an evaluation was made to determine the portion, if any, that was already performed as part of historical activities (*i.e.*, embedded base costs) and the portion, if any, that was incremental to

base year activities. Furthermore, for the incremental activities, a review was completed to determine if any portion of incremental activity was part of the workgroup's base forecast methodology. The result is what SDG&E considers to be a true representation of incremental increases over the base year.

Our incremental request supports the ongoing management of these risks that could pose significant safety, reliability, and financial consequences.

C. Changes from RAMP Report

Other than as discussed below, the RAMP-related activities described in our GRC testimony are consistent with the activities presented in the 2021 RAMP Report. General changes to risks scores or Risk Spend Efficiency (RSE) values are primarily due to changes in the Multi-Attribute Value Framework (MAVF) and RSE methodology, as discussed in the RAMP to GRC Integration testimony.

The Foundational Technology Systems portfolio has changed from the 2021 RAMP Report in scope, but we remain within range of estimated costs presented.

III. SUSTAINABILITY AND SAFETY CULTURE

Sustainability, safety, and reliability are the cornerstones of SDG&E's core business operations and are central to SDG&E's GRC presentation. SDG&E is committed to not only deliver clean, safe, and reliable electric and natural gas service, but to do so in a manner that supports California's climate policy, adaptation, and mitigation efforts. In support of the legal and regulatory framework set by the state, SDG&E has set a goal to reach Net Zero greenhouse gas (GHG) emissions by 2045, adopted a Sustainability Strategy to facilitate the integration of GHG emission reduction strategies into SDG&E's day-to-day operations and long-term planning, and published an economy-wide GHG Study that recommends a diverse approach for California leveraging clean electricity, clean fuels, and carbon removal to achieve the 2045 goals through the lens of reliability, affordability, and equity. The Sustainability Strategy serves as SDG&E's guide to enable a more just and equitable energy future in SDG&E's service territory and beyond. As a "living" strategy, SDG&E will continue to update the goals and objectives as technologies, policies, and stakeholder preferences change. See the Sustainability Policy testimony of Estela de Llanos (Ex. SDG&E-02).

In this GRC, SDG&E focuses on three major categories that underpin the Sustainability Strategy: mitigating climate change, adapting to climate change, and transforming the grid to be

the reliable and resilient catalyst for clean energy. SDG&E's goal is to contribute to the decarbonization of the economy by way of diversifying energy resources, collaborating with regional partners, and providing customer choice that enables an affordable, flexible, and resilient grid.

Safety is a core value, and SDG&E is committed to providing safe and reliable service to all its stakeholders. This safety-first culture is embedded in every aspect of the Company's work. In 2020, the Companies commenced development and deployment of a Safety Management System (SMS), which better aligns and integrates safety, risk, asset, and emergency management across the entire organization. The SMS takes a holistic and proactive approach to safety and expands beyond "traditional" occupational safety principles to include asset safety, system safety, cyber safety, and psychological safety for improved safety performance and culture. The Companies' SMS is a systematic, enterprise-wide framework that utilizes data to collectively manage and reduce risk and promote continuous learning and improvement in safety performance through deliberate, routine, and intentional processes. For additional information regarding the Companies' SMS, please see the Safety, Risk and Asset Management testimony of Kenneth Deremer (Ex. SDG&E-31) and testimony of Neena Master (Ex. SCG-27).

The IT Division works to fulfill that culture by providing the technology support required for operations and business units to fulfill their objectives safely and efficiently. As processes and operations become increasingly dependent on technology for efficiencies and safety, the IT Division's business clients rely on IT to provide technology support.

SDG&E remains focused on identifying and implementing the most cost-effective solutions with the potential to make the greatest impact on reducing GHG emissions, while maintaining a safe and reliable energy system. SDG&E believes that safety, reliability, and sustainability are inextricably linked and fundamental to the Company's ability to continue to successfully operate. Please see the Sustainability Policy testimony of Estela de Llanos (Ex. SDG&E-02) for additional detail on SDG&E's Sustainability Strategy.

IT is dedicated to all aspects of providing safe and reliable energy delivery while protecting customer information and ensuring compliance with regulations. IT employees participate in all Company-mandated safety training and are responsible for the availability and operability of the technology that business clients rely on to run their operations.

The activities described in further detail in this testimony advance the state's climate goals and align with SDG&E's Sustainability Strategy. Specifically, the proposed projects in Table TB/WE-7 will drive progress in the area(s) of Climate Adaptation and Climate Mitigation.

TABLE TB/WE-7

Work Paper	Project Name	Focus Area
00908F	Energy Communications Enhancements	Climate Mitigation
00925Q	Telecom Site Improvements	Climate Mitigation
00920BC	Digital Process Automation Platform	Climate Adaptation
00920P	Asset Damages and Detection Platform	Climate Adaptation
00920BB	Energy Transition Digital Twin	Climate Mitigation

IV. NON-SHARED COSTS

"Non-Shared Services" are activities that are performed by a utility solely for its own benefit. Corporate Center provides certain services to the utilities and to other subsidiaries. For purposes of this GRC, SDG&E treats costs for services received from Corporate Center as Non-Shared Services costs, consistent with any other outside vendor costs incurred by the utility. Table TB/WE-8 summarizes the total non-shared O&M forecasts for the listed cost categories.

TABLE TB/WE-8
Non-Shared O&M Summary of Costs

INFORMATION TECHNOLOGY (In 2021 $)			
Categories of Management	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
A. Applications	10,678	20,382	9,704
B. Infrastructure	9,130	6,731	(2,399)
Total Non-Shared Services	**19,808**	**27,113**	**7,305**

A. O&M Forecast Methodology

The forecast methodology developed for IT costs is the base year (2021) recorded, plus adjustments. The pace of change in the technology industry continues to accelerate when compared to prior years. This is evidenced by growth in computing power at the hardware level as well as the number and diversity of applications at the software level. Factoring in emerging

computing trends, such as Cloud computing and the increasing commercialization of IT capabilities, required us to use current data and adjustments rather than relying on historical averages that do not include these types of trends in our computing environment. In addition, the level of support required of IT continues to grow due to new systems and capabilities being implemented to support business and customer needs, and these would not be reflected in our historical costs.

B. Applications (Non-Shared)

1. Description of Costs and Underlying Activities

The non-shared SDG&E IT applications costs represent labor and non-labor for technology systems where 100% of the activities directly support the objectives of operating and maintaining the Company infrastructure systems safely and reliably. The types of functions supported in this area include customer billing and revenue management, smart grid and electric operations, meter data services, smart grid and electric operations portfolio management office, applications and utility operations maintenance agreements, and customer information systems (CIS) operations. Customer information systems include ongoing costs related to the CIS replacement.

2. Description of RAMP Mitigations

RAMP-related costs for non-shared applications include the costs for CFF-4 Foundational Technology Systems, which includes the following activities described in Table TL/WE-5 above: (1) Data Center Modernization, (2) Network and Voice System Resiliency, (3) Monitoring Systems and Services, (4) Electric Operations System Resiliency, (5) Gas Operations System Resiliency, (6) End User Access and Supporting Services, (7) IT Service Continuity, (8) Cloud Resilience Services, and (9) Emergency Operations Center (EOC) Technology Resiliency.

Table TB/WE-9 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to our workpapers (SDG&E-25-WP, 1IT002.000).

TABLE TB/WE-9
Non-Shared O&M RAMP Costs – Applications

INFORMATION TECHNOLOGY **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**						
Workpaper	**RAMP ID**	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
1IT002.000	SDG&E-CFF-4 - 1 – 9	All Mitigations	2,579	2,619	40	0
Total			**2,579**	**2,619**	**40**	**0**

*An RSE was not calculated for this activity.

3. Cost Drivers

Table TB/WE-10 below lists the forecasted changes associated with non-shared O&M related to Applications.

TABLE TB/WE-10
Non-Shared O&M Cost Drivers – Applications

INFORMATION TECHNOLOGY (In 2021 $)	
Cost Driver Descriptions	**TY 2024 Estimated (000s)**
A. CIS Replacement operational costs	11,015
B. Additional labor	420
C. Decrease in contract labor	(352)
D. CIS Replacement benefits*	(1,379)
Total	**9,704**

*A summary of CIS Replacement benefits for TY 2024 can be found in Table TS-1 and TS-2 of the CIS Replacement Policy testimony, Ex. SDG&E-16.

C. Infrastructure (Non-Shared)

1. Description of Costs and Underlying Activities

These non-shared SDG&E IT infrastructure costs represent non-labor costs for technology systems where 100% of the activities directly support the objectives of operating and maintaining the Company infrastructure systems safely and reliably. The types of functions in this area include IT operations outsourced services and hardware and/or software maintenance agreements supporting non-shared Company infrastructure.

2. Description of RAMP Mitigations

RAMP-related costs for non-shared infrastructure include the costs for CFF-4 Foundational Technology Systems, which includes the following activities described in Table

TL/WE-5 above: (1) Data Center Modernization, (2) Network and Voice System Resiliency, (3) Monitoring Systems and Services, (4) Electric Operations System Resiliency, (5) Gas Operations System Resiliency, (6) End User Access and Supporting Services, (7) IT Service Continuity, (8) Cloud Resilience Services, and (9) EOC Technology Resiliency.

Table TB/WE-11 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to our workpapers (SDG&E-25-WP, 1IT004.000).

TABLE TB/WE-11
Non-Shared O&M RAMP Costs – Infrastructure

INFORMATION TECHNOLOGY **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**						
Workpaper	**RAMP ID**	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
1IT004.000	SDG&E-CFF-4 - 1 - 9	All Mitigations	3,195	2,509	(686)	0
Total			**3,195**	**2,509**	**(686)**	**0**

*An RSE was not calculated for this activity.

3. Cost Drivers

Table TB/WE-12 below lists the forecasted changes associated with non-shared O&M related to Infrastructure.

TABLE TB/WE-12
Non-Shared O&M Cost Drivers – Infrastructure

INFORMATION TECHNOLOGY (In 2021 $)	
Cost Driver Descriptions	**TY 2024 Estimated (000s)**
A. CIS Replacement benefits*	(1,883)
B. Prepaid maintenance adjustment	(1,556)
C. Increase in IT Operations Managed Services	1,040
Total	**(2,399)**

*A summary of CIS Replacement benefits for TY 2024 can be found in Table TS-1 and TS-2 of the CIS Replacement Policy testimony, Ex. SDG&E-16.

V. SHARED COSTS

As described in the testimony of Paul Malin (Ex. SDG&E-34, Shared Services & Shared Assets Billing, Segmentation, & Capital Reassignments), Shared Services are activities performed by a utility shared services department (*i.e.*, functional area) for the benefit of: (i)

SDG&E or SoCalGas, (ii) Corporate Center, and/or (iii) any affiliate subsidiaries. The utility providing Shared Services allocates and bills incurred costs to the entity or entities receiving those services. Table TB/WE-13 summarizes the total shared O&M forecasts for the listed cost categories.

TABLE TB/WE-13
Shared O&M Summary of Costs

INFORMATION TECHNOLOGY (In 2021 $)			
(In 2021 $) Incurred Costs (100% Level)			
Categories of Management	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
A. Applications	31,946	34,587	2,641
B. Infrastructure	35,845	37,634	1,789
C. Support	10,396	11,084	688
Total Shared Services (Incurred)	**78,187**	**83,305**	**5,118**

We are sponsoring the forecasts on a total incurred basis, as well as the shared services allocation percentages related to those costs. Those percentages are presented in our shared services workpapers, along with a description explaining the activities being allocated. See Ex. SDG&E-34-WP. The dollar amounts allocated to affiliates are presented in our Shared Services Policy and Procedures testimony. See Ex. SDG&E-34 (Paul Malin).

A. O&M Forecast Methodology

The forecast methodology developed for IT costs is the base year (2021) recorded, plus adjustments. The pace of change in the technology industry continues to accelerate when compared to prior years. This is evidenced by growth in computing power at the hardware level as well as the number and diversity of applications at the software level. Factoring in emerging computing trends, such as Cloud computing and the increasing commercialization of IT capabilities, required us to use current data and adjustments rather than relying on historical averages that do not include these types of trends in our computing environment. In addition, the level of support required of IT continues to grow due to new systems and capabilities being implemented to support business and customer needs and these would not be reflected in our historical costs.

B. Applications (Shared)

1. Description of Costs and Underlying Activities

The shared SDG&E IT applications costs represent labor and non-labor for technology systems where costs are shared between multiple business units and support the objectives of operating and maintaining the Company infrastructure systems safely and reliably. The types of systems supported in this area include utility operations, work management, business intelligence, analytics and reporting, and emergency operations. The types of functions supported in this area include systems engineering, systems architecture and integration, portfolio management services, applications outsourced services, and software maintenance agreements. The shared SDG&E IT applications costs also support all other Company-specific activities such as enterprise services (human resources, benefits, time keeping, compensation, payroll), supply chain, financial, business intelligence, analytics and reporting, and software maintenance agreements.

a. Description of RAMP Mitigations

RAMP-related costs for shared applications include the costs for CFF-4 Foundational Technology Systems, which include the following activities described in Table TL/WE-5 above: (1) Data Center Modernization, (2) Network and Voice System Resiliency, (3) Monitoring Systems and Services, (4) Electric Operations System Resiliency, (5) Gas Operations System Resiliency, (6) End User Access and Supporting Services, (7) IT Service Continuity, (8) Cloud Resilience Services, and (9) EOC Technology Resiliency.

Table TB/WE-14 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to our workpapers (SDG&E-25-WP, 2100-3073.000).

TABLE TB/WE-14
Shared O&M RAMP Costs – Applications

INFORMATION TECHNOLOGY **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**						
Workpaper	**RAMP ID**	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
2100-3073.000	SDG&E-CFF-4 - 1 - 9	All Mitigations	3,290	2,576	(714)	0
Total			**3,290**	**2,576**	**(714)**	**0**

*A RSE was not calculated for this activity.

2. Cost Drivers

Table TB/WE-15 below lists the forecasted changes associated with shared O&M related to Applications.

TABLE TB/WE-15
Shared O&M Cost Drivers – Applications

INFORMATION TECHNOLOGY (In 2021 $)	
Cost Driver Descriptions	**TY 2024 Estimated (000s)**
A. Increase in Cloud consumption	1,251
B. Increase in payroll and benefits system costs	1,002
C. Additional labor	840
D. Increase in contract labor	824
E. Increase in SAP costs	454
F. Prepaid Cloud subscription adjustment	(167)
G. Decrease in maintenance	(1,563)
Total	**2,641**

C. Infrastructure (Shared)

1. Description of Costs and Underlying Activities

The shared SDG&E IT infrastructure costs represent labor and non-labor for technology systems where costs are shared between multiple business units and support the objectives of operating and maintaining the Company infrastructure systems safely and reliably. The types of systems supported in this area include data center computing, Cloud computing, storage, network, telecom, and operations technology. The types of functions supported in this area include network operations, field support services, portfolio management services, and hardware and/or software maintenance agreements. The shared SDG&E IT infrastructure costs also support all other Company-specific activities such as end-user computing, IT service management, and office productivity tools.

2. Description of RAMP Mitigations

RAMP-related costs for shared infrastructure include the costs for CFF-4 Foundational Technology Systems, which includes the following activities described in Table TL/WE-5 above: (1) Data Center Modernization, (2) Network and Voice System Resiliency, (3) Monitoring Systems and Services, (4) Electric Operations System Resiliency, (5) Gas Operations System Resiliency, (6) End User Access and Supporting Services, (7) IT Service Continuity, (8) Cloud Resilience Services, and (9) EOC Technology Resiliency.

Table TB/WE-16 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to our workpapers (SDG&E-25-WP, 2100-0207.000).

TABLE TB/WE-16
Shared O&M RAMP Costs – Infrastructure

INFORMATION TECHNOLOGY **RAMP Activity O&M Forecasts by Workpaper ($000's)**						
Workpaper	**RAMP ID**	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
2100-0207.000	SDG&E-CFF-4 - 1 - 9	All Mitigations	19,226	21,777	2,551	0
Total			**19,226**	**21,777**	**2,551**	**0**

*An RSE was not calculated for this activity.

3. Cost Drivers

Table TB/WE-17 below lists the forecasted changes associated with shared O&M related to Infrastructure.

TABLE TB/WE-17
Shared O&M Cost Drivers – Infrastructure

INFORMATION TECHNOLOGY (In 2021 $)	
Cost Driver Descriptions	**TY 2024 Estimated (000s)**
A. Smart Meter 2.0	2,176
B. Increase in Telecom	1,546
C. Increase in Cloud consumption	1,075
D. Additional labor	420
E. Prepaid maintenance adjustment	90
F. CIS Replacement benefits adjustments	(1,071)
G. Decrease in maintenance	(2,447)
Total	**1,789**

D. IT Support (Shared)

1. Description of Costs and Underlying Activities

The shared SDG&E IT support costs represent labor and non-labor for technology systems where costs are shared between multiple business units and support the objectives of operating and maintaining the Company infrastructure systems safely and reliably. The types of services supported in this area include quality assurance, release and environment management,

enterprise monitoring, and solutions architecture. The shared SDG&E IT support costs also support all other Company-specific activities such as vendor management office, financial investment optimization, organizational change management, associate and intern program, training and development, portfolio management, and Cloud transformation office.

2. Description of RAMP Mitigations

RAMP-related costs for shared IT support include the costs for CFF-4 Foundational Technology Systems, which includes the following activities described in Table TL/WE-5 above: (1) Data Center Modernization, (2) Network and Voice System Resiliency, (3) Monitoring Systems and Services, (4) Electric Operations System Resiliency, (5) Gas Operations System Resiliency, (6) End User Access and Supporting Services, (7) IT Service Continuity, (8) Cloud Resilience Services, and (9) EOC Technology Resiliency.

Table TB/WE-18 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to our workpapers (SDG&E-25-WP, 2100-0460.000).

TABLE TB/WE-18
Shared O&M RAMP Costs – IT Support

INFORMATION TECHNOLOGY **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**						
Workpaper	**RAMP ID**	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
2100-0460.000	SDG&E-CFF-4 - 1 - 9	All Mitigations	828	828	0	0
Total			**828**	**828**	**0**	**0**

*An RSE was not calculated for this activity.

3. Cost Drivers

Table TB/WE-19 below lists the forecasted increases associated with shared O&M related to Infrastructure.

TABLE TB/WE-19
Shared O&M Cost Drivers – IT Support

INFORMATION TECHNOLOGY (In 2021 $)	
Cost Driver Descriptions	**TY 2024 Estimated (000s)**
A. Additional labor	504
B. Increase in contract labor	500
C. Decrease in IT quality assurance	(316)
Total	**688**

VI. CAPITAL

A. Introduction

Table TB/WE-20 below summarizes the total SDG&E IT capital forecasts for 2022, 2023, and 2024. Table TB/WE-20 shows the full complement of IT projects being proposed by SDG&E in this filing. In other words, Table TB/WE-20 is composed of both business unit-sponsored IT capital projects, as well as IT Division-sponsored IT capital projects. The costs depicted in Table TB/WE-20 are the total costs to be incurred by the proposed capital projects and charged to SDG&E cost centers. They do not reflect adjustments or allocations due to a shared asset that may result in sharing of project costs across SoCalGas and Corporate Center, if appropriate.

Included in Table TB/WE-20 are projects sponsored by the business units that include IT technology solutions to meet business demand. The business justifications for the business-sponsored projects are included in the testimony of the associated business witnesses:

Administrative and General	*Agarwal (Ex: SDG&E-33)*
Clean Transportation	*Reynolds (Ex: SDG&E-21)*
Customer Services – Field Operations	*Thai (Ex: SDG&E-17)*
Customer Services – Office Operations	*Baule (Ex: SDG&E-18)*
Customer Services – Information	*Baule (Ex: SDG&E-19)*
Clean Energy Innovations	*Valero (Ex: SDG&E-15)*
Energy Procurement	*Summers (Ex: SDG&E-10)*
Electric Distribution – Capital	*Reyes (Ex: SDG&E-11)*
Electric Distribution – O&M	*Swetek (Ex: SDG&E-12)*
Electric Distribution - Wildfire Mitigation and Vegetation Management	*Woldemariam (Ex: SDG&E-13)*
Fleet Services	*Alvarez (Ex: SDG&E-22)*
Gas Distribution	*Kinsella (Ex: SDG&E-04)*
Safety, Risk & Asset Management	*Deremer (Ex: SDG&E-31)*

Our workpapers contain the cost justifications for the IT portion of these business unit-sponsored capital projects. We provide additional information about IT Division-sponsored IT capital projects below in Section D. Table TB/WE-20 summarizes the total capital forecasts for 2022, 2023, and 2024.

TABLE TB/WE-20
Capital Expenditures Summary of Costs

INFORMATION TECHNOLOGY (In 2021 $)			
Categories of Management	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
A. Administrative and General	1,800	1,265	1,265
B. Clean Transportation	1,125	1,459	1,612
C. Customer Service – Field Operations	22,833	52,849	81,418
D. Customer Service – Office Operations	19,233	31,353	33,557
E. Customer Service – Information*	4,969	4,367	0
F. Clean Energy Innovations*	1,068	2,040	897
G. Energy Procurement	1,915	3,060	1,811
H. Electric Distribution - Capital*	6,782	718	0
I. Electric Distribution – O&M*	11,963	8,728	7,578
J. Electric Distribution – Wildfire Mitigation and Vegetation Management	1,884	6,546	1,678
K. Fleet Services	466	618	330
L. Gas Distribution	371	632	0
M. Safety, Risk, and Asset Management System	20,198	24,049	21,781
O. Information Technology	125,405	71,109	62,259
Total	**220,012**	**208,793**	**214,186**

*A portion of this cost supports SDG&E's Grid Modernization Plan. (Ex. SDG&E-12, Appendix C). Refer to this category's work paper for details.

B. IT Capital Planning Process

Before an IT capital project is funded and moves into development, it must go through SDG&E's IT capital project approval process, which has several distinct stages, as described below.

1. IT Division Capital Plan Development

The IT Division develops a proposed set of capital projects for the upcoming year by working with business clients to identify new technology capabilities to meet business and customer needs as well as working with the IT teams to identify technology lifecycle needs. IT and business client teams develop a project Concept that is used to prioritize and approve projects to proceed to developing a Business Case. Business cases are reviewed and approved by a functional capital committee to be funded and proceed to begin work.

2. Concepts

Concepts are high-level assessments developed for review during the capital planning process. The concepts include typical project elements, such as cost estimates, business benefits, and project schedules. It also provides delivery teams the opportunity to document alternative options considered, as well as business risks and implications of not proceeding with the project. All of these elements are available for consideration during project prioritization and approval.

3. Project Prioritization and Approval

The concepts provided by delivery teams are utilized for prioritization purposes. Rankings are determined based on various factors including, but not limited to, safety, regulatory, technology lifecycle needs and cost-benefit analysis. The annual capital planning process for SDG&E is administered by the Capital and Operating Planning group and the process is referenced in SDG&E's Rate Base testimony of Steven P. Dais (Ex. SDG&E-35). Based on the rankings, projects are approved for preliminary funding and to proceed to Business Case development.

4. Business Cases

Once funding is approved by the Capital and Operating Planning group for a concept, a complete business case must be prepared and approved before work begins. Business cases are developed jointly by representative(s) from the sponsoring IT department, the sponsoring business department (when applicable), and the IT Technology Investment team. Others may be added to the team as required.

- The sponsoring IT department is primarily responsible for defining the project scope, identifying the technical approach, and generating the basis of the estimate for the capital costs and ongoing O&M support costs.
- The business representatives are primarily responsible for confirming the business requirements, calculating the business benefits, and ensuring that the proposed solution meets the business objectives.
- The IT Technology Investment team ensures that the templates are completed correctly, that the project costs are calculated and characterized correctly, and that the proposed scope is consistent with policy.

5. Cost Sharing Mechanisms

A cost-sharing mechanism must be determined for any project that will be utilized across SDG&E, SoCalGas, and/or Corporate Center. As part of the business case development, a project team will include a recommendation of how costs will be shared for consideration during the capital approval process based on its assessment of project scope.

C. Capital Forecast Methodology

SDG&E capital projects use a zero-based forecast methodology. A zero-based estimate is a more accurate indicator of future costs for this category based on current and expected projects of this nature as the historical average does not inform the forecast due to changing technological advancements. Detailed cost estimates are provided by internal and external delivery teams (where applicable) experienced in estimating projects with similar scope, schedule, and resources such as FTE, systems, and environment.

D. IT-Sponsored Capital Projects

The remainder of the IT capital costs we are requesting are for SDG&E IT-sponsored capital projects. Table TB/WE-21 below provides a summary of costs for the IT-sponsored capital projects. Summary descriptions of the projects are provided in the subsections below, and details can be found in our capital workpapers for each project (Ex. SDG&E-25-CWP).

TABLE TB/WE-21
Capital Expenditures Summary of Costs – IT Projects Only

INFORMATION TECHNOLOGY (In 2021 $)					
ID	**Project Description**	**Work Paper**	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
1	IT Quality and Continuous Testing Platforms	00907A	1,967	779	995
2	SAP Computing Resource and Storage Expansion	00907K	2,078	0	0
3	Cloud Data Lake	00907M	0	2,500	2,500
4	Microsoft Enterprise Agreement	00907N	27,900	0	0
5	Microsoft 365 Service Management	00907O	336	0	0
6	Network Attached Storage (NAS) Modernization	00908AA	793	0	0

INFORMATION TECHNOLOGY (In 2021 $)					
ID	**Project Description**	**Work Paper**	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
7	IT Converged Infrastructure Compute Capacity Expansion	00908AC	193	0	0
8	a. Digi Remote Manager 2022	00908AE	497	0	0
	b. Digi Remote Manager 2023	00908O	0	1,273	0
9	Digital Workspace	00908B	10,694	0	0
10	Virtual Desktop Infrastructure (VDI) Expansion - Phase 2	00908C	0	1,550	1,550
11	Emergency Communications Enhancements	00908F	863	0	0
12	Network Attached Storage (NAS) Stringent Compliance Tier 2023	00908G	0	2,080	0
13	Emergency Response Commander Trucks	00908H	349	0	0
14	Elastic Cloud Storage (ECS) Capacity Expansion 2022	00908I	629	0	0
15	Elastic Cloud Storage (ECS) EX300 Hardware Refresh 2023	00908J	0	631	0
16	Network Attached Storage (NAS) Archive Tier 2022	00908K	549	0	0
17	Network Attached Storage (NAS) Isolated Hi-Perf-Low-Latency Workloads Tier 2023	00908L	0	1,774	0
18	IT Small Capital	00908U	300	0	0
19	Middleware Platforms Disaster Recovery 2022	00908V	1,112	0	0
20	Infrastructure as a Service (IaaS) Implementation	00908W	0	0	2,000
21	Cloud Foundations	00908X	5,968	4,812	5,312
22	Lifecycle Management Data Platform	00908Y	324	0	0
23	Telecom Asset Management Capabilities	00908Z	1,400	300	0

INFORMATION TECHNOLOGY (In 2021 $)					
ID	**Project Description**	**Work Paper**	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
24	Virtual Reality Expansion	00920AL	2,498	0	0
25	a. App Modernization & Vulnerability Reduction - Phase 1	00920AV	259	0	0
	b. App Modernization & Vulnerability Reduction - Phase 2	00920AR	3,270	4,000	4,000
26	Energy Transition Digital Twin	00920BB	1,986	1,986	1,986
27	Digital Process Automation	00920BC	4,950	4,950	4,853
28	Foundational Analytics for Safety, Compliance and Efficiency	00920BD	6,642	5,767	5,867
29	Advanced Data and Decision Modeling	00920BE	1,235	3,960	3,960
30	Decision Analytics & Situational Awareness	00920BF	1,736	1,536	1,536
31	Situational Awareness Dashboards	00920BH	524	0	0
32	Noggin Phase 3B	00920BK	841	2,748	0
33	Digital Asset and Damages Detection Platform	00920P	4,505	3,680	3,680
34	Container Modernization on Cloud Web Services	00921AA	371	0	0
35	DevSecOps Source Code Management (SCM) GitHub	00921C	2,922	3,001	0
36	Test Acceleration Enablement (TAE) with DevSecOps	00921D	1,516	1,485	1,726
37	Digital Service Integration Platform	00921E	1,550	1,550	1,550
38	Data Governance Tools & Framework	00921F	2,550	2,250	2,250
39	Application Factory - Utility Operations	00921G	1,400	600	0

INFORMATION TECHNOLOGY (In 2021 $)					
ID	**Project Description**	**Work Paper**	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
40	Test Acceleration Enablement (TAE)	00921I	114	0	0
41	Source Code Management & DevOps Implementation	00921L	362	0	0
42	Business Adaptation Technologies & Digitalization	00921R	1,415	1,190	1,190
43	Software Defined Wide Area Network (SD-WAN) Implementation 2022	00925B	521	114	0
44	Emergency Communications Microwave (MW) Auto Alignment System	00925E	462	93	0
45	Network Switch 2022 Equipment Replacement Agreement	00925F	1,193	1,193	1,193
46	Network Time Protocol (NTP) Clock Refresh	00925H	477	0	0
47	a. Transmission Communications Reliability Improvement (TCRI) 2022	00925I	4,413	0	0
	b. Transmission Communications Reliability Improvement (TCRI) 2023	00925J	0	4,413	0
	c. Transmission Communications Reliability Improvement (TCRI) 2024	00925K	0	0	4,413
48	Local Area Network (LAN) Refresh 2022	00925L	3,734	4,245	4,945
49	Field Area Network (FAN) Voice & Dispatch - Phase 2	00925M	10,357	0	0
50	Data Center Network (DCN) Core Refresh	00925N	2,999	0	0
51	Telecom Site Improvements	00925Q	1,835	3,721	3,721

INFORMATION TECHNOLOGY (In 2021 $)					
ID	**Project Description**	**Work Paper**	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
52	Wide Area Network (WAN) Refresh	00925R	2,495	2,928	3,032
53	EVC and GC Telecom Security Remediation	00925S	50	0	0
54	Call Recording System Refresh	00925T	271	0	0

1. WP# 00907A - IT Quality and Continuous Testing Platform

a. Description of Costs and Underlying Activities

The forecast for the IT Quality and Continuous Testing Platform project for 2022, 2023, and 2024 are $1.967 million, $0.779 million, and $0.995 million, respectively. SDG&E plans to build and place in service the IT Quality and Continuous Testing Platform project by the Test Year. Agile and DevSecOps capabilities currently being implemented by the company highlight a need for additional technology capabilities. These capabilities include further enhancement of test automation of SAP and mobile testing and adding code quality analysis capabilities in support of DevSecOps Continuous Improvement (CI) and Continuous Delivery (CD) pipelines. This project implements and integrates tools and capabilities within our service delivery landscape with new testing platforms. This project implementation strengthens the position of the overall business agility transformation while enabling high-quality delivery of an enterprise-scale software testing automation platform. This project also speeds up adoption of continuous testing in agile teams and DevSecOps by introducing next generation test automation and source code quality review tools to our Company's application environments. These forecasted capital expenditures support the Company's IT goal of transforming how we work.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services, software, and prepaid maintenance. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00907A).

2. WP# 00907K - SAP Computing Resource and Storage Expansion

a. Description of Costs and Underlying Activities

The forecast for the SAP Computing Resource and Storage Expansion project for 2022, 2023, and 2024 are $2.078 million, $0, and $0, respectively. SDG&E plans to build and place in service the SAP Computing Resource and Storage Expansion project by the Test Year. This project addresses the post Customer Information System (CIS) replacement computing and storage growth in the data center. This growth is due to increasing operational functionality that resulted in a need for additional computing resources for the new CIS and the dependent systems. This project increases computing and storage resource capacity to support additional development and organic growth. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware and prepaid maintenance. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00907K).

3. WP# 00907M - Cloud Data Lake

a. Description of Costs and Underlying Activities

The forecast for the Cloud Data Lake project for 2022, 2023, and 2024 are $0, $2.5 million, and $2.5 million, respectively. SDG&E plans to build and place in service the Cloud Data Lake project by the Test Year. This project develops and scales the Cloud data lake to support data analytics, machine learning, digital twin, and related data analytics solutions. This project incorporates predictive analytics into its business processes and decision support models to modernize analytics platforms and streamline access to data. This project minimizes data replication and provides centralized data governance in the Cloud, thereby improving data quality and accessibility. This project also ensures company level data security and access. These forecasted capital expenditures support the Company's IT goal of accelerating digital.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development and implementation, and SaaS licensing. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00907M).

4. WP# 00907N - Microsoft Enterprise Agreement

a. Description of Costs and Underlying Activities

The forecast for the Microsoft Enterprise Agreement project for 2022, 2023, and 2024 are $27.900 million, $0, and $0, respectively. SDG&E plans to build and place in service the Microsoft Enterprise Agreement project by the Test Year. This project covers licensing and subscriptions required for select Microsoft software products across the company. A Microsoft license is essential and required for each employee and contractor to enable productivity and complete common digital tasks in the workplace. This project meets required licensing to promote collaboration, productivity, security, infrastructure, and monitoring. Licenses are subject to renewal prior to December 2022 to maintain continuity of product use. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

b. Cost Drivers

The underlying cost drivers for this capital project relate to non-labor costs including Microsoft product licensing and prepaid SaaS subscription. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00907N).

5. WP# 00907O - Microsoft 365 Service Management

a. Description of Costs and Underlying Activities

The forecast for the Microsoft 365 Service Management project for 2022, 2023, and 2024 are $0.336 million, $0, and $0, respectively. SDG&E plans to build and place in service the Microsoft 365 Service Management project by the Test Year. This project started in 2021. This project enables external clients to request and access internal Microsoft 365 and SharePoint resources through an automated process. This project speeds up provisioning while enforcing standards and incorporating a dashboard feature to centralize reporting functions. This project allows for self-provisioning and self-management capabilities that enhance the customer user experience. This project improves reporting efficiency and enables external collaboration for third parties and affiliates with affiliate compliance controls. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services, software, hardware, and prepaid maintenance.

Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00907O).

6. WP# 00908AA – Network Attached Storage (NAS) Modernization (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Network Attached Storage (NAS) Modernization project for 2022, 2023, and 2024 are $0.793 million, $0, and $0, respectively. SDG&E plans to build and place in service the NAS Modernization project by the Test Year. This project started in 2021. This project modernizes our existing NAS to migrate from on-premise to the Cloud. This project leverages Cloud economies of scale and reduces the on-premise NAS footprint in the primary and secondary data centers. The project improves the long-term storage requirements by migrating required storage from hard assets on-premise to virtual storage owned and maintained by a third-party. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Data Center Modernization CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-22 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-22
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908AA.001	SDG&E-CFF-4	1	Data Center Modernization	793	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services and hardware. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908AA).

7. WP# 00908AC - IT Converged Infrastructure Compute Capacity Expansion (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the IT Converged Infrastructure Compute Capacity Expansion project for 2022, 2023, and 2024 are $0.193 million, $0, and $0, respectively. SDG&E plans to build and place in service the IT Converged Infrastructure Compute Capacity Expansion project by the Test Year. This project started in 2021. This project includes the purchase of additional storage and compute capacity for the primary and secondary data centers. This purchase supports the converged infrastructure growth requirements and allows for optimal utilization of storage, which should remain below 70%. This project improves performance, increases availability and reliability to meet system demands and allows for capacity to be under 70% utilization. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Data Center Modernization CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-23 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-23
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908AC.001	SDG&E-CFF-4	1	Data Center Modernization	193	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services, hardware, and prepaid maintenance. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908AC).

8. WP# 00908AE & 00908O - Digi Remote Manager (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Digi Remote Manager projects for 2022, 2023, and 2024 are $0.497 million, $1.273 million, and $0, respectively. SDG&E plans to build and place in service the Digi Remote Manager projects by the Test Year. This project started in 2021. These projects include the deployment of software licensing through a Network Services Platform (NSP) for field and data center network Out of Band Management (OOBM) devices at the Company service territories. Integrating OOBM devices into an NSP allows our Network Operations Center (NOC) to monitor and remotely manage the network devices to ensure we are compliant with Cybersecurity audit requirements. This project provides reliable and secure management, device inventory, and remote monitoring of field and data center network OOBM devices. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

These two projects are within the Monitoring Systems and Services CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-24 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-24
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908AE.001	SDG&E-CFF-4	3	Monitoring Systems and Services	497	0	0	0
00908O.001	SDG&E-CFF-4	3	Monitoring Systems and Services	0	1,273	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for these capital projects relate to internal labor costs and non-labor costs including vendor services, hardware, software licenses, and prepaid maintenance.

Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908AE & 00908O).

9. WP# 00908B - Digital Workspace (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Digital Workspace project for 2022, 2023, and 2024 are $10.694 million, $0, and $0, respectively. SDG&E plans to build and place in service the Digital Workspace project by the Test Year. This project started in 2021 and procures, configures, and deploys workstations to company employees. These workstations include a combination of desktops and laptops with a docking station. This project improves client experience, operational efficiency and reduces the risk of technology obsolescence. The project also increases mobility and flexibility for office workers by replacing desktops with laptops. These forecasted capital expenditures support the Company's IT goal of transforming how we work.

This is a project within the End User Access and Supporting Services CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-25 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-25
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908B.001	SDG&E-CFF-4	6	End User Access and Supporting Services	10,694	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services, SaaS subscription, hardware, software, and prepaid maintenance. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908B).

10. WP# 00908C - Virtual Desktop Infrastructure (VDI) Expansion - Phase 2 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Virtual Desktop Infrastructure (VDI) Expansion - Phase 2 project for 2022, 2023, and 2024 are $0, $1.55 million, and $1.55 million, respectively. SDG&E plans to build and place in service the Virtual Desktop Infrastructure (VDI) Expansion - Phase 2 project by the Test Year. This project expands the enterprise Virtual Desktop Infrastructure (VDI) Expansion Platform, making Citrix the single VDI Expansion Platform for the Company. This project includes new capabilities such as Bring Your Own Device (BYOD) for IT contractors and supports 3D rendering requirements. It also reduces desktop provisioning time for contractors onboarding thereby increasing productivity. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the End User Access and Supporting Services CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast, in its entirety, aligns with a RAMP activity.

Table TB/WE-26 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-26
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908C.001	SDG&E-CFF-4	6	End User Access and Supporting Services	0	1,550	1,550	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services, hardware, and prepaid maintenance. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908C).

11. WP# 00908F – Emergency Communications Enhancements (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Emergency Communications Enhancement project for 2022, 2023, and 2024 are $0.863 million, $0, and $0, respectively. SDG&E plans to build and place in service the Emergency Communications Enhancement project by the Test Year. This project started in 2021. This project enhances the existing emergency communications infrastructure to allow emergency response personnel to communicate through mobile devices. This project enables Company site business continuity and better situational awareness for emergency and first responders utilizing the emergency communications network. Additionally, the project allows for enhanced command and control of emergency response personnel and equipment. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the EOC Technology Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety, aligns with a RAMP activity.

Table TB/WE-27 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-27
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908F.001	SDG&E-CFF-4	9	Emergency Operations Center (EOC) Technology Resiliency	863	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware, prepaid maintenance, contract labor, and vendor services.

Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908F).

12. WP# 00908G – Network Attached Storage (NAS) Stringent Compliance Tier 2023 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Network Attached Storage (NAS) Stringent Compliance Tier 2023 project for 2022, 2023, and 2024 are $0, $2.08 million, and $0, respectively. SDG&E plans to build and place in service the NAS Stringent Compliance Tier 2023 project by the Test Year. This project creates a NAS Compliance Tier to store NAS data that requires full Federal Information Processing Standards (FIPS) compliance. This project meets FIPS 140-2 Compliance requirements by encrypting data at rest using cryptography. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Data Center Modernization CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-28 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-28
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908G.001	SDG&E-CFF-4	1	Data Center Modernization	0	2,080	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware, prepaid maintenance, licenses, and vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908G).

13. WP# 00908H – Emergency Response Commander Trucks (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Emergency Response Commander Trucks project for 2022, 2023, and 2024 are $0.349 million, $0, and $0, respectively. SDG&E plans to build and place in service the Emergency Response Commander Trucks project by the Test Year. This project provides internet connectivity to company vehicles so that users can connect to internal network and data centers while being out in the field. Secure, encrypted communication will be achieved by leveraging existing Virtual Private Network (VPN) solutions. This project allows company commander crews to conduct business more efficiently while out in the field by being connected to the internal network and data centers. These forecasted capital expenditures support the Company's IT goal of proactively managing risk.

This is a project within the EOC Technology Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-29 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-29
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908H.001	SDG&E-CFF-4	9	Emergency Operations Center (EOC) Technology Resiliency	349	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware, software, licenses, and prepaid maintenance. Documentation of these cost drivers is included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908H).

14. WP# 00908I – Elastic Cloud Storage (ECS) Capacity Expansion 2022 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Elastic Cloud Storage (ECS) Capacity Expansion 2022 project for 2022, 2023, and 2024 are $0.629 million, $0, and $0, respectively. SDG&E plans to build and place in service the ECS Capacity Expansion 2022 project by the Test Year. This project expands capacity on the existing primary production ECS clusters to accommodate additional long-term backup retention needs. This project enables long-term retention requirements for critical backup data and increases the reliability and resiliency of on-premise data protection services. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Data Center Modernization CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-30 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-30
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908I.001	SDG&E-CFF-4	1	Data Center Modernization	629	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware, prepaid maintenance, and vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908I).

15. WP# 00908J – Elastic Cloud Storage (ECS) EX300 Hardware Refresh 2023 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the ECS EX300 Hardware Refresh 2023 project for 2022, 2023, and 2024 are $0, $0.631 million, and $0, respectively. SDG&E plans to build and place in service the ECS EX300 Hardware Refresh 2023 project by the Test Year. This project consists of a technical refresh to ECS EX300 hardware located at the primary and secondary data centers. This project reduces operational risk and increases business continuity by replacing legacy hardware that is reaching end of life with more efficient hardware. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Data Center Modernization CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-31 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-31
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908J.001	SDG&E-CFF-4	1	Data Center Modernization	0	631	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware, prepaid maintenance, and vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908J).

16. WP# 00908K – Network Attached Storage (NAS) Archive Tier 2022 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the NAS Archive Tier 2022 project for 2022, 2023, and 2024 are $0.549 million, $0, and $0, respectively. SDG&E plans to build and place in service the NAS Archive Tier 2022 project by the Test Year. This project creates a NAS Archive to relocate data that should not leave the on-premise data center infrastructure. This project augments existing NAS overall capacity and automates transparent data migration to lowest cost storage. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Data Center Modernization CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-32 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-32
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908K.001	SDG&E-CFF-4	1	Data Center Modernization	549	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware, prepaid maintenance, and vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908K).

17. WP# 00908L – Network Attached Storage (NAS) Isolated Hi-Perf-Low-Latency Workloads Tier 2023 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the NAS Isolated Hi-Perf-Low-Latency Workloads Tier 2023 project for 2022, 2023, and 2024 are $0, $1.774 million, and $0, respectively. SDG&E plans to build and

place in service the NAS Isolated Hi-Perf-Low-Latency Workloads Tier 2023 project by the Test Year. This project creates a separate NAS for high performing workloads. This storage would be isolated from all the general-purpose workload contention, requiring low-latency response times. This project provides a NAS environment that delivers higher performance to the most demanding workloads with minimal contention to other transactions and simplifies the upgrade process. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Data Center Modernization CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-33 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-33
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908L.001	SDG&E-CFF-4	1	Data Center Modernization	0	1,774	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware, license cost, prepaid maintenance, and vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908L).

18. WP# 00908U - IT Small Capital

a. Description of Costs and Underlying Activities

The forecast for the IT Small Capital project for 2022, 2023, and 2024 are $0.3 million, $0, and $0, respectively. SDG&E plans to build and place in service the IT Small Capital project by the Test Year. This project started in 2020. This project addresses routine customer operational issues, network improvements, information security, faster service delivery,

collaboration, and innovation. For example, replacement of End of Life (EOL) and/or End of Service (EOS) batteries at critical remote telecommmunications sites in the SDG&E territory for power redundancy. This project makes improvements to the overall performance of the network and systems, thereby making it easier for employees to do their job more effectively and efficiently. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware costs and prepaid maintenance. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908U).

19. WP# 00908V – Middleware Platforms Disaster Recovery 2022 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Middleware Platforms Disaster Recovery 2022 project for 2022, 2023, and 2024 are $1.112 million, $0, and $0, respectively. SDG&E plans to build and place in service the Middleware Platforms Disaster Recovery 2022 project by the Test Year. In the event of an unplanned catastrophic event that threatens core and/or shared business Company applications and data, intermediary applications that sit between other applications (called middleware applications) may be at risk, threatening business continuity if one were to occur. This project enables business teams to use Middleware platforms and core services on demand for Disaster Recovery (DR). This project develops a comprehensive Middleware Platform Disaster Recovery environment and enables application teams to create a reliable Disaster recovery plan. Executing on the DR plan results in minimal outage time for Middleware core services during a DR event. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the IT Service Continuity CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-34 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-34
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908V.001	SDG&E-CFF-4	7	IT Service Continuity	1,112	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including software, and licensing. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908V).

20. WP# 00908W – Infrastructure as a Service (IaaS) Implementation (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Infrastructure as a Service (IaaS) Implementation project for 2022, 2023, and 2024 are $0, $0, and $2 million, respectively. SDG&E plans to build and place in service the IaaS Implementation project by the Test Year. The IaaS Cloud service model is described in the IT Testimony Chapter 1 Table (Figure TB/WE-1). IT has a goal to move additional business applications out of the Company data centers and into a Cloud provider to allow for increased business resilience and innovation opportunities. The IaaS option will enable application computation to run on servers in the Cloud provider's data service centers. This project provides prepaid infrastructure in the Cloud provider for critical applications to migrate to the Cloud. Additionally, this project enables faster delivery of this infrastructure through a standard consumption and pricing model. Pricing for infrastructure in the Cloud varies over time. Leveraging a pre-paid amount of compute via a Reserved Instance (RI) allows the business to plan for and commit to a specific consumption over a fixed period achieving discounted pricing. If the organization does not reserve instances, the costs would be significantly higher and unpredictable. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Cloud Resiliency Services CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-35 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-35
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908W.001	SDG&E-CFF-4	8	Cloud Resilience Services	0	0	2,000	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to non-labor costs including IaaS subscription. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908W).

21. WP# 00908X – Cloud Foundations (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Cloud Foundations project for 2022, 2023, and 2024 are $5.968 million, $ 4.812 million, and $5.312 million, respectively. SDG&E plans to build and place in service the Cloud Foundations project by the Test Year. This project started in 2020 and establishes a bridge from on-premise capabilities to Cloud services. It provides a hybrid Cloud environment capable of quickly provisioning or recovering IT services to support business needs more efficiently.

Examples of demand for additional Cloud services as described in the IT Testimony Chapter 1 (Figure TB/WE-1) from business units include where applicable:

- Infrastructure as a Service (IaaS) - Data archiving, disaster recovery, business continuity

- Platform as a Service (PaaS) - Database as a service, analytics, web application development
- Software as a Service (SaaS) – Standardized on-boarding and integration support

This project provides strategic alignment with data center modernization, enhanced innovation offering a greater breadth of IT services and delivery agility, improved reliability due to a high availability of applications for disaster recovery or performance spikes, and operations excellence from automation of provisioning, monitoring, cost allocation and deprovisioning of services and licenses. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Cloud Resiliency Services CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-36 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB-WE/36
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908X.001	SDG&E-CFF-4	8	Cloud Resilience Services	5,968	4,812	5,312	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services and SaaS subscription. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908X).

22. WP# 00908Y – Lifecycle Management Data Platform (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Lifecycle Management Data Platform project for 2022, 2023, and 2024 are $0.324 million, $0, and $0, respectively. SDG&E plans to build and place in service

the Lifecycle Management Data Platform project by the Test Year. This project started in 2021. This project automates, catalogs, and manages lifecycle information for technology assets. This project provides automated dashboards with an enterprise view of technology asset lifecycles by category and provides details for every deployed hardware model and software version that has reached end of support. This project automates technology categorization, data quality management, and stack detection. The project also allows for better planning of technology upgrades based on technology end of support dates. Additionally, this project automates on demand reporting to view and manage technology lifecycle information, reduce technical risk and vulnerabilities. Lastly, this project creates comprehensive architecture diagrams with up-to-date component information. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the IT Service Continuity CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-37 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-37
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00908Y.001	SDG&E-CFF-4	7	IT Service Continuity	324	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services, hardware, software, and prepaid maintenance. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908Y).

23. WP# 00908Z - Telecomm Asset Management Capabilities

a. Description of Costs and Underlying Activities

The forecast for the Telecomm Asset Management Capabilities project for 2022, 2023, and 2024 are $1.4 million, $0.3 million, and $0, respectively. SDG&E plans to build and place in service the Telecomm Asset Management Capabilities project by the Test Year. The current network and communication records are not incorporated into a geospatially aware system, resulting in disjointed communication system planning, construction, outage planning and troubleshooting. This project builds a geospatially aware communications record system. This project provides better coordination and timing for fiber deployments, a clear and quick process to submit IT outages for fiber assets, and the ability to troubleshoot and resolve fiber communications outages. The project also offers a pre-requisite for advanced capabilities offered by fiber manager within Geographic Information System (GIS). These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

b. Cost Drivers

The underlying cost drivers for this capital project relate to non-labor costs including hardware purchases, software licensing, prepaid maintenance, and vendor professional services.

Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00908Z).

24. WP# 00920AL - Virtual Reality Expansion

a. Description of Costs and Underlying Activities

The forecast for the Virtual Reality Expansion project for 2022, 2023, and 2024 are $2.498 million, $0, and $0, respectively. SDG&E plans to build and place in service the Virtual Reality Expansion project by the Test Year. This project started in 2021. This project builds out a new virtual reality (VR) or extended reality (XR) training application that simulates real-world scenarios and situations to effectively train the Electrical Test System (ETS) staff to find and troubleshoot faults. This project enhances customer user experience, reduces training time and field visits, and enables the identification of sub-switches and Planned Safety Power Shutoff (PSPS) events. These forecasted capital expenditures support the Company's IT goal of accelerating digital.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development and implementation, hardware, and software licenses. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920AL).

25. WP# 00920AR & 00920AV - App Modernization and Vulnerability Reduction

a. Description of Costs and Underlying Activities

The forecast for the App Modernization and Vulnerability Reduction projects for 2022, 2023, and 2024 are $3.529 million, $4 million, and $4 million, respectively. SDG&E plans to build and place in service the App Modernization and Vulnerability Reduction projects by the Test Year. These projects modernize select legacy on-premise applications. The applications were identified as having out-of-support technology software components, including operating systems, programming languages, utilities and databases that have reached end of support, putting the systems at risk. These projects utilize common components shared amongst the applications to optimize development efforts. These projects also enhance user interfaces and navigation frameworks that improve user experience and productivity. The new application structure makes it easier to enhance and integrate with other applications. These improvements benefit SDG&E customers by reducing the ongoing costs to support and maintain the software. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

b. Cost Drivers

The underlying cost drivers for these capital projects relate to internal labor costs and non-labor costs including vendor services for implementation, development, and IT quality assurance. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920AR & 00920AV).

26. WP# 00920BB – Energy Transition Digital Twin (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Energy Transition Digital Twin project for 2022, 2023, and 2024 are $1.986 million, $1.986 million, and $1.986 million, respectively. SDG&E plans to build and place in service the Energy Transition Digital Twin project by the Test Year. The Digital Twin

capability leverages the Cloud, internal and external data sources, to create virtual representations of physical objects, processes and environments that will be used to run simulations that will help inform strategic decisions around the Company's environmental, sustainability and net zero goals. For example, simulate the environmental effects of replacing a percentage of fleet vehicles with clean energy options. This project enables company alignment with Net Zero goals by providing models that can be used to implement solutions that will help reduce company emissions. These forecasted capital expenditures support the Company's IT goal of accelerating digital.

This is a project within the Monitoring Systems and Services CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-38 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-38
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00920BB.002	SDG&E-CFF-4	3	Monitoring Systems and Services	1,986	1,986	1,986	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development, scrum managers, Cloud implementation and SaaS licenses. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920BB).

27. WP# 00920BC – Digital Process Automation (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Digital Process Automation project for 2022, 2023, and 2024 are $4.95 million, $4.95 million, and $4.853 million, respectively. SDG&E plans to build and place in service the Digital Process Automation project by the Test Year. This project automates

business processes across the company to standardize, expedite operational backlogs and optimize labor capacity for strategic work. This project improves process accuracy, timeliness, quality, standardization, security, and compliance. The project also enhances process controls and consistency and improves digitization and efficiency of workflows, traceability, and document storage. Lastly, the project provides secure access to online and offline applications, enables high volume data processing, and enables access to business processes through mobile devices. These forecasted capital expenditures support the Company's IT goal of accelerating digital.[9]

This is a project within the Electric Operations System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-39 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-39
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00920BC.002	SDG&E-CFF-4	4	Electric Operations System Resiliency	1,633	1,633	1,604	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development and implementation and SaaS licenses. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920BC).

[9] This project relates to Building a Better Business (BBB). BBB is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest and most reliable energy infrastructure company in America.

28. WP#00920BD – Foundational Analytics for Safety, Compliance, and Efficiency

a. Description of Costs and Underlying Activities

The forecast for the Foundational Analytics for Safety, Compliance, and Efficiency project for 2022, 2023, and 2024 are $6.642 million, $5.767 million, and $5.867 million, respectively. SDG&E plans to build and place in service the Foundational Analytics and Safety, Compliance, and Efficiency project by the Test Year. This project provides business insights that drive business operational decisions. The project also designs and develops new and enhanced data views, data integrations, data cataloging, data visualizations and reports to allow the business to drive operational decisions. This project enables business centric planning and reporting tools that support self-service, collaboration, and advanced forecasting. This project also includes data quality remediation, data masking, anonymization, and data lineage. These forecasted capital expenditures support the Company's IT goal of accelerating digital.[10]

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920BD).

29. WP# 00920BE – Advanced Data and Decision Modeling (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Advanced Data and Decision Modeling project for 2022, 2023, and 2024 are $1.235 million, $3.96 million, and $3.96 million, respectively. SDG&E plans to build and place in service the Advanced Data and Decision Modeling project by the Test Year. This project started in 2021. This project focuses on advanced machine learning and statistical or decision science use cases that inform decision making related to Company operations. This project allows the Company to leverage the elasticity of Cloud resources. It also focuses on the development and implementation of data science workbench and machine learning operations to support the enterprise. This project allows for scalability and re-usability of data science

[10] This project relates to Building a Better Business (BBB). BBB is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest and most reliable energy infrastructure company in America.

pipelines. This project also utilizes serverless components of the Cloud and reduces turnaround time to operationalize the machine learning model. These forecasted capital expenditures support the Company's IT goal of accelerating digital.

This is a project within the Electric Operations System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-40 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-40
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00920BE.002	SDG&E-CFF-4	4	Electric Operations System Resiliency	1,235	3,960	3,960	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920BE).

30. WP# 00920BF – Decision Analytics and Situational Awareness (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Decision Analytics and Situational Awareness project for 2022, 2023, and 2024 are $1.736 million, $1.536 million, and $1.536 million, respectively. SDG&E plans to build and place in service the Decision Analytics and Situational Awareness project by the Test Year. This project (phase 2) will implement new situational analytics dashboards and reports during the project duration that will inform business operational decisions. The project designs and develops new and enhanced data views, data integrations, data cataloging, data visualizations and reports to allow the business to make operational decisions. This project

improves timeliness and completeness of data available to support decision making across the company thereby improving safety and compliance. These forecasted capital expenditures support the Company's IT goal of accelerating digital.[11]

This is a project within the Electric Operations System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-41 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-41
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00920BF.002	SDG&E-CFF-4	4	Electric Operations System Resiliency	1,736	1,536	1,536	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920BF).

31. WP# 00920BH – Situational Awareness Dashboards (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Situational Awareness Dashboards project for 2022, 2023, and 2024 are $0.524 million, $0, and $0, respectively. SDG&E plans to build and place in service the Situational Awareness Dashboards project by the Test Year. This project (phase 1) started in 2019. This project develops operational situational awareness and executive dashboards to

[11] This project relates to Building a Better Business (BBB). BBB is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest and most reliable energy infrastructure company in America.

support high value business use cases. This project improves timeliness and completeness of data available to support decision making and safety and compliance. These forecasted capital expenditures support the Company's IT goal of accelerating digital.[12] Phase 2 of the Situational Awareness Dashboards project is listed under (SDG&E-CWP-25-WP, 00920BF).

This is a project within the Electric Operations System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-42 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-42
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00920BH.001	SDG&E-CFF-4	4	Electric Operations System Resiliency	210	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920BH).

32. WP# 00920BK – Noggin Phase 3B (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Noggin Phase 3B project for 2022, 2023, and 2024 are $0.841 million, $2.748 million, and $0, respectively. SDG&E plans to build and place in service the Noggin Phase 3B project by the Test Year. The Noggin system phase 1, implemented in 2019,

[12] This project relates to Building a Better Business (BBB). BBB is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest and most reliable energy infrastructure company in America.

supports mission-critical functions in the EOC for tracking, managing, and reporting incidents. Noggin Phase 2 implemented a system upgrade in 2020 for SDG&E with the digitization of less than ten SDG&E incident management forms for the Emergency Management team. The Noggin Phase 3B will introduce additional digitized forms specific for the SDG&E Service Dispatch and Area Resource Service Operators (ARSO) teams for incident tracking to meet regulatory compliance. The project will meet mandatory business requirements to support SDG&E Service Dispatch and ARSO teams for incident tracking by digitalizing SDG&E specific incident tracking forms, workflows, and dashboards to support streamlined business processes. This project streamlines the process for customers to report safety incidents and on-demand situational awareness to meet compliance and safety requirements. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the EOC Technology Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-43 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-43
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00920BK.001	SDG&E-CFF-4	9	Emergency Operations Center (EOC) Technology Resiliency	841	2,748	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including SaaS subscription, vendor services for system configuration, project implementation, and system testing support.

Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920BK).

33. WP# 00920P - Digital Asset and Damages Detection Platform (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Digital Asset and Damages Detection Platform for 2022, 2023, and 2024 are $4.505 million, $3.680 million, and $3.680 million, respectively. SDG&E plans to build and place in service the Digital Asset and Damages Detection Platform by the Test Year. This project addresses the increasing backlog of opportunities to utilize Intelligent Image Processing (IIP) and machine learning to automatically identify gas and electric assets, third party equipment and asset damages. This project improves our asset management processes and inspection efficiency. These digital capabilities will help identify and inform the risk of wildfire events through rapid, automated detection of asset damages and improves asset management efficiency. These forecasted capital expenditures support the Company's IT goal of accelerating digital.

This is a project within the Electric Operations System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-44 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-44
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00920P.001	SDG&E-CFF-4	4	Electric Operations System Resiliency	4,505	3,680	3,680	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development and Cloud implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00920P).

34. WP# 00921AA - Container Modernization on Cloud Web Services

a. Description of Costs and Underlying Activities

The forecast for the Container Modernization on Cloud Web Services project for 2022, 2023, and 2024 are $0.371 million, $0, and $0, respectively. SDG&E plans to build and place in service the Container Modernization on Cloud Web Services project by the Test Year. This project aligns with the Company's IT strategy by leveraging a new enterprise-ready container solution that will increase platform security, performance and resiliency. This will provide a consistent container platform that will be leveraged by on-premises, Cloud, and application deployments. These forecasted capital expenditures support the Company's IT goal of accelerating digital.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development, SaaS licensing and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00921AA).

35. WP# 00921C – DevSecOps Source Code Management (SCM) GitHub

a. Description of Costs and Underlying Activities

The forecast for the DevSecOps Source Code Management (SCM) GitHub project for 2022, 2023, and 2024 are $2.922 million, $3.001 million, and $0, respectively. SDG&E plans to build and place in service the DevSecOps SCM GitHub project by the Test Year. Development, Security, and Operations (DevSecOps) is a collaboration framework that integrates application security principles and practices into software development and operations. This project enhances our standard enterprise SCM repository for managing applications. This project includes establishing and configuring an Azure DevOps pipeline and GitHub repository to enhance our standard source code management repository. This project enhances our standard source code management repository by extending the existing Azure DevOps (ADO) with GitHub. It also enables self-service capabilities for application teams with Infrastructure as Code (IaC) and Cloud services and provides sandbox capabilities for application team testing. Lastly, this project provides automation capabilities by implementing direct emails to application teams on Splunk monitoring and alerts. Splunk is used for monitoring and searching through big data. It indexes and correlates information in a container that makes it searchable, and makes it

possible to generate alerts, reports and visualizations. Splunk is used to support security, infrastructure, and application monitoring for the Companies. These forecasted capital expenditures support the Company's IT goal of transforming how we work.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services and SaaS subscription. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00921C).

36. WP# 00921D - Test Acceleration Enablement (TAE) with DevSecOps

a. Description of Costs and Underlying Activities

The forecast for the Test Acceleration Enablement (TAE) with DevSecOps project for 2022, 2023, and 2024 are $1.516 million, $1.485 million, and $1.726 million, respectively. SDG&E plans to build and place in service the TAE with DevSecOps project by the Test Year. Software testing is largely a manual effort with extensive regression test cycles across projects and programs. System and application issues found during implementations result in re-execution of the regression test cycles that could lead to additional scope and project delays. This project automates system end-to-end testing of critical applications prior to release for production. This project enables faster delivery of software testing capabilities and enhancements to dashboards and reporting across the organization. This project also enables DevSecOps continuous testing in agile teams to accelerate the qualitative delivery. These forecasted capital expenditures support the Company's IT goal of transforming how we work.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00921D).

37. WP# 00921E - Digital Service Integration Platform

a. Description of Costs and Underlying Activities

The forecast for the Digital Service Integration Platform project for 2022, 2023, and 2024 are $1.55 million, $1.55 million, and $1.55 million, respectively. SDG&E plans to build and place in service the Digital Service Integration Platform by the Test Year. This project aligns with the Company's IT strategy to address the influx of multi-platform applications that are being implemented by the various application factory and modernization initiatives. Strategic

themes include self-service Application Programming Interface (API) and microservice catalogs that reduce operational overheads and enable faster application implementation times (speed to value). These forecasted capital expenditures support the Company's IT goal of accelerating digital.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development and implementation, and SaaS licenses. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00921E).

38. WP# 00921F - Data Governance Tools and Framework

a. Description of Costs and Underlying Activities

The forecast for the Data Governance Tools and Framework project for 2022, 2023, and 2024 are $2.55 million, $2.25 million, and $2.25 million, respectively. SDG&E plans to build and place in service the Data Governance Tools and Framework project by the Test Year. This project implements toolsets and automations to support data governance initiatives, including data catalog, data quality workflows and data management. It also develops and deploys data governance, policies and procedures and scales data governance across IT and business groups. This project provides a centralized listing of critical data, enhances data quality, ensures reporting accuracy, clearly identifies data sources of truth, and improves data integrity. This project provides the ability to quickly obtain operational and efficiency reports that enables faster identification and mitigation of gaps in customer service and/or safety. These forecasted capital expenditures support the Company's IT goal of accelerating digital.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development, and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00921F).

39. WP# 00921G - Application Factory - Utility Operations

a. Description of Costs and Underlying Activities

The forecast for the Application Factory – Utility Operations project for 2022, 2023, and 2024 are $1.4 million, $0.6 million, and $0, respectively. SDG&E plans to build and place in service the Application Factory – Utility Operations project by the Test Year. This project

encompasses modernizing workflow automation applications (distribution process management, pole loading, workload management, workstream) off of the Business Process Management (BPM) platform that is nearing end of life and on to a Cloud provider. In addition, this project enables the rapid development and deployment of new solutions in support of reducing technical and operational risk, as well as providing a better user experience. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

b. Cost Drivers

The underlying cost drivers for this capital project relate to non-labor costs including vendor services for application development, Cloud architecture and testing services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00921G).

40. WP# 00921I – Test Acceleration Enablement (TAE)

a. Description of Costs and Underlying Activities

The forecast for the TAE project for 2022, 2023, and 2024 are $0.114 million, $0, and $0, respectively. SDG&E plans to build and place in service the TAE project by the Test Year. This project started in 2019. This project implements an automated system testing platform to identify and remediate issues prior to patches, enhancements, and new software being released to production. This project provides the ability to validate, monitor, and track these testing activities and their associated results to enable continuous improvement. This project will create an automation testing asset that can be deployed for testing system outages, upgrades, patches, and daily monitoring. As a result, the project will enable faster delivery, system reliability, efficiency, and cost effectiveness of software testing capabilities across the organization. This project provides a cohesive solution and a "One Team" approach to working with IT and Business clients for delivery of automation capabilities and continued innovation within the IT Quality Assurance team. These forecasted capital expenditures support the Company's IT goal of transforming how we work.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00921I).

41. WP# 00921L - Source Code Management and DevOps Implementation

a. Description of Costs and Underlying Activities

The forecast for the Source Code Management and DevOps Implementation project for 2022, 2023, and 2024 are $0.362 million, $0, and $0, respectively. SDG&E plans to build and place in service the Source Code Management (SCM) and DevOps Implementation project by the Test Year. This project started in 2019. This project implements a standard enterprise SCM repository for managing application source code using Cloud-based services along with other standardized integration tools. This project provides speed of delivery through features such as Continuous Integration (CI), Continuous Delivery (CD), and Continuous Testing (CT). This project also reduces operational risk through reusability of source code and improved efficiency, and quality. These forecasted capital expenditures support the Company's IT goal of transforming how we work.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00921L).

42. WP# 00921R - Business Adaptation Technologies & Digitalization

a. Description of Costs and Underlying Activities

The forecast for the Business Adaptation Technologies & Digitalization project for 2022, 2023, and 2024 are $1.415 million, $1.190 million, and $1.190 million, respectively. SDG&E plans to build and place in service the Business Adaptation Technologies & Digitalization project by the Test Year. This project implements emerging technology to provide scalable business capabilities that align with the company's digital transformation and digital acceleration goals. This project enables asset and operational data visualization to improve Company operational planning. This project also modernizes the way the Company tracks customer transactions and carbon credit tracing to support operations. These forecasted capital expenditures support the Company's IT goal of accelerating digital.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including vendor services for development, Cloud implementation, and SaaS licenses.

Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00921R).

43. WP# 00925B – Software Defined Wide Area Network (SD-WAN) Implementation 2022 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Software Defined Wide Area Network (SD-WAN) Implementation project for 2022, 2023, and 2024 are $0.521 million, $0.114 million, and $0, respectively. SDG&E plans to build and place in service the SD-WAN Implementation project by the Test Year. This project consists of an upgrade to the current SD-WAN management appliance, transitioning from an on-premise to a Cloud-based solution. This project enables decommissioning of old data center infrastructure, including the migration from old perimeter to new perimeter, and increases resiliency by building diversity of support and security for operations that is currently performed exclusively through one secondary data center. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-45 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-45
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925B.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	522	115	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware and vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925B).

44. WP# 00925E – Emergency Communications Microwave (MW) Auto Alignment Systems (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Emergency Communications Microwave (MW) Auto Alignment Systems project for 2022, 2023, and 2024 are $0.462 million, $0.093 million, and $0, respectively. SDG&E plans to build and place in service the MW Auto Alignment Systems project by the Test Year. This project improves Company emergency communications systems for increased reliability, improved performance, and user safety. This project improves reliability and performance of the backhaul microwave solution. Additionally, this project improves efficiency and accuracy by automatically pointing to the microwave line of sight communications thereby improving user safety. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-46 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-46
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925E.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	462	93	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware and vendor services for implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925E).

45. WP# 00925F – Network Switch 2022 Equipment Replacement Agreement (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Network Switch 2022 Equipment Replacement Agreement project for 2022, 2023, and 2024 are $1.193 million, $1,193 million, and $1,193 million, respectively. SDG&E plans to build and place in service the Network Switch 2022 Equipment Replacement agreement project by the Test Year. This project is for the annual Juniper Equipment Replacement agreement. When a Juniper device on the Company network fails this agreement allows us to trade that device into Juniper for a new one allowing us to keep our network up and running. This project enables timely replacement of failed production hardware reducing operational risk to the Company network and systems running on the network. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-47 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-47
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925F.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	1,193	1,193	1,193	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to non-labor costs including hardware replacement agreement. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925F).

46. WP# 00925H – Network Time Protocol (NTP) Clock Refresh (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Network Time Protocol (NTP) Clock Refresh project for 2022, 2023, and 2024 are $0.477 million, $0, and $0, respectively. SDG&E plans to build and place in service the NTP Clock Refresh project by the Test Year. This project is to replace and/or upgrade the NTP clocks and their corresponding antennas. This project is required to decommission the legacy devices that the vendor no longer supports, as these devices have reached End of Life (EOL) and/or End of Service (EOS). Replacing the legacy devices will reduce operational risk and ensure reliable precision timing for data and/or packet transmission and/or reception and mitigate delays, communication errors, and slips. Precision timing is necessary to mitigate delays, communication errors and slips. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-48 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-48
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925H.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	477	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware and prepaid maintenance. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925H).

47. WP# 00925I, 00925J, & 00925K – Transmission Communications Reliability Improvement (TCRI) (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Transmission Communications Reliability Improvement (TCRI) projects for 2022, 2023, and 2024 are $4.413 million, $4.413 million, and $4.413 million, respectively. SDG&E plans to build and place in service the TCRI projects by the Test Year. These projects standardize the network communications equipment and monitoring by replacing the legacy network communication inter-site and intra-site infrastructure and allow the Company's Network Operations Center (NOC) to better monitor network infrastructure and isolate and troubleshoot network issues. The projects further address single points of failure in the network by providing diverse communication paths and intelligent rerouting. These projects enable faster provisioning and prioritization of communications services and provide increased monitoring and visibility into the wide-area network. Additionally, these projects improve the availability and reliability of Supervisory Control and Data Acquisition (SCADA) communications and tele protection relay traffic between substations. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

These three projects are within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-49 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-49
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925I.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	4,413	0	0	0
00925J.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	0	4,413	0	0
00925K.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	0	0	4,413	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for these capital projects relate to internal labor costs and non-labor costs including hardware, and vendor services for design, architecture, and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925I, 00925J, 00925K).

48. WP# 00925L – Local Area Network (LAN) Refresh 2022 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Local Area Network (LAN) Refresh 2022 project for 2022, 2023, and 2024 are $3.734 million, $4.245 million, and $4.945 million, respectively. SDG&E plans to build and place in service the LAN Refresh 2022 project by the Test Year. This project replaces end of support LAN switches and upgrades the Wireless Local Area Network (WLAN) with newer switches and Access Points (AP) for Company employees and contractors. This project provides enhanced wireless coverage and a higher Service Level Availability (SLA) to end-users. This project also decreases business risk by reducing outages caused by aging equipment and reduces complexity of operational support by implementing a single network device management system. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-50 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-50
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925L.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	3,734	4,245	4,945	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware, prepaid maintenance, and vendor services for architecture, design, and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925L).

49. WP# 00925M – Field Area Network (FAN) Voice & Dispatch - Phase 2 (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Field Area Network (FAN) Voice & Dispatch - Phase 2 project for 2022, 2023, and 2024 are $10.357 million, $0, and $0, respectively. SDG&E plans to build and place in service the FAN Voice & Dispatch - Phase 2 project by the Test Year. This project started in 2020. This project upgrades the existing unsupported FAN voice and dispatch system. The two-way radio system is necessary for continued field crew safety during emergencies and critical gas and electric daily operations. This project supports reliable means of voice communications and dispatch for day-to-day operations, as well as emergency response. Additionally, this project doubles the call capacity and increases coverage area and LTE interoperability. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-51 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-51
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925M.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	10,357	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware and vendor services for architecture, design, and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925M).

50. WP# 00925N – Data Center Network (DCN) Core Refresh (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Data Center Network (DCN) Core Refresh project for 2022, 2023, and 2024 are $2.999 million, $0, and $0, respectively. SDG&E plans to build and place in service the DCN Core Refresh project by the Test Year. This project started in 2020. The data center network core replacement project is required in order to decommission legacy infrastructure that the vendor no longer supports. The new network core infrastructure provides a highly available and resilient foundational platform that is necessary for the continued operations of all Company platforms and systems that rely on our network. This project upgrades the existing data center network core to a new platform that aligns with the data center strategy and maximizes the benefits of the converged IT infrastructure. This project improves network stability, reliability, resiliency, and maximizes high availability. This project also minimizes downtime during migration and upgrades, reduces complexity of configuration, and maximizes high availability. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-52 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-52
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925N.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	2,999	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to non-labor costs including vendor services and hardware including fiber, switches, optics line cards and cabling, and spine racks. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925N).

51. WP# 00925Q – Telecom Site Improvements (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Telecom Site Improvements project for 2022, 2023, and 2024 are $1.835 million, $3.721 million, and $3.721 million, respectively. SDG&E plans to build and place in service the Telecom Site Improvements project by the Test Year. This project started in 2021. This project improves infrastructure required at critical telecommunication sites as well as telecommunication services availability levels. These sites support grid communications that are critical to business functions. This project enables higher levels of availability for grid communications that are critical to business functions. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-53 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-53
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925Q.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	1,835	3,721	3,721	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware and vendor services for design, architecture, and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925Q).

52. WP# 00925R – Wide Area Network (WAN) Refresh (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Wide Area Network (WAN) refresh project for 2022, 2023, and 2024 are $2.495 million, $2.928 million, and $3.032 million, respectively. SDG&E plans to build and place in service the WAN refresh project by the Test Year. This project started in 2019. This project replaces end of support WAN routers and firewalls to meet internal compliance requirements. The project also focuses on network resiliency by adding additional telecom connections between the primary and secondary data centers to handle the connections in the event of a telecom circuit failure. This project provides a higher level of SLA to end-users by replacing older equipment. This project decreases the business risk by reducing outages caused by aging equipment. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety, aligns with a RAMP activity.

Table TB/WE-54 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-54
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925R.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	2,495	2,928	3,032	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware and vendor services for architecture, design, and implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925R).

53. WP# 00925S – EVC and GC Telecom Security Remediation (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the EVC and GC Telecom Security Remediation project for 2022, 2023, and 2024 are $0.05 million, $0, and $0, respectively. SDG&E plans to build and place in service the EVC and GC Telecom Security Remediation project by the Test Year. This project started in 2020. This project remediates security vulnerabilities that have been identified by the Threat Vulnerability Management (TVM) team on modems used by Electric Volume Correctors (EVC) and Gas Chromatographs (GC). This project provides continued Internet Protocol (IP) based communication for noncore volumes and gas quality. Additionally, this project reduces Company risk due to customer data security breach. These forecasted capital expenditures support the Company's IT goal of proactively managing risk.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-55 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-55
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925S.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	50	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware, software, and vendor services. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925S).

54. WP# 00925T – Call Recording System Refresh (RAMP)

a. Description of Costs and Underlying Activities

The forecast for the Call Recording System Refresh project for 2022, 2023, and 2024 are $0.271 million, $0, and $0, respectively. SDG&E plans to build and place in service the Call Recording System Refresh project by the Test Year. This project started in 2021. This project implements mandatory call recording capabilities. This would separate recordings by functional need and utilize the current system for the Company's call center, while migrating compliance recording to the new platform. This project provides a more robust recording system to meet compliance requirements and has the capability to use dedicated recording servers where necessary. These forecasted capital expenditures support the Company's IT goal of simplifying and standardizing.

This is a project within the Network and Voice System Resiliency CFF activity that mitigates safety risks identified in the 2021 RAMP Report: Foundational Technology Systems (FTS) CFF-4. Accordingly, this forecast in its entirety aligns with a RAMP activity.

Table TB/WE-56 below shows the TY 2024 forecast dollars associated with the activities in the 2021 RAMP Report.

TABLE TB/WE-56
RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
00925T.001	SDG&E-CFF-4	2	Network and Voice System Resiliency	271	0	0	0

*An RSE was not calculated for this activity.

b. Cost Drivers

The underlying cost drivers for this capital project relate to internal labor costs and non-labor costs including hardware and vendor services for implementation. Documentation of these cost drivers are included in our capital workpapers. *See* (SDG&E-CWP-25-WP, 00925T).

VII. CONCLUSION

This concludes our prepared direct testimony.

VIII. WITNESS QUALIFICATIONS - TIA L. BALLARD

My name is Tia L. Ballard. My primary work location is 8680 Balboa Ave, San Diego, California, United States, 92123. I am currently employed by SDG&E as the Director of the Digital Workspace and Automation department for SoCalGas, SDG&E, and Sempra. In this role, I oversee the IT End User Experience, as well as Cloud transformation, data center infrastructure, automation, and enablement for SoCalGas, SDG&E, and Sempra.

I have been a member of the IT department since 2004. I began my career with Sempra Global supporting Network & Systems Engineering. In 2009, I transferred to SDG&E to manage IT Infrastructure projects, managing large scale efforts focused on IT infrastructure resiliency. I have held various roles with increased responsibility since then managing a 24x7 Network Operations Center, delivering Network and Telecom field support, managing IT Service desk and Desktop Engineering groups, managing, and ensuring IT Compliance and IT Service Management as well as taking on a role as Vendor Manager supporting IT Infrastructure major agreements. In 2019, I became the Director of End User and Cybersecurity technologies, delivering End User technologies and services to include conferencing and collaboration, service desk, desktop support, enterprise monitoring, as well as Cybersecurity technology services. In 2021, my role shifted to focus on End User Experience, Cloud transformation and Automation, ensuring there is established governance in place as we continue our transformation and modernization to the Cloud. In 2022, I also expanded my scope to include Data Center infrastructure, middleware, and Cloud platform services.

I am a graduate of Pepperdine University, where I received a Bachelor of Science in Management. I also earned a Master's degree in Political Management from George Washington University.

I have not previously testified before the California Public Utilities Commission.

IX. WITNESS QUALIFICATIONS - WILLIAM J. EXON

My name is Jamie Exon. My primary work location is 8680 Balboa Ave, San Diego, California, United States, 92123. I am currently employed by SDG&E as the Director of the IT Digital & SDG&E Customer department for SoCalGas, SDG&E, and Sempra. In this role, I oversee the digital transformation for SoCalGas, SDG&E, Sempra and customer applications for SDG&E.

I have been with SDG&E since 2001 and began my career within the IT department. From 2001through 2007, I supported Supply Chain and Logistics that integrated with SAP. In 2008 through 2012, SDG&E and SoCalGas embarked on a large program to modernization their major operations applications. During that timeframe, I managed two major application modernization projects: Geographic Information System (GIS) and Condition Based Maintenance (CBM). In 2012, I left IT and assumed responsibility of a Major Projects team in Electric Distribution Operations that included Meteorology and Wildfire Mitigation projects. In 2015, my responsibilities were expanded and included the SCADA operational technology team to support the delivery of electricity to the customer. In 2017, I managed the business technology teams that supported the SDG&E field technologies and gas and electric operations. I also helped lead the technology strategy and vision for Asset Management. In 2019, I transferred back to IT and became the director of the Digital Transformation for both SDG&E and SoCalGas. In 2020, the responsibility was expanded to also include SDG&E customer applications.

I am a graduate from California State University – San Marcos, where I received a Bachelor of Science in Computer Science. I also earned a Master of Business Administration degree from the University of Southern California.

I have not previously testified before the California Public Utilities Commission.

APPENDIX A

Glossary of Terms

APPENDIX A – Glossary of Terms

Term	Description
AI	Artificial Intelligence
AIM	Asset Integrity Management
AIP	Asset Investment Prioritization
AMS	Asset Management System
AP	Access Points
ARSO	Area Resource Service Operators
API	Application Programming Interface
AUD	Automated Utility Design
BPM	Business Process Management
BYOD	Bring Your Own Device
CAISO	California Independent System Operator
CBM	Condition Based Maintenance
CD	Continuous Delivery
CFF	Cross Functional Factor
CI	Continuous Improvement
CI	Continuous Integration
CIS	Customer Information Systems
CoF	Consequence of Failure
CPUC	California Public Utilities Commission
CT	Continuous Testing
CWP	Capital Work Paper
DCN	Data Center Network
DevSecOps	Development, Security and Operations
ECS	Elastic Cloud Storage
EFC	Executive Finance Committee
EOC	Emergency Operations Center
EOL	End of Life
EOS	End of Support

Term	Description
ETS	Electrical Test System
EV	Electric Vehicle
EVC	Electric Volume Correctors
FAN	Field Area Network
FTS	Foundational Technology Systems
GC	Gas Chromatographs
GHG	Greenhouse Gas
GIS	Geographic Information System
GRC	General Rate Case
HW	Hardware
IaaS	Infrastructure as a Service
IaC	Infrastructure as Code
IIP	Intelligent Image Processing
IP	Internet Protocol
IT	Information Technology
LAN	Local Area Network
MAVF	Multi-Attribute Value Framework
ML	Machine Learning
MW	Microwave
NAS	Network Attached Storage
NOC	Network Operations Center
NSP	Network Services Platform
NTP	Network Time Protocol
O&M	Operations and Maintenance
O/S	Operating System
OOBM	Out of Band Management
PaaS	Platform as a Service
PoF	Probability of Failure
RAMP	Risk Assessment Mitigation Phase

Term	Description
RI	Reserved Instances
RSE	Risk Spend Efficiency
SaaS	Software as a Service
SAP	Systems Applications and Products
SCADA	Supervisory Control and Data Acquisition
SCG	Southern California Gas Company
SCM	Source Code Management
SDG&E	San Diego Gas & Electric Company
SPD	Safety Policy Division
SD-WAN	Software Defined Wide Area Network
SLA	Service Level Availability
SMS	Safety Management System
SoCalGas	Southern California Gas Company
SW	Software
TAE	Test Acceleration Enablement
TCRI	Transmission Communications Reliability Improvement
TVM	Threat Vulnerability Management
TY	Test Year
VDI	Virtual Desktop Infrastructure
VPN	Virtual Private Network
VR	Virtual Reality
WAN	Wide Area Network
WLAN	Wireless Local Area Network
XR	Extended Reality

APPENDIX B

Glossary of Definitions

APPENDIX B – Glossary of Definitions

Term	Definition
Agile	A group of software development methodologies based on iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams.
Cloud	Refers to software and services that run on the Internet, instead of locally on a computer. Most Cloud services can be accessed through a Web browser like Firefox or Google Chrome, and some companies offer dedicated mobile apps.
Container	A standard unit of software that packages up code and all its dependencies so the application runs quickly and reliably from one computing environment to another.
DevSecOps	An approach to culture, automation, and platform design that integrates security as a shared responsibility throughout the entire IT lifecycle.
Infrastructure as Code (IaC)	The managing and provisioning of infrastructure through code instead of through manual processes. With IaC, configuration files are created that contain your infrastructure specifications, which makes it easier to edit and distribute configurations.
Infrastructure as a Service (IaaS)	A model in which a third-party provider hosts servers, storage, and other virtualized compute resources and makes them available to customers over the internet.
Kanban	A lean workflow management method for defining, managing, and improving services that deliver work. It helps visualize work, maximize efficiency, and improve continuously. Work is represented on Kanban boards, allowing you to optimize work delivery across multiple teams and handle even the most complex projects in a single environment.
Microservices	A distinctive method of developing software systems that tries to focus on building single-

Term	Definition
	function modules with well-defined interfaces and operations.
Platform as a Service (PaaS)	A model in which a third-party provider hosts application development platforms and tools on its own infrastructure and makes them available to customers over the internet.
Refactoring	A systematic process of improving code without creating new functionality that can transform a mess into clean code and simple design.
Scrum	An Agile project management methodology involving a small team led by a Scrum master, whose primary objective is to remove obstacles to getting work done. Work is done in short cycles called sprints, and the team meets daily to discuss current tasks and any roadblocks that need to be cleared.
Software as a Service (SaaS)	A software distribution model in which a third-party provider hosts applications and makes them available to customers over the internet.

APPENDIX C

Summary of Safety Related Risk Mitigation Costs by Workpaper – O&M

APPENDIX C - Summary of Safety Related Risk Mitigation Costs by Workpaper – O&M

INFORMATION TECHNOLOGY **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**						
Workpaper	**RAMP ID**	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
1IT002.000	SDG&E-CFF-4 - 1 - 9	All Mitigations	2,579	2,619	40	0
1IT004.000	SDG&E-CFF-4 - 1 - 9	All Mitigations	3,195	2,509	(686)	0
2100-0207.000	SDG&E-CFF-4 - 1 - 9	All Mitigations	19,226	21,777	2,551	0
2100-0460.000	SDG&E-CFF-4 - 1 - 9	All Mitigations	828	828	0	0
2100-3073.000	SDG&E-CFF-4 - 1 - 9	All Mitigations	3,290	2,576	(714)	0
Total			**29,118**	**30,309**	**1,191**	**0**

*An RSE was not calculated for this activity.

APPENDIX D

Summary of Safety Related Risk Mitigation Costs by Workpaper – Capital

APPENDIX D - Summary of Safety Related Risk Mitigation Costs by Workpaper – Capital

INFORMATION TECHNOLOGY **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
00908AA.001	SDG&E-CFF-4 - 1	Data Center Modernization	793	0	0	0
00908AC.001	SDG&E-CFF-4 - 1	Data Center Modernization	193	0	0	0
00908AE.001	SDG&E-CFF-4 - 3	Monitoring Systems and Services	497	0	0	0
00908B.001	SDG&E-CFF-4 - 6	End User Access and Supporting Services	10,694	0	0	0
00908C.001	SDG&E-CFF-4 - 6	End User Access and Supporting Services	0	1,550	1,550	0
00908F.001	SDG&E-CFF-4 - 9	Emergency Operations Center (EOC) Technology Resiliency	863	0	0	0
00908G.001	SDG&E-CFF-4 - 1	Data Center Modernization	0	2,080	0	0
00908H.001	SDG&E-CFF-4 - 9	Emergency Operations Center (EOC) Technology Resiliency	349	0	0	0
00908I.001	SDG&E-CFF-4 - 1	Data Center Modernization	629	0	0	0
00908J.001	SDG&E-CFF-4 - 1	Data Center Modernization	0	631	0	0
00908K.001	SDG&E-CFF-4 - 1	Data Center Modernization	549	0	0	0
00908L.001	SDG&E-CFF-4 - 1	Data Center Modernization	0	1,775	0	0
00908O.001	SDG&E-CFF-4 - 3	Monitoring Systems and Services	0	1,273	0	0

INFORMATION TECHNOLOGY RAMP Activity Capital Forecasts by Workpaper (In 2021 $)						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
00908V.001	SDG&E-CFF-4 - 7	IT Service Continuity	1,112	0	0	0
00908W.001	SDG&E-CFF-4 - 8	Cloud Resiliency Services	0	0	2,000	0
00908X.001	SDG&E-CFF-4 - 8	Cloud Resiliency Services	5,968	4,812	5,312	0
00908Y.001	SDG&E-CFF-4 - 7	IT Service Continuity	324	0	0	0
00920AI.001	SDG&E-CFF-4 - 4;5	Electric Operations Systems Resiliency; Gas Operations Systems Resiliency	13,400	10,437	13,206	0
00920AM.001	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	4,713	500	0	0
00920AW.001	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	171	0	0	0
00920AX.001	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	1,558	0	0	0
00920BB.002	SDG&E-CFF-4 - 3	Monitoring Systems and Services	1,986	1,986	1,986	0
00920BC.002	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	1,633	1,633	1,604	0
00920BE.002	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	1,235	3,960	3,960	0

INFORMATION TECHNOLOGY
RAMP Activity Capital Forecasts by Workpaper (In 2021 $)

Workpaper	RAMP ID	Description	2022 Estimated RAMP Total (000s)	2023 Estimated RAMP Total (000s)	2024 Estimated RAMP Total (000s)	GRC RSE*
00920BF.002	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	1,736	1,536	1,536	0
00920BG.001	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	466	0	0	0
00920BH.001	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	210	0	0	0
00920BI.003	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	0	618	330	0
00920BK.001	SDG&E-CFF-4 - 9	Emergency Operations Center (EOC) Technology Resiliency	841	2,748	0	0
00920BL.001	SDG&E-CFF-1 - 1	AIM (Gov, Strat, AIP)	3,314	5,694	3,731	0
00920BM.001	SDG&E-CFF-1 - 2b	Asset Data Syst & Rec Mgt (Data Integration)	4,389	4,269	2,347	0
00920H.001	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	0	3,489	3,544	0
00920M.001	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	1,564	2,344	324	0
00920P.001	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	4,505	3,680	3,680	0

INFORMATION TECHNOLOGY RAMP Activity Capital Forecasts by Workpaper (In 2021 $)						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
00920R.001	SDG&E-CFF-4 - 4	Electric Operations Systems Resiliency	0	5,753	1,678	0
00920T.002	SDG&E-CFF-4 - 4;5	Electric Operations Systems Resiliency; Gas Operations Systems Resiliency	0	3,402	6,090	0
00925B.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	522	115	0	0
00925E.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	462	93	0	0
00925F.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	1,193	1,193	1,193	0
00925H.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	477	0	0	0
00925I.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	4,413	0	0	0
00925J.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	0	4,413	0	0
00925K.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	0	0	4,413	0
00925L.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	3,734	4,245	4,945	0
00925M.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	10,357	0	0	0

INFORMATION TECHNOLOGY RAMP Activity Capital Forecasts by Workpaper (In 2021 $)						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
00925N.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	2,999	0	0	0
00925Q.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	1,836	3,721	3,721	0
00925R.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	2,495	2,927	3,032	0
00925S.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	50	0	0	0
00925T.001	SDG&E-CFF-4 - 2	Network & Voice System Resiliency	271	0	0	0
Total			**92,501**	**80,877**	**70,182**	**0**

*An RSE was not calculated for this activity.

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APPENDIX E

Capital Expenditures List of IT and Business Projects

APPENDIX E - Capital Expenditures List of IT and Business Projects

INFORMATION TECHNOLOGY Capital Expenditures List by Workpaper				
ID	**Work Paper**	**Project Description**	**Categories of Management**	**IT Goal**
1	218810	Smart Meter 2.0	CS - Field Operations	Proactively Manage Risk
2	00900C	Demand Response Management Systems (DRMS) Replacement	CS - Information	Proactively Manage Risk
3	00900D	Smart Meter (Product) 2022-2024	CS - Field Operations	Proactively Manage Risk
4	00900E	Smart Meter Upgrade 2022-2023	CS - Field Operations	Simplify and Standardize
5	00903B	Contact Center of the Future (CCotF)	CS - Office Operations	Accelerate Digital
6	00903D	Customer Energy Network (Product) 2023-2024	CS - Office Operations	Accelerate Digital
7	00903E	CIS Regulatory & Enhancement 2022	CS - Office Operations	Proactively Manage Risk
8	00903F	CIS Regulatory & Enhancement 2023	CS - Office Operations	Proactively Manage Risk
9	00903G	CIS Regulatory & Enhancement 2024	CS - Office Operations	Proactively Manage Risk
10	00903H	Clean Transportation Product Team 2023-2024	Clean Transportation	Proactively Manage Risk
11	00903I	Clean Transportation Product Team 2022-2023	Clean Transportation	Proactively Manage Risk
12	00907A	IT Quality and Continuous Testing Platforms	Information Technology	Transform How We Work
13	00907K	SAP Computing Resource and Storage Expansion	Information Technology	Simplify and Standardize
14	00907M	Cloud Data Lake	Information Technology	Accelerate Digital
15	00907N	Microsoft Enterprise Agreement	Information Technology	Simplify and Standardize
16	00907O	Microsoft 365 Service Management	Information Technology	Simplify and Standardize
17	00908A	Electric Material Traceability	Electric Distribution - Capital	Simplify and Standardize
18	00908AA	Network Attached Storage (NAS) Modernization	Information Technology	Simplify and Standardize
19	00908AC	IT Converged Infrastructure Compute Capacity Expansion	Information Technology	Simplify and Standardize

INFORMATION TECHNOLOGY Capital Expenditures List by Workpaper				
ID	**Work Paper**	**Project Description**	**Categories of Management**	**IT Goal**
20	00908AE	Digi Remote Manager 2022	Information Technology	Simplify and Standardize
21	00908B	Digital Workspace	Information Technology	Transform How We Work
22	00908C	Virtual Desktop Infrastructure (VDI) Expansion - Phase 2	Information Technology	Simplify and Standardize
23	00908F	Emergency Communications Enhancements	Information Technology	Simplify and Standardize
24	00908G	Network Attached Storage (NAS) Stringent Compliance Tier 2023	Information Technology	Simplify and Standardize
25	00908H	Emergency Response Commander Trucks	Information Technology	Proactively Manage Risk
26	00908I	Elastic Cloud Storage (ECS) Capacity Expansion 2022	Information Technology	Simplify and Standardize
27	00908J	Elastic Cloud Storage (ECS) EX300 Hardware Refresh 2023	Information Technology	Simplify and Standardize
28	00908K	Network Attached Storage (NAS) Archive Tier 2022	Information Technology	Simplify and Standardize
29	00908L	Network Attached Storage (NAS) Isolated Hi-Perf-Low-Latency Workloads Tier 2023	Information Technology	Simplify and Standardize
30	00908O	Digi Remote Manager 2023	Information Technology	Simplify and Standardize
31	00908Q	Electric Grid Ops Small Capital 2022	Electric Distribution - O&M	Simplify and Standardize
32	00908S	Electric Grid Ops Small Capital 2023	Electric Distribution - O&M	Simplify and Standardize
33	00908T	Electric Grid Ops Small Capital 2024	Electric Distribution - O&M	Simplify and Standardize
34	00908U	IT Small Capital	Information Technology	Simplify and Standardize
35	00908V	Middleware Platforms Disaster Recovery 2022	Information Technology	Simplify and Standardize
36	00908W	Infrastructure as a Service (IaaS) Implementation	Information Technology	Simplify and Standardize
37	00908X	Cloud Foundations	Information Technology	Simplify and Standardize
38	00908Y	Lifecycle Management Data Platform	Information Technology	Simplify and Standardize

INFORMATION TECHNOLOGY Capital Expenditures List by Workpaper				
ID	**Work Paper**	**Project Description**	**Categories of Management**	**IT Goal**
39	00908Z	Telecom Asset Management Capabilities	Information Technology	Simplify and Standardize
40	00920A	Microgrid Portal	Electric Distribution - Capital	Simplify and Standardize
41	00920AF	CAISO Mandates 2024	Energy Procurement	Proactively Manage Risk
42	00920AG	Telecommunications Attachment Management System (TAMS) Modernization	Electric Distribution - O&M	Transform How We Work
43	00920AH	Work Management Enhancements	Safety, Risk, & Asset Management	Simplify and Standardize
44	00920AI	Field Service Delivery (FSD) - Scheduling & Dispatch Phase	CS - Field Operations	Simplify and Standardize
45	00920AJ	Distribution Interconnection Info. System - Rule 21 and Net Energy Metering Enhancements - Phase 1	Electric Distribution - O&M	Proactively Manage Risk
46	00920AL	Virtual Reality Expansion	Information Technology	Accelerate Digital
47	00920AM	Field Hardware Mobile Data Terminals (MDT) Replacement	Safety, Risk, & Asset Management	Transform How We Work
48	00920AN	Geospatial Field Improvement	Electric Distribution - Wildfire Mitigation and Veg Mgmt.	Simplify and Standardize
49	00920AO	Builder Services Customer Portal - Phase 3	Electric Distribution - Capital	Simplify and Standardize
50	00920AQ	CAISO Mandates 2021	Energy Procurement	Proactively Manage Risk
51	00920AR	App Modernization & Vulnerability Reduction - Phase 2	Information Technology	Simplify and Standardize
52	00920AS	Field Mobility Development	Safety, Risk, & Asset Management	Simplify and Standardize
53	00920AU	LADC (Local Area Distribution Controller)	Clean Energy Innovations	Simplify and Standardize
54	00920AV	App Modernization & Vulnerability Reduction - Phase 1	Information Technology	Simplify and Standardize

INFORMATION TECHNOLOGY Capital Expenditures List by Workpaper				
ID	**Work Paper**	**Project Description**	**Categories of Management**	**IT Goal**
55	00920AW	Electric GIS Modernization Project	Safety, Risk, & Asset Management	Simplify and Standardize
56	00920AX	Reliability and Operational Safety (ROSE) - Phase 2	Electric Distribution - O&M	Simplify and Standardize
57	00920B	Smart Grid Operations 2022-2023	Electric Distribution - O&M	Simplify and Standardize
58	00920BA	Enterprise Distributed Energy Resource Management System (DERMS)	Electric Distribution - O&M	Simplify and Standardize
59	00920BB	Energy Transition Digital Twin	Information Technology	Accelerate Digital
60	00920BC	Digital Process Automation	Information Technology	Accelerate Digital
61	00920BD	Foundational Analytics for Safety, Compliance and Efficiency	Information Technology	Accelerate Digital
62	00920BE	Advanced Data and Decision Modeling	Information Technology	Accelerate Digital
63	00920BF	Decision Analytics & Situational Awareness	Information Technology	4. Accelerate Digital
64	00920BG	Vehicle Telematics - Phase 1	Fleet Services	Simplify and Standardize
65	00920BH	Situational Awareness Dashboards	Information Technology	Accelerate Digital
66	00920BI	Vehicle Telematics - Phase 2	Fleet Services	4. Accelerate Digital
67	00920BJ	Load Curtailment Modernization	Electric Distribution - O&M	Simplify and Standardize
68	00920BK	Noggin Phase 3B	Information Technology	Simplify and Standardize
69	00920BL	Electric Distribution Asset Investment Prioritization	Safety, Risk, & Asset Management	Simplify and Standardize
70	00920BM	Asset 360 - Asset Data Foundation	Safety, Risk, & Asset Management	Simplify and Standardize
71	00920C	Smart Grid Operations 2024	Electric Distribution - O&M	Simplify and Standardize

INFORMATION TECHNOLOGY Capital Expenditures List by Workpaper				
ID	**Work Paper**	**Project Description**	**Categories of Management**	**IT Goal**
72	00920E	Investment Prioritization	Safety, Risk, & Asset Management	Accelerate Digital
73	00920F	Construction, Planning and Design (CPD) Enhancements	Safety, Risk, & Asset Management	Simplify and Standardize
74	00920G	Gas Ops Tool Tracker SAP Enhancement	Gas Distribution	Simplify and Standardize
75	00920H	Field Mobile Hardware Replacement	Safety, Risk, & Asset Management	Proactively Manage Risk
76	00920L	Local Area Distribution Controller (LADC) 2023-2024	Clean Energy Innovations	Simplify and Standardize
77	00920M	GIS Modernization	Safety, Risk, & Asset Management	Simplify and Standardize
78	00920P	Digital Asset and Damages Detection Platform	Information Technology	Accelerate Digital
79	00920R	Vegetation Management - Work Management	Electric Distribution - Wildfire Mitigation and Veg Mgmt.	Accelerate Digital
80	00920T	Field Service Delivery (FSD) - Data & Analytics Platform	CS - Field Operations	Simplify and Standardize
81	00920V	CAISO Mandates 2022	Energy Procurement	Proactively Manage Risk
82	00920W	CAISO Mandates 2023	Energy Procurement	Proactively Manage Risk
83	00920X	Distribution Interconnection Info. System - Rule 21 and Net Energy Metering Enhancements - Phase 2	Electric Distribution - O&M	Proactively Manage Risk
84	00920Y	Local Area Distribution Controller (LADC) 2022-2023	Clean Energy Innovations	Simplify and Standardize
85	00921A	GRC & Regulatory Management System - Phase 3	Administrative and General	Accelerate Digital
86	00921AA	Container Modernization on Cloud Web Services	Information Technology	Accelerate Digital
87	00921C	DevSecOps Source Code Management (SCM) GitHub	Information Technology	Transform How We Work
88	00921D	Test Acceleration Enablement (TAE) with DevSecOps	Information Technology	Transform How We Work

INFORMATION TECHNOLOGY Capital Expenditures List by Workpaper				
ID	**Work Paper**	**Project Description**	**Categories of Management**	**IT Goal**
89	00921E	Digital Service Integration Platform	Information Technology	Accelerate Digital
90	00921F	Data Governance Tools & Framework	Information Technology	Accelerate Digital
91	00921G	Application Factory - Utility Operations	Information Technology	Simplify and Standardize
92	00921I	Test Acceleration Enablement (TAE)	Information Technology	Transform How We Work
93	00921J	Claims Management	Administrative and General	Simplify and Standardize
94	00921K	Electric Damages Optimization	Administrative and General	Simplify and Standardize
95	00921L	Source Code Management & DevOps Implementation	Information Technology	Transform How We Work
96	00921N	Engineering & Construction Document Centralization and Compliance	Safety, Risk, & Asset Management	Accelerate Digital
97	00921Q	Cross-Functional Work Management Enhancements	Electric Distribution - O&M	Simplify and Standardize
98	00921R	Business Adaptation Technologies & Digitalization	Information Technology	Accelerate Digital
99	00921Y	Construction Management Software Integration with SAP	Electric Distribution - Capital	Simplify and Standardize
100	00921Z	Automated Utility Design (AUD)	Electric Distribution - Capital	Simplify and Standardize
101	00925B	Software Defined Wide Area Network (SD-WAN) Implementation 2022	Information Technology	Simplify and Standardize
102	00925E	Emergency Communications Microwave (MW) Auto Alignment System	Information Technology	Simplify and Standardize
103	00925F	Network Switch 2022 Equipment Replacement Agreement	Information Technology	Simplify and Standardize
104	00925H	Network Time Protocol (NTP) Clock Refresh	Information Technology	Simplify and Standardize
105	00925I	Transmission Communications Reliability Improvement (TCRI) 2022	Information Technology	Simplify and Standardize

INFORMATION TECHNOLOGY Capital Expenditures List by Workpaper				
ID	**Work Paper**	**Project Description**	**Categories of Management**	**IT Goal**
106	00925J	Transmission Communications Reliability Improvement (TCRI) 2023	Information Technology	Simplify and Standardize
107	00925K	Transmission Communications Reliability Improvement (TCRI) 2024	Information Technology	Simplify and Standardize
108	00925L	Local Area Network (LAN) Refresh 2022	Information Technology	Simplify and Standardize
109	00925M	Field Area Network (FAN) Voice & Dispatch - Phase 2	Information Technology	Simplify and Standardize
110	00925N	Data Center Network (DCN) Core Refresh	Information Technology	Simplify and Standardize
111	00925Q	Telecom Site Improvements	Information Technology	Simplify and Standardize
112	00925R	Wide Area Network (WAN) Refresh	Information Technology	Simplify and Standardize
113	00925S	EVC and GC Telecom Security Remediation	Information Technology	Proactively Manage Risk
114	00925T	Call Recording System Refresh	Information Technology	Simplify and Standardize