Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2016 General Rate Case
Application: A.14-11-___
Exhibit: SDG&E-09

SDG&E

DIRECT TESTIMONY OF JOHN D. JENKINS

ELECTRIC DISTRIBUTION CAPITAL

November 2014

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

A Sempra Energy utility®

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TOTAL CAPITAL	**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
	443,612	**486,399**	**474,033**

SDG&E is requesting the Commission adopt our Test Year 2016 (TY2016) forecast of $474,033,000 for Electric Distribution Capital. SDG&E is also requesting the Commission adopt our forecast for capital expenditures in 2014 and 2015 of $443,612,000 and $486,399,000, respectively. The capital projects described in my testimony are intended to maintain the delivery of safe and reliable service to our customers. SDG&E prioritizes our work to comply with applicable laws and regulations, and to provide system integrity and reliability in accordance with our commitment to safety. SDG&E's longstanding commitment to safety focuses on three primary areas – public safety, customer safety and employee safety. This safety-first culture is embedded in the manner in which we carry out our work and build our systems – from initial employee training to the installation, operation and maintenance of our utility infrastructure, and to our commitment to provide safe and reliable service to our customers.

My testimony demonstrates SDG&E's need for this portfolio of projects through individual descriptions and analysis of each project's business justification, need and related support to safety and reliability for our customers, employees and communities. My testimony addresses the forecasted costs associated with the capital electric distribution work SDG&E deems necessary to provide safe, reliable and high-quality service to our customers. The capital electric distribution costs are broken down into 11 primary cost categories: Capacity, Equipment & Tools, Franchise, Mandated, Materials, New Business, Overhead Pools, Reliability, Safety & Risk Management, Smart Meter Program, and Transmission/Federal Energy Regulatory Commission (FERC) Driven Projects. Of the 11 capital project categories, there are four categories that make up the majority (67%) of the overall forecast. The four major categories are New Business (15%), Safety & Risk Management (10%), Reliability (18%) and Overhead (OH) Pools (24%). My testimony also breaks out and describes Safety & Risk Management projects that increase safety by reducing wildfire risk. While wildfire risk reduction has long been ingrained in SDG&E's core business activities, my testimony describes SDG&E's commitment to increased fire risk reduction efforts through capital upgrades. Each specific work category is described in greater detail in my testimony.

In preparing our projections for TY2016 requirements, SDG&E analyzed historical 2009 to 2013 spending levels, considered underlying cost drivers and developed an assessment of future requirements. Forecast methodologies were selected based on future expectations for the underlying cost drivers, and include:

- Forecasts based on historical averages;
- Forecasts based on the base year (2013) adjusted recorded spending; and
- Forecasts based on zero-based cost estimates for specific projects.

In addition, my testimony identifies work requirements incremental to levels of historical spending and necessary to maintain the safe and reliable operations of the distribution system. Funding requirements for these new or more extensive work elements are forecasted based on historical spending plus incremental expense requirements.

SDG&E DIRECT TESTIMONY OF JOHN D. JENKINS

ELECTRIC DISTRIBUTION CAPITAL

I. INTRODUCTION

My testimony describes estimated 2014-2016 capital expenditures for SDG&E's Electric Distribution utility plant and demonstrates why these expenditures are necessary and reasonable. Section II of my testimony summarizes the overall capital electric distribution forecast. Section III explains SDG&E's project evaluation and prioritization process. Section IV describes the details of plant additions and the major capital budget categories for electric distribution. Within Section IV, there is an explanation of changes affecting each category of work. Section V shows a summary of the requested costs by category, and then further details the requested costs by category and individual budget code, Section VI concludes my testimony, and Section VII describes my witness qualifications.

II. SUMMARY OF REQUEST

I sponsor the TY2016 forecasts for capital costs for the forecast years 2014, 2015, and 2016, associated with the Electric Distribution area for SDG&E. Table 1 summarizes the total capital costs in my area.

TABLE 1

Test Year 2016 Summary of Total Costs

ELECTRIC DISTRIBUTION			
Figures Shown in Thousands of 2013 Dollars			
TOTAL CAPITAL[1]	**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
	443,612	**486,399**	**474,033**

[1] These costs represent the total cost to perform electric distribution capital work. These totals include the forecasted amounts for budgets that have a collectible portion of the costs. The Franchise and New Business categories of work include budgets where certain costs are reimbursed to SDG&E by other parties. For example, the City of San Diego reimburses SDG&E for work/costs in the 213 budget – City of San Diego Surcharge Program (20SD). The net capital costs, taking into account the collectible amounts, are $407,901 for 2014, $447,729 for 2015, and $432,724 for 2016. Additional details on the budgets with collectibles are described in the following testimony, and in the capital workpapers (see SDG&E-09-CWP at section 00213 – City Of San Diego Surcharge Prog (20SD)).

III. ELECTRIC DISTRIBUTION CAPITAL PROJECT OVERSIGHT AND PRIORITIZATION

A. Capital Management Governance

Several departments within the electric operations areas at SDG&E generate electric distribution capital projects, which are all reviewed, approved and prioritized by multiple cross-functional committees. These committees, or teams, are described in more detail below.

1. Reliability Assessment Team

The Reliability Assessment Team (RAT) comprises technical leaders from various departments in the company, including: Distribution Operations, Electric Reliability and Distribution Planning, System Protection, Engineering Standards, Operations and Engineering offices, Substation Engineering and Design, and Kearny Maintenance and Operations. The Reliability Assessment Team focuses primarily on providing strategy and guidance for continuously improving system reliability performance, providing integrated planning support, and managing budgets for approved reliability improvement projects.

Proposals for reliability improvement projects are presented to the Reliability Assessment Team in the form of a circuit analysis. The circuit analysis considers the reliability risks for the individual circuit, alternatives for reliability enhancements, reliability benefits for each mitigation alternative, and a recommended approach to enhancing reliability on the circuit. After the circuit analysis presentation, the Reliability Assessment Team either requests that further analysis of the circuit be done, or it approves the alternative that it deems to provide the most cost-effective reliability benefit. Approved projects are sent to the Technical Review Committee (TRC) for consideration.

2. Substation Equipment Assessment (SEA) Team

The SEA Team consists of individuals from the Substation Engineering and Design group and the Kearny Maintenance and Operations group. The SEA Team examines transmission and distribution substations and equipment for potential risks and potential failures. The team has developed a methodology for assessing risk related to substation equipment and criteria for evaluating and prioritizing the equipment for repairs and/or replacement. In some cases, larger scale projects are created to address the issues identified by the SEA Team.

In support of daily operations, the SEA Team maintains a database to track and process key operating information. The team analyzes this data to support condition-based equipment replacement. It also supports the online monitoring and diagnostics for key equipment. The SEA Team analyzes historical data, monitors how substation equipment impacts reliability indices, reviews trends related to equipment failure rates, and evaluates the amount of spare equipment in inventory. These factors are included in the methodology the SEA Team uses to assess risk.

3. Technical Review Committee

All capacity and reliability capital projects are reviewed by the Technical Review Committee (TRC). The TRC serves as an independent council of technical experts that assesses the prudence and value to customers of transmission and distribution capacity and reliability projects. The TRC is made up of representatives from Transmission and Distribution Planning and Engineering, Resource Planning, Real Estate, Substation Construction & Maintenance, Environmental Services, Construction Services, Customer Services, and Electric Grid Operations. The TRC reviews all projects within a 5 -10 year planning horizon and meets monthly to approve projects. The purpose of the TRC is to perform the following tasks:

- Analyze project alignment with company strategies for the Generation, Transmission and Distribution areas;
- Determine whether alternatives have been thoroughly described, assessed and evaluated (e.g., Transmission vs. Distribution upgrades, energy efficiency measures, distributed generation planning, or do nothing);
- Determine whether project risks are reasonable, and whether mitigation plans have been developed to minimize project risks;
- Assess whether customer and company issues have been addressed early on in the planning process; and
- Assists in prioritizing projects for the Electric Transmission & Distribution Capital Committee.

All proposed projects are scrutinized by the TRC using the guidance noted above. Proposed projects that do not satisfy the criteria are either eliminated from further consideration, or the department is directed to explore changes or additional alternatives and then bring the project back to the TRC for further consideration. Once projects have been approved by the TRC, they are then sent to the Electric Transmission & Distribution Capital Committee for consideration.

4. Electric Transmission & Distribution Capital Committee

All projects approved by the TRC are reviewed, approved and prioritized by the Electric Transmission & Distribution Capital Committee. The Electric Transmission & Distribution Capital Committee comprises Directors from the following functional areas: Electric Transmission & Distribution Planning, Electric Transmission & Distribution Engineering, Construction Services, Electric Regional Operations, Kearny Maintenance & Operations, Electric Grid Operations, Electric Distribution Operations, Real Estate & Facilities, and Public Affairs. Non-voting members include Directors from Gas Engineering and Gas Operations Services.

The primary role of the Electric Transmission & Distribution Capital Committee is to establish priorities among the funding requests within their areas of expertise to complete the highest priority work. Electric Distribution projects are prioritized for spending using the following priorities:

- Safety and Risk Management:
    - Fire risk reduction projects, like fire-hardening and aerial marking projects
- Mandated/Compliance:
    - Projects required in compliance with programs mandated by the CPUC or other regulatory agencies.
    - Corrective Maintenance Program, pole replacements, underground (UG) switch replacements, and spill prevention.
- Restoration and Maintenance of Service:
    - Reactive cable replacement, restoration of service, and management of service (e.g., voltage correction).
- New Business:
    - New extensions and upgrades required to correct equipment loadings above 100% resulting from major new business load additions (commercial, industrial, or large residential developments).
    - Percent equipment loading is used to sub-prioritize projects within this category.
- Franchise:
    - Conversions requested by applicants.
    - Relocations required due to municipal improvements.

- Conversions performed under Rule 20A or the City of San Diego Surcharge.

- Capacity:
  - Capacity projects required to correct equipment loadings above 100%, due to area load growth.
  - Capacity projects required to increase system capacity where highly loaded equipment (above 90%) will adversely impact operations and reliability.
- Reliability:
  - Proactive infrastructure replacement projects in avoidance of reactive repair or replacement.
  - Projects required to maintain or to improve reliability.
  - Capacity projects required to correct deviations from system design criteria (e.g., loading between sectionalizing devices) or reduce equipment loading above 85% that may impact operations and reliability.
  - Capacity projects required to reduce area substation tie deficiencies that exceed 15MW.
  - Power quality projects to promote monitoring and level of service.
- Construction:
  - Projects already in construction, over 25% complete or more than $100k spent.

The Electric Transmission and Distribution Capital Committee uses a Capital Budget Documentation (CBD) form to document the project's business purpose, physical description, scope, schedule, justification, and estimated cost. A project manager is assigned to each project and is responsible for the documentation submitted through the review processes of the planning committees. Information from those CBDs is used to complete the Capital Project Workpapers that appear in the accompanying workpapers to this testimony.

Each project is assigned unique project number that usually indicates the year in which the project was initiated (as in 13247, project number 247 of year 2013). While most projects are "individual" or "specific" projects, there are also "blanket" projects, which continue from year to year and encompass the installation of many small, but related or identical, capital items. The wood-pole replacement project (87232) is an example of one such blanket project. Many of these blanket projects have legacy numbering, usually of three digits, such as the 230 cable replacement project.

The Electric T&D Capital Budget Committee confirms project prioritization for each year, and requests monthly status reports. Priorities are adjusted, depending on whether or not risks are adequately being addressed, if new risks materialize based on new data, and depending on overall budget status.

5. Executive Risk Management Committee

When risks are identified, they are first vetted by a cross-functional group of Directors and Managers, familiar with the electric transmission and distribution system to assess legitimacy. Risks that meet this threshold are then presented to the Executive Risk Management Committee (ERMC). The information for each risk presented to the Committee includes the background related to the risk, potential impacts, and mitigation alternatives. The mitigation alternatives are, presented to the ERMC, illustrating the estimated costs for each alternative, and a recommended approach for mitigating the risk is presented. If the risk mitigation proposals are significant, like the FiRM program, financial modeling is performed to determine the rate impact and revenue requirement.

Because wildfire is such a significant risk (the #1 priority risk on the enterprise risk register), risk reduction efforts in this area are typically prioritized above other categories of work. Once programs are developed to mitigate risks, they are presented to the Electric T&D Capital Budget Committee for approval.

6. Fire Risk Management Teams

Fire risk reduction efforts have become a core tenet for all operational activities at SDG&E. There are a couple of cross-functional teams responsible for managing and prioritizing fire risk reduction activities, and reporting on status updates. One of these teams is called the Fire Preparedness team. The Fire Prep team meets monthly to discuss capital and O&M activities focused on reducing fire risk. That team is responsible for maintaining SDG&E's Fire Prevention Plan[2] and ensuring the activities in the Community Fire Safety Program are closely managed. There is also a Fire Preparedness Director Steering Committee that meets to review the status of risk reduction activities in fire areas, to prioritize the fire risk reduction work, and to provide direction to the project managers involved in the fire risk reduction activities.

[2] Resolution E-4576 approved SDG&E's Advice Letter 2429-E, which contained SDG&E's Fire Prevention Plan (FPP), pursuant to the Phase 2 decision in the Electric Safety OIR (D.12-01-032).

Another team that focuses on fire risk reduction work is the Reliability Improvements in Rural Areas Team (RIRAT). Early in 2010, this multi-disciplinary technical team of subject matter experts within SDG&E, was formed and tasked with (a) developing a multi-dimensional understanding of the complex fire-risk issue within the SDG&E service territory, (b) assessing the conditions which pose the greatest risks related to fire, (c) determining the level of risk mitigation that could be provided by various proposed projects, and (d) assigning priorities to capital and operating programs and projects that could address fire-related risks in the Fire Threat Zone (FTZ). As is illustrated in the FTZ and Highest Risk Fire Area (HRFA) map (see Appendix D), a large percentage of San Diego County is considered to be a significant fire threat, and it is in these areas where the potential for uncontrolled wildfires, and potentially the greatest losses, is the highest. The RIRAT focuses its attention on facilities and activities in these areas so as to assure that all prudent and cost-effective fire-prevention measures are promptly evaluated and implemented.

The RIRAT is led by the SDG&E Asset Management and Smart Grid Department and includes managers and engineers from the Asset Management and Smart Grid Projects Department, the Electric Transmission and Distribution Engineering Department, the Electric Regional Operations Department, and other stakeholders, as required.

The RIRAT, among other things, oversees the evaluation and implementation of various distribution fire-hardening activities. Its work is guided by the following specific goals and objectives:

- Improve the distribution system in the FTZ and HRFA;
- Develop statistical measures for assessing distribution-system performance relevant to fire-related risks so as to provide an understanding of the scope of the risks that must be addressed and develop metrics for measuring improvement;
- Identify and prioritize areas posing the greatest fire-related risks;
- Develop guidelines and a portfolio of solutions to minimize fire-related risks;
- Develop a multi-year plan for the rebuilding of circuits creating the greatest and/or most probable fire-related risks;
- Review and analyze all reports of "wire-down" occurrences; and,
- Use the "wire-down" analysis to identify causes and best solutions so as to minimize future occurrences and fire-related risks.

In order to meet their goals, the RIRAT adopted the following guiding principles:

- Utilize risk-based prioritizations to maximize risk-mitigation;
- Improve design specifications to reduce the potential for igniting fires;
- Consider and, to the extent prudent and cost-effective, employ technology-based solutions to reduce fire risks and improve overall system reliability;
- Prioritize system-rebuild efforts based on a matrix of available projects, considering the most important input factors such as the recent occurrence of a "wire-down," wind and weather conditions, fire risks, values at risk, outage history, conductor type, condition of equipment, environmental conditions, and critical customers;
- Systematically consider and evaluate the following options:
    - Fire-hardening sections of circuits or individual circuit branches;
    - Undergrounding by traditional undergrounding or cable-in-conduit;
    - Adjusting protective equipment by revising settings, balancing loads, adding reclosers, replacing expulsion fuses with fault tamers, and/or reducing fuse size; and
    - Employing new methods and/or technologies, such as spacer cables, wireless fault indicators, "off-grid" solutions, and Smart Grid technologies;
- Replace high-risk equipment based upon statistical analytics;
- Realign circuit routings to avoid trees and dense vegetation or use tree guards and/or insulated aerial cables; and
- Assess the costs and benefits of optional solutions for reasonableness.

The RIRAT oversees the evaluation and approval processes for the various system improvements and capital projects described above and specifically addresses system design and facilities from the perspective of minimizing fire-related risks in the rural areas included in the FTZ and HRFA. Until recently, this team also managed the capital budgets for distribution fire hardening activities. This team and associated processes have now been incorporated into the Fire Risk Mitigation (FiRM) program, which is discussed in greater detail in Section V.

SDG&E also has an executive-level team that meets quarterly to get briefed on risks and the plans for addressing those risks. The Executive Risk Management Committee provides guidance for risk reduction activities and adjusts priorities, as necessary.

B. Safety/Risk Considerations

The risk policy witnesses describe how risks are assessed and factored into cost decisions on an enterprise-wide basis. See Exhibits SDG&E-02 (Day) and SDG&E-03 (Schneider/Geier). In this section of my testimony, I describe how risk assessment drives our investments and the key risks that my capital programs will be mitigating. The forecasted expenditures that are specifically focused on addressing safety and risk management are $27,563 in 2014, $42,309 in 2015, and $77,378 in 2016. Section IV-B of the testimony describes the category of investments in more detail, and Section V-I covers specific project details and forecasts.

1. Risk Assessment

Risk assessment is a core component of our electric operations and is a key driver for our investments. Within SDG&E, there are teams dedicated to identifying and evaluating the risks that exist in the electric system. These teams are discussed in more detail in Section III-A above. One of the teams, whose primary responsibility is addressing risk, is the Reliability Improvements in Rural Areas Team (RIRAT). That team is responsible for identifying and understanding wildfire risks that exist within SDG&E's service territory, evaluating the conditions that pose the greatest fire risks, determining the level of risk mitigation that various options could provide and prioritizing investments that address fire-related risks in the Fire Threat Zone (FTZ).

The assessments conducted by the RIRAT drive the majority of the electric distribution capital work aimed at reducing wildfire risk, including the recently developed Fire Risk Mitigation (FiRM) program. Several of the fire-hardening projects described in more detail in Section V-I, were initiated as a result of the RIRAT work.

2. Risk Mitigation Alternatives Evaluation

Risk mitigation alternatives are evaluated at several levels within SDG&E. It starts with a cross-functional assessment team, made up of Managers, Engineers, and Analysts, and rises to the Technical Review Committee and the Electric Transmission and Distribution Capital Committee to thoroughly evaluate the alternatives that were considered to select the most appropriate option to mitigate the identified risks.

When risk mitigation alternatives and project alternatives are brought to the cross-functional teams for evaluation, an alternatives analysis is performed beforehand and the results are presented to the team. For example, the RAT has a model that incorporates failure rate data, circuit configuration data, customer counts, segmentation schemes, average field response times and estimated project cost. The RAT model is run for various alternatives, and the alternative with the superior results is presented to the RAT along with the alternatives that were ruled out. The RAT will look at the reliability results and the costs and confer to determine if they all agree with the recommended approach.

The RIRAT has a similar matrix for prioritization of activities, but the matrix has different data inputs and criteria for narrowing down the areas of highest risk. The RIRAT evaluation takes into account the extent of fire risk, based on maps and data from the Fire Coordination group and Meteorology, and trends related to failed components/elements on the overhead electric system. The RIRAT tracks statistics related to wire-down events and equipment failures, and utilizes that data to determine where risks related to the overhead line elements exist. Priorities can shift as data is analyzed and trends change. They also shift as SDG&E gains more data about meteorological conditions that can impact the electric system and/or more data about the fire conditions.

3. Risk Mitigation Activities Selected

Risk mitigation projects are selected based on the severity of the risk, the probability of occurrence, the amount of data available related to the risk, and the amount of history showing that the risk can truly be mitigated with the proposed approach. There are times where SDG&E begins down a path to reduce one risk, and finds additional risks that need to be mitigated as well. For example, in 2013, SDG&E began developing a program to address pole loading concerns in fire prone areas. As SDG&E progressed in creating the program to address pole loading, the project team scoured the RIRAT data and determined that overloaded poles were not the only risk in the FTZ. Based on historical data, splices, connectors, aged conductor, and overloaded poles all appeared to be risks. SDG&E's proposed pole loading program then turned into a more comprehensive risk mitigation program, the FiRM program. SDG&E has done a tremendous amount of work to reduce risk through operational measures, through fire-hardening, and through the deployment of advanced technology, and the FiRM program combines all of those efforts, to further reduce the risk of wildfire ignition in high risk areas. As described in detail below, the program will address aged conductor, aged splices, overloaded poles, as well as other conditions that are known to be a risk in the FTZ.

4. Integration of Risk Mitigation Actions and Investment Prioritization

When significant risks are identified, the risks are presented to the Executive Risk Management Committee (ERMC). They are usually presented after being vetted through a cross-functional group of Directors and Managers, familiar with the electric transmission and distribution system, to assess whether the risk is legitimate. When risks are presented to the ERMC, mitigation alternatives are presented along with the associated costs, as well as a recommended approach for mitigating the risk. If the risk mitigation proposals are significant, like the FiRM program, financial modeling is performed to determine the rate impact and revenue requirement. This is done so the program alternatives can be analyzed from a cost impact perspective, while also looking at the duration of the mitigation efforts. Because wildfire is such a significant risk (known risk based on the catastrophic 2007 wildfires), risk reduction efforts in this area are typically prioritized above other categories of work. Once programs are developed to mitigate risk, they are presented to the Electric T&D Capital Budget Committee, which is a cross functional team of Directors and higher level Managers. If approved by that team, the projects are then entered into a budgeting system that ranks projects based on various inputs (category of work, cost, risk, etc.). The Electric T&D Capital Budget Committee confirms project prioritization for each year, and requests monthly status reports. Priorities are adjusted, depending on whether or not risks are adequately being addressed, if new risks materialize based on new data, and depending on overall budget status.

IV. PLANT ADDITIONS AND SUMMARY OF MAJOR BUDGET CATEGORIES

A. Electric Distribution Plant Additions

Electric distribution plant additions include capital projects to construct or modify facilities for the distribution of electricity at 15,000 volts (15kV) and below, projects to construct or modify facilities that transform energy from transmission voltage levels to distribution voltage levels and projects to improve system reliability. Protective relaying, circuit breakers, substation switchgear, and associated equipment for distribution substations and for equipment on the 15 kV and below systems are also included in the electric distribution plant additions. For an overall description of the electric distribution system, please see the prepared testimony of Mr. Jonathan Woldemariam (see Exhibit SDG&E-10).

Electric distribution capital projects are driven by safety and risk management, reliability, capacity needs, customer requests or system needs, such as new customer requests for service, Rule 20 conversions, public street or highway relocations, compliance and system growth. As customer requests are received or needs are identified, resource requirements are estimated and those jobs are reviewed. If approved, these jobs are included in a category of similar types of jobs, characterized by the principal priority (e.g., new business). Likewise, capital work driven by the need for existing system replacement, reinforcement and reliability issues is grouped into general project designations with other like projects (e.g., cable replacement). Other capital work projects that are generally driven by the need for additional capacity (such as new circuits and transformer banks, with estimated costs exceeding $500,000) are identified by their own specific capital project designations.

Some projects, in particular substation projects, may include in their CBD authorization for expenditures in more than one category of capital expenditure, including transmission-related expenses. The CBD may identify transmission-related costs for each project, but those costs are not included in SDG&E's GRC request. The total costs presented reflect the sum of all forecasted costs authorized on the CBDs, with an adjustment to exclude transmission-related (FERC-jurisdictional) costs. For example, in project 9125, the distribution work accounts for less than 5% of the total project cost. This request excludes the other 95% of costs that are covered by FERC transmission rates.

Similarly, current projects planned for SDG&E's transmission system and substations contain components of work on the distribution network. In these cases, my testimony supports a request for the portion of the project expenditures associated with the distribution network.

B. Major Budget Categories

As illustrated in Table 2 and Figure 2, SDG&E has eleven primary cost categories: Capacity, Equipment & Tools, Franchise, Mandated, Materials, New Business, Overhead Pools, Reliability, Safety & Risk Management, Smart Meter Program, and Transmission/FERC Driven Projects. Forecasted Smart Meter Program costs are not included for this discussion because they are relatively small and do not extend past 2014. Of the ten capital project categories (described below), there are four categories that make up 67% of the overall 2014-2016 forecast. The four major categories are New Business (15%), Safety & Risk Management (10%), Reliability (18%), and OH Pools (24%).

1. Capacity/Expansion

SDG&E's system peak load in 2013 was 4,604 megawatts. SDG&E must construct the distribution system to accommodate the peak loads, in order to meet all capacity needs. The weather-normalized system peak was 4,489 megawatts, while the 1-in-10 adverse weather peak was approximately 4,911 megawatts, or 9.4% higher. SDG&E's daily load profile on an average circuit swings 30% to 40% when comparing peak to average load. The daily peak could also triple in the mostly residential, inland or desert areas. The primary cost drivers for capacity projects are growth, reliability, safety and regulatory compliance. These drivers are explained in more detail below.

Actual capacity expenditures are linked to customer and load growth, but are not always proportional. Variations are due to the location of development with respect to available capacity. As San Diego expands and urban land utilization is maximized or priced at a premium, increased greenfield commercial and industrial construction in rural areas occurs. The outlying infrastructure must be augmented by adding circuits and substations to accommodate load increases.

The capacity/expansion category of projects is required for capacity and substation additions. Capacity and substation projects include those facilities necessary to serve system growth. Capacity projects typically consist of load transfers, re-conductors, circuit extensions, and new circuits. The Distribution for Substation category of projects includes distribution projects that are required to support the expansion of existing substations (e.g., substation bank additions) or to support the construction of new substations. Since the mix of optimum solutions to projected deficiencies can vary annually, distribution capacity expenditures for circuits and substations are managed and forecasted collectively. This allows for efficient allocation of capital as required to meet forecasted load growth needs.

Customer growth forecasts, new customer information, forecasted demand, and distribution substation assessment generate the best estimates of future capital requirements for capacity. In addition to customer growth, SDG&E's customers today use more peak electricity per customer than in the past. Existing customers continue to add and upgrade electronic devices and appliances in their homes. Housing density continues to climb, and new homes are larger with more electrical amenities. The net effect is that per-unit load has generally increased and demand growth continues to exceed customer growth. SDG&E's Electric Customer Forecast projects a growth rate of 0.9%, based upon a compound annual growth rate from 2013 to 2016.[3] However, the Area Peak Demand Forecast projects a 1-in-10 weather demand increase at a rate of 1.4% per year based upon compound annual growth from 2013 to 2016.

As I previously mentioned, SDG&E must construct the system to accommodate the peak even though average load may be appreciably less (varying greatly throughout the day, from day to day and from season to season); otherwise, SDG&E's system and customers would be subject to outages due to overloaded equipment and decreased reliability. While linked to customer and load growth, actual capacity expenditures have variations due to the location of development with respect to available capacity. Non-uniform system load growth that occurs in a few concentrated areas can increase costs. The Civic San Diego Development Plan forecasts considerable residential and commercial developments in specific regions of San Diego.[4] As San Diego expands and urban land utilization is maximized or priced at a premium, coupled with increasing greenfield commercial and industrial construction in rural areas that lack supporting infrastructure, the cost per customer to provide service in general increases.

Capacity projects increasingly require SDG&E to provide measures to promote safety and regulatory compliance. One example is the environmental monitors for archaeological findings, Native American artifacts and burial sites, biological nesting and hauling construction waste to special material sites. These monitors require compliance and construction modifications to designs. Because of increasing regulations, SDG&E expects these expenses to continue and increase. Storm Water Pollution Prevention Plans (SWPPP) requirements by Federal, State and Municipal jurisdictions also affect costs and time spent on the job. These SWPPP expenses can increase significantly due to the new State regulations. Training of crews is now required and ongoing costs are expected to increase as contractors must comply with new requirements.

SDG&E's primary objectives with respect to planning the distribution system are to promote distribution system reliability, safety, and power quality under peak conditions and other operational contingencies, and to meet all capacity needs.

[3] Direct testimony of Kenneth E. Shiermeyer (Electric Customers and Sales), Exh. SDG&E-32.
[4] http://www.civicsd.com/.

SDG&E performs two types of distribution planning studies: (1) Long-term distribution area studies that look out 10 to 15 years, and (2) SDG&E's annual planning process that looks out 10 years for circuits and substations, and 10-15 years for distribution area studies. An essential element of the planning process is evaluating peak loads. Peak load evaluation considers weather conditions, generation, and operational changes that may have taken place during peak conditions. Typically, this evaluation is done for several peak days to fully assess the peak load for which capacity relief projects will be needed.

Area studies are a cornerstone of SDG&E's planning process. The studies forecast long-term growth for large contiguous regions using data from the San Diego County Association of Governments (SANDAG), as well as city, community and major developers' development plans. Area studies are essential for identifying long term needs and initiating lengthy permitting and construction schedules for substation projects. As land becomes scarce and costs continue to escalate dramatically in San Diego, SDG&E must quickly identify and secure substation locations to accommodate future growth. SDG&E works closely with cities and communities to secure mutually agreeable sites prior to development, as another key component of Area Studies and advance planning. Area studies vary in frequency. Factors such as the economy drive customer load growth, which in turn drives the need to perform area studies. Further area studies are planned for the following regions: Elliott/Murray/Garfield, Streamview/Chollas/Spring Valley, and Carlsbad/South Vista. SDG&E has recently stepped up the effort to purchase land for future substation needs for these regions. This increased effort is due to major challenges in land acquisitions in the era of fast development and shortage of viable sites for substation construction.

The load capacity of substations and field equipment is evaluated annually against projected loading and system configurations. Generally, generation on the distribution system is noted, but is assumed to provide zero output at peak for distribution capacity evaluations. This treatment of distributed generation (DG) occurs since DG currently does not provide SDG&E with physical assurance, a guarantee of performance, at local system peak loading. Substations are evaluated to minimize risk, such that thermal loading limits for transformer, breaker, conductor capacities and other equipment are not exceeded.

SDG&E forecasts projected loads on each circuit and substation within the system on an annual basis. Planning forecasts consider historical growth rates, adjusted recorded loads, identification of large project developments, and local economic conditions. Forecasts rely on information obtained from local cities, developers, and large customers. Forecasts for both substations and circuits are established for a ten-year planning window. For short-term planning forecasts (1-2 years), specific customer (site-specific) load additions are considered.

SDG&E evaluates load forecasts against system capabilities to determine if system modifications are required. Planning studies are performed on radial circuits to meet this obligation. This analysis often includes computer simulations or load flow analysis to model both peak and contingency situations. Once a piece of equipment is projected to exceed allowable loading limits, SDG&E reviews and considers alternative system modifications. Various project alternatives would be considered, including reconfiguring the system, installing new facilities, and modifying existing facilities, as appropriate.

Substation and circuit load forecasts evaluate every piece of equipment from the transmission system through every line section, substation transformer, substation equipment, and distribution line. Not only is the equipment evaluated to determine adequate capacity but similarly the system is evaluated to maintain appropriate voltages established in SDG&E's Rule 2 Tariff (Description of Service) during steady state and contingency situations. Operating criteria for transformers and other equipment are established to prevent equipment damage due to thermal overload. Criteria are established for normal load with additional criteria typically established for emergency conditions. Equipment limits are typically established by the manufacturer of the equipment and include ratings related to maximum load current, voltage, and fault current. Since substation transformer designs vary by manufacturer, the criteria for substation capacity are substation- and transformer-specific.

System capacity analysis is included in determining system capabilities. Examples of this analysis are loss of line studies (N-1) for looped substations, circuit tie capabilities for contingencies, and loss of generation components. While outages of line sections on radial circuits will result in customer outages, SDG&E evaluates scenarios to isolate faulted sections and minimize customer downtime.

An additional factor that SDG&E considers in the planning process is an analysis of the impact of customers with DG on standby tariffs. This analysis utilizes "what if" scenarios to consider whether the customer will require its standby load to be served by SDG&E if its generator is not operating. The distribution system is evaluated to assess whether this additional load can be served without affecting the reliability, safety, and power quality of the system. For planning purposes, demand and stand-by demand are treated the same.

Project solutions include several factors in addition to economics. Other factors SDG&E considers include system safety, reliability, and power quality. Project solution selection is based not only on the least cost alternatives but also on factors that may have an influence on reliability. SDG&E does not select a project solution based on the economics of a single project alone, but instead must consider the requirements of all the proposed projects in an area required to serve the load.

As mentioned earlier, SDG&E has implemented a (TRC) to review proposed alternative solutions to forecasted system deficiencies. This committee comprises members with a diversity of backgrounds throughout all aspects of SDG&E's operations. The TRC assesses compliance with Public Utilities Code §353.5, which requires SDG&E to consider Distributed Energy Resource (DER) alternatives as part of delivering reliable service at the lowest possible cost. After this review, the Electric Transmission and Distribution Capital Committee also reviews the specific capital projects and prioritizes the capital expenditures.

Additional details on the cost drivers can be found in each budget code.

2. Equipment/Tools/Miscellaneous

This budget category is required to purchase new electric distribution tools and equipment required by field personnel to safely and efficiently inspect, operate and maintain the electric distribution system. The result is increased safety, reliability, and regulatory compliance.

3. Franchise

This category of projects is required to perform municipal overhead to underground conversion work or work in accordance with SDG&E's franchise agreements. The two categories of projects in the Franchise Category are those devoted to conversion of overhead distribution systems to underground and street or highway relocations due to improvements by governmental agencies.

Rule 20A projects are funded by allocations set in negotiations with the cities and counties through franchise agreements and are implemented in coordination with those cities and counties. Street and highway relocations are also included in this category and performed at SDG&E expense in accordance with Franchise Agreements.

SDG&E also has a Franchise Agreement with the City of San Diego, which imposes a surcharge on ratepayers within the City. The proceeds from this surcharge are used by the City to fund overhead-to-underground conversion projects within the city limits through SDG&E's Budget Code 213. This surcharge program is revenue and rate base neutral, since all surcharge funds collected are turned over to the City, and all related SDG&E construction expenses are reimbursed by the City. While there are timing differences that result in an initial cost to the conversion, the cost is completely reconciled by the city at no expense to ratepayers.

In addition to the 213 budget, certain other New Business and Franchise budgets have a "collectible" component, where some funds are received from customers prior to construction. An example is Contributions in Aid of Construction, or CIAC. Compared to prior GRC showings, my testimony demonstrates the "gross," or total cost estimates for budgets that have collectible components, like the 213 budget discussed above. This presentation illustrates the actual total project cost to do the work, independent from any collectible portion, which illustrates the true facility expense. Rate base modeling performed on these values still credits the collectible portion, so that ratepayer impact is unchanged from the manner in which SDG&E has demonstrated the cost of collectible projects in prior GRCs. In past GRCs, SDG&E demonstrated the net values in part because of the complexity required to determine historic collectible values.

4. Mandated

Mandated projects are those required by CPUC and other regulatory agencies. Mandated programs help promote public safety and employee safety. In addition, these programs protect SDG&E's capital investments of overhead and underground distribution facilities, maintain quality of service to SDG&E's customers, and avoid degradation of reliability due to aging electric systems.

This category of projects includes, among others, the replacement of equipment from SDG&E's Corrective Maintenance Program (229), the replacement/reinforcement of wood distribution poles (87232), distribution switch replacement/removal (289), and manhole repair (289). Three of these programs (229, 289, and 87232) are driven by CPUC General Order (G.O.) 165, which governs the inspection and maintenance program for a utility distribution system in furtherance of overhead and underground construction's compliance with G.O. 95 (Rules for Overhead Line Construction) and G.O. 128 (Rules for Construction of Underground

Electric Supply and Communications Systems). SDG&E's G.O. 165 program that is filed with the CPUC is referred to as the Corrective Maintenance Program (CMP). G.O. 165 and SDG&E's submitted plan require the routine inspection of electric distribution facilities and the correction of infractions found from those inspections. The infractions identified during the inspections represent deviations from the rules outlined in G.O. 95 and G.O. 128 and must be cleared within twelve months of the initial inspection. Imminent safety hazards found on the inspections are immediately addressed. These programs represent the capital expenditures necessary to correct those infractions.

5. Materials

This project is required to provide distribution transformers necessary to operate and maintain the electric distribution system. This blanket project is required to purchase transformers, supplying new and replacement equipment and maintaining inventory at each electric distribution service center. The expenditures in this category are closely related to work being done in New Business, Mandated, Capacity, Reliability, Safety & Risk Management, as well as all other categories where transformers are installed.

6. New Business

The majority of the expenditures associated with the New Business budgets are a direct result of a customer requests. Those requests can be for new services, upgraded services, new distribution systems for commercial and residential developments, system modifications to accommodate new customer load, customer requested relocations, rearrangements, removals and the conversion of existing overhead lines to underground. All work and cost responsibilities are governed by applicable tariffs, which typically place the bulk of the cost on the utility. This category of work has some budgets with collectible components, similar to the Franchise category. The forecasted amounts are shown in gross dollars, as described in the Franchise discussion above.

Since New Business work is subject to a fairly quick turnaround, all projected budget requirements are based on economic indicators suggesting the anticipated level of construction activity. The New Business budgeting process relies heavily on the Construction Unit Forecast, an in-depth assessment that combines data on permit activity and the most current outlook on housing and land development presented by a variety of economic forecasting entities. The Construction Unit Forecast is produced by SDG&E and typically updated twice a year.

Construction units are a concept unique to SDG&E. A residential unit represents the work performed by SDG&E construction crews to bring energy to new construction. A construction unit is not the same as a "meter set," because a meter can be connected or disconnected to a residence many times over the life of the structure and is counted as one "set" each time the task is performed. A construction unit is counted only once, when the company extends its system to serve a new residence. One residential construction unit usually maps to one new dwelling unit. One new single-family residence equals one residential construction unit, or one new apartment unit equals one residential construction unit. Nonresidential construction units, on the other hand, do not match one-to-one to each related business. Rather, one nonresidential construction unit maps to one business structure (point of service). For example, one newly constructed office building may represent one nonresidential construction unit, even though there may be many tenant businesses occupying the same office building.

There are electric construction units and gas construction units. A residence may have both electric service and gas service. If so, two construction units are counted: one electric unit and one gas unit. A construction unit forecast with an electric component and a gas component is also produced. Forecasting residential electric construction units is the primary forecasting effort. Gas units are derived by applying a set of historical ratios of completed gas units to completed electric units, to a forecast of residential electric units. The forecast of residential electric units is driven by a forecast of San Diego county residential building permits. The forecast of residential permits is usually permit information gathered locally, combined with permit information provided by a nationally recognized data service provider, such as Global Insight, Inc. The information gathered locally is used to develop a current-year and one-year-out forecast of permits. The permit series provided by the national data service provider is merged with the front end of the permit forecast to create a five-year set of residential permits to use as a model driver. The forecasting tool is based on a relationship between a long history of San Diego county residential permits and SDG&E residential electric construction units. Once the forecast of residential electric construction units is prepared, it is then shared down to electric sub-categories such as single-family/multi-family and overhead/underground electric. Gas units are generated by applying the above-mentioned ratios.

The recession period that the entire country has experienced over the last six years has had a marked impact on construction activity. SDG&E saw a dramatic drop in completed

Construction Units starting in 2008, which reached a historic low in 2010/2011. Since that time, construction activity has increased slowly, but the most recent forecasts suggest a marked increase in the coming years, starting in 2014. SDG&E has seen signs supporting the projected increase in construction activity.

The forecasts in this testimony reflect these anticipated increases in activity. The last year in which SDG&E saw the number of recorded Construction Units, close to what has been forecasted for 2014, was 2007. In that year New Business budget expenditures topped $67 million (in 2007 dollars). The recession and the decimation of the housing industry resulted in five years of relatively low New Business expenditures. However, customer-related construction activity has always been cyclical and all indications are this protracted slump may well be over. The initial New Business budget requirements are based on the Construction Unit Forecast from April, 2014 (see Appendix C).

7. Overhead Pools

Capital projects incur certain costs that originate from central activities, which are subsequently distributed to those capital projects based one or more factors, such as project direct labor, contracted invoice amounts, or total project direct cost. Examples of costs included in this category are engineering capacity studies, reliability analysis and preliminary design work. Many of these costs cannot be attributed to a single capital project and are thus spread to those projects that are ultimately constructed and placed into service. These central activity costs are also called 'pooled' or 'indirect' costs. My Electric Distribution capital project testimony presents capital project forecasts as direct labor and non-labor costs. SDG&E has shown pool costs as separate components starting in the TY2008 GRC. The mechanics of the distribution of indirect costs onto these project direct costs, resulting in total project costs, is performed in the rate base model. The source of Contract Administration and Department Overhead indirect costs originating in the Electric Distribution functions at SDG&E are presented in my testimony and address those pooled costs that are ultimately distributed over capital projects, including both electric and gas distribution. I also present the source of capital indirect costs related to Local Engineering - Electric Distribution (ED) Pool and the distribution portion of the Local Engineering - Substation Pool. Indirect capital costs are applied consistently and uniformly to work done within a given category, such as Electric Distribution, for both collectible and non-collectible jobs.

Internally at SDG&E, more detailed engineering is being done for new facilities and for rebuilding electric infrastructure. Historically, distribution has been a standards-based business. With regulation changes and an increased focus on risk reduction, the need has arisen to perform more engineering than in the past. More advanced tools and methodologies are also being utilized. The forecasts in the labor and non-labor areas of these local engineering pools are based on historical information with a trend applied to synchronize the pool forecasts with the overall increases in projected work for the entire Electric Distribution area and the distribution portion of the Electric Substation projects and related activities, respectively. The forecasted increases in the three other major categories described above will have a significant impact on the Local Engineering - Distribution Pool.

8. Reliability/Improvements

Customer's expectations with regard to availability of service continue to be driven up by widespread use of computers and other electronic devices. SDG&E has been proactive over the past two decades in trying to address this increased expectation and aging infrastructure issues.

SDG&E has been recognized for having a very reliable electric system. Beginning in 2005, SDG&E has been ranked "Best in the West" in reliability by PA Consulting Group,[5] earning their regional ReliabilityOne award for eight consecutive years. SDG&E also received PA Consulting Group's National Award for Outstanding Reliability Performance in 2010.

While SDG&E has been recognized for excellent reliability, continuing to maintain the same level of reliability will be a challenge, particularly with increased new demands to the system, such as the influx of rooftop solar installations and electric vehicles. For over 20 years, SDG&E has done a substantial amount of work to improve reliability. SDG&E has replaced a tremendous amount of cable, installed sectionalizing devices to reduce the impacts of outages, has installed SCADA devices for better operational control, has replaced poor performing vintages of equipment, has monitored trends, and has made other operational improvements to provide reliable electric service. In addition to work that still needs to be done in the core areas of reliability, SDG&E is now faced with the need to do more to mitigate the impacts associated with customer-owned photovoltaic systems and plug-in electric vehicles. As of April 2014, approximately 36,450 customers had installed rooftop solar systems, with approximately 254

[5] *See* http://www.paconsulting.com/introducing-pas-media-site/releases/pa-consulting-group-recognizes-north-american-utilities-for-excellence-in-reliability-and-customer-service-21-november-2013/.

MW in nameplate capacity (see Appendix E), and as of May 2014, there were approximately 7,000 electric vehicles in San Diego County). The Advanced Technology capital budget testimony section focuses on these issues in more detail.

Cable failures remain the biggest contributor to System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI), and SDG&E continues to experience and forecast polymeric cable failures. The cable failure rate is primarily due to the remaining 1,948 circuit miles of high-failure rate unjacketed branch cable. In 2013, unjacketed branch cable caused approximately 25% of all distribution outages, and this continues to tax the workforce and impact customers.

SDG&E continues with its effort to improve reliability through the installation of additional Supervisory Control and Data Acquisition (SCADA) devices and other advanced technologies. With additional fault indicating, sectionalizing and circuit automation devices, the ability to restore customers' service improves and outage times can be reduced.

9. Safety & Risk Management

A new major category of projects/budgets since the TY2012 GRC is the Safety & Risk Management category. The capital investments requested in this category address the mitigation of safety and physical system security risks. For example, a large percentage of the capital projects in this category are focused on increasing safety, by reducing wildfire risk. While wildfire risk reduction has been ingrained in SDG&E's core business activities, the sole purpose of several of the projects in this category is to reduce risk by performing capital upgrades.

For many years, utilities have been held to standards-based criteria, such as those embodied in General Orders 95, 128 and 165, in which facilities were repaired or replaced based on inspection or operational performance. Gas and electric utilities are now in a position where aging infrastructure needs to be reinforced, or in many cases replaced, to continue to provide safe and reliable service. Electric assets have various expected service lives, depending on the type of asset. To some extent, utilities, including SDG&E, have proactively addressed aging infrastructure. Many of those upgrades have occurred in urban areas where lines have been replaced and/or rebuilt to accommodate capacity needs. In the rural, fire-prone areas, where loads have not changed dramatically since the lines were originally installed, upgrades have been far less frequent.

The rural areas of SDG&E's service territory are characterized by inland valleys and mountainous areas with smaller communities, lower density development and significant wildland areas. This area is predominantly served by an overhead electric distribution system, unlike the more densely developed coastal areas where the system is primarily underground. In addition to the safety and operational challenges of winter rain and snow storms, SDG&E's rural service area is subject to extreme Santa Ana conditions. These conditions are characterized by warm temperatures, high winds and low humidity. This creates increased fire ignition risk, increased potential for the spread of fire, and reduced ability to combat fire. CAL FIRE[6] has identified more than 55% of SDG&E's service territory as falling within "very high" and "extreme" fire threat zones. These zones lie mostly within rural areas. Over 3,400 miles of electric distribution lines lie within these zones. In response to the Commission's direction in D.09-08-029, SDG&E developed the FTZ map (see Appendix D, which is a map showing the FTZ as well as other pertinent data), which closely matches the CAL FIRE map.

One of the projects that will be described in greater detail later in my testimony is the Fire Risk Mitigation (FiRM) project. The FiRM project falls within the Safety & Risk Management category and is SDG&E's proposed plan for addressing aging infrastructure within the FTZ, while also taking into account data on local meteorological and fire conditions that were not considered or known when the lines were originally constructed. While SDG&E did make the request for fire hardening funds in the TY2012 GRC, the level of required work has increased substantially now that SDG&E has access to improved information about known local conditions and historical information about specific risks (e.g., data on hardware failures, equipment failures, wire failures), and due to changes in rules/requirements related to pole loading. Figure 1 is a simplified illustration, showing how the FiRM work is prioritized. The confluence of each circle in the Venn diagram below shows the areas of higher risk, with the area of highest risk being where all three circles overlap. The FiRM program will address pole loading in fire prone areas, address aged conductor, and replace equipment and/or line elements known to have a heightened probability of failure. The FiRM program is very similar to the Pipeline Safety Enhancement Program (PSEP) taking place on the gas side of the business, as it aggressively addresses an area of high risk through significant investment.

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[6] California Department of Forestry and Fire Protection.

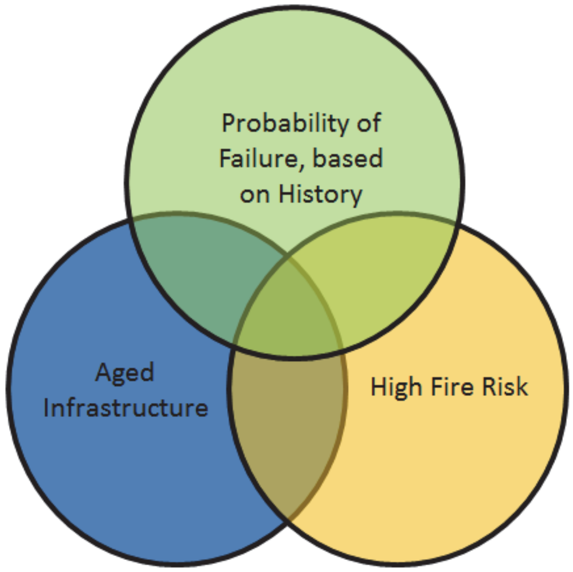


Figure 1: Prioritization of FiRM Work

10. Transmission/FERC Driven Projects

This category of projects covers transmission projects with a distribution component. Many transmission lines have underbuilt distribution facilities on them, such as a 69kV transmission line with a 12kV distribution circuit on a second level. When transmission capital work is done on a transmission line, the distribution facilities often need to be modified or replaced in conjunction with the transmission work. The same scenario applies to substations containing distribution facilities. There are times where a new transmission substation is being built, or an existing transmission substation is being modified, and there is a distribution component in the work. The distribution costs associated with the scenarios described above are included in SDG&E's TY2016 GRC forecasts. The FERC costs are recovered through the formula ratemaking process. Ideally, the FERC and CPUC costs would be recovered through the same mechanism. Unfortunately, that is not currently the case, so the distribution component of transmission projects is included in the overall request in this GRC. For the majority of the FERC projects with CPUC components, the percentage of CPUC costs is low. In the example used previously, the distribution work for project 9125 accounts for less than 5% of the total project cost. The other 95% is in FERC transmission rates and is excluded from this request.

V. ELECTRIC DISTRIBUTION CAPITAL FORECASTS BY CATEGORY

Table 2 and Figure 2 summarize the total capital forecasts for 2014, 2015, and 2016.

TABLE 2

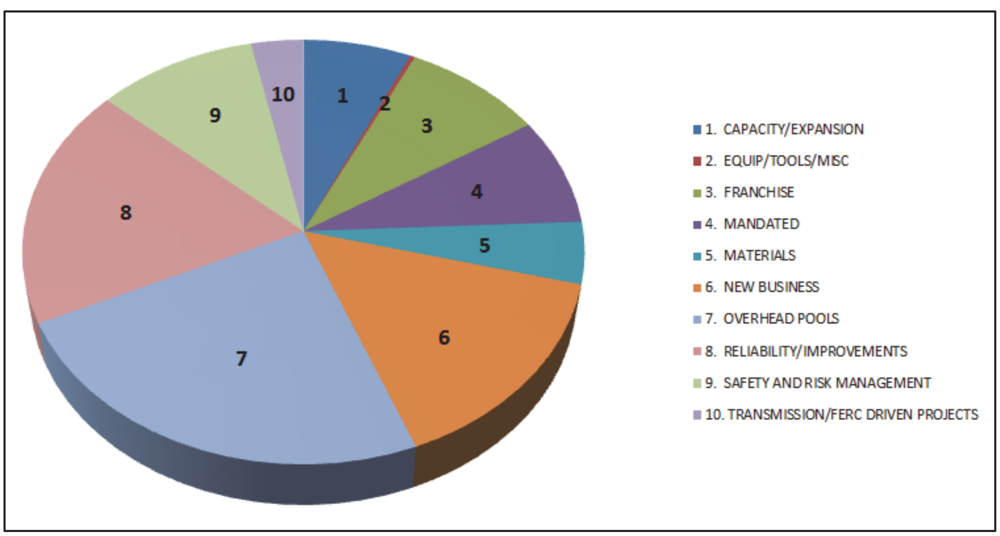
Capital Expenditures Summary of Costs

By Category - $'s in Thousands

ELECTRIC DISTRIBUTION				
Figures Shown in Thousands of 2013 Dollars				
CATEGORIES OF MANAGEMENT		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
A	CAPACITY/EXPANSION	50,655	31,282	14,241
B	EQUIP/TOOLS/MISC	1,372	1,372	1,372
C	FRANCHISE	41,764	41,764	41,764
D	MANDATED	37,872	38,148	39,063
E	MATERIALS	21,024	22,025	23,027
F	NEW BUSINESS	58,592	70,653	81,962
G	OVERHEAD POOLS	108,552	118,357	110,224
H	RELIABILITY/IMPROVEMENTS	81,848	102,934	74,427
I	SAFETY AND RISK MANAGEMENT	26,209	40,684	75,423
J	SMART METER PROGRAM	1,116	0	0
K	TRANSMISSION/FERC DRIVEN PROJECTS	14,608	19,180	12,530
Totals[7]		**443,612**	**486,399**	**474,033**

Figure 2

2014 - 2016 Capital Forecast By Category



[7] See footnote 1.

A. CAPACITY/EXPANSION

➢ **Table 3 - Summary of Capacity/Expansion Budgets ($'s in Thousands)**

A. CAPACITY/EXPANSION		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
209	Field Shunt Capacitors	594	594	594
228	Reactive Small Capital Projects	1,448	1,448	1,448
2252	Mira Sorrento 138/12KV Substation	12,218	0	0
2258	Salt Creek Substation & New Circuits	1,008	5,065	1,816
7245	Telegraph Canyon- 138/12kV Bank & C1226	3,080	0	0
7249	San Ysidro- New 12kv Circuit 1202	748	0	0
7253	C1161 BD - New 12kV Circuit	1,315	0	0
8253	Substation 12kV Capacitor Upgrades	3,278	3,278	3,278
8259	C917, CC: New 12kV Circuit	1,450	0	0
9271	C1259, MAR: New 12kV Circuit	0	961	0
9274	C1282 LC - New Circuit	4,031	0	0
9276	Poseidon - Cannon Substation Modification	9,402	808	0
10266	C350, LI: Reconductor & Voltage Regulation	933	0	0
10270	C1049, CSW: New 12kV Circuit	2,506	0	0
10272	Middletown 4kV Substation RFS	734	0	0
11244	C928, POM: New 12kV Circuit	734	0	0
11257	Camp Pendleton 12kv Service	612	0	0
11259	C100, OT: 12kV Circuit Extension	1,858	0	0
13250	C108, B: 12kV Circuit Reconfiguration	619	0	0
13251	PO: Reconductor	0	657	0
13259	C1243, RMV: Reconductor	0	1,341	0
13260	C1288, MSH: New 12kV Circuit	980	0	0
13263	C982: OL-Voltage Regulation	551	0	0
13285	C1090, JM: New 12kV Circuit	0	14,574	0
13286	C1120, BQ: New 12kV Circuit	0	0	2,965
13288	GH New 12kV Circuit	0	0	1,584
97248	Distribution System Capacity Improvement	2,556	2,556	2,556
Totals		**50,655**	**31,282**	**14,241**

➢ **Description Of Individual Budgets Within The Capacity/Expansion Category ($'s in Thousands)**

1. 209 - Field Shunt Capacitors

The forecasts for Field Shunt Capacitors for 2014, 2015, and 2016 are $594, $594, and $594, respectively. This is an ongoing project that is expected to continue through the Test Year.

a. Project Description

Shunt capacitors installed on electric distribution circuits improve power factor and reduce the ampere loading on distribution circuits, substation transformers, transmission lines, and generating stations. Capacitors installed on distribution circuits also improve system voltage and voltage control on both distribution circuits and transmission lines. This project is required to achieve the present design standard in each substation and to maintain this standard in the future years through the use of shunt capacitors. This project will also provide funding for relocating capacitors from downstream of fuses to upstream of fuses to meet SDG&E current standards.

This project provides for the installation of overhead and underground shunt capacitors on 4kV and 12kV distribution circuits. Reactive power requirements increase with load growth. Capacitors are needed to efficiently supply reactive power to meet the growth while maintaining a system power factor of at least 0.995 lag measured at the transmission bus. This power factor was specified by the Power Control Department in their 1987 Bulk Power System Performance Study. This project is also required to provide funding for relocating existing capacitors that do not comply with SDG&E current standards in capacitor placement.

The specific details regarding Field Shunt Capacitors are found in the capital workpapers. See SDG&E-09-CWP at section 00209 – Field Shunt Capacitors.

b. Forecast Method

The forecast method used for Field Shunt Capacitors is a 5-year average, based on historical data. This is the most appropriate methodology, as work load can vary from year to year. For example, 2011 and 2012 were above the average, while 2009, 2010, and 2013 were below the average. If a shorter period average were utilized, the forecasted figures would be higher. The 5-year average levels out the peaks and valleys in this blanket budget over a larger period of time and still provides for the necessary level of funding for the work that falls within this budget.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by installing capacitor banks on electric distribution circuits. This project is required to achieve the present design standards of 0.995 (lagging) power factor on the transmission bus in each substation and to maintain this standard in the future years through the use of shunt capacitors. This project has improved the reliability electrical system and provided better quality of service, and will continue to provide the same benefits in the future.

d. Cost Driver(s)

The types of activities in this blanket budget are consistent from year to year, but the volume of work may vary, so a 5-year average was used for the forecast. There are no incremental cost drivers for this budget.

2. 228 - Reactive Small Capital Projects

The forecasts for Reactive Small Capital Projects for 2014, 2015, and 2016 are $1,448, $1,448, and $1,448, respectively. This is an ongoing project that is expected to continue through the Test Year.

a. Project Description

This project is required to address primary distribution system overload and voltage related issues with individual capital jobs under $500K in costs. It is intended for the capacity projects that are not covered under the specific capital budget process. This type of project often requires a short turnaround time to address the overload and cannot be handled through the specific capital budget process. It is also required to meet the SDG&E design standards.

This project provides for the reconstruction and extension of overhead and underground distribution facilities to replace overloaded conductors, to correct primary voltage problems, and to transfer load to balance circuits and substations. Other minor modifications that may be required to delay larger specific projects are also included in this budget. Additionally, this project installs remote metering equipment to monitor questionable circuit loading. A cost-benefit analysis will be performed for various alternatives. The project with the lowest overall cost will be proposed.

The specific details regarding Reactive Small Capital Projects are found in the capital workpapers. See SDG&E-09-CWP at section 00228 – Reactive Small Capital Projects.

b. Forecast Method

The forecast method used for Reactive Small Capital Projects is a 5-year average, based on historical data. This is the most appropriate as work load can vary from year to year. For example, 2010 and 2013 were above the average, while 2009, 2011, and 2012 were below the average. The 5-year average levels out the peaks and valleys in this blanket cost category over a larger period of time, and still provides for the necessary level of funding for the work that falls within this cost center.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by reconstructing and extending overhead and underground distribution facilities, correcting primary voltage problems, transferring loads to balance circuits and substations, and correcting primary voltage problems.

d. Cost Driver(s)

The types of activities in this blanket cost category are consistent from year to year, but the volume of work may vary since the work covered by this budget is reactive in nature. There are no incremental drivers for this budget.

3. 2252 - Mira Sorrento 138/12KV Substation

The forecasts for Mira Sorrento 138/12KV Substation for 2014, 2015, and 2016 are $12,218, $0, and $0, respectively. SDG&E plans to build and place in service Mira Sorrento 138/12KV Substation by the Test Year.

a. Project Description

The purpose of this project is to eliminate projected overloads at North City West Substation, and high loading at Mesa Rim, Genesee, and Torrey Pines Substations. These substations primarily serve large commercial/industrial customers, including electronics manufacturing companies, wireless technology companies, and many biomedical and pharmaceutical companies. The first phase of the area study for the Torrey Pines/Sorrento Mesa area concluded that there is a need for another substation in the area. Mira Sorrento substation is required to serve existing load and new development in the Sorrento Valley, Torrey Pines, and Golden Triangle areas. This project provides for acquiring land for the new Mira Sorrento substation, construction of the new substation with an initial capacity of 60MVA and an ultimate capacity of 120MVA, and installation of six new circuits to offload Torrey Pines, Genesee, Mesa Rim, and Eastgate substations.

Genesee, Mesa Rim and Torrey Pines substations are built out to their maximum capacity of four transformer banks (120 MVA), and Eastgate Substation is built out to its maximum of two banks (60 MVA). The new Mira Sorrento substation is required to provide additional substation capacity in the area. Six new 12kV circuits are required to off-load existing surrounding substations. This project will eliminate high loads, provide the necessary new capacity, and improve circuit and substation reliability.

The specific details regarding Mira Sorrento 138/12KV Substation are found in the capital workpapers. See SDG&E-09-CWP at section 02252 – Mira Sorrento 138/12KV Substation.

b. Forecast Method

The forecast method used for Mira Sorrento 138/12KV Substation is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects. This project is in construction and expected to be completed in 2014.

c. Supports Reliability Goal

This project supports the goal of maintaining system reliability by bringing on new capacity.

d. Cost Driver(s)

The underlying cost driver for this capital project is to eliminate overloads by constructing a new substation and new circuits in the Sorrento Valley area.

4. 2258 - Salt Creek Substation & New Circuits

The forecasts for Salt Creek Substation & New Circuits for 2014, 2015, and 2016 are $1,008, $5,065, and $1,816, respectively. SDG&E plans to build and place in service Salt Creek Substation & New Circuits by the Test Year.

a. Project Description

The purpose of this project is to build a new low-profile Salt Creek Substation in the Otay Ranch-Chula Vista Area. SDG&E will install a 69/12kV substation with an ultimate capacity of 120MVA that provides future required capacity to the rapidly developing area and increases the substation /circuit reliability. The new Salt Creek Substation is required to serve the ultimate load for the area. Southeastern Chula Vista is currently fed primarily from the existing Telegraph Canyon and Proctor Valley Substations, both of which currently exceed the optimum maximum loading. The project also includes installing a new 69kV transmission line (TL6965) in the existing transmission corridor from the Salt Creek Substation to Miguel Substation and looping an existing 69kV transmission line (TL6910) into the Salt Creek substation.

The specific details regarding Salt Creek Substation & New Circuits are found in the capital workpapers. See SDG&E-09-CWP at section 02258 – Salt Creek Substation & New Circuits.

b. Forecast Method

The forecast method used for Salt Creek Substation & New Circuits is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess accuracy. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

This project supports the goal of maintaining system reliability by bringing on new capacity.

d. Cost Driver(s)

The underlying cost driver for this capital project is to eliminate overloads by constructing a new substation and new circuits in the Chula Vista area.

5. 7245 - Telegraph Canyon- 138/12kV Bank & C1226

The forecasts for Telegraph Canyon- 138/12kV Bank & C1226 for 2014, 2015, and 2016 are $3,080, $0, and $0, respectively. SDG&E plans to build and place in service Telegraph Canyon- 138/12kV Bank & C1226 by the Test Year.

a. Project Description

The purpose of this project is to avoid circuit and bus overloads on Telegraph Canyon Substation and circuits, which are forecasted for 2013. Increased capacity is required to handle the 5MW combined normal and specific growth per year from the Eastern Urbanizing Center (EUC) from 2010-2025 located in the Otay Ranch, Chula Vista development area. In 2013, the fourth 30 MVA 138/12kV bank was installed with switchgear, SCADA, and capacitor bank. The new C1226 was deferred until 2014. Installation of the new C1226 will eliminate the forecast overload in the EUC area and provide capacity. Load will be reconfigured on the Telegraph Canyon substation to balance load and add tie capacity.

The specific details regarding Telegraph Canyon- 138/12kV Bank & C1226 are found in the capital workpapers. See SDG&E-09-CWP at section 07245 – Telegraph Canyon- 138/12kV Bank & C1226.

b. Forecast Method

The forecast method used for Telegraph Canyon 138/12kV Bank & C1226 is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating overloads.

d. Cost Driver(s)

The underlying cost driver for this capital project is to eliminate overloads by adding a new substation transformer and a new distribution circuit out of the existing Telegraph Canyon Substation.

6. 7249 - San Ysidro- New 12KV Circuit 1202

The forecasts for San Ysidro- New 12KV Circuit 1202 for 2014, 2015, and 2016 are $748, $0, and $0, respectively. SDG&E plans to build and place in service San Ysidro- New 12KV Circuit 1202 by the Test Year.

a. Project Description

San Ysidro circuit C463 is nearly overloaded in 2015, and circuit C460 is overloaded, with a high customer count and 2.9MW of tie deficiency. Installation of new San Ysidro circuit C1202 will eliminate the high loading issues, reduce customer count, and improve circuit reliability. This project includes installing an OH reconductor, installing a trench/conduit, installing one switch, reconfiguring three switches, creating one new circuit tie, and re-tagging equipment.

San Ysidro circuit C463 would be nearly overloaded in 2015, and a high customer count will exist on circuit C460. The load growth is 0.6MW/year. A new circuit is required to meet the current and future capacity needs and to improve circuit reliability.

The specific details regarding San Ysidro- New 12KV Circuit 1202 are found in the capital workpapers. See SDG&E-09-CWP at section 07249 – San Ysidro- New 12KV Circuit 1202.

b. Forecast Method

The forecast method used for San Ysidro- New 12KV Circuit 1202 is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project-specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by increasing the capacity of the electric distribution system and eliminating the forecasted overload.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to eliminating the overload on C460 and reducing the load on the heavily loaded C463.

7. 7253 – C1161 BD - New 12kV Circuit

The forecasts for C1161 BD - New 12kV Circuit for 2014, 2015, and 2016 are $1,315, $0, and $0, respectively. SDG&E plans to build and place in service C1161 BD - New 12kV Circuit by the Test Year.

a. Project Description

The purpose of this project is to install a new circuit out of Border (BD) substation to eliminate a forecasted overload on circuit C533 in 2015. The new circuit will provide capacity for the upcoming commercial development and future growth. Otay Mesa is a commercial area with significant forecasted growth, directly impacting C533. Circuit reliability will be improved with the addition of new circuit, C1161. The load is expected to increase as new business growth returns. This project will install new, cable and conductor, switches, and other ancillary equipment necessary to provide reliable service on the new circuit. The scope of work also includes the creation of two new circuit/bank ties, retagging of equipment, and cutting overload from C533 to the new circuit, C1161.

The specific details regarding C1161 BD - New 12kV Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 07253 – C1161 BD - New 12kV Circuit.

b. Forecast Method

The forecast method used for C1161 BD - New 12kV Circuit is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating the overload on C533 and installing new switches to assist with transferring load.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to eliminating the overload on C533.

8. 8253 - Substation 12kV Capacitor Upgrades

The forecasts for Substation 12kV Capacitor Upgrades for 2014, 2015, and 2016 are $3,278, $3,278, and $3,278, respectively. SDG&E plans to build and place in service Substation 12kV Capacitor Upgrades by the Test Year.

a. Project Description

This project will improve load power factor at the substations, decrease loading of the distribution transformers to delay future bank additions, decrease loading of the transmission system to delay line and bulk power transformer upgrades, upgrade obsolete equipment, improve transmission voltage profile during heavy load conditions, and improve customer power quality. The project will replace existing single-step capacitor banks at selected substations with banks of increased capacity and multiple steps, and add capacitor and/or reactor banks where the power factor is below minimum requirements.

SDG&E Grid Operations previously identified a reactive power deficiency based on the peak load. This deficiency is primarily due to the poor power factor at the distribution substations. Substation and distribution line capacitors out-of-service or operating improperly were determined to have contributed to this situation. Adding new banks, replacing obsolete banks, and adding monitoring of substation banks can all contribute greatly to improving the electric system operation by: 1) improving the transmission voltage profile, delaying or eliminating the need for transmission capacitors; 2) greatly improving the customer power quality by adding capacitors in 4-1800 kVAr steps in place of one 6000 kVA step; and 3) significantly decreasing the apparent power (MVA) loading of the distribution transformers, transmission lines, and bulk power transformers by improving the load power factor, which delays the need for system upgrades.

Reactive power flow from the 12 kV bus to the transmission system of over 10 MVAr was recorded at twelve substations. This significant reactive power flow into the transmission system is causing voltage regulation problems during light load conditions. Adding switched reactor banks can help correct the power factor at the substation. This equipment will help control the reactive power flow at the substation and reduce the transmission voltages under light load conditions.

The specific details regarding Substation 12kV Capacitor Upgrades are found in the capital workpapers. See SDG&E-09-CWP at section 08253 – Substation 12kV Capacitor Upgrades.

b. Forecast Method

The forecast method used for Substation 12kV Capacitor Upgrades is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project-specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by replacing old & obsolete equipment, improving the transmission voltage profile, improving the load power factor, and improving customer power quality.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to the needed capacitor upgrades at multiple substations.

9. 8259 - C917, CC: New 12kV Circuit

The forecasts for C917, CC: New 12kV Circuit for 2014, 2015, and 2016 are $1,450, $0, and $0, respectively. SDG&E plans to build and place in service C917, CC: New 12kV Circuit by the Test Year.

a. Project Description

The purpose of this project is to eliminate a projected overload on circuit 910 and to reduce the heavily loaded C912 in 2015, at Chicarita (CC). The new circuit will provide necessary circuit tie capacity to both circuits C910 and C912, thus strengthening service reliability to the customers served by these circuits. This project includes installing trench and conduit, cable, and a switch.

The specific details regarding C917, CC: New 12kV Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 08259 – C917, CC: New 12kV Circuit.

b. Forecast Method

The forecast method used for C917, CC: New 12kV Circuit is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating the overload on C912 and installing a new switch to assist with transferring load.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to eliminating the overload on C912.

10. 9271 - C1259, MAR: New 12kV Circuit

The forecasts for C1259, MAR: New 12kV Circuit for 2014, 2015, and 2016 are $0, $961, and $0, respectively. SDG&E plans to build and place in service C1259, MAR: New 12kV Circuit by the Test Year.

a. Project Description

The purpose of this project is to provide additional capacity, based on comprehensive distribution system modeling, at Margarita (MAR). Alternatives have been and are being evaluated, but currently this is the preferred project to continue providing safe and reliable service.

Distribution Planning continuously runs system models and performs load flow analysis based on existing and forecasted system loads. When overloads are forecasted, they look at alternatives to prevent future overloads. The proposed project and evaluated alternatives are eventually presented to the Technical Review Committee and the Capital T&D Budget Committee to get final approval. This project was identified as the proposed project by the Distribution Planning group.

The specific details regarding C1259, MAR: New 12kV Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 09271 – C1259, MAR: New 12kV Circuit.

b. Forecast Method

The forecast method used for C1259, MAR: New 12kV Circuit is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project-specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by increasing the capacity of the distribution system.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to increasing capacity to the distribution system, with a new 12kV circuit at Margarita Substation.

11. 9274 - C1282 LC - New Circuit

The forecasts for C1282 LC - New Circuit for 2014, 2015, and 2016 are $4,031, $0, and $0, respectively. SDG&E plans to build and place in service C1282 LC - New Circuit by the Test Year.

a. Project Description

This project is required to eliminate an overload in 2016 on Los Coches (LC) C241 and C242. The new LC C1282 will eliminate the overload. The project will install a new circuit, manhole, conduit, underground cable, and SCADA equipment & switches (among other work).

The specific details regarding C1282 LC - New Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 09274 – C1282 LC - New Circuit.

b. Forecast Method

The forecast method used for C1282 LC - New Circuit is zero-based. The forecast is based on detailed engineering and other cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating the overload on C241 and C242.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to eliminating the overload on C241 and C242.

12. 9276 - Poseidon - Cannon Substation Modification

The forecasts for Poseidon - Cannon Substation Modification for 2014, 2015, and 2016 are $9,402, $808, and $0, respectively. SDG&E plans to build and place in service Poseidon - Cannon Substation Modification by the Test Year.

a. Project Description

Poseidon Resources is developing and constructing a seawater desalination plant (“Plant”) located at the Encina Power Generation Station in Carlsbad. Poseidon has requested from SDG&E electric service to the Plant’s normal and standby operation. Projected average and peak demands of the Plant’s load are respectively 31.5 MW and 38 MW. This project is required to serve the Plant’s new load addition. The project will modify Cannon substation for an additional 56 MVA, install four (4) 12kV primary circuits from Cannon substation to the Plant, and install four (4) service meters at the Plant's east side.

This project is included in the 2014 - 2018 FERC Base 5 Year Plan. The modifications to the Cannon Substation and the four 12kV distribution lines under the project scope come as the result of the execution of a Special Conditions Contract between SDG&E and Poseidon. Under the Special Conditions Contract, SDG&E is required to serve energy needs of Poseidon's seawater desalination plant by December 2014. The Contract will require Poseidon to pay up front the CPUC components of the estimated installed cost. The Contract also has provisions for allowances to refund a portion of the actual cost paid by Poseidon. Reconciliation of actual costs will occur after construction of the extension facilities.

The specific details regarding Poseidon - Cannon Substation Modification are found in the capital workpapers. See SDG&E-09-CWP at section 09276 – Poseidon - Cannon Substation Modification.

b. Forecast Method

The forecast method used for Poseidon - Cannon substation Modification is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects. This project is in construction and scheduled to be completed by the end of 2014, with some trailing costs in 2015.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by meeting new load demands.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to serving the load addition from Poseidon's new water desalination plant.

13. 10266 - C350, LI: Reconductor & Voltage Regulation

The forecasts for C350, LI: Reconductor & Voltage Regulation for 2014, 2015, and 2016 are $933, $0, and $0, respectively. SDG&E plans to build and place in service C350, LI: Reconductor & Voltage Regulation by the Test Year.

a. Project Description

This project replaces small copper wire with larger ACSR and installs two sets of regulators, removes a capacitor, and installs fault indicators. The goal is to relieve the overload and reduce voltage drop at Lilac (LI). The small copper wire is overloaded during summer peak load and end-of-line voltage falls below critical levels. The regulators provide voltage support and allow a capacitor to be removed.

New customer load scheduled for spring 2015 cannot be served without the upgrade. The specific details regarding C350, LI: Reconductor & Voltage Regulation are found in the capital workpapers. See SDG&E-09-CWP at section 10266 – C350, LI: Reconductor & Voltage Regulation.

b. Forecast Method

The forecast method used for C350, LI: Reconductor & Voltage Regulation is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess accuracy. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating the overload on Circuit 350, and correcting low voltage on the primary. Both of the improvements will reduce outages for C350, and improve overall quality of service.

d. Cost Driver(s)

As discussed above, this is a specific capital project to address projected overloads and low voltage issues on C350.

14. 10270 - C1049, CSW: New 12kV Circuit

The forecasts for C1049, CSW: New 12kV Circuit for 2014, 2015, and 2016 are $2,506, $0, and $0, respectively. SDG&E plans to build and place in service C1049, CSW: New 12kV Circuit by the Test Year.

a. Project Description

This project is required to eliminate an overload on Streamview BK3031 and a very high load on Chollas West (CSW) C165 in 2014. Streamview Substation and CSW C165 both serve a large number of commercial and residential customers. This project will benefit Chollas West and Streamview substations and includes the installation of new circuit 1049, SCADA (Supervisory Control and Data Acquisition) switches, conduit, UG cable, and circuit breaker.

Because there are no available banks/circuits, it is necessary to install new C1049 to eliminate the high load issues. The specific details regarding C1049, CSW: New 12kV Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 10270 – C1049, CSW: New 12kV Circuit.

b. Forecast Method

The forecast method used for C1049, CSW: New 12kV Circuit is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project-specific details. When projects are completed, actual costs are compared to the estimate to assess accuracy. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating the overload at Streamview substation and by installing new switches to assist with transferring and reducing the load on the heavily loaded C165. Both improvements will reduce outages and provide additional capacity to the distribution system.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relates to relieving circuit overloads.

15. 10272 - Middletown 4kV Substation RFS

The forecasts for Middletown 4kV Substation RFS for 2014, 2015, and 2016 are $734, $0, and $0, respectively. SDG&E plans to build and place in service Middletown 4kV Substation RFS by the Test Year.

a. Project Description

The purpose of this project is to remove from service (RFS) the aging 4 kV substation equipment and replace it with pad-mounted step-down transformers and a switch. Middletown Substation equipment is over 50 years old. The substation equipment such as transformers, breakers, and relays are obsolete and replacement parts are no longer available. Maintenance costs are high and continue to increase, compounded with a lack of personnel who possess the experience and knowledge to operate and maintain the equipment. The substation is a reliability risk for customers, because of the probability of equipment failure and lack of replacement parts available. In addition to the equipment related concerns, a sinkhole has developed at the substation site. SDG&E has mitigated the sinkhole with geotechnical stabilization techniques, but those remedies are merely stop-gap measures. The most effective way to mitigate all of the reliability concerns is to replace the substation with pad-mounted step-down transformers, and ancillary equipment.

The specific details regarding Middletown 4kV Substation RFS are found in the capital workpapers. See SDG&E-09-CWP at section 10272 – Middletown 4kV Substation RFS.

b. Forecast Method

The forecast method used for Middletown 4kV Substation RFS is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goal of enhancing safety and reliability by replacing the equipment that has a high probability of failure, by eliminating the potential for extended outages related to the obsolete equipment, and by eliminating the risk related to the soil problems at the substation.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to the need to mitigate multiple reliability issues at Middletown Substation.

16. 11244 - C928, POM: New 12kV Circuit

The forecasts for C928, POM: New 12kV Circuit for 2014, 2015, and 2016 are $734, $0, and $0, respectively. SDG&E plans to build and place in service C928, POM: New 12kV Circuit project by the Test Year.

a. Project Description

A new 12kV circuit will be built at Pomerado (POM). This project will offload Chicarita C916 and Scripps substation bus 3132, both of which are forecast to be very highly loaded in 2015. This will help reduce the forecasted loading on C916 and Scripps bus 3132. It also improves SCADA ties among circuits and improves reliability as a result.

The specific details regarding C928, POM: New 12kV Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 11244 – C928, POM: New 12kV Circuit.

b. Forecast Method

The forecast method used for C928, POM: New 12kV Circuit is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating the overload on Chicarita C916 and reducing the load on the heavily loaded Scripps substation. Upgrading switches to SCADA switches will improve SCADA ties among circuits, improving reliability.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to alleviating the heavily loaded circuit and transformers.

17. 11257 – Camp Pendleton 12kV Service

The forecasts for Camp Pendleton 12kV Service for 2014, 2015, and 2016 are $612, $0, and $0, respectively. SDG&E plans to build and place in service Camp Pendleton 12kV Service by the Test Year.

a. Project Description

This project will construct a new 69/12kV, 75 MVA, substation northeast of the existing Camp Pendleton substation, in order to provide 12kV service to the Marine Corps Camp Pendleton at three different locations: Camp Pendleton, Las Pulgas, and the new Basilone substation at the northwest corner of the territory.

b. Forecast Method

The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. The forecast for 2014 covers the estimated work remaining for this project.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by providing new 12kV facilities to meet the capacity and reliability needs of the Camp Pendleton military base.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relates to the Camp Pendleton military base requiring additional capacity to meet their operational needs. This project is currently in construction and the requested funds are required to complete construction.

18. 11259 - C100, OT: 12kV Circuit Extension

The forecasts for C100, OT: 12kV Circuit Extension for 2014, 2015, and 2016 are $1,858, $0, and $0, respectively. SDG&E plans to build and place in service C100, OT: 12kV Circuit Extension by the Test Year.

a. Project Description

This project will extend Circuit 100 (Old Town- OT) to pick-up load from circuit 545. Circuit 545 of Pacific Beach substation is in the top ten worst performing circuits in the Beach

Cities district. This project is proposed to improve circuit reliability and customer service by reducing the customer count on the circuit and correcting a circuit tie deficiency. Circuit 545 serves many customers, including Bahia Hotel, Belmont Roller coaster and Bahia Point 12/4 kV Step-down. This project includes installing both underground cable and conduit.

This project is required to reduce customer count on Pacific Beach C545 in order to improve circuit reliability performance. It also eliminates a tie deficiency on C545 and heavily loaded condition on Pacific Beach BK 3031. The specific details regarding C100, OT: 12kV Circuit Extension are found in the capital workpapers. See SDG&E-09-CWP at section 11259 – C100, OT: 12kV Circuit Extension.

b. Forecast Method

The forecast method used for C100, OT: 12kV Circuit Extension is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by reducing customer count on one of the worst performing circuits and correcting a circuit tie deficiency.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relates to reducing customer count and reducing the load on the heavily loaded transformers.

19. 13250 - C108, B: 12kV Circuit Reconfiguration

The forecasts for C108, B: 12kV Circuit Reconfiguration for 2014, 2015, and 2016 are $619, $0, and $0, respectively. SDG&E plans to build and place in service C108, B: 12kV Circuit Reconfiguration by the Test Year.

a. Project Description

The purpose of this project is to provide increase capacity of 3.5MW to a new business customer, Solar Turbines, by 2014. Solar Turbines has increased the size of their new engines, resulting in a power demand increase from 10MW to 13.5MW. This project includes reconfiguring C108 (Station B) and changing the existing single feed to a twin run of feeder to Solar Turbines' primary meter station.

This project is required to meet Solar Turbines' increased needs for power. The specific details regarding C108, B: 12 kV Circuit Reconfiguration are found in the capital workpapers. See SDG&E-09-CWP at section 13250 – C108, B: 12 kV Circuit Reconfiguration.

b. Forecast Method

The forecast method used for C108, B: 12 kV Circuit Reconfiguration is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess accuracy. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by providing necessary increased capacity to Solar Turbines.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relates to Solar Turbines' requirement for additional capacity to serve their new business needs.

20. 13251 - C176 PO: Reconductor

The forecasts for C176 PO: Reconductor for 2014, 2015, and 2016 are $0, $657, and $0, respectively. SDG&E plans to build and place in service C176 PO: Reconductor by the Test Year.

a. Project Description

The purpose of this project is to reduce the overload on Circuit 176 (Poway- PO) in the Poway area fire threat zone. The project will upgrade conductor on this circuit and replace wood poles with steel. Circuit 176 serves a mixture of commercial and residential customers. Increased conductor size will also allow more tie capacity to improve outage restoration. An additional benefit is that all wood poles will be replaced with steel in the fire threat zone with dry grassland, mountainous terrain and no vehicle access. The project will add capacity required to reliably serve existing and new customers. The specific details regarding C176 PO: Reconductor are found in the capital workpapers. See SDG&E-09-CWP at section 13251 – C176 PO: Reconductor.

b. Forecast Method

The forecast method used for C176 PO: Reconductor is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess accuracy. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating the overload on C176 in the Fire Threat Zone and replacing all wood poles with steel poles.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to the overload on C176.

21. 13259 - C1243, RMV: Reconductor

The forecasts for C1243, RMV: Reconductor for 2014, 2015, and 2016 are $0, $1,341, and $0, respectively. SDG&E plans to build and place in service C1243, RMV: Reconductor by the Test Year.

a. Project Description

The purpose of this project is to alleviate overload on C1243 (Rancho Mission Viejo RMV) and provide additional capacity based on comprehensive distribution system modeling. Alternatives have been and are being evaluated, but this is the preferred project for SDG&E to continue providing safe and reliable service.

Distribution Planning continuously runs system models and performs load flow analysis based on existing and forecasted system loads. When overloads are forecasted, they look at alternatives to prevent future overloads. The proposed project and evaluated alternatives are eventually presented to the Technical Review Committee, and the Capital T&D Budget Committee to get final approval. This project was identified as the proposed project by the Distribution Planning group. The specific details regarding C1243, RMV: Reconductor are found in the capital workpapers. See SDG&E-09-CWP at section 13259 – C1243, RMV: Reconductor.

b. Forecast Method

The forecast method used for C1243, RMV: Reconductor is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive programs to develop detailed cost estimates based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by alleviating overloads and providing additional capacity to C1243.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to an overload on C1243.

22. 13260 - C1288, MSH: New 12kV Circuit

The forecasts for C1288, MSH: New 12kV Circuit for 2014, 2015, and 2016 are $980, $0, and $0, respectively. SDG&E plans to build and place in service C1288, MSH: New 12kV Circuit by the Test Year.

a. Project Description

The purpose of this project is to install new Mesa Heights (MSH) C1288. Solar Turbines is increasing load by 10.0 MW in 2014. Existing circuit 251 cannot serve the new load addition. This project includes installing underground cable, trench and conduit, a switch, and two pad-mounted capacitor banks.

Solar Turbine has signed a special facility contract for their new Electric Motor Drive (EMD) Gas Compressor test stand at their facilities in Kearny Mesa. The existing C251 cannot serve the entire new load and would become overloaded. A new C1288 is the preferred alternative. The specific details regarding C1288, MSH: New 12kV Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 13260 – C1288, MSH: New 12kV Circuit.

b. Forecast Method

The forecast method used for C1288, MSH: New 12kV Circuit is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by increasing the necessary capacity to Solar Turbines and by installing two new switches to assist with transferring load and removing overload on circuit 251.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relates to Solar Turbines' need for additional capacity to serve their new business.

23. 13263 - C982: OL-Voltage Regulation

The forecasts for C982: OL- Voltage Regulation for 2014, 2015, and 2016 are $551, $0, and $0, respectively. SDG&E plans to build and place in service C982: OL- Voltage Regulation by the Test Year.

a. Project Description

This project will replace a 300A regulator with a 600A regulator. The purpose of this project is to enhance reliability by providing greater voltage regulation capability on C982 (Otay Lakes- OL). Distribution Planning continuously runs system models and performs load flow analysis based on existing and forecasted system loads. When overloads or voltage issues are forecasted, Distribution Planning looks at alternatives to prevent future overloads and mitigate voltage issues. In this case, voltage drop was the primary issue, which can be mitigated by installing a larger regulator. The specific details regarding C982: OL- Voltage Regulation are found in the capital workpapers. See SDG&E-09-CWP at section 13263 – C982: OL- Voltage Regulation.

b. Forecast Method

The forecast method used for C982: OL- Voltage Regulation is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating the overloaded equipment.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to overloaded equipment.

24. 13285 - C1090, JM: New 12kV Circuit

The forecasts for C1090, JM: New 12kV Circuit for 2014, 2015, and 2016 are $0, $14,574, and $0, respectively. SDG&E plans to build and place in service C1090, JM: New 12kV Circuit by the Test Year.

a. Project Description

The purpose of this project is to provide capacity for the new Jamul Casino Resort estimated to add 9.5MW to existing Jamacha (JM) C75 in 2015, and this new business load will cause an overload on C75. New Jamacha C1090 is designed to serve the new business load and eliminate the forecasted high load issues on Jamacha C75 and C524. The project will install a new circuit breaker, a trench conduit, SCADA switches, capacitors and voltage regulators and will replace wood poles with steel. The specific details regarding C1090, JM: New 12kV Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 13285 – C1090, JM: New 12kV Circuit.

b. Forecast Method

The forecast method used for C1090, JM: New 12kV Circuit is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goal of enhancing safety maintaining system reliability, by replacing wood poles with steel poles, by eliminating the overloads when the new business customer connects to the distribution system, and by installing two new switches to assist with transferring load.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relates to eliminating the overloaded circuit.

25. 13286 - C1120, BQ: New 12kV Circuit

The forecasts for C1120, BQ: New 12kV Circuit for 2014, 2015, and 2016 are $0, $0, and $2,965, respectively. SDG&E plans to build and place in service C1120, BQ: New 12kV Circuit by the Test Year.

a. Project Description

The purpose of this project is to provide additional capacity, based on comprehensive distribution system modeling, at Batiquitos (BQ). Alternatives have been and are being evaluated, but currently this is the preferred project to continue providing safe and reliable service.

Distribution Planning continuously runs system models and performs load flow analysis based on existing and forecasted system loads. When overloads are forecasted, preventative alternatives are examined. The proposed project and evaluated alternatives are eventually presented to the Technical Review Committee and the Capital T&D Budget Committee to get final approval. This project was identified as the proposed project by the Distribution Planning group. The specific details regarding C1120, BQ: New 12kV Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 13286 – C1120, BQ: New 12kV Circuit.

b. Forecast Method

The forecast method used for C1120, BQ: New 12kV Circuit is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by reducing the load on the heavily loaded circuit and providing additional capacity to distribution system.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to increasing capacity to the distribution system, with a new 12kV circuit at Batiquitos Substation.

26. 13288 - GH New 12kV Circuit

The forecasts for GH New 12kV Circuit for 2014, 2015, and 2016 are $0, $0, and $1,584, respectively. SDG&E plans to build and place in service GH New 12kV Circuit by the Test Year.

a. Project Description

The project will install a new circuit to off load bank UB31 (forecasted to be overloaded in 2015) at Urban Substation, transfer alternate service of Navy Hospital, and trench and install conduit. It also includes the installation of SCADA switches, pad-mounted SCADA capacitors, and 12kV circuit breaker in the substation.

UB31 is forecasted to be overloaded in 2015. This area has a normal growth of 0.5MW per year. By transferring a circuit to Grant Hill (GH) it will provide the capacity to UB31 to accommodate normal growth. The specific details regarding GH New 12kV Circuit are found in the capital workpapers. See SDG&E-09-CWP at section 13288 – GH New 12kV Circuit.

b. Forecast Method

The forecast method used for GH New 12kV Circuit is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive programs to develop detailed cost estimates based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess accuracy. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by eliminating the overload at Urban Substation.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to eliminating the overload at Urban Substation.

27. 97248 - Distribution System Capacity Improvement

The forecasts for Distribution System Capacity Improvement for 2014, 2015, and 2016 are $2,556, $2,556, and $2,556, respectively. This is an ongoing project that is expected to continue through the Test Year.

a. Project Description

This blanket project provides for additional capacity on the distribution system in the heavily loaded areas. These areas have highly loaded circuits (>450A) with limited tie capacity and sectionalizing device use capabilities. This cost category reduces circuit loading and increases tie capacity and sectionalizing capability. It is intended to provide additional capacity and reliability on the distribution system as required by SDG&E design standards. Projects identified within this budget are $500K or less in cost. Projects exceeding $500K are identified as specific budget capacity projects.

Construction may include new substation banks, new circuits, feeder and branch reconductoring, installation of appropriate switching, cutover from 4kV to 12kV, and other equipment as necessary to increase the capacity of the distribution system for reliability and operating concerns. This project may also be used to install infrastructure for future circuit projects in conjunction with road improvements, transmission system upgrades or other upgrade activities. Each project will be evaluated by comparing the risk level and potential impact to customer service. Projects planned for this budget will be prioritized and recommended accordingly. The specific details regarding Distribution System Capacity Improvement are found in the capital workpapers. See SDG&E-09-CWP at section 97248 – Distribution System Capacity Improvement.

b. Forecast Method

The forecast method used for Distribution System Capacity Improvement is a 5-year average, based on historical data. This method is the most appropriate, as work load can vary from year to year. The 5-year average levels out the peaks and valleys in this blanket budget over a larger period of time, and still provides for the necessary level of funding for the work that falls within this budget.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of maintaining system reliability by reducing circuit loading and increasing tie capacity and sectionalizing capabilities in highly loaded circuits with limited tie capacity and sectionalizing.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to funding to provide additional capacity in heavily loaded areas of the electric distribution system. Construction of these projects may include new substation banks, new circuits, reconductoring, switching, cutover of circuits from 4kV to 12kV, as well as installation of any other equipment necessary to increase capacity of the electric distribution system.

B. EQUIPMENT/TOOLS/MISCELLANEOUS

➢ **Table 4 - Summary of Equip/Tools/Misc Budgets ($'s in Thousands)**

B. EQUIP/TOOLS/MISC		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
206	Electric Distribution Tools/Equipment	1,372	1,372	1,372
Totals		**1,372**	**1,372**	**1,372**

➢ **Description Of Individual Budgets Within The Equipment/Tools/Misc Category ($'s in Thousands)**

1. 206 – Electric Distribution Tools/Equipment

The forecasts for Electric Distribution Tools/Equipment for 2014, 2015, and 2016 are $1,372, $1,372, and $1,372, respectively. This is an ongoing project that is expected to continue through the Test Year.

a. Project Description

This blanket project is required to purchase new electric distribution tools and equipment required by field personnel to inspect, operate and maintain the electric distribution system. Acquisition of standard tools will be conducted to maintain compliance with safety regulations and promote optimal performance. In addition, tools will be purchased for the purpose of evaluating the latest technological advancements. All purchases will be conducted in accordance with individual user needs.

SDG&E crews require tools to perform various aspects of their jobs. These tools in some instances require repair and maintenance or may be damaged during use. This blanket project allows new tools to be procured in a timely fashion. The specific details regarding Electric Distribution Tools/Equipment are found in the capital workpapers. See SDG&E-09-CWP at section 00206 – Electric Distribution Tools/Equipment.

b. Forecast Method

The forecast method used for Electric Distribution Tools/Equipment is a 5-year average, based on historical data. The 5-year average levels out the peaks and valleys in this blanket budget over a longer period of time, while providing for the necessary level of funding for the covered activities.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goal of enhancing safety and reliability by providing the necessary tools and equipment to safely inspect, operate and maintain the electric distribution system.

d. Cost Driver(s)

There are no cost drivers resulting in incremental changes for this budget/project forecasted for this GRC forecast period.

C. FRANCHISE

➢ **Table 5 and 5a - Summary of Franchise Budgets ($'s in Thousands)**

C. FRANCHISE (Total Cost)		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
205	Electric Dist. Street/Hwy Relocations	6,079	6,079	6,079
210	Conversion From OH To UG Rule 20A	13,025	13,025	13,025
213	City Of San Diego Surcharge Prog (20SD)	22,660	22,660	22,660
Totals		**41,764**	**41,764**	**41,764**

C.a FRANCHISE (Net Capital)		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
205	Electric Dist. Street/Hwy Relocations	5,173	5,173	5,173
210	Conversion From OH To UG Rule 20A	13,025	13,025	13,025
213	City Of San Diego Surcharge Prog (20SD)	0	0	0
Totals		**18,198**	**18,198**	**18,198**

➢ **Description Of Individual Budgets Within The Franchise Category ($'s in Thousands)**

1. 205 - Electric Dist. Street/Hwy Relocations

The forecasts for the Electric Dist. Street/Hwy Relocations project for 2014, 2015, and 2016 are $6,079, $6,079, and $6,079, respectively.

a. Project Description

This project is required to fund relocation of existing distribution facilities for public improvements under the terms of franchise agreements with municipalities and the provisions of the street and highway codes with respect to state highways. It also funds relocations for North County Transit District (NCTD), Metropolitan Transit Development Board (MTDB), NCTD, Civic San Diego (formerly Centre-City Development Corporation), and the Port of San Diego.

This project covers relocations of electric distributions facilities, including both overhead and underground that are in conflict with public street and highway improvements and other infrastructure improvement projects having rights superior to those of SDG&E. This budget has a collectible component, as described earlier in the testimony.

The specific details regarding the Electric Dist. Street/Hwy Relocations project are found in my capital workpapers. See SDG&E-09-CWP at section 00205 – Electric Dist. Street/Hwy Relocations.

b. Forecast Method

The activities in this blanket budget are consistent from year to year, so a 5-year average was appropriately used for the forecast. A 3-year average would not be appropriate to use for this forecast, because 2013 actuals were abnormally low due to a lower volume of requests for relocations. With the economic turnaround, expenditures for 2014-2016 are forecasted to be more in-line with the 5-year average. The 5-year average levels out the peaks and valleys in this blanket budget over a larger snapshot of time, while providing for the necessary level of funding for the activities that are covered by this budget.

c. Supports Safety and Reliability Goals

This project accounts for relocations of electric facilities to accommodate changes in other infrastructure within franchise. Relocations are necessary to continue providing safe and reliable electric service when the modifications to the other infrastructure or utilities occur.

d. Cost Driver(s)

There are no expected incremental activity changes for this budget/project for this GRC forecast period.

2. 210 - Conversion from OH to UG Rule 20A

The forecasts for the Conversion from OH to UG Rule 20A project for 2014, 2015, and 2016 are $13,025, $13,025, and $13,025, respectively.

a. Project Description

This project converts overhead facilities to underground based on the requirements of Rule 20A, a CPUC-mandated program defined in decision 73078, case 8209, dated September 27, 1967, and effective January 1, 1968, and franchise agreements with the cities of San Diego and Chula Vista. The significant other customers that participate in the program are Orange and San Diego Counties, and the cities of Carlsbad, Coronado, Dana Point, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, Laguna Beach, Laguna Hills, Laguna Niguel, La Mesa, Lemon Grove, Mission Viejo, National City, Oceanside, Poway, Solana Beach, San Clemente, San Juan Capistrano, San Marcos, and Santee.

This project provides for replacement of existing overhead electric facilities with new underground electric facilities, at the utility's expense. Replacement activities are planned at the request of the governing body in the city or county in which such electric facilities are located, provided that the conversion area selected by the governing body meets the criteria as set forth in Rule 20A.

The specific details regarding the Conversion from OH to UG Rule 20A project are found in my capital workpapers. See SDG&E-09-CWP at section 00210 – Conversion from OH to UG Rule 20A.

b. Forecast Method

The forecast method used for this budget is a 5-year average, based on historical data. A five-year average is the most appropriate methodology, because work load can vary from year to year. For example, 2009 and 2012 were above the average, while 2010, 2011, and 2013 were below the average. The peak spending for this budget was in 2012, with an actual cost of $14,665. The 5-year average levels out the peaks and valleys in this blanket budget over a larger snapshot of time, and still provides for the necessary level of funding for the work that falls within this budget.

c. Supports Compliance Goals

These forecasted capital expenditures support the goal of compliance with Rule 20 of the Electric Tariff.

d. Cost Driver(s)

This is a CPUC-mandated program that is also incorporated into the SDG&E franchises with the cities of San Diego and Chula Vista. The expenditures herein reflect the renewed franchise agreement between SDG&E and the city of San Diego, which was adopted on January 28, 2002. Total program allocations are based on the San Diego agreement, with each other city and county receiving an amount proportional to their electric meter count in accordance with the methodology specified in Rule 20A.

3. 213 - City Of San Diego Surcharge Prog (20SD)

The forecasts for the City Of San Diego Surcharge Prog (20SD) project for 2014, 2015, and 2016 are $22,660, $22,660, and $22,660, respectively.

a. Project Description

This project converts overhead facilities to underground based on requirements and negotiated agreement with the city of San Diego (commonly referred to as the "surcharge program"). This project provides replacement of existing overhead electric facilities with new underground electric facilities (transmission and distribution), in accordance with Resolution E-3788. Replacement is effected at the request of San Diego. This is a separate and distinct program unrelated to the Rule 20A program (budget 210). This program is associated with SDG&E's franchise agreement with the city of San Diego and is required by that agreement. All expenses associated with this program will be reimbursed to SDG&E by the city from the proceeds of a surcharge collected from each electric meter account in the city of San Diego. No net capital or O&M expenditures are anticipated. The specific details regarding the City Of San Diego Surcharge Prog (20SD) project are found in the capital workpapers. See SDG&E-09-CWP at section 00213 – City Of San Diego Surcharge Prog (20SD).[8]

b. Forecast Method

The forecast method used for this budget is a 5-year average, based on historical data. This is the most appropriate methodology, as work load can vary from year to year, and the schedule for the projects within this budget is dictated by the City of San Diego. The 5-year average levels out the peaks and valleys in this blanket budget over a larger snapshot of time, and still provides for the necessary level of funding for the work that falls within this budget. All costs incurred under this project are collectible, and this project is rate base neutral. The forecast assumes that the City of San Diego will continue to perform construction at historic rates and that collected amounts will escalate with inflation. All collectible amounts are credited as direct dollars.

Actuals in any given calendar year will be non-zero due to the billing schedule. Expenditures in December of any calendar year are not collected until the following year. Similarly, collectibles received in January are for prior year expenditures. In any given year, the

[8] Additional information can also be found on the City of San Diego website: http://www.sandiego.gov/undergrounding/overview/history/expanded.shtml.

net is roughly the difference between the amount collected in January and the amount of expenditure in December. Overall, the project remains rate base neutral.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goals of safety and reliability, because aged infrastructure is replaced with new facilities when conversions are done.

d. Cost Driver(s)

The costs in this budget are dictated by the City of San Diego schedule for the conversion work covered by this budget.

D. MANDATED

- **Table 6 – Summary of Mandated Budgets ($'s in Thousands)**

D. MANDATED		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
229	Corrective Maintenance Program (CMP)	8,652	8,464	8,954
289	CMP UG Switch Replacement & Manhole Repair	12,191	12,328	12,466
1295	Load Research/DLP Electric Metering Project	302	302	302
10265	Avian Protection	1,680	1,645	1,609
87232	Pole Replacement And Reinforcement	15,047	15,409	15,732
Totals		**37,872**	**38,148**	**39,063**

- **Description Of Individual Budgets Within The Mandated Category ($'s in Thousands)**

1. 229 - Corrective Maintenance Program (CMP)

The forecasts for CMP for 2014, 2015, and 2016 are $8,652, $8,464, and $8,954, respectively. This is an ongoing program that is expected to continue through the Test Year.

a. Project Description

This project provides funding for the inspection and maintenance of overhead and underground electric distribution facilities. This program is mandated under CPUC General Orders 165, 95 and 128 to promote safe, high-quality electrical service and compliance with SDG&E and CPUC construction standards. Inspections are performed on a cyclical basis and conditions found during inspections are repaired in a timely manner. This program has been ongoing since January 1998. All electric distribution facilities are visually patrolled on an annual basis in urban and rural areas and inspected in detail every three, five, or ten years depending on equipment type. Conditions found during the inspections may require only labor to repair equipment or may require replacement of equipment that is no longer serviceable. Inspections and some repair work are captured under O&M budgets.

This program is mandated by the CPUC. It is also incumbent on SDG&E to provide a safe environment for workers and the public and to provide reliable service. The specific details regarding CMP are found in the capital workpapers. See SDG&E-09-CWP at section 00229 – Corrective Maintenance Program (CMP).

b. Forecast Method

The forecast method used for CMP is zero-based, and includes projected workload increases in this mandated area. SDG&E closely tracks the activities related to the mandated projects, as well as the associated unit costs. The unit costs are applied to the anticipated work in the future, which is predictable with a high level of confidence due to the comprehensive data management activities performed by the group managing the mandated work. Forecasted costs are below the 5-year average.

c. Supports Safety, Reliability, and Regulatory Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining system reliability and maintaining regulatory compliance, by ensuring overhead and underground electric distribution facilities are maintained in accordance with State regulations.

d. Cost Driver(s)

The driver for this budget is the CMP inspections. This budget is used for work resulting from those inspections.

2. 289 - CMP UG Switch Replacement & Manhole Repair

The forecasts for CMP UG Switch Replacement & Manhole Repair for 2014, 2015, and 2016 are $12,191, $12,328, and $12,466, respectively. This is an ongoing program that is expected to continue through the Test Year.

a. Project Description

The purpose of this project is to replace or remove underground and overhead switches and to repair underground structures, all of which impact system integrity and employee and public safety. Switches are a vital part of SDG&E's distribution infrastructure; they allow for the isolation of problems on the electric system, and they reduce outage impact. Substructures, such as manholes, are equally as important as they contain critical pieces of distribution equipment. Their structural integrity is important to prevent cave-ins and falling debris, which could injure crews, damage equipment, and threaten surface traffic. The result of this project will be improved operational safety and reliability, a reduction in maintenance and operational costs, and decreased public reliability risk.

The primary objectives of this program are to maintain distribution equipment and facilities for the safety and well-being of both employees and the general public and to comply with General Orders 95, 128 and 165. Failure to implement this program will significantly reduce reliability and limit operational flexibility. Without implementing such a program, SDG&E may increase the risk of equipment failure and prolonged outages. The specific details regarding CMP UG Switch Replacement & Manhole Repair are found in the capital workpapers. See SDG&E-09-CWP at section 00289 – CMP UG Switch Replacement & Manhole Repair.

b. Forecast Method

The forecast method used for CMP UG Switch Replacement & Manhole Repair is zero-based. Cost estimates were generated using unit costs, and applying those unit costs to the projected workload increases in this mandated area. The projected workload increases are related to a backlog of "Do Not Operate Energized" (DOE) switches, which are switches that have low levels of insulating medium and cannot be operated while energized. Spending must be increased to reduce the number of inoperable switches in service. The forecasted costs are based on specific cost estimates for each switch replacement job and for each substructure repair job.

c. Supports Safety, Reliability and Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining system reliability and maintaining regulatory compliance, by ensuring overhead and underground electric distribution facilities are maintained in accordance with State regulations.

d. Cost Driver(s)

The increase in this budget is related to the number of substructures requiring structural repair and the large number of switches that need to be removed or replaced because of DOE or "Mechanically Inoperable" (MIO) status. Inoperable switches severely hamper SDG&E's ability to restore service in an outage and limit operating flexibility, so it is very important that they get removed or replaced. Every year, CMP inspections result in an additional amount of 30-40 switches that are tagged DOE for the first time in their lifecycle. These switches get added to the existing backlog of DOE switches. To eliminate the current backlog of over 100 DOE switches, the forecasted funding is necessary.

3. 1295 - Load Research/DLP Electric Metering Project

The forecasts for Load Research/DLP (Dynamic Load Profile) Electric Metering Project for 2014, 2015, and 2016 are $302, $302, and $302, respectively. This is an ongoing project that is expected to continue through the Test Year.

a. Project Description

The purpose is to update the load research and metering sample in support of Load Research Metering and Data Collection Requirements in California Code of Regulations, Title 20. In addition, an updated sample is required to support SDG&E's Marginal Cost Studies and the development of pricing strategies and rate design to accurately reflect differing cost causation by rate class. SDG&E is required to maintain a Dynamic Load Research sample to determine, on a daily basis, usage by rate class for the purposes of pricing and energy procurement forecasting. In addition to these samples used in producing daily or yearly reports, there are other samples fielded that aid in supporting strategic analysis in support of regulatory and other business units on high profile issues such as Air Conditioning usage, Solar Energy (California Solar Initiative) and Alternative Fuels OIR.

This project analyzes electric vehicle (EV) charging habits and how that might affect SDG&E's system. SDG&E is partnering with other agencies (as well as the CPUC) to conduct an EV Study. This study will meter EV charging patterns. Additionally, new EV rates will be tested on the study participants to determine price sensitivity. The study will include price response and evaluate EV charging impacts relative to SDG&E's system load. Impacts to transformers and circuits will also be identified.

The EV pricing study's experimental rates have been extended through 2014. SDG&E must comply with providing the metering to enable the EV rate options. Advice letter 2157-E and 2157-A authorizes rates EPEV-X, EPEV-Y and EPEV-Z to continue through 2014. The EPEV rates require a separate meter for the EV charging and Capital Budget 1295 provides this funding for the installations of these billing meters. The specific details regarding Load Research/DLP Elec. Metering Project are found in the capital workpapers. See SDG&E-09-CWP at section 01295 – Load Research/DLP Electric Metering Project.

b. Forecast Method

The forecast method used for Load Research/DLP Electric Metering Project is zero-based. The forecast is based on detailed cost estimates that are developed based on the equipment costs, the labor rate at the time the estimate was completed, and historical expenditures. The forecast also considers incremental changes. For example, an incremental increase is expected related to the need for multi-family dwelling metering solutions.

c. Supports Compliance Goal

This budget provides the funds necessary to comply with the Load Research Metering and Data Collection Requirements in California Code of Regulations, Title 20.

d. Cost Driver(s)

The underlying incremental cost driver for this capital project is related to a need to install multi-family dwelling metering for EV customers. The increase can also be attributed to the increase in Net Energy Metering applications and the increase in EVs in San Diego County.

4. 10265 - Avian Protection

The forecasts for Avian Protection program for 2014, 2015, and 2016 are $1,680, $1,645, and $1,609, respectively. This is an ongoing program that is expected to continue through the Test Year.

a. Project Description

The purpose is to identify and retro-fit, rearrange, or build-to-standard distribution poles in the SDG&E service territory to prevent electrocution of birds in compliance with State and Federal Laws: 1) Migratory Bird Treaty Act, 2) Bald and Golden Eagle Protection Act, and 3) the California Fish and Game Code. The project will also harden the system and reduce fire risk associated with avian electrocutions, improve SDG&E reliability and customer service, and align with Avian Power Line Interaction Committee (APLIC) Guidelines. The plan will systematically inspect all distribution lines and poles in the overhead distribution system that either 1) lie within the Avian Protection Zone, or 2) have associated known bird contacts, in which case we will identify and resolve potential avian risks.

The specific details regarding Avian Protection program are found in the capital workpapers. See SDG&E-09-CWP at section 10265 – Avian Protection.

b. Forecast Method

The forecast method used for Avian Protection program is zero-based, and includes projected workload increases in this mandated area. SDG&E closely tracks the activities related to the mandated projects, as well as the associated unit costs. The unit costs are applied to the anticipated work in the future, which is predictable with a high level of confidence due to the comprehensive data management activities done by the group managing the mandated work. SDG&E has mapped and prioritized areas where avian issues are a concern, and has focused on those areas for enhancements to the overhead electric system to reduce the potential for avian electrocutions. Using a long-term average was not appropriate for this budget, since the program only began to ramp up in 2009 and 2010. The forecasted expenditures are expected to be closer to the 2012 actuals, based on the forecasted amount of work and the actual unit costs.

c. Supports Safety, Reliability, and Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining system reliability and maintaining regulatory compliance, by ensuring overhead electric distribution facilities are designed, constructed and maintained in a manner as to reduce avian electrocutions, associated outage impacts and fire risk.

d. Cost Driver(s)

The forecasted expenditures are based on the forecasted workload for the Avian Protection program. The underlying cost drivers for this capital project are the need to reduce the potential for bird electrocutions, and to comply with State and Federal laws.

5. 87232 - Pole Replacement and Reinforcement

The forecasts for Pole Replacement and Reinforcement for 2014, 2015, and 2016 are $15,047, $15,409, and $15,732, respectively. This is an ongoing program that is expected to continue through the Test Year.

a. Project Description

The purpose of this budget is to provide funding to continue the pole restoration and replacement program for in-service distribution poles. Steel and fiberglass pole implementation will be incorporated into these routine Corrective Maintenance Program (CMP) pole replacements going forward. Wood pole damage is attributed to numerous factors including, but not limited to, the loss of original preservative treatment experienced with Penta-Cellon poles (Pentachlorophenol, a pesticide, and Cellon, a preservative treatment for wood poles used by the

DOW Chemical Company to inject pentachlorophenol using a liquid petroleum gas such as propane), the presence of fungi decay, and bird and/or termite damage. All electric distribution poles and associated equipment are visually patrolled on an annual basis in urban and rural areas, inspected in detail every five years, and receive a wood pole intrusive inspection on average every ten years. Inspections and some repair work are captured under O&M budgets.

The pole inspection/restoration/replacement program is designed to comply with General Order 165 and SDG&E's compliance plan submitted on July 1, 1997. General Order 165 became effective on January 1, 1998. In addition, this budget protects SDG&E's capital investments of overhead distribution facilities by maintaining General Order 95 mandated safety factors for the applicable grades of construction. This program promotes SDG&E's compliance with General Orders 95 and 165, drastically improves the life expectancy of the overhead distribution system, minimizes customer safety risks, and mitigates the need for extensive capital replacements. Pole replacement candidates are identified through the CMP Overhead Visual Program and contracted wood pole intrusive inspections. Candidate poles are confirmed for replacement and enter the job queue for either SDG&E or contract crew work. The specific details regarding Pole Replacement and Reinforcement are found in the capital workpapers. See SDG&E-09-CWP at section 87232 – Pole Replacement and Reinforcement.

b. Forecast Method

The forecast method used for Pole Replacement and Reinforcement is zero-based, and includes projected workload increases in this mandated area. SDG&E closely tracks the activities related to the mandated projects, as well as the associated unit costs. The unit costs are applied to the anticipated work in the future, which is predictable with a high level of confidence due to the comprehensive data management activities performed by the group managing the mandated work.

c. Supports Safety, Reliability and Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining system reliability and maintaining regulatory compliance, by ensuring overhead and underground electric distribution facilities are maintained in accordance with State regulations.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to compliance with GO requirements, and an increased emphasis on pole loading analysis in recent years. In addition, the recent change in the testing and inspection standard, to focus more on pole loading analysis going forward, is expected to generate a higher replacement rate. The average unit cost per pole replacement has gone up about 11% since the last GRC filing, from about $18,000 to about $20,000 (fully loaded). There were also more pole replacements done in 2013 than in previous years. We expect to have about the same numbers of pole replacement in 2014, based on a 12-month backlog, and project a slight increase in the level of work in 2015 and 2016.

E. MATERIALS

➢ **Table 7 - Summary of Materials Budgets ($'s in Thousands)**

E. MATERIALS		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
214	Transformers	21,024	22,025	23,027
Totals		**21,024**	**22,025**	**23,027**

➢ **Description Of Individual Budgets Within The Materials Category ($'s in Thousands)**

1. 214 - Transformers

The forecast for the Transformers project for 2014, 2015, and 2016 are $18,287, $19,158, and $20,029, respectively.

a. Project Description

This project is required to provide distribution transformers necessary to operate and maintain the electric distribution system. This blanket project is required to purchase transformers, supplying new and replacement equipment and maintaining inventory at each electric distribution service center. The specific details regarding the Transformers project are found in my capital workpapers. See SDG&E-09-CWP at section 00214 – Transformers.

b. Forecast Method

The forecast for this project is zero-based. The expenditures in this project are closely related to the work being done in New Business, Mandated, Capacity, Reliability, Safety and Risk Mitigation, as well as the other categories where transformers are installed. Historically, the primary drivers have been the mandated maintenance work and new business work, which together account for half of the expenditures. In addition to increases in this project related to the other electric distribution increases, SDG&E is also planning on using FR3 fluid (Envirotemp FR3 fluid, a substitute for conventional transformer oils developed by Cooper Power Systems) in transformers instead of the current mineral oil that is used. There is an incremental cost increase per unit, but using FR3 provides fire safety, asset and insulation life, and environmental benefits.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the majority of the goals for Electric Distribution. Transformers are used in the majority of the categories of work.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to customer growth, increased mandated maintenance activities, and the use of FR3 insulating medium as a replacement for mineral oil. There is an incremental increase in unit cost for transformers filled with FR3, but the benefits are a much higher flash-point for FR3, more efficient operation of the transformers, longer transformer life, and greater capability of the transformer to handle intermittent loads related to PV systems and EV charging.

F. NEW BUSINESS

- **Table 8 and 8a - Summary of New Business Budgets ($'s in Thousands)**

F. NEW BUSINESS (Total Cost)		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
202	Electric Meters & Regulators	4,036	4,488	4,769
204	Electric Distribution Easements	3,968	4,857	5,084
211	Conversion From OH-UG Rule 20B 20C	1,806	1,985	2,184
215	OH Residential NB	588	775	937
216	OH Non-Residential NB	1,129	1,490	1,802
217	UG Residential NB	9,084	11,988	14,503
218	UG Non-Residential NB	6,858	9,051	10,950
219	New Business Infrastructure	11,117	14,670	17,749
224	New Service Installations	5,184	6,840	8,274
225	Customer Requested Upgrades And Services	8,001	8,800	9,678
235	Transformer & Meter Installations	5,256	5,709	6,032
2264	Sustainable Community Energy Systems	1,565	0	0
Totals		**58,592**	**70,653**	**81,962**
F.a NEW BUSINESS (Net Capital)		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
202	Electric Meters & Regulators	4,036	4,488	4,769
204	Electric Distribution Easements	3,825	4,682	4,901
211	Conversion From OH-UG Rule 20B 20C	464	509	560
215	OH Residential NB	369	486	587

216	OH Non-Residential NB	930	1,227	1,484
217	UG Residential NB	7,290	9,620	11,638
218	UG Non-Residential NB	4,589	6,056	7,326
219	New Business Infrastructure	8,067	10,644	12,878
224	New Service Installations	4,865	6,419	7,764
225	Customer Requested Upgrades And Services	5,221	5,741	6,314
235	Transformer & Meter Installations	5,226	5,677	5,998
2264	Sustainable Community Energy Systems	1,565	0	0
Totals		**46,447**	**55,549**	**64,219**

- **Description Of Individual Budgets Within The New Business Category ($'s in Thousands)**

1. 202 – Electric Meters and Regulators

The forecasts for the Electric Meters and Regulators project for 2014, 2015, and 2016 are $4,036, $4,488, and $4,769, respectively.

a. Project Description

This project provides the funding for distribution regulators necessary to maintain quality of service to customers, as well as the funding for electric distribution meters. This budget allows SDG&E to maintain adequate meter and regulator inventory levels at each of the electric distribution service centers. This is an ongoing blanket budget that is required to purchase meters. The meters are used for new business installations and to replace meters that are damaged or not functioning properly. The specific details regarding the Electric Meters and Regulators project are found in the capital workpapers. See SDG&E-09-CWP at section 00202 – Electric Meters and Regulators.

b. Forecast Method

The forecast is based on the Construction Unit Forecast, and the forecasted need for regulators, meters, and other equipment. Because the activities associated with this budget have changed with the deployment of smart meters, the forecast is based on the relatively short amount of time the smart meters have been in operation. Old meter labor costs, material costs, and equipment failure rates no longer apply. This forecast is based on new meter pricing and on operating costs from January 1, 2013 to October 31, 2013. Supply Management will maintain Advanced Metering Infrastructure (AMI) inventory for maintenance purposes in support of meters in the field that fail, or that are removed for testing.

c. Supports Reliability and Compliance Goals

This budget supports the reliability and compliance goals, because meters and regulators are an integral part of the electric distribution system, and are directly related to the ability to provide safe and reliable, high quality service.

d. Cost Driver(s)

One of the primary cost drivers is the Construction Unit Forecast. As described earlier in the testimony, New Business is expected to increase significantly, based on the Construction Unit Forecast.

2. 204 – Electric Distribution Easements

The forecasts for the Electric Distribution Easements project for 2014, 2015, and 2016 are $3,968, $4,857, and $5,084, respectively.

a. Project Description

This project is required to obtain new electric distribution easements necessary to provide service to new customers, accommodate street and highway relocations, underground conversion projects, and capital projects improving service levels. This project performs necessary surveys and mapping functions, document research, document preparation, and negotiations with private and governmental property owners for the acquisition of real property rights to allow the installation of new electrical distribution facilities on private property of public lands.

US Forest Service Master Special Use Permit (MSUP) – This portion of the project is required to renew expired special use permits (SUPs) for electric distribution facilities installed within the Cleveland National Forest (CNF). There are approximately 60 expired SUPs that will be consolidated, along with expired easements for transmission facilities, funding for which is being encumbered separately from this project, and renewed via the one FSMSUP.

The specific details regarding the Electric Distribution Easements project are found in my capital workpapers. See SDG&E-09-CWP at section 00204 – Electric Distribution Easements.

b. Forecast Method

This project forecast utilizes historical costs and anticipated growth levels in the Construction Unit Forecast. The forecast also takes into account existing easements that have expired or are expected to expire in this GRC forecast period. Appraisals are done to determine what the cost of new easements will actually be.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goal of constructing and maintaining a safe and reliable electric system, by ensuring there are adequate and current easements for the electric facilities.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to the requirement to operate and maintain the electric distribution system in a safe and reliable manner.

3. 211 – Conversion From OH-UG Rule 20B, 20C

The forecasts for the Conversion from OH-UG Rule 20B, 20C project for 2014, 2015, and 2016 are $1,798, $1,977, and $2,176, respectively.

a. Project Description

This project is required to convert existing electric overhead distribution lines to underground upon customer request. SDG&E is obligated to pay for a portion of the cost associated with converting the overhead distribution lines to underground, in compliance with Rules 20B and 20C.

The specific details regarding the Conversion from OH-UG Rule 20B, 20C project are found in the capital workpapers. See SDG&E-09-CWP at section 00211 – Conversion from OH-UG Rule 20B, 20C.

b. Forecast Method

This project forecast is based on a 5-year historical average, with adjustments made based on the Construction Unit Forecast, to account for expected annual growth rates for 2015 and 2016.

The estimate for this blanket project is derived by considering a variety of factors including previous expenditures, the amount of conversion work currently awaiting construction, changing trends toward the use of 20B conversions by municipalities and the forecasted level of new customer growth.

An estimated budget requirement for 2014 was established and a growth factor was applied as a means of estimating the requirements for 2015 and 2016. Conversion work can be impacted by new construction growth, but not all new developments require the conversion of existing overhead lines to underground. Municipally funded 20B conversions have the potential for the greatest impact on 211, but their dependence on public funding and public vote make their schedules unpredictable. Therefore, using the Construction Unit Forecast to set growth direction and tempering the effect for reasons stated above, applying a conservative percentage of growth serves as the best means of estimating future project requirements.

c. Supports Compliance Goals

These forecasted capital expenditures support compliance goals by converting overhead facilities to underground facilities in accordance with Rule 20 requirements.

d. Cost Driver(s)

The forecast for this project are based on the amount of conversion work currently awaiting construction, changing trends toward the use of 20B conversions by municipalities and the forecasted level of new customer growth.

4. 215 – OH Residential New Business

The forecasts for the OH Residential New Business project for 2014, 2015, and 2016 are $586, $773, and $935, respectively.

a. Project Description

This project is required to extend new overhead distribution systems to new residential electric customers. The specific details regarding the OH Residential New Business project are found in my capital workpapers. See SDG&E-09-CWP at section 00215 – OH Residential New Business.

b. Forecast Method

This project forecast is based on 5-year historical costs with projected annual growth rates for 2015 and 2016.

The methodology used to forecast anticipated expenditures for the 215 Project relied heavily on a review of the history of actual expenditures over a 5-year period. The total Project 215 expenditure for each year 2009 through 2013 was adjusted to 2013 levels using escalation factors provided by Global Insight. The adjusted total was then divided by the number of overhead residential construction units recorded for that period to establish a cost per unit. That unit cost was then multiplied by a forecasted number of overhead residential construction units for each year, 2014 through 2015, producing an estimated project requirement for each year. The volume of overhead work is not proportional to that of underground work. More often than not, new development requires underground line extensions rather than overhead. To forecast future budget requirements, the number of overhead Construction Units completed in 2013 was used as a basis. The anticipated rate of growth derived from the Construction Unit Forecast was then used to establish a base number of overhead Construction Units for 2014. That number of units was then multiplied by the cost per unit referred to above. The percentage of growth for 2015 and 2016, as derived from the Construction Unit Forecast, was then used to project the project requirements for those years.

c. Supports Reliability and Compliance Goals

This budget and associated activities support the goals of Reliability and Compliance by providing new overhead services to customers.

d. Cost Driver(s)

The underlying cost driver for this capital project is customer growth.

5. 216 – OH Non-Residential New Business

The forecasts for the OH Non-Residential New Business project for 2014, 2015, and 2016 are $586, $773, and $935, respectively.

a. Project Description

This project is required to extend new overhead distribution systems to new non-residential electric customers. The specific details regarding the OH Non-Residential New Business project are found in my capital workpapers. See SDG&E-09-CWP at section 00216 – OH Non-Residential New Business.

b. Forecast Method

This project forecast is based on 5-year historical costs with projected annual growth rates for 2015 and 2016. The methodology used to forecast anticipated expenditures for the 216 project relied heavily on a review of the history of actual expenditures over a 5-year period. The total project 216 expenditure for each year 2009 through 2013 was adjusted to 2013 levels using escalation factors provided by Global Insight. The adjusted total was then divided by the number of overhead non-residential construction units recorded for that period to establish a cost per unit. That unit cost was then multiplied by the forecasted number of overhead residential construction units for each year, 2014 through 2016, producing an estimated project requirement for each year. The volume of overhead work is not proportional to that of underground work. More often than not, new development requires underground line extensions rather than overhead. To forecast future project requirements the number of OH construction units completed in 2013 was used as a basis. The anticipated rate of growth derived from the

Construction Unit Forecast was then used to establish a base number of OH construction units for 2014. That number of units was then multiplied by the cost per unit referred to above. The percentage of growth for 2015 and 2016, as derived from the Construction Unit Forecast, were then used to forecast the project requirements for those years.

c. Supports Reliability and Compliance Goals

This budget and associated activities support the goals of reliability and compliance by providing new overhead services to customers.

d. Cost Driver(s)

The underlying cost driver for this capital project is customer growth.

6. 217 – UG Residential New Business

The forecasts for the UG Residential New Business project for 2014, 2015, and 2016 are $9,076, $11,980, and $14,495, respectively.

a. Project Description

This project is required to extend new underground distribution systems to new residential electric customers. In accordance with the rules for the sale of electric energy, filed with and approved by the CPUC, electric facilities must be provided to qualified applicants.

The specific details regarding the UG Residential New Business project are found in my capital workpapers. See SDG&E-09-CWP at section 00217 – UG Residential New Business.

b. Forecast Method

This project forecast is based on 5-year historical costs with projected annual growth rates for 2015 and 2016. The methodology used to forecast anticipated expenditures for the 217 Project relied on a review of the history of actual expenditures over a 5-year period. The total project expenditure for each year 2009 through 2013 was adjusted to 2013 levels using escalation factors provided by Global Insight. The adjusted total was then divided by the number of underground residential construction units recorded for that period to establish a cost per unit. That unit cost was then multiplied by the forecasted number of underground residential construction units for each year, 2014 through 2016, producing an estimated project requirement for each year.

c. Supports Reliability and Compliance Goals

This budget and associated activities support the goals of reliability and compliance by providing new underground services to customers.

d. Cost Driver(s)

The underlying cost driver for this capital project is customer growth.

7. 218 – UG Non-Residential New Business

The forecasts for the UG Non-Residential New Business project for 2014, 2015, and 2016 are $6,674, $8,809, and $10,659, respectively.

a. Project Description

This project is required to extend new underground distribution systems to new non-residential electric customers. In accordance with the rules for the sale of electric energy, filed with and approved by the CPUC, electric facilities must be provided to qualified applicants.

The specific details regarding the UG Non-Residential New Business project are found in my capital workpapers. See SDG&E-09-CWP at section 00218 – UG Non-Residential New Business.

b. Forecast Method

This project forecast is based on 5-year historical costs with projected annual growth rates for 2015 and 2016.

The methodology used to forecast anticipated expenditures for the 218 project relied heavily on a review of the history of actual expenditures over a five year period. The total budget expenditure for each year 2009 through 2013 was adjusted to 2013 levels using escalation factors provided by Global Insight. The adjusted total was then divided by the number of construction units recorded for that period to establish a cost per unit. That unit cost was then multiplied by the forecasted number of underground non-residential construction units for each year, 2014 through 2016, producing an estimated project requirement for each year.

c. Supports Reliability and Compliance Goals

This budget and associated activities support the goals of reliability and compliance by providing new underground services to customers.

d. Cost Driver(s)

The underlying cost driver for this capital project is customer growth.

8. 219 – New Business Infrastructure

The forecasts for the New Business Infrastructure project for 2014, 2015, and 2016 are $6,674, $8,809, and $10,659, respectively.

a. Project Description

This project is required to extend new underground distribution systems to new non-residential electric customers. In accordance with the rules for the sale of electric energy, filed with and approved by the CPUC, electric facilities must be provided to qualified applicants.

The specific details regarding the New Business Infrastructure project are found in my capital workpapers. See SDG&E-09-CWP at section 00219 – New Business Infrastructure.

b. Forecast Method

This project forecast is based on 5-year historical costs with projected annual growth rates for 2015 and 2016. The methodology used to forecast anticipated expenditures for the 219 Project relied heavily on a review of the history of actual expenditures over a five-year period. The total budget expenditure for each year 2009 through 2013 was adjusted to 2013 levels using escalation factors provided by Global Insight. The adjusted total was then divided by the entire number of construction units recorded for that period to establish a cost per unit. That unit cost was then multiplied by the total forecasted number of construction units, overhead and underground, for each year, 2014 through 2016, producing an estimated project requirement for each year.

c. Supports Reliability and Compliance Goals

This budget and associated activities support the goals of reliability and compliance by extending new underground distribution systems to customers.

d. Cost Driver(s)

The underlying cost driver for this capital project is customer growth.

9. 224 – New Service Installations

The forecasts for the New Service Installations project for 2014, 2015, and 2016 are $5,173, $6,829, and $8,263, respectively.

a. Project Description

This project is required to provide electric service to new customers from new or existing electric distribution systems. This project provides for the installation of new overhead and underground electric services for new customers. The installation of distribution facilities is to be installed on budgets 215, 216, 217, 218 or 219. In accordance with the rules for the sale of electric energy, filed with and approved by the CPUC, electric facilities must be provided to qualified applicants.

The specific details regarding the New Service Installations project are found in my capital workpapers. See SDG&E-09-CWP at section 00224 – New Service Installations.

b. Forecast Method

This project captures costs for individual services not installed as part of larger electric distribution system extensions. Since SDG&E does not include such individual services in its historical count of lots and units, there is only an indirect relationship between forecasted units and total expenditures for project 224. However, the relationship is significant enough to rely on as a means of forecasting future project requirements. The total project expenditure for the years 2009 - 2013 was adjusted to 2013 levels using escalation factors provided by Global Insight. The total for each year was then divided by the number of completed services for that period to establish a cost per service. That cost per service was then multiplied by the total forecasted number of services for 2014, 2015 and 2016. The anticipated number of services was forecasted using a growth factor derived from SDG&E's Construction Unit Forecast. As we experience an increasing number of multi-family developments, we find we can serve more units with fewer individual services. To establish a basis for future service requirements we identified a percentage relationship between the number of individual services completed in 2013 and the total number of completed construction units. We then applied that resulting percentage to the total number of forecasted units for 2014 and multiplied that resulting figure by the calculated unit cost. The forecasted level of growth derived from the Construction Unit Forecast was then used to project required project amounts for 2015 and 2016.

c. Supports Reliability and Compliance Goals

This budget and associated activities support the goals of reliability and compliance by installing or extending electric distribution service to new customers.

d. Cost Driver(s)

The underlying cost driver for this capital project is customer growth.

10. 225– Customer Requested Upgrades and Services

The forecasts for the Customer Requested Upgrades and Services project for 2014, 2015, and 2016 are $7,979, $8,778, and $9,656, respectively.

a. Project Description

This project is required to replace, relocate, rearrange or remove existing electric distribution and service facilities as requested by customers. In accordance with the rules for the sale of electric energy, filed with and approved by the CPUC, modification to existing electric facilities may be required by customer request and in conjunction with new business projects.

The specific details regarding the Customer Requested Upgrades and Services project are found in my capital workpapers. See SDG&E-09-CWP at section 00225 – Customer Requested Upgrades and Services.

b. Forecast Method

To forecast requirements for project 225, historical expenditures over the five-year period from 209 through 2013 were reviewed. It is difficult to predict the number of existing customers who will elect to upgrade their existing electric service facilities, but there is always the potential for remodels, both residential and commercial. Historical data suggests that service upgrades to both residential and commercial facilities are fairly constant, with a slight correlation to the level of new construction activity. However, the general state of the economy can have a marked impact on a customer's decision to remodel and/or upgrade their existing electrical facilities. SDG&E experienced a decline in activity in this category from 2009 -2011, whereas years 2012 - 2013 saw activity increase as the economy improved. SDG&E has also witnessed an increase in the amount of inner city redevelopment, as well as "in-building," construction on the remaining vacant lots or recently cleared property in older, well-established neighborhoods. These projects often require the relocation or removal of existing electric distribution facilities to allow for new construction and to maintain safe clearances. This trend is expected to continue as the volume of developable raw land steadily decreases. To forecast future project requirements an average of annual expenditures for the years 2009-2013 was calculated. This average was then increased by a percentage consistent with the increase in activity experienced in the last two years as economic conditions were improving. The result is a forecasted project requirement for 2014, with an escalation factor added for years 2015 and 2016.

c. Supports Reliability and Compliance Goals

This budget and associated activities support the goals of reliability and compliance by replacing, relocating, rearranging or removing existing electric distribution and service facilities as requested by customers.

d. Cost Driver(s)

The underlying cost driver for this capital project is customer growth.

11. 235 – Transformers and Meter Installations

The forecasts for the Transformers and Meter Installations project for 2014, 2015, and 2016 are $5,238, $5,691, and $6,014, respectively.

a. Project Description

This project is required to provide funding for specific work related to new or existing customer installations and the handling and salvage of scrapped distribution line equipment, specifically involving the installation and/or removal of transformers and meters.
In accordance with the rules for the sale of electric energy, filed with and approved by the CPUC, modification to existing electric facilities may be required due to customer request and in conjunction with new business projects.

The specific details regarding the Transformers and Meter Installations project are found in my capital workpapers. See SDG&E-09-CWP at section 00235 – Transformers and Meter Installations.

b. Forecast Method

The methodology used to forecast expenditures for the 235 project relied on historical trends. Actual expenditures for the years 2009 through 2013 were reviewed and consideration was given to projections in SDG&E's Construction Unit Forecast. The 235 project includes a variety of activities. The largest component is labor associated with transformer installation and removal, regardless of whether the transformer is installed new or as a replacement. Another large component is labor for electric meter installations. Both of these components are partially influenced by customer growth and, therefore, impacted by SDG&E's Construction Unit Forecast, but not entirely. Therefore, historical trends were used to estimate a base requirement for each year, after which the Construction Unit Forecast was used to estimate the effect of new customer growth on the impacted portion. With transformer labor being the single largest component of this project, it is also the part most affected by New Business customer activity. In an effort to isolate that effect on historical figures it was determined what percentage of transformers purchased are typically for new business. We then took the 2013 full year actual expenditure for 235, determined how much money that represented and then increased each year for the years 2014 – 2016. That adjusted component was then factored back into the total to establish project requirements for years 2014 – 2016.

c. Supports Reliability and Compliance Goals

This budget and associated activities support the goals of reliability and compliance by installing or upgrading distribution transformers and meters for new customers.

d. Cost Driver(s)

The underlying cost driver for this capital project is customer growth.

12. 2264 – Sustainable Community Energy Systems

The forecasts for the Sustainable Community Energy Systems project for 2014, 2015, and 2016 are $1,565, $0, and $0, respectively.

a. Project Description

The project provides a new service to customers by installing and operating state-of-the-art energy systems and smart grid technologies that focus on community-based sustainable energy systems, in conjunction with interval meters and control technologies. The project also will analyze the impact of these technologies on the existing distribution system in preparation for expanded utilization in the future. The main objectives include: meeting customer demands and interests, ensuring environmentally sensitive energy solutions, stimulating distributed technology and clean distributed energy generation, supporting and partnering with interested developers, gaining necessary experience with localized distributed sources, including engineering, design, construction, maintenance, and operation in preparation for future customer needs by promoting energy and demand savings, and enhancing reliability and power quality. The specific details regarding the Sustainable Community Energy Systems project are found in my capital workpapers. See SDG&E-09-CWP at section 02264 – Sustainable Community Energy Systems.

b. Forecast Method

This project is being phased out, as directed in Ordering Paragraph 8 of the decision in SDG&E's prior rate case, A.10-12-005/D.13-05-010: "The sustainable community energy systems project for San Diego Gas & Electric Company (SDG&E) shall end at the end of this General Rate Case (GRC) cycle." The program was concluded in 2013, but there are trailing charges in 2014 to account for two in-progress projects; the Civita Microgrid and Energy Storage for the Fast EV Suncharge Del Lago Site. The forecasted expenditures are based on cost estimates for those projects. As shown in the forecast for 2015 and 2016, no additional expenditures are planned beyond 2014.

c. Supports Reliability and Environmental Stewardship Goals

This project supports reliability and environmental stewardship goals. One of the primary objectives in initiating the project was for SDG&E to obtain necessary experience with distributed energy systems. The experience will help solidify standards, procedures, and technical requirements to further distributed generation and integration with the distribution system.

d. Cost Driver(s)

This project is scheduled to be completed in 2014. The drivers are the two in-progress projects described above.

G. OVERHEAD POOLS

- **Table 9 - Summary of Overhead Budgets ($'s in Thousands)**

G. OVERHEAD POOLS		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
901	Local Engineering - ED Pool	84,987	93,688	92,593
904	Local Engineering - Substation Pool	15,328	15,147	7,045
905	Department Overhead Pool	3,319	3,727	4,139
906	Contract Administration Pool	4,918	5,795	6,447
Totals		**108,552**	**118,357**	**110,224**

- **Description Of Individual Budgets Within The Overhead Pools Category ($'s in Thousands)**

1. 901 – Local Engineering– ED Pool

The forecasts for the Local Engineering - Electric Distribution (ED) Pool for 2014, 2015, and 2016 are $84,987, $93,688, and $92,593, respectively.

a. Project Description

The Local Engineering - ED Pool consists of Planners, Designers and Engineers, and support personnel who research, analyze, and design the facilities needed to serve customers. These persons address the engineering needs for new services, facilities relocations, overhead-to-underground conversions, capacity, and reliability projects. These persons also address the interaction with internal and external customers in preparing a work order package for construction. This pool includes the costs that will be allocated to electric distribution capital activities. Typical activities included in this account are:

- Communicating with internal and external customers to collect information necessary to prepare a work order package for construction;
- Performing load and sizing studies to determine the design characteristics to apply to a construction project;
- Developing a design for the construction project that meets the customer needs for service and the overall system design requirements. This design identifies the material, labor and equipment requirements necessary to complete the construction project;
- Coordination of the permitting and rights of way requirements;
- Preparing cost estimates according to the line extension rules and presenting these estimates to the internal or external customer for their approval;
- Preparing contracts and processing fees for new business construction projects; and
- Preparing work order packages and transmitting them to the internal and external groups.

Local Engineering activities are required to see a project from inception to completion. Due to the volume of capital work that takes place on the distribution system, the most effective and efficient way to allocate the planning and engineering activities is through the use of the overhead pools. It is not feasible to charge directly for each electric distribution job due to the tremendous volume of work orders. These capital overhead pool forecast values are referenced in the testimony of Mr. Jesse Aragon in Exhibit SDG&E-27, under budget code 901.

The specific details regarding the Local Engineering - ED Pool budget are found in my capital workpapers. See SDG&E-09-CWP at section 00901 – Local Engineering - ED Pool.

b. Forecast Method

With regulation changes and an increased focus on risk reduction, the need to perform more engineering than in the past (historically, distribution has been a standards-based business) has arisen. Internally at SDG&E, more detailed engineering is being done for new facilities and for rebuilding electric infrastructure. More advanced tools and methodology are also being utilized. The forecast in the labor and non-labor areas of this pool is derived from the Base Year expenditures with a net upward adjustment based on a historical relationship of Local Engineering – ED capital overheads to capital expenditures. Local Engineering support tracks the historical relationship between the engineering and support requirements and the related capital of Capacity/Expansion, Franchise, Mandated, Materials, New Business, Reliability/Improvements, Safety and Risk Management, and Transmission/FERC Driven

Projects (Expenditures for Meters & Regulators, Capital Tools, and the Smart Meter Program are excluded). The forecasted increases in New Business, Reliability/Improvements, and Safety and Risk Management will have a significant impact on the Local Engineering - ED Pool.

c. Supports Safety, Reliability, and Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining adequate reliability levels, and compliance with Federal, State and local regulations.

d. Cost Driver(s)

The costs in the Pools follow the costs in the other capital categories. The expenditures in the Pools have increased as the industry is moving toward the use of detailed engineering studies or designs, instead of relying solely on standards. New advanced tools, like LiDAR and PLS-CADD, are also changing the way engineering and design work is done for electric distribution facilities.

2. 904– Local Engineering - Substation Pool

The forecasts for the Local Engineering - Substation Pool for 2014, 2015, and 2016 are $15,328, $15,147, and $7,045, respectively.

a. Project Description

The Local Engineering – Substation Pool consists of the pool of planners, designers and engineers and support personnel who research, analyze, and design the facilities needed to serve customers. These persons address the engineering needs for substation projects. These persons also address the interaction with internal and external customers in preparing a work order package for construction. This pool includes the costs that will be allocated to electric distribution and transmission substation capital activities. Typical activities included in this account are:

- Communicating with internal and external customers to collect information necessary to prepare a work order package for construction;
- Performing load and sizing studies to determine the design characteristics to apply to a construction project;
- Developing a design for the construction project that meets the customer needs for service and the overall system design requirements. This design identifies the material, labor and equipment requirements necessary to complete the construction project;
- Coordination of the permitting and rights of way requirements;

- Preparing cost estimates according to the line extension rules and presenting these estimates to the internal or external customer for their approval;
- Preparing contracts and processing fees for new business construction projects; and
- Preparing work order packages and transmitting them to the internal and external groups.

Local Engineering activities are required to see a project from inception to completion. Due to the volume of capital work that takes place on the distribution system, the most effective and efficient way to allocate the planning and engineering activities is through the use of the overhead pools. It is not feasible to charge directly for each electric distribution/substation job due to the tremendous volume of work orders. In the case of the Local Engineering – Substation Pool, only the related substation activities are charged to this project. These capital overhead pool forecast values are referenced in the testimony of Mr. Jesse Aragon in Exhibit SDG&E-27, under budget code 904.

The specific details regarding the Local Engineering - Substation Pool budget are found in my capital workpapers. See SDG&E-09-CWP at section 00904 – Local Engineering - Substation Pool.

b. Forecast Method

The forecast for this pool is derived from the Base Year expenditures with a net upward adjustment based on a historical relationship of Local Engineering – Substation capital overhead to capital expenditures. Local Engineering – Substation support tracks the historical relationship between the engineering and support requirements and the related capital of Capacity/Expansion, Mandated, Reliability/Improvements, and Transmission/FERC Driven Projects (Expenditures for Meters & Regulators, Capital Tools, and the Smart Meter Program are excluded).

c. Supports Safety, Reliability, and Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining adequate reliability levels, and compliance with Federal, State and local regulations.

d. Cost Driver(s)

The costs in the Substation Pool track closely with the capital substation work.

3. 905– Department Overhead Pool

The forecasts for the Department Overhead Pool for 2014, 2015, and 2016 are $3,319, $3,727, and $4,139, respectively.

a. Project Description

Department Overheads are those costs for supervision and administration of crews in the SDG&E Construction and Operation (C&O) districts. Department Overhead is charged for expenses that are not attributable to one particular project, but benefit many projects, or the Construction and Operation (C&O) districts as a whole. C&O managers, construction managers, construction supervisors, dispatchers, operations assistants and other clerical C&O employees charge this account. Construction field employees charge this account when meeting on multiple projects. The non-labor piece consists of administrative expenses such as: office supplies, telephone expenses, mileage, employee uniforms and professional dues. This pool includes the costs that will be allocated to distribution gas and electric capital activities. These capital overhead pool forecast values are referenced in the testimony of Mr. Jesse Aragon in Exhibit SDG&E-27, under budget code 905. Typical activities included in this account are:

- Management and supervision of construction personnel; and
- Scheduling, material ordering, dispatching for construction personnel.

The specific details regarding the Department Overhead Pool budget are found in my capital workpapers. See SDG&E-09-CWP at section 00905 – Department Overhead Pool.

b. Forecast Method

This forecast is derived by taking the Base Year expenditures and applying a net upward adjustment based on a historical relationship of electric and gas distribution capital overhead to capital expenditures. Department Overhead support tracks the historical relationship between the support requirements and the related capital of Capacity/Expansion, Franchise, Mandated, Materials, New Business, Reliability/Improvements, Safety and Risk Management, and Transmission/FERC Driven Projects (Expenditures for Meters & Regulators, Capital Tools, and the Smart Meter Program are excluded).

c. Supports Safety, Reliability, and Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining adequate reliability levels, and compliance with Federal, State and local regulations. Since this pool is used for the supervision and administration of the crews in the C&O districts, the activities and costs in this area support the majority of the goals related to electric operations.

d. Cost Driver(s)

The cost drivers in the Department Overhead Pool follow the costs in the other capital categories.

4. 906 – Contract Administration (CA) Pool

The forecasts for the CA Pool project for 2014, 2015, and 2016 are $4,918, $5,795, and $6,447, respectively.

a. Project Description

The CA pool consists of those expenses necessary for the administration of projects that are performed by contractors for SDG&E. The expenses to this pool consist of labor for Contract Administrators and support personnel, as well as the associated non-labor support costs such as office and field supplies. This pool includes the costs that will be allocated to contracted work. These capital overhead pool forecast values are referenced in the testimony of Mr. Jesse Aragon in Exhibit SDG&E-27, under budget code 906. Typical activities included in this account are:

- Working with Contractors to develop fixed price bid for construction projects;
- Overseeing the Contractor work to remove obstacles and verify work is completed and complies with company standards;
- Approving Contractor Invoices for completed work; and
- Developing and Administering Contract Units for unit priced contracts.

The CA Pool consists of those expenses necessary for the administration of projects that are performed by contractors for SDG&E. Due to the volume of capital work that takes place on the electric distribution system, the most effective and efficient way to allocate the contract administration costs is through the use of the CA Pool. It is not feasible to charge directly for each electric distribution job due to the tremendous volume of work orders.

The specific details regarding the CA Pool budget are found in my capital workpapers. See SDG&E-09-CWP at section 00906 – Contract Administration (CA) Pool.

b. Forecast Method

This forecast is derived from the Base Year Recorded expenditures with a net upward adjustment based on a historical relationship of contract administration overhead to capital expenditures. Contract Administration support tracks the historical relationship between the support requirements and the related capital of Capacity/Expansion, Franchise, Mandated, New

Business, Reliability/Improvements, Safety and Risk Management, and Transmission/FERC Driven Projects (Expenditures for Meters & Regulators, Capital Tools, and the Smart Meter Program are excluded).

c. Supports Safety, Reliability, and Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining adequate reliability levels, and compliance with Federal, State and local regulations. Because this pool is tied to the administration of contracted electric work, the activities and costs in this area support the majority of the goals related to electric operations.

d. Cost Driver(s)

The cost drivers in the CA Pool follow the cost drivers described in the other capital categories.

H. RELIABILITY/IMPROVEMENTS

➢ **Table 10 - Summary of Reliability/Improvements Budgets ($'s in Thousands)**

H. RELIABILITY/IMPROVEMENTS		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
203	Distribution Substation Reliability	1,526	1,538	1,634
226	Management Of OH Dist. Service	9,273	9,273	9,273
227	Management Of UG Dist. Service	3,708	3,708	3,708
230	Replacement Of Underground Cables	13,005	13,339	13,049
236	Capital Restoration Of Service	3,844	3,844	3,844
1269	Rebuild Pt Loma 69/12kV Substation	234	11,042	0
6254	Emergency Transformer & Switchgear	386	386	386
6260	Remove 4kv Subs. From Service	3,096	3,032	2,965
8162	Substation Security	834	834	834
8261	Vista 4kV Substation RFS	884	0	0
10261	Advanced Technology	12,264	12,360	12,324
11247	Advanced Energy Storage	2,562	0	0
11261	Sewage Pump Station Rebuilds	2,228	1,616	0
12125	Sunnyside 69/12kv Rebuild	1,414	450	0
12266	Condition Based Maintenance Program	3,852	3,876	3,780
13242	Rebuild Kearny 69/12kV Substation	857	15,255	650
14243	Microgrid Systems for Reliability	5,628	5,796	5,676
93240	Distribution Circuit Reliability Construction	10,218	10,611	10,380
94241	Power Quality Program	140	187	233
99282	Replace Obsolete Substation Equipment	5,895	5,787	5,691

Totals	**81,848**	**102,934**	**74,427**

- **Description Of Individual Budgets Within The Reliability/ Improvements Category ($'s in Thousands)**

1. 203 – Distribution Substation Reliability

The forecasts for the Distribution Substation Reliability project for 2014, 2015, and 2016 are $1,526, $1,538, and $1,634, respectively.

a. Project Description

This project is for small changes to electrical distribution substation facilities. General project categories include:

Safety-related improvements;

Replacement of failed/obsolete equipment; and

Capital additions under $500,000.

The specific details regarding the Distribution Substation Reliability project are found in my capital workpapers. See SDG&E-09-CWP at section 00203 – Distribution Substation Reliability.

b. Forecast Method

This forecast is based on historical activities as well as specific detailed cost estimates for forecasted work. This budget covers primarily reactive activities, with some smaller proactive activities, as required. Failures are hard to predict, so the proactive work is balanced with the reactive, depending on the number of failures within a given year.

c. Supports Safety and Reliability Goals

This budget is required to maintain the reliability and integrity of distribution substations. The specific work required to meet safety requirements, replace obsolete or failed equipment, and make necessary small capital additions is based on requests from Engineering, Planning, Operations, and Maintenance groups. There are no alternatives to this budget, if safety requirements are to be met. Replacing obsolete or failed equipment promotes continued delivery of safe and reliable power to customers.

d. Cost Driver(s)

The primary cost driver is the need to replace obsolete or failed equipment.

2. 226 – Management of OH Distribution Service

The forecasts for the Management of OH (Overhead) Distribution project for 2014, 2015, and 2016 are $9,273, $9,273, and $9,273, respectively.

a. Project Description

This project is required to reinforce the electric overhead distribution system infrastructure by responsive action to system damages, deterioration and unsafe conditions outside normal restoration of service. The overall objective is to maintain continuity of safe and reliable customer service.

This project provides for the reconstruction of existing overhead distribution facilities as necessary to:

- Correct improper voltage conditions;
- Replace overloaded overhead facilities;
- Make emergency repairs not normally associated with restoration of service;
- Repair or replace deteriorated or unsafe equipment not found through the "Corrective Maintenance Program"; and
- Install fault indicators / fusing / switching equipment as necessary to maintain service reliability.

The specific details regarding the Management of OH Distribution Service project are found in my capital workpapers. See SDG&E-09-CWP at section 00226 – Management of OH Distribution Service.

b. Forecast Method

The forecast method used for the management of OH distribution services is a 5-year average, based on historical data. This is the most appropriate as work load can vary from year to year. For example, 2009 and 2011 were above the average, while 2010, 2012, and 2013 were below the average. Taking the 2-year average provides the lowest revenue request at $7,376 per forecast year. However, the slightly lower costs associated with the work completed on this budget in 2012 and 2013 do not represent trends. There has been no significant fundamental change in the business that has lowered the cost requirement to perform the work required in this budget, as voltage correction and emergency replacements are responsive in nature. The volume of work required in this area will continue to vary greatly, making the 5-year average the appropriate methodology.

c. Supports Safety and Reliability Goals

The purpose of this project is to fund ongoing expenditures for overhead equipment repairs and upgrades necessary to maintain continuity of safe and reliable electric service to customers.

d. Cost Driver(s)

The activities in this blanket budget are variable from year to year, and responsive in nature, so a 5-year average was used for the forecast. There are no expected incremental changes for this budget/project for this GRC forecast period.

3. 227 – Management of UG Distribution Service

The forecasts for the Management of UG Distribution Service project for 2014, 2015, and 2016 are $3,708, $3,708, and $3,708, respectively.

a. Project Description

This project is required to reinforce the electric underground distribution system infrastructure by responsive action to system damages, deterioration and unsafe conditions outside normal restoration of service. The overall objective is to maintain continuity of safe and reliable customer service. This project provides for the reconstruction of existing underground distribution facilities as necessary to:

- Correct improper voltage conditions;
- Replace overloaded overhead facilities;
- Make emergency repairs not normally associated with restoration of service;
- Repair or replace deteriorated or unsafe equipment not found through the "Corrective Maintenance Program"; and
- Install fault indicators / fusing / switching equipment as necessary to maintain service reliability.

The specific details regarding the Management of UG Distribution Service project are found in my capital workpapers. See SDG&E-09-CWP at section 00227 – UG Distribution Service.

b. Forecast Method

The forecast method used for the management of UG Distribution Service is a 5-year average, based on historical data. The 5-year average levels out the peaks and valleys in this blanket budget over a larger period of time and still provides for the necessary level of funding for the work that falls within this budget.

c. Supports Safety and Reliability

The purpose of this project is to fund ongoing expenditures for underground equipment repairs and upgrades necessary to maintain continuity of safe and reliable electric service to customers.

d. Cost Driver(s)

The activities in this blanket budget are variable from year to year and responsive in nature, so a 5-year average was used for the forecast. There are no expected incremental changes for this budget/project for this GRC forecast period.

4. 230 – Replacement of Underground Cable

The forecasts for the Replacement of Underground Cable project for 2014, 2015, and 2016 are $13,005, $13,339, and $13,049, respectively.

a. Project Description

This project is required to provide quality customer service and reliability to both new and existing customers by replacement of failed cable and proactive replacement of the underground cable system. There are presently about 90 circuit miles of unjacketed feeder cable and 1858 circuit miles of unjacketed lateral cable remaining on the SDG&E electric distribution system. The project will provide funding to replace some of this remaining unjacketed cable that has a high failure rate.

This project provides funding for the following items:

1. Replacement of underground cables that have failed;
2. Proactive replacement of underground cable that has been identified to have a high probability of failure based on the electric reliability circuit analysis or the cable failure data; and
3. The Enhanced Cable Strategy (ECS) project – replacement of underground branch cable.

The specific details regarding the Replacement of Underground Cable project are found in my capital workpapers. See SDG&E-09-CWP at section 00230 – Replacement of Underground Cable.

b. Forecast Method

Project requirements are determined primarily by reactive replacement of failed cable. Approximately 25% of this project is proactive replacements that are based on a study of past cable installations by type, year, and manufacturer. The estimate for the reactive cable replacement component of this budget is based on the forecasted number of cable failures each year and the historical unit costs of previous recent cable failures.

c. Supports Safety and Reliability Goals

Unjacketed cable has a high rate of failure. Replacing unjacketed cable with new jacketed cable has a direct improvement on distribution reliability.

d. Cost Driver(s)

Proactive replacement is based on the electric reliability circuit analysis or the cable failure data. The cable failure data has identified several poor cable vintages. There is a cross-functional team that identifies and prioritizes the replacement of these poor cable vintages.

5. 236 – Capital Restoration Service

The forecasts for the Capital Restoration Service project for 2014, 2015, and 2016 are $3,834, $3,834, and $3,834, respectively.

a. Project Description

This project is required to accomplish restoration of electric service due to system interruptions caused by severe inclement weather conditions, fires, equipment failures and damages caused by a third party. This project provides for the reconstruction of existing overhead and underground distribution facilities as necessary to restore electric service to customers. The funds within this budget cover all costs associated with the following factors:

- Storm Damage (for example: rain, wind, or fire);
- Damage to electric distribution facilities by others (for example: car, equipment, or other contacts); and
- Emergency repairs of facilities that are required for service restoration (for example: cable or equipment failures).

The specific details regarding the Capital Restoration Service project are found in my capital workpapers. See SDG&E-09-CWP at section 00236 – Capital Restoration Service.

b. Forecast Method

This forecast is based on the average expenditures from 2009-2013. This is the most appropriate methodology, as work load can vary from year to year, and is responsive in nature. The 5-year average levels out the peaks and valleys in this blanket budget over a larger snapshot of time, and provides the best forecast for work that is anticipated to take place within this budget.

c. Supports Safety and Reliability Goals

The purpose of this project is to fund responsive repairs to SDG&E distribution facilities as necessary to restore electric service to customers in a timely manner and in compliance with the CPUC General Orders.

The alternatives to full funding for this project include:

- Reduction or suspension of restoration efforts; and
- Delay in timely restoration of system interruptions.

The above alternatives will have an adverse effect on public safety, service reliability, customer satisfaction and repair costs.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to storm activity or extreme weather events.

6. 1269 - Rebuild Pt Loma Substation

The forecasts for the Rebuild Pt Loma Substation project for 2014, 2015, and 2016 are $234, $11,042, and $0, respectively.

a. Project Description

Point Loma Substation currently ranks in the Substation Equipment Assessment (SEA) Team's upper fifth percentile of poor performing substations, with outages being the result of 69 kV insulator and cable failures as well as 12 kV insulator, circuit breaker, and disconnect switch failures.

The substation's existing distribution bus configuration does not meet SDG&E's current substation reliability design standards, because there is only one (1) 12 kV bus tie circuit breaker for nine (9) 12 kV circuits, whereas today's design standards require a 12 kV bus tie circuit breaker for every four (4) 12 kV circuits. Additionally, distribution substation transformers are now standardized at 28 MVA to minimize customer outage exposure in the event of an adjacent transformer outage. Point Loma Bank 31 is a 50 MVA transformer which, in the event of a Bank 31 outage during peak loading conditions, risks overloading the remaining 28 MVA Bank 30. The 69/12kV Bank 31 is among the top worst performing transformers in the SDG&E fleet, having experienced multiple Load Tap Changer (LTC) motor drive control issues and subsequent unscheduled maintenance outages. The 69/12kV Bank 31 is the only remaining 69/12 kV, 50 MVA transformer in the SDG&E transformer fleet with no replacements available in the event of a Bank 31 failure. The 69/12 kV Bank 30 has been deemed to be in "Fair Condition"; and, in order to minimize project costs, it will be reutilized in the substation rebuild after being retrofitted with a highly reliable vacuum bottle LTC.

The 69 kV oil and gas circuit breakers will be replaced to eliminate reliability and maintenance costs associated with aging infrastructure. The control shelter will require relocation and updating to accommodate the 12 kV yard rebuild, an ultimate of four 69/12 kV, 28 MVA transformers, and required substation security systems. The scope of work for this project also includes the slope stabilization work that is necessary for an adjacent hillside.
The 12kV distribution system serving the Point Loma area is currently limited in its operating flexibility due to the current configuration of Point Loma Substation. Since Point Loma Substation is limited to 60MVA, this limits the available tie capacity between neighboring substations: Cabrillo, Kettner and Pacific Beach. Two substations (Kettner and Pacific Beach) are currently and will be loaded to over 90% of their maximum rating of 60MVA. A loss of one or more of their 12kV banks would result in customer load loss, due to lack of available transfer capacity at Point Loma Substation. This transfer capacity is further decreasing as the loading at Point Loma Substation increases. Point Loma has been offloaded to these two substations to reduce loading at Point Loma, to keep it below 60MVA. Currently, the loss of one bank at any of these substations will result in the loss of customer load until a portable transformer is set (approximately 12 hours).

The new expanded 12kV yard at Point Loma will enable a third transformer (ultimate four transformers) to be added, thereby reducing the high loading of the existing 60MW capacity and reducing the area's substation tie deficiency. This additional capacity at Point Loma Substation will improve reliability by allowing load to be moved back to Point Loma and providing tie capacity to the adjacent Kettner and Pacific Beach substations. This improved reliability will come from building the new 12kV at Point Loma to current substation and reliability standards, which will include adding extra 12kV bus ties and additional circuit positions.

The specific details regarding the Rebuild Point Loma Substation project are found in my capital workpapers. See SDG&E-09-CWP at section 01269 – Rebuild Pt Loma Substation.

b. Forecast Method

The forecast is based on detailed cost estimates, which were developed based on the specific scope of work for this project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability Goals

The Point Loma Substation was originally built over 60 years ago and currently ranks in the SEA Team's upper fifth percentile of poor performing substations with outages. The existing substation does not allow room for expansion and its current configuration does not meet today's reliability standards. A rebuild of Point Loma Substation will result in improved reliability and capacity for both Distribution and Transmission. The project will also mitigate slope stability issues at the site.

d. Cost Driver(s)

This is a specific capital project to address reliability issues. The forecast is based on a detailed cost estimate for the specific scope of work.

7. 6254 - Emergency Transformer & Switchgear

The forecasts for the Emergency Transformer & Switchgear project for 2014, 2015, and 2016 are $482, $482, and $482, respectively.

a. Project Description

This project supports the restoration of service to our distribution customers following outages caused by equipment failure, by purchasing additional emergency spare and mobile equipment. The number of aging transformers on the SDG&E system is at the level where additional failures are expected, despite our efforts to replace the transformers before failure. Lead times for replacement units continue to be extended out further every year. This project will provide two additional 69/12kV transformers for this purpose. Our existing non-LTC mobile transformers are frequently utilized for routine maintenance and construction activities due to the high loading of our substations.

This project will provide an additional 69/12kV mobile transformer with an LTC to allow the rapid restoration of service. SDG&E currently does not have any mobile 12kV regulators or a section of 12kV switchgear. This project will correct that issue, with the purchase of both of those items. A failure inside any existing metal clad switchgear could result in a lengthy outage. All of this mobile equipment is usually connected using portable 69kV and 12kV cables. This project will also provide a cable dolly to store these cables for rapid transport to the site where they are needed.

Two 69/12kV transformers will be purchased, delivered and installed on a concrete pad at locations to be determined. One 69/12kV mobile transformer with a Load Tap Changer (LTC) will be purchased and stored at Miramar with the other mobile equipment. One 12kV mobile regulator will be purchased and stored at Miramar. One quarter section of 12kV switchgear mounted on a skid to allow it to be transported on a flatbed trailer will be purchased and stored at Miramar. One trailer mounted cable dolly will be purchased and stored at Kearny. Six 12kV tertiary reactors, six 69kV breakers, eight 138kV breakers, four 230kV breakers and three 500kV reactors will also be purchased.

The specific details regarding the Emergency Transformer & Switchgear project are found in my capital workpapers. See SDG&E-09-CWP at section 06254 – Emergency Transformer & Switchgear.

b. Forecast Method

The forecast methodology is based on detailed cost estimates that are developed based on the specific scope of work for the project. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. This forecast is based on the expected material procurement costs for the substation equipment described in the project description.

c. Supports Safety and Reliability

The purchase of this additional equipment is required to allow rapid restoration of service following an outage caused by equipment failures, increasing reliability. It is driven by the size of the SDG&E distribution system and the age of the SDG&E distribution substation equipment in service. There are no alternatives other than not purchasing this equipment.

d. Cost Driver(s)

This project is to procure materials that allows for the quick restoration of distribution customers due to potential substation equipment failures. The forecast is based on detailed cost estimates for the material procurement.

8. 6260 – Remove 4kV Substations from Service

The forecasts for the Remove 4kV Substations from Service project for 2014, 2015, and 2016 are $3,096, $3,032, and $2,965, respectively.

a. Project Description

This blanket budget provides funding for distribution work to support the removal of 4kV substations. The 4kV system is a legacy system at SDG&E. Retaining 4kV substations would exacerbate any existing safety, operation and maintenance issues. Half of the substations are over 50 years old, and replacement parts for those substations are no longer available. The operation of 4kV substations is of a major safety concern because the company is facing a shortage of qualified crews and electricians who are familiar and knowledgeable of design and operation of those aging and obsolete substations. The maintenance cost is unusually high and continues to increase. The 4kV substations are also reliability risks for the customers because high failure rates and lack of replacement parts would cause more frequent and unnecessary extended outages. This project will support construction activities on the distribution system that prepare for the removal of 4kV substations. The activities are associated with converting 4kV circuits to 12kV circuits, replacing 4kV-substation sources with 12/4kV step-downs, and removing de-energized distribution facilities. Construction will include but is not limited to changing poles, cross-arms, and insulation for 12kV, replacing secondary transformers from 4kV high side to 12kV high side, installing switches, and removing de-energized distribution facilities. The Reliability Assessment Team has identified the condition of thirty-six 4kV substations remaining in the system. Together they serve ninety 4kV circuits, 58,000 customers and 100MW of load. Twenty-two substations are 40 years or older. Certain equipment inside the substations such as transformers and breakers are obsolete, and replacement parts are no longer available. This project is required to support the removal of 4kV substations, to rectify safety issues associated with the operation of those substations, and to improve reliability to the customers.

The specific details regarding the Remove 4kV Substations from Service project are found in my capital workpapers. See SDG&E-09-CWP at section 06260 – Remove 4kV Substations from Service.

b. Forecast Method

This project is forecasted utilizing historical unit costs for similar projects. The historical unit cost was multiplied by the 22 substations that were prioritized for replacement, as described above.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support general safety and reliability at SDG&E by removing aging and obsolete 4kV substations.

d. Cost Driver(s)

The maintenance cost for this ageing infrastructure is high and continues to increase with time.

9. 8162 - Substation Security Installations

The forecasts for the Substation Security Installations project for 2014, 2015, and 2016 are $834, $834, and $834, respectively.

a. Project Description

This project installs new and/or upgrades existing security systems at fifty-nine substations to comply with North American Electric Reliability Criteria (NERC)/Critical Infrastructure Protection (CIP) Guidelines to protect Critical Infrastructure Facilities, which reduces or deters vandalism that could result in system outages or personal injury. Installing new, upgrading existing or replacing older/outdated security systems creates a uniform and consistent approach to managing security issues and incidents, by centralizing all intrusion and detection endpoints into a single security software suite. This project also reduces response time by security analysts, provides for clear, concise video surveillance and more accurate intrusion detection (substantial reduction in false alarms). It also provides for a consistent expandable security system that can expand with increased compliance requirements while reducing lifecycle total cost of ownership (TCO) and uses standardized hardware and software at all sites. This effort also installs access control (Card Readers) at control house locations, in accordance with NERC/CIP Compliance. Security systems will also now be installed at all 230kV cable poles.

The intrusion alarming, monitoring and video surveillance systems equipment will include: yard and control house video cameras, nighttime video illuminators, access control door card readers, perimeter microwave intrusion detection (replaces intrepid), audible alarms (inside and outside of control house). The list of substations below is subject to change. Some substations will require a new control shelter to be built to provide room for the equipment. These control shelters were already planned as part of other future projects so they will be removed from the scope of those projects. Security systems will also now be installed at all 230kV cable locations, including current locations in Alpine, South Bay, and San Diego.

The specific details regarding the Substation Security Installations project are found in my capital workpapers. See SDG&E-09-CWP at section 08162 – Substation Security Installations.

b. Forecast Method

The forecast methodology is based on the 2013 expenditures for substation security installations. Based on recent events in the industry and the increase in the regulations related to substation and critical infrastructure security, SDG&E expects spending in this area to continue at the same level as 2013.

c. Supports Safety and Reliability Goals

This project supports overall safety by reducing or deterring vandalism that could result in system outages or personal injury.

Copper thefts have continued at various substations. This creates a safety hazard for employees working in substations, increases fault and outage potential in addition to possible injury of the perpetrator. For example, if the substation ground grid has been ripped out, it is a safety hazard for our employees until we replace it. These security systems should reduce and/or deter this activity in addition to recording any activity that occurs.

d. Cost Driver(s)

The underlying cost drivers for this capital project relate to increased compliance requirements around critical infrastructure security and the increased need for security due to copper theft and sabotage.

10. 8261 - Vista 4KV Substation RFS

The forecasts for the Vista 4KV Substation RFS project for 2014, 2015, and 2016 are $884, $0, and $0, respectively.

a. Project Description

The purpose of this project is to remove the Vista 4 kV substation from service due to aging infrastructure and replace it with two 12/4 kV step-down transformers. This job also reduces loading on the four existing Vista 4 kV circuits, by splitting them into six 4 kV circuits. The removal of this substation is part of SDG&E's plan to phase out aging 4 kV substations. This substation is 60 years old and is at the end of its useful life, according to the analysis by Kearny substation maintenance. The substation needs to be removed from service and load transferred over to 12/4 kV step-down transformers, to mitigate risks of service interruption caused by aging infrastructure.

The specific details regarding the Vista 4KV Substation RFS project are found in my capital workpapers. See SDG&E-09-CWP at section 08261 – Vista 4KV Substation RFS.

b. Forecast Method

The forecast methodology is based on detailed cost estimates that are developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability

These forecasted capital expenditures support the goals of safety and reliability by removing the Vista 4kV substation from service due to aging infrastructure and replacing it with two 12/4 kV step-down transformers. The removal of this substation is part of SDG&E's plan to phase out 4kV obsolete substations.

d. Cost Driver(s)

The underlying cost driver for this capital project is to provide funding to replace aging infrastructure to improve reliability, safety and customer satisfaction.

11. 10261 – Advanced Technology

The forecast for the Advanced Technology project for 2014, 2015, and 2016 are $12,264, $12,360, and $12,324, respectively.

a. Project Description

This project portfolio's focus is on reliable grid management. SDG&E needs to manage the grid to maintain compliance with Rule 2 standards of service while customers increasingly adopt new technologies to meet their own needs that require connection to the grid. Customer's photovoltaic systems, electric vehicle (EV) charging facilities, and other choices are introducing a new complexity into grid operations. To reliably manage the grid, SDG&E needs grid sensing and situational awareness technologies and grid management tools.

This reliability-based portfolio includes projects that improve SDG&E's information and control capabilities for distribution systems. These capabilities may be used to address the complexities associated with integrating distributed energy resources and electric vehicles, advanced outage management, and/or Volt/VAr control. These projects will provide the ability to safely and reliably incorporate high penetrations of distributed energy resources by mitigating voltage fluctuations resulting from intermittent power generation. They will also provide the ability to safely and reliably incorporate the increasing load of charging EVs. The incremental customer load from EV charging is expected to be clustered in specific distribution circuits of the power grid that are not currently designed to manage high levels of EV penetration, especially if significant charging activity takes place during periods of higher demand. This project portfolio will detect and isolate faults when they occur, immediately restore service to as many customers as possible, and provide information about outages in real-time. Self-healing circuits will reduce the number of customers affected by sustained system disturbances and will enable faster service restoration. Some projects will also provide optimization of voltage and reactive power on the system to enhance power quality and decrease energy consumption, including system losses. There is also an overlap between sensing and managing grid conditions. As customers continue to install large quantities of distributed energy resources, the complexity of grid operations also increases, as there are more sensors and more control systems being put in place to adequately integrate edge devices, and maintain quality service to customers. Sensors such as Phasor Measurement Units (PMUs) will be installed in SCADA capacitors and other line switches that SDG&E utilizes to manage the conditions on the grid in a reliable manner. Other sensing systems, such as potential and current transformers, are standalone measurement devices; however, the information provided is utilized by systems such as SDG&E's Outage Management

System/Distribution Management System (OMS/DMS) in its Distribution Operations Center, to meet SDG&E's mission of providing reliable service to customers.

A safe, reliable system helps enable electricity markets to flourish and helps deliver a grid that has the infrastructure and policies necessary to enable and support the integration of demand response, energy efficiency, distributed generation, and energy storage into energy markets.

Specific technologies to be provided by this project are listed below.

Advanced Technology – Grid Awareness

Phasor Measurement Units (PMUs)

Wireless Fault Indicators (WFIs)

Advanced Ground Fault Detection

SCADA Capacitors

Unmanned Aerial Vehicles (UAVs)

Weather Modeling

Advanced Technology – Grid Management Advanced SCADA

Advanced Energy Storage

Advanced SCADA

Dynamic Voltage Control

Photovoltaic Power Prediction

Volt/VAR Management

The specific details regarding Advanced Technology are found in my capital workpapers. See SDG&E-09-CWP at section 10261 – Advanced Technology.

b. Forecast Method

The forecast method used for Advanced Technology is zero-based in nature. The forecast is based on individual cost estimates for each project/activity within the overall Advanced Technology portfolio. In some cases, actual/historical costs were used to come up with cost estimates. For example, SDG&E has installed fault indicators on the overhead electric system, so historical cost information could be used to generate the forecast. In some cases, new technologies are being applied that have not been installed on the electric system before. An example of this is the Intelligent Power Regulator, which is a device used to mitigate negative impacts on the electric system due to residential PV. The device is a pad-mounted transformer with built-in power electronics. For cases like this, the forecast is based on cost estimates and/or quotations from the equipment manufacturer. To the extent possible, historical information was used to create reasonable forecasts.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal(s) of enhancing system reliability. With the influx of rooftop PV systems and EVs, it is even more important to utilize the latest and greatest equipment to mitigate intermittency and any other imbalances or harmonics issues caused by those systems. PV and EVs can have an impact on distribution reliability if overloads on equipment occur, if equipment life is reduced due to intermittency, and if distribution equipment locations (like capacitors) need to be moved due to the changes in the load profile for the circuit.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project is the need to utilize advanced technology not only to enhance reliability, but to maintain reliability.

12. 11247 - Advanced Energy Storage

The forecasts for the Advanced Energy Storage project for 2014, 2015, and 2016 are $2,562, $0, and $0, respectively.

a. Project Description

The purpose of this project is to mitigate intermittency and operational problems from renewable energy sources, by installing energy storage on distribution circuits that have a high concentration of photovoltaic (PV) systems. Additionally, energy storage has potential to provide benefits such as peak shaving and reactive power support. This project supports the installation of energy storage in the form of electric batteries on the electric distribution system. Advanced energy storage devices will minimize impacts of intermittency and operational problems associated with the variable output of renewable energy resources. The solution will place distributed energy storage system on circuits with a high penetration of customer photovoltaic systems or other distributed energy resources. The specific details regarding the Advanced Energy Storage project are found in my capital workpapers. See SDG&E-09-CWP at section 11247 – Advanced Energy Storage.

b. Forecast Method

The forecast is based on manufacturer contract quotes for the procurement and installation of energy storage.

c. Supports Reliability Goal

These forecasted capital expenditures support the goals maintaining adequate reliability levels by reducing the impacts of intermittency and associated operational problems such as voltage surge and sag.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to the growing penetration of PV on the electric distribution system.

13. 11261 - Sewage Pump Station Rebuilds

The forecasts for Sewage Pump Station Rebuilds for 2014, 2015, and 2016 are $2,228, $1,616, and $0, respectively. SDG&E plans to build and place in service Sewage Pump Station Rebuilds by the Test Year.

a. Project Description

The projects are rebuilds based on aging infrastructure and reliability of critical substations. The three stations that are being rebuilt pump all the sewage generated in the city and a large portion of the sewage generated in the county out to be treated before it is pumped into the Pacific Ocean. All three stations need upgrades to the breakers and transformers, as the electrical equipment has reached the end of its life. The seismic performance will be evaluated and upgraded if needed.

Point Loma Sewage (PLS) Substation

Point Loma Wastewater Treatment Plant (PLWTP) requires significant amount of repairs in order to salvage some of the existing structures. Every bolt on the steel needs to be replaced due to corrosion, and all insulators show signs of corrosion. Equipment grounds have separated due to corrosion. Transformer fans are falling off due to corrosion suffered by the 57-year-old bank. All fuses and disconnect are corroded. Structural steel is corroded and needs replacement. The breaker is an obsolete oil type that is also corroded. The transformer has reached the end of it useful life and needs to be replaced.

In short, PLS is in desperate needs of a rebuild. In order to repair the structural steel on the same location would require outages longer then PLWTP is able to withstand. The facility can support itself with cogeneration, but it is not preferred by the PLWTP. PLWTP indicated that is hesitant to let an outage go on for more than three days. Repairing the existing facility in place would require a long outage or daily outages. Due to this constructability constraint, repairing the existing structural steel is not recommended. The labor cost would be extremely high and new construction would take less time, less outages would be required, and would assess whether the substation meets the latest seismic design criteria. The PLS Substation is different than the Point Loma Substation discussed in the testimony for the 1269 – Rebuild Pt. Loma Substation project.

<u>Sewage Pump Station 2</u>

This aging equipment needs replacement. The structure does not meet current seismic criteria. Repairing the existing structure is not logistically possible, in order to keep the station energized. The switchgear does not have spare parts, and the repairs needed are extensive. The equipment is located on a small land lot, which also adds to the challenges of repairing it. The configuration of the equipment makes it extremely difficult to repair, as the city will not allow long outages during their wet season (September through March).

<u>Sewage Pump Station 1</u>

The aging equipment needs replacement. The structure does not meet current seismic criteria. Repairing the existing structure is not logistically possible, in order to keep the station energized.

The specific details regarding Sewage Pump Station Rebuilds are found in my capital workpapers. See SDG&E-09-CWP at section 11261 – Sewage Pump Station Rebuilds.

b. Forecast Method

The forecast method used for Sewage Pump Station Rebuilds is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project-specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability

These forecasted capital expenditures support the goal of enhancing safety and reliability by replacing critical aging infrastructure.

d. Cost Driver(s)

The underlying cost driver is the need to replace aging infrastructure that supports the service provided to the sewage pump stations described above.

14. 12125 - Sunnyside 69/12KV Rebuild

The forecasts for the Sunnyside 69/12KV Rebuild project for 2014, 2015, and 2016 are $1,414, $450, and $0, respectively.

a. Project Description

The existing Sunnyside Substation is currently a non-standard design fed by a radial 69kV tap off of a three-terminal transmission line. The tap that feeds the station causes reliability issues on the 69kV transmission system, which also causes our customers to suffer distribution outages if this tapped line ever goes out of service. Sunnyside is limited to 12.5MVA of capacity and cannot be expanded in its current configuration. The substation has no control shelter, no SCADA, no security, and low substation reliability due to lack of bus ties and breakers. The existing transmission system surrounding the substation consists of underground 69kV cable, which is then carried overhead by two cable poles and one switched tap pole. The County of San Diego has also requested that SDG&E complete an underground conversion and removal of these poles in the near future, because of the unsightly aesthetics of the current substation configuration. The ultimate configuration of Sunnyside Substation after it is rebuilt will consist of a new 69kV bus, three 69kV TL breakers, two 69kV bank breakers, new control shelter, two ¼ sections of 12kV switchgear, two 30MVA 69/12kV transformers, one new 12kV capacitor bank, new relaying, SCADA, and undergrounded 69kV transmission system around the substation.

The specific details regarding the Sunnyside 69/12KV Rebuild project are found in my capital workpapers. See SDG&E-09-CWP at section 12125 – Sunnyside 69/12KV Rebuild.

b. Forecast Method

The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

Sunnyside Substation was originally built in 1953 and expanded in 1972. The existing substation does not allow room for expansion and its current configuration (radially fed tapped TL without a 12kV BT breaker) does not meet today's reliability standards. San Diego County's requested conversion cannot be completed with the current substation configuration. A rebuild of Sunnyside Substation will result in improved reliability and capacity for the distribution and transmission systems.

d. Cost Driver(s)

The underlying cost driver for this capital project is the need to enhance the reliability of Sunnyside Substation and the overall quality of service to customers fed by that substation.

15. 12266 - Condition Based Maintenance Program

The forecasts for the Condition Based Maintenance Program for 2014, 2015, and 2016 are $3,852, $3,876, and $3,780, respectively.

a. Project Description

This project implements advanced technologies to monitor the health of critical distribution substation assets. It installs condition-based maintenance (CBM) Monitoring equipment on distribution facilities in SDG&E substations. The CBM project originated in 2009 and is ongoing, with a 7-year roll-out schedule (2009-2015). The project benefits are centered around better understanding of the health of assets so that power maintenance activities are identified and performed as needed to achieve greater asset utilizations and longevity of use. Additionally, the CBM project has dependency from the OMS/DMS system, which will use portions of the real-time asset information generated by the CBM system to dynamically rate substation transformer load capacity. This will provide operational benefits aligned with the Smart Grid Deployment plan.

The specific details regarding the Condition Based Maintenance-Smart Grid project are found in my capital workpapers. See SDG&E-09-CWP at section 12266 – Condition Based Maintenance Program.

b. Forecast Method

This labor forecast is based upon SDG&E's project-specific estimate of the distribution costs. Projected labor expenditures are estimated based on the detailed work scope, and are compared to actual expenditures for similar historical work. This non-labor forecast is based upon SDG&E's project-specific estimate of the distribution costs. Projected non-labor expenditures are based on the detailed scope of work, quotations from equipment manufacturers, quotations from contracted resources, and historical expenditures for similar work.

c. Supports Safety and Reliability

These forecasted capital expenditures support the goal(s) of safety and reliability by implementing CBM monitoring. SDG&E will have better visibility into potential issues with major equipment before failures occur, and will be able to more effectively operate and manage the electric network.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project is the need to install advanced monitoring equipment on substation equipment, to enhance safety and reliability.

16. 13242 - Rebuild Kearny 69/12KV Substation

The forecasts for the Rebuild Kearny 69/12KV Substation project for 2014, 2015, and 2016 are $857, $15,255, and $650, respectively.

a. Project Description

Kearny Substation, built in 1968, ranks in the top percentile of the SEA team's poor performing substations. It currently feeds the San Diego County Emergency Operation Center and in early 2016 will feed the new Kaiser Hospital proposed to be built approximately ½ mile from Kearny substation. Approximately 4MWs of load from this hospital will be served by this substation. In 2016, Kearny will be at 93% capacity, and this load addition will drive the need for a 4th bank addition. Due to the current configuration of the substation, the substation will have to expand in order to add this fourth bank and associated 12kV equipment. This expansion will require the substation to be relocated (to a new site in the Kearny facility), because its current site cannot be expanded to accommodate all issues that need to be addressed, including:

- Replacement of the 69kV cap & pin glass;
- Replacement of the 12kV cap & pin glass;
- Replacement of the 39-year-old 12kV switchgear;

- Replacement of the 39-year-old bus tie cable;
- Replacement of six transmission oil breakers;
- Replacement of eight distribution oil breakers;
- Replacement and upgrades of 12kV capacitors and elimination of them off 12kV bus fused disconnects; and
- Installation of two additional 12kV bus ties.

The Kearny Substation rebuild will relocate the existing installation to a larger and more suitable location to accommodate expansion. The relocation will be on existing Kearny facility property zoned for utility use and therefore would not be subject to any permits. It will be rebuilt on the site once utilized by transformer oil tanks, in the southwest corner of the Kearny facility. This site will allow space for all required expansion to meet existing and projected electric distribution load growth, and the ultimate arrangement will allow for feeds to proposed generator and battery storage areas. It is anticipated that the rebuild will significantly improve the reliability of Kearny Substation.

The ultimate arrangement of the substation will consist of five 69kV bays consisting of five 69 kV TL breakers, one 69kV bus tie breaker, four 69 kV bank breakers, one 69kV ground bank and breaker, four 30 MVA 69/12 kV standard profile transformers, open 12kV rack with 16 circuits ultimate, four 12 kV capacitors, one new control shelter, new relaying, SCADA, five 69 kV transmission lines, and sixteen distribution circuits.

The specific details regarding the Rebuild Kearny 69/12KV Substation project are found in my capital workpapers. See SDG&E-09-CWP at section 13242 – Rebuild Kearny 69/12KV Substation.

b. Forecast Method

The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability

This project supports the goals of safety and reliability by replacing aging infrastructure with a history of equipment failure.

d. Cost Driver(s)

The underlying cost drivers for this capital project relate to the purchase of additional equipment required to allow rapid restoration of service following an outage caused by equipment failures. It is driven by the size of the SDG&E distribution system and the age of the SDG&E distribution substation equipment in service.

17. 14243 – Microgrid Systems for Reliability

The forecasts for the Microgrid Systems for Reliability project for 2014, 2015, and 2016 are $5,628, $5,796, and $5,676, respectively.

a. Project Description

Microgrid projects allow pockets of the distribution system to isolate from the rest of the system when a disturbance or contingency situation occurs and to utilize localized generation resources to keep that pocket in service until the problem with the distribution system can be resolved. The project goals are as follows:

- Enhancing emergency readiness;
- Increasing operational flexibility;
- Decreasing outage response time;
- Decreasing interruptions;
- Increasing grid resiliency;
- Demonstrating new microgrid technologies; and
- Increasing microgrid load capacity.

The specific details regarding the Microgrid Enhancements for Reliability project are found in my capital workpapers. See SDG&E-09-CWP at section 14243 – Microgrid Systems for Reliability.

This program may include future microgrid projects as well as enhancements to existing micro grids such as the Borrego Springs Microgrid (Borrego Springs Microgrid 2.0 project). The residents of Borrego Springs are radially fed by a single transmission line from Narrows to Borrego Springs Substation. Inherent to this current configuration, frequent outages that impact 100% of the residents have occurred. This project allows for better utilization of the Borrego

Springs Microgrid in responding to a variety of outage situations. By leveraging various new technologies and resources, as well as adding, hardening, and reconfiguring key infrastructure, the newly enhanced Microgrid will become more flexible and automated for increased Microgrid capabilities. The Borrego Springs Microgrid has been utilized to pick up critical load during major contingency situations, but enhancements are necessary to expand that service and provide safe and reliable power to the Borrego community.

The Borrego Springs Microgrid 2.0 project consists of two phases. Phase 1 of the project involves near-term solutions to operationalizing the Microgrid, specifically allowing EDO to operate the Microgrid as an asset and the resolution of the Noise Ordinance compliance. Phase 2 of the project involves increasing the operational flexibility and capability of the current Microgrid. This will include hardening key distribution infrastructure, installing additional SCADA devices, and installing upgrades to the protection schemes.

For the past 5 years, the 3 distribution circuits that serve Borrego Springs have ranked in the top 10 worst circuits in SDG&E's service territory, in terms of reliability. There are service restoration challenges, because Borrego Substation is radially fed by a single transmission line, and location of the community it serves is remote, and isolated. Borrego Springs has proven through the Borrego Springs Microgrid Demonstration (BSMD) Project that a microgrid can be an effective solution to mitigating long term outage situations. However, when the BSMD project was constructed to perform specific demonstrations, the microgrid was originally configured to be used in conjunction with only one circuit. In its current configuration, many challenges have been encountered while trying to utilize the Microgrid for energizing the critical loads of Borrego.

The specific details regarding the Borrego Springs Microgrid Enhancements project are found in my capital workpapers. See SDG&E-09-CWP at section 14243 – Microgrid Systems for Reliability.

b. Forecast Method

This forecast is based upon SDG&E's project-specific estimate of the distribution costs. Projected labor expenditures are estimated based on the detailed work scope and are compared to actual expenditures for similar historical work. Projected non-labor expenditures are based on the detailed scope of work, based on quotations from equipment manufacturers, quotations from contracted resources, and based on historical expenditures for similar work.

c. Supports Reliability

These forecasted capital expenditures support the goal of enhancing system reliability. This project allows for better utilization of Microgrid Technologies in responding to a variety of outage situations. By leveraging various new technologies and resources, as well as adding, hardening, and reconfiguring key infrastructure, Microgrids will become more flexible and automated for increased Microgrid capabilities. For example, the Borrego Springs Microgrid has been utilized to pick up critical load during major contingency situations, but enhancements are necessary to expand that service and continue providing the Borrego community with safe and reliable power.

d. Cost Driver(s)

The underlying cost driver for this capital project relate to the need to provide reliable service, especially in remote areas of San Diego County.

18. 93240– Distribution Circuit Reliability Construction

The forecasts for the Distribution Circuit Reliability Construction project for 2014, 2015, and 2016 are $10,218, $10,611, and $10,380, respectively.

a. Project Description

This project provides funds for the addition of equipment necessary to improve service reliability of electric customers and maintain corporate reliability standards. This budget supports construction of projects that include installation of fuses, OH and UG manual switches, SCADA service restorers, SCADA switches, overhead fault indicators, overhead line extensions and circuit reconductoring for improving electric system reliability. The electric service reliability will deteriorate in the absence of comprehensive remedial solutions offered by these projects; also, electric reliability performance is negatively impacted by system deficiencies and aging infrastructure.

The specific details regarding the Distribution Circuit Reliability Construction project are found in my capital workpapers. See SDG&E-09-CWP at section 93240 – Distribution Circuit Reliability Construction.

b. Forecast Method

This project forecast is based on a 5-year average, with incremental adjustments made to account for changes in construction standards in backcountry areas, as well as the installation of pulse reclosers, additional SCADA devices, and new fuse devices, all aimed at enhancing reliability and reducing risk.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal(s) of the SCADA initiative program or SCADA 1.5 per each 12kV circuit. SCADA 1.5 refers to having a mid-point SCADA switch as well as a SCADA tie switch. This will provide faster isolation of faulted electric distribution circuits (feeders & branches), resulting in faster load restoration when system disturbances occur. Furthermore, preventing equipment deterioration will promote SDG&E's ability to meet reliability expectations of electric customers and the attainment of PBR reliability goals.

d**.** Cost Driver(s)

This budget funds projects that mitigate existing electric system deficiencies and projects for system performance improvements as follows: General Reliability, SCADA Initiative and Community Fire Safety Program (CFSP).

19. 94241 – Power Quality Program

The forecasts for the Power Quality Program for 2014, 2015, and 2016 are $140, $187, and $233, respectively.

a. Project Description

This project provides for new deployment, maintenance, operations, and communications infrastructure, for the substation power quality monitoring system (PQNode). This system of advanced high-resolution monitors yields distribution system health information on system parameters including RMS voltage levels, voltage and current transient events, system harmonics (including spectra), real and reactive power flow, power factor, flicker, and others. As the system is migrated to network connections, real-time monitoring will provide system alert notifications for pre-established conditions in addition to the historical data recorded. The PQ Program provides SDG&E with critical data to better understand and operate the electrical system and to improve customer service. The information obtained will allow SDG&E to better understand the impact of the growing number of distributed energy resources (DER) on the electric distribution system. The project installs revenue certified and power quality certified monitors on 12KV buses and select field locations, provides for maintenance of the existing monitor network, maintains back-office software and hardware, and allows for system training.

Information from monitoring has proven integral to identifying many problems and developing solutions to issues on the electrical system.

The specific details regarding the Power Quality Program are found in my capital workpapers. See SDG&E-09-CWP at section 94241 – Power Quality Program.

b. Forecast Method

The forecast for the Power Quality Program is zero based. The forecast is based upon the number of proposed equipment installations and the historical unit costs of similar installations.

c. Supports Reliability Goal

These forecasted capital expenditures support the goal of providing reliable and high quality service to customers.

d. Cost Driver(s)

The primary cost driver is the need to provide high quality electric service to customers. The activities in this budget provide additional visibility into the quality of service provided at a circuit level. Customer-related impacts are mitigated by installation of power quality equipment.

20. 99282 - Replace Obsolete Substation Equipment

The forecasts for the Replace Obsolete Substation Equipment project for 2014, 2015, and 2016 are $5,055, $4,947, and $4,851, respectively.

a. Project Description

This project will improve safety and reliability related to the replacement of obsolete and problematic substation equipment. This project will focus primarily on distribution substation bank transformers and circuit breaker replacements. The Substation Equipment Assessment Team will develop alternatives to replace or remove obsolete and problematic equipment. A condition assessment process and evaluation criteria have been created using probability and risk analysis, financial impacts and present value analysis to justify projects. Equipment that is truly obsolete, such as equipment that cannot be maintained (no spare parts available) or poses a safety risk will be replaced. Each year the average age of all substation equipment increases, with the oldest transformer currently 80+ years old. The ranking of substation equipment is an ongoing process and involves identifying equipment that presents a significant risk to the system. Based on the cost and availability of raw materials from the manufacturer and global demand, lead times for major substation equipment has increased to six months for breakers and to approximately one year for transformers.

Substations are essential to the operation of the electric system and must be kept in reliable condition. The sum of all distribution substations contain a total of approximately 300 transformers with an average age of approximately 13 years and 1500 circuit breakers, with an average age of 26 years. The estimated cost of replacing 3% or 9 bank transformers and 5% or 75 distribution circuit breakers is $26M which will provide a sufficient rate of funding to replace the highest priority obsolete and problematic equipment. A cost-benefit analysis will be conducted on a project-by-project basis. Proactive planning is required for the replacement of equipment that has exhausted its useful life.

Due to safety and reliability concerns, there are no alternatives to obsolete equipment projects. However, alternative repair options are evaluated if they are proven to be a cost effective solution and can reasonably extend the life or reduce the risk of failure of the equipment. Each project is evaluated on a case-by case basis. The primary difference between the 99282 budget and the 203 budget is that the 99282 budget covers work that is proactive in nature, whereas the 203 budget primarily covers reactive work.

The specific details regarding the Replace Obsolete Substation Equipment project are found in my capital workpapers. See SDG&E-09-CWP at section 99282 – Replace Obsolete Substation Equipment.

b. Forecast Method

The forecast is based on a 5-year average, with minor adjustments made based on the forecasted amount of work.

c. Supports Safety and Reliability Goals

This project will improve safety and reliability related to the replacement of obsolete and problematic substation equipment.

d. Cost Driver(s)

The primary driver is the need to replace obsolete equipment or to add new equipment to enhance substation reliability.

I. SAFETY AND RISK MANAGEMENT

➢ **Table 11 - Summary of Safety and Risk Management Budgets ($'s in Thousands)**

I. SAFETY AND RISK MANAGEMENT		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
6247	Replacement Of Live-Front Equipment	843	843	843
11243	SDG&E Weather Instrumentation Install	285	0	0
12256	Powerworkz	468	0	0
12265	C1215- Fire Risk Mitigation Project	186	0	0
13247	Fire Risk Mitigation (FiRM) - Phases 1 and 2	13,056	12,780	12,496
13255	C441-Pole Loading Study/Fire Risk Mitigation	186	0	0
13266	Distribution Aerial Marking and Lighting	140	140	140
13282	Future CNF Blanket Budget	0	2,598	7,106
14247	Fire Risk Mitigation (FiRM) - Phase 3	11,045	24,323	44,950
14249	SF6 Switch Replacement	0	0	9,888
Totals		**26,209**	**40,684**	**75,423**

➢ **Description Of Individual Budgets Within The Safety & Risk Management Category ($'s in Thousands)**

1. 6247 - Replacement of Live-Front Equipment

The forecasts for Replacement of Live-Front Equipment for 2014, 2015, and 2016 are $843, $843, and $843, respectively. This is an ongoing project that is expected to continue through the Test Year.

a. Project Description

The purpose of this project is to replace live-front pad-mounted distribution equipment with dead-front pad-mounted distribution equipment, when it is encountered during normal SDG&E work. Live-front equipment is electric components enclosed in a protective (usually steel) cabinet that does not have additional protective barriers; live electric connections are exposed when live-front equipment cabinets are opened, an action that is supposed to only be performed by qualified electric personnel. Live-front equipment was primarily installed on SDG&E's electric distribution system during the 1960's and 1970's and has since become obsolete, being replaced by 'dead-front' equipment that has additional safety barriers such as removable fiberglass or composite plates, protective covers or additional compartmentalization. This project will improve operational flexibility, reliability, and safety for SDG&E field personnel, as well as the public.

The primary objectives of this project are to promote public and employee safety, operational flexibility, and the reliability of the SDG&E electric distribution system. SDG&E has been working with live-front equipment since the 1960's. SDG&E is one of the few utilities that will allow its linemen to perform operations on this type of equipment while energized on its distribution system. This has been done safely in the past due to proper training and the use of proper tools, but as SDG&E's workforce matures, it is losing this experience. Replacement of live-front equipment will increase the operational safety for our work force. It will also increase public safety by insulating primary conductors in distribution equipment. Even though the connections to distribution equipment are behind locked cabinet doors, live-front equipment poses a higher risk for wire entry conditions. Live-front equipment is also more difficult to work with as compared to dead-front equipment. Electric service isolation and restoration procedures will be performed with greater ease and speed on dead-front equipment, thus improving SDG&E's operational flexibility and electric reliability to its customers. In addition to the justifications given, the manufacturing of this equipment has slowed in recent years, and SDG&E has been paying a premium for manufacturers to build live-front equipment for replacements. In addition, the potential for rodent/reptile contact with exposed primary conductors is eliminated.

The specific details regarding Replacement of Live-Front Equipment are found in the capital workpapers. See SDG&E-09-CWP at section 06247 – Replacement of Live-Front Equipment.

b. Forecast Method

The forecast method used for Replacement of Live Front Equipment is a 5-year average, based on historical data. This method is the most appropriate, as work load can vary from year to year. The 5-year average levels out the peaks and valleys in this blanket budget over a larger period of time, and still provides for the necessary level of funding for the work that falls within this budget.

c. Supports Safety, Reliability, and Risk Management Goals

These forecasted capital expenditures support the goal of enhancing safety, reliability, and risk management by increasing operational safety for the SDG&E workforce, increasing operational efficiency, maintaining the reliability of the electric distribution system, and reducing the public safety risk of making contact with live-front equipment.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to replacing live-front pad-mounted distribution equipment with dead-front pad-mounted distribution equipment, in order to increase the safety and reliability of our system.

2. 11243 - SDG&E Weather Instrumentation Install

The forecasts for the SDG&E Weather Instrumentation Install project for 2014, 2015, and 2016 are $285, $0, and $0, respectively.

a. Project Description

Santa Ana winds generally occur between October and May across Southern California. Most of the time, these winds are accompanied by very low humidity and warm temperatures. Fuels tend to be driest and most susceptible to new ignitions from late September through the middle of November, just prior to when significant wetting rains normally begin. Santa Ana winds occurring during this period have the potential to produce large and destructive fires when an ignition occurs. Such devastating fires have happened in 2003 and 2007. Because of the destructive nature of these fires, there has been a strong need to build a forecasting system. This system consists of computer hardware that is used to run numerical weather models and conduct analytics on the output to generate forecasts. This enables us to better predict and categorize these events much the same way hurricanes have been categorized. Addressing this need would allow for fire agencies, private industry, and the general public to be more prepared for the type of offshore wind event that might occur and take appropriate action.

This project is a collaborative effort with the National Weather Service, CAL FIRE, UCLA, and the U.S. Forest Service. This project also includes the procurement of two Atmospheric Profilers. The Profilers will increase our understanding of Santa Ana winds.

The specific details regarding the SDG&E Weather Instrumentation Install project are found in my capital workpapers. See SDG&E-09-CWP at section 11243 – SDG&E Weather Instrumentation Install.

b. Forecast Method

The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project, and historical unit cost data. The forecast for 2014 covers the estimated work remaining for this project.

c. Supports Safety, Reliability, and Risk Management Goals

These forecasted capital expenditures support the goals of safety, reliability, and risk management. This project develops a tool to mitigate risks associated with extreme fire potential during Santa Ana Winds, with a vision to provide a decision support tool to fire agencies and the general public to increase public safety and overall preparedness.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to developing weather-related tools to reduce fire risk. With the increase of data availability, enhancements to the computing infrastructure supporting this project may be needed in the future.

3. 12256 - Powerworkz

The forecasts for the Powerworkz project for 2014, 2015, and 2016 are $468, $0, and $0, respectively.

a. Project Description

Powerworkz is a Geographical Information System (GIS)-integrated work management system that will be used by Vegetation Management and Transmission Construction & Maintenance (TCM) to manage their operations. The project combines three off-the-shelf software systems, including a widely used GIS platform, a mobile GIS solution, and asset management program. The resulting composite system will be combined with multiple customizations, targeted at highly specialized business needs. Additionally, the solution will be integrated with multiple in-house systems. The solution will support the following system functions: scheduling, inspections, work routing/approval/completion, random sample work auditing, and work aggregation for invoicing.

The specific details regarding the Powerworkz project are found in my capital workpapers. See SDG&E-09-CWP at section 12256 – Powerworkz.

b. Forecast Method

The forecast method used for Powerworkz is zero-based. The forecast is based on detailed cost estimates that were developed according to the specific scope of work for the project and is based on quotations/proposals from vendors. The forecast for 2014 covers the estimated work remaining for this project.

c. Supports, Reliability, Compliance and Safety and Risk Management Goals

These forecasted capital expenditures support the goals of maintaining reliability, maintaining compliance with Federal, State, and Local requirements, and supports the goal of enhancing safety and managing risks. Since the program will be used by TCM and Vegetation Management, there is a direct link to the work done by those groups to enhance safety, manage risks, comply with regulatory requirements, and maintain system reliability.

d. Cost Driver(s)

The cost driver for this project is the need to complete the development and deployment of the Powerworkz program.

4. 12265 - C1215-Fire Risk Mitigation Project

The forecasts for the C1215-Fire Risk Mitigation project for 2014, 2015, and 2016 are $186, $0, and $0, respectively.

a. Project Description

Distribution fire hardening efforts are a key component of the Community Fire Safety Program (CFSP). Under the umbrella of the CFSP, the Reliability Improvements in Rural Areas Team (RIRAT) and the Fire Preparation Steering Committee approved this project for reliability improvements. This particular circuit is located in mountainous areas vulnerable to extreme winds and other storm events, which have resulted in outages related to fallen trees/branches, debris blowing into the energized conductors, wire-to-wire contact, and equipment failure. All of these things have the potential for being an ignition source.

This project will replace aged overhead conductor with new conductor, and replace wood poles with steel poles to enhance circuit reliability. The new facilities will be designed using known local conditions as the basis for design, which in the case of this circuit includes extreme wind conditions.

The specific details regarding the C1215-Fire Risk Mitigation Project are found in my capital workpapers. See SDG&E-09-CWP at section 12265 – C1215-Fire Risk Mitigation Project.

b. Forecast Method

The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. The forecast for 2014 covers the estimated work remaining for this project.

c. Supports Safety, Reliability, and Risk Management Goals

These forecasted capital expenditures support the goals of enhancing safety and reliability, by fire-hardening C1215, resulting in reduced fire risk and a hardened source of power to customers fed by the circuit.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to mitigating fire risk.

5. 13247 - Fire Risk Mitigation (FIRM) – Phases 1 & 2

The forecasts for Fire Risk Mitigation (FIRM) – Phases 1 & 2 for 2014, 2015, and 2016 are $13,056, $12,780, and $12,496, respectively. SDG&E plans to build and place in service Fire Risk Mitigation (FIRM) – Phases 1 & 2 by the Test Year, although some remaining work may continue after the Test Year.

a. Project Description

The wildfires in 2003 and 2007 had devastating impacts on San Diego County. Since 2007, SDG&E has put a tremendous amount of effort into reducing fire risk. In 2013, SDG&E combined the fire hardening efforts with a program designed to address pole loading issues, creating a program called the Fire Risk Mitigation (FiRM) program. FiRM is aggressively addressing fire risk by hardening critical areas by replacing antiquated line elements, utilizing advanced technology, and safeguarding facilities from known local weather conditions. FiRM is being broken into multiple phases, with the scope of work varying within each phase.

In order to effectively manage the program, the overhead electric facilities in the Fire Threat Zone have been segmented into smaller & more manageable groupings and prioritized based on fire risk. Statistics from the Reliability Improvements in Rural Areas Team will be coupled with information about “known local conditions” to proactively address fire risk. There is a subset of overhead facilities (poles, wire, and equipment) that will be replaced/hardened to improve system preparedness for known local conditions. SDG&E has far more information about known local conditions than ever before, and is now using that information to upgrade areas where conditions could exceed the thresholds that were used for the original system design.

The specific details regarding Fire Risk Mitigation (FIRM) are found in the capital workpapers. See SDG&E-09-CWP at section 13247 – Fire Risk Mitigation (FIRM) – Phases 1 & 2.

b. Forecast Method

The forecast method used for Fire Risk Mitigation (FIRM) is zero-based. The forecast is based on detailed cost estimates that are developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety, Reliability, and Risk Management Goals

These forecasted capital expenditures support the goal of enhancing safety, reliability, and risk management by hardening critical areas, replacing antiquated line elements, utilizing advanced technology, and improving system preparedness for known local weather conditions. This program will strengthen the overhead electric system in fire prone areas, resulting in improved reliability.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to the need to reduce fire risk. Wildfire is a significant risk for San Diego County and South Orange County, as witnessed in 2003, 2007, and most recently 2014. The risk of wildfire has increased in 2014, due to the extreme drought conditions in California. The State has declared a State of Emergency due to the drought. Not only is wildfire a risk to the public, it also threatens the reliability of the electric system. This program will address aged conductor, aged splices, and overloaded poles, as well as other conditions that are known to be a risk in the fire-prone areas.

6. 13255 - C441-Pole Loading Study/Fire Risk Mitigation

The forecasts for the C441-Pole Loading Study/Fire Risk Mitigation project for 2014, 2015, and 2016 are $186, $0, and $0, respectively.

a. Project Description

Distribution fire hardening efforts are a key component of the Community Fire Safety Program (CFSP). Under the umbrella of the CFSP, the Reliability Improvements in Rural Areas Team (RIRAT) and the Fire Preparation Steering Committee approved this project for reliability improvements. This particular circuit is located in mountainous areas vulnerable to extreme winds and other storm events, which have resulted in outages related to fallen trees/branches, debris blowing into the energized conductors, wire-to-wire contact, and equipment failure. All of these things have the potential for being an ignition source.

This project will replace aged overhead conductor with new conductor, and replace wood poles with steel poles to enhance circuit reliability. The new facilities will be designed using known local conditions as the basis for design, which in the case of this circuit includes extreme wind conditions.

The specific details regarding the C441-Pole Loading Study/Fire Risk Mitigation project are found in my capital workpapers. See SDG&E-09-CWP at section 13255 – C441-Pole Loading Study/Fire Risk Mitigation.

b. Forecast Method

The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. The forecast for 2014 covers the estimated work remaining for this project.

c. Supports Safety, Reliability, and Risk Management Goals

These forecasted capital expenditures support the goals of safety, reliability, and risk management. The poles on C441 were determined to be overloaded and a potential fire risk. In addition to replacing wood poles with steel poles, some of the aged overhead conductor will be replaced at the same time.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to mitigating fire risk. If not funded, this project area specifically has a high probability of future wire downs and potential brush fires based on multiple past wire-down events. Additionally, deteriorating facilities will result in negative impacts to the corporation in the areas of system reliability and customer satisfaction.

7. 13266 - Distribution Aerial Marking and Lighting

The forecasts for Distribution Aerial Marking and Lighting for 2014, 2015, and 2016 are $140, $140, and $140, respectively. This is an ongoing project that is expected to continue through the Test Year.

a. Project Description

The Federal Aviation Administration (FAA), under the U.S. Department of Transportation, has authority to regulate and oversee all aspects of American civil aviation. Federal Regulation Title 14 CFR Part 77 establishes the standards and notification criteria for the construction or alteration of objects affecting navigable airspace. SDG&E is subject to this regulation and must notify the FAA when proposing the construction or alteration of facilities that exceed notice criteria under Part 77.9(b). When determined by the FAA, SDG&E will install aviation hazard marking and lighting consistent with FAA recommendations and advisories. In addition to complying with FAA regulations, SDG&E is also subject to California State Aeronautics Code Title 21, and local Airport Land Use Commissions. This budget is a sister budget to the Transmission Aerial Marking and Lighting Budget.

The primary objective of this budget is to comply with FAA requirements, California State Aeronautics Code Title 21, and local Airport Land Use Commissions, in addition to increasing public and employee safety by installing aerial marking and lighting. The alternative to this project is just merely complying with FAA regulations, but that does not address all areas where there is a risk of aviation collision with overhead electric facilities.

The specific details regarding Distribution Aerial Marking and Lighting are found in the capital workpapers. See SDG&E-09-CWP at section 13266 – Distribution Aerial Marking and Lighting.

b. Forecast Method

The forecast method used for Distribution Aerial Marking and Lighting is zero-based. This is a new budget for distribution, with little-to-no history. This blanket budget will cover the aerial marking and lighting activities as the need for such markings is determined. The marking activities will be done in accordance with FAA requirements, but will also be installed in areas of potential risk that may not be covered by the FAA requirements.

c. Supports Safety, Reliability, and Risk Management Goals

These forecasted capital expenditures support the goal of enhancing safety, reliability, and risk management by installing aerial marking and lighting equipment on overhead distribution lines.

d. Cost Driver(s)

The underlying cost driver for this capital project relate to complying with FAA and other state & local agency requirements through the installation of aerial marking and lighting.

8. 13282 – Future CNF Blanket Budget

The forecasts for Future CNF Blanket Budget for 2014, 2015, and 2016 are $0, $2,598, and $7,106, respectively. This is ongoing work that is expected to continue through the Test Year.

a. Project Description

This budget is required as part of an agreement with CNF to replace aging overhead infrastructure with new overhead and underground facilities. As part of the renewal of our Master Special Use Permit with CNF, SDG&E agreed to rebuild overhead power lines by replacing them with new overhead and underground facilities.

This work is required as a result of a Legal Agreement with CNF. As part of our permit renewal with CNF, SDG&E agreed to rebuild our overhead system and to convert a portion of it with new underground facilities. The specific details regarding Future CNF Blanket Budget are found in the capital workpapers. See SDG&E-09-CWP at section 13282 – Future CNF Blanket Budget.

b**.** Forecast Method

The forecast method used for Future CNF Blanket Budget is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety, Reliability, and Risk Management Goals

These forecasted capital expenditures support the goal of enhancing safety, reliability, and risk management by replacing aged overhead power lines, located within high risk fire areas, with new, hardened overhead facilities, and in some cases with new underground facilities.

d. Cost Driver(s)

The underlying cost driver for this capital project relates to the need to fire harden overhead distribution lines within the Fire Threat Zone.

9. 14247 - Fire Risk Mitigation (FIRM) – Phase 3

The forecasts for Fire Risk Mitigation (FIRM) – Phase 3 for 2014, 2015, and 2016 are $11,045, $24,323, and $44,950, respectively. SDG&E plans to build and place in service part of the Fire Risk Mitigation (FIRM) – Phase 3 by the Test Year, while some remaining work will continue after the Test Year.

a. Project Description

The wildfires in 2003 and 2007 had devastating impacts on San Diego County. Since 2007, SDG&E has put a tremendous amount of effort into reducing fire risk. In 2013, SDG&E combined the fire hardening efforts with a program designed to address pole loading issues, creating a program called the Fire Risk Mitigation (FiRM) program. FiRM is aggressively addressing fire risk by hardening critical areas, by replacing antiquated line elements, by utilizing advanced technology, and by improving facilities to adequately handle known local weather conditions. FiRM is being broken into multiple phases, with the scope of work varying within each phase.

In order to effectively manage the program, the overhead electric facilities in the Fire Threat Zone have been segmented into smaller and more manageable groupings and prioritized based on fire risk. Statistics from the Reliability Improvements in Rural Areas Team will be coupled with information about "known local conditions" to proactively address fire risk. There is a subset of overhead facilities (poles, wire, and equipment) that will be replaced/hardened to improve system ability to adequately handle "known local conditions." SDG&E has far more information about known local conditions than ever before, and is now using that information to upgrade areas where conditions could exceed the thresholds that were used for the original designs.

The specific details regarding Fire Risk Mitigation (FIRM) are found in the capital workpapers. See SDG&E-09-CWP at section 14247 – Fire Risk Mitigation (FIRM) – Phase 3.

b. Forecast Method

The forecast method used for Fire Risk Mitigation (FIRM) is zero-based. The forecast is based on detailed cost estimates that are developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety, Reliability, and Risk Management Goals

These forecasted capital expenditures support the goal of enhancing safety, reliability, and risk management by hardening critical areas, replacing antiquated line elements, utilizing advanced technology, and improving system ability to adequately handle known local weather conditions. This program will strengthen the overhead electric system in fire prone areas, resulting in improved reliability.

d. Cost Driver(s)

The underlying cost driver(s) for this capital project relate to reducing fire risk. Wildfire is a significant risk for San Diego County and South Orange County, as witnessed in 2003, 2007, and most recently 2014. The risk of wildfire has increased in 2014, due to the extreme drought conditions in California. The State has declared a State of Emergency due to the drought. Not only is wildfire a risk to the public, it also threatens the reliability of the electric system. This program will address aged conductor, aged splices, overloaded poles, as well as other conditions that are known to be a risk in the fire-prone areas.

10. 14249 – SF6 Switch Replacement

The forecasts for SF6 (Sulfur Hexafluoride, a type of dielectric gas) Switch Replacement for 2014, 2015, and 2016 are $0, $0, and $9,888, respectively. This is an ongoing project that is expected to continue through the Test Year.

a. Project Description

The purpose of this project is to proactively remove or replace sulfur hexafluoride (SF6) gas insulated distribution switchgear, to reduce environmental risks associated with the potential for SF6 emissions. SF6 is known to have a global warming potential many times that of carbon dioxide. (See the testimony of Mr. Scott Pearson, Exhibit SDG&E-18, for more details on SF6.) In an effort to reduce greenhouse gas emissions to 1990 levels, and with a deadline to achieve this objective by 2020, federal (Environmental Protection Agency) and state (California Air Resources Board) agencies have created respective regulations for utilities to follow. Both regulating agencies require utilities to track the "life" of a gas switch from "cradle-to-grave," as well as a gas cylinder inventory and gas transfers in and out of switches. Removal and replacement of SF6 switches in SDG&E's distribution system will reduce the likelihood of SF6 emissions from leaking switches, thus reducing emissions.

SF6 switches were first installed on SDG&E's electric distribution system during the 1980's and 1990's, as SF6 was the best insulation option available at that time. Since then, SF6 has been recognized by federal and state legislatures as a large contributor to elevated greenhouse gas levels, leading to the increased regulatory oversight in utility procedures involving SF6 switchgear.

This project will reduce environmental risks associated with the potential for emissions. While the incremental cost to install monitoring equipment on substation circuit breakers is small, the cost to do the same for distribution switches would be greater than replacing the switch with a non-SF6 alternative. In addition, the communications equipment necessary to send real-time information to a centralized location may not be available at the existing switch locations, unless SCADA infrastructure is located nearby.

SDG&E has approximately 900 SF6 distribution switches (pad-mounted and underground) in service, and is currently proposing a program to replace the switches with non-SF6 switches over the next 5 years. One alternative is to not do anything, but the risk is a potential leak to the environment, thus causing harm to the environment. Another alternative is to install monitoring equipment, but as described above, the cost and feasibility make it unviable. Another alternative is to adjust the time period for switch replacement. In the case of this project, a 5-year period was selected, because it resolves the risk by 2020, while also not overextending resources to get the work done. In addition to reducing the potential for SF6 exposure to the environment, this program will also reduce the amount of recordkeeping required, therefore reducing the potential for tracking errors and increasing accuracy of asset data and reports. Other efforts at SDG&E are underway to reduce SF6 emission risks, including leak detection and monitoring of substation gas breakers.

All of the switches removed or replaced as a part of this project are pad-mounted or sub-surface in nature. With new technologies, many of the units can be replaced with similar, non-gas insulated switches. Some switches will simply be removed while others may require a more involved switch change-out, including a circuit reconfiguration.

The specific details regarding SF6 Switch Replacement are found in the capital workpapers. See SDG&E-09-CWP at section 14249 – SF6 Switch Replacement.

b. Forecast Method

The forecast method used for SF6 Switch Replacement is zero-based. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project (replacement of approximately 900 switches). In the case of this project, the historical unit cost for switch replacement, and cost estimates for switch replacements were analyzed to come up with a reasonable unit cost. That unit cost was multiplied by the number of units in service, to come up with the total project cost; that cost was then spread over a 5-year period starting in 2016. The leak rate requirement will hit the most conservative level in 2020. A 1% leak rate will be imposed on owners of SF6 equipment. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates.

c. Supports Risk Management, Reliability, Compliance, and Environmental Stewardship Goals

These forecasted capital expenditures support the goals of Risk Management and Reliability. Risk will be mitigated by removing SF6 switches from service and eliminating the potential for the gas to be released into the environment. This is consistent with state and federal environmental policy goals regarding SF6, and will reduce compliance activities. This project will also enhance reliability. Currently, when the gas level is reported low in a distribution SF6 switch, the switch is tagged Do Not Operate Energized (DOE). What this does is reduce operational flexibility, and the ability to quickly isolate segments of circuits and restore customers quicker. There are some cases where tie switches are tagged DOE, which prevents the

Distribution Operators from being able to transfer load to another circuit in a contingency situation without de-energizing both circuits.

d. Cost Driver(s)

The underlying cost driver for this capital project relates to reducing greenhouse gas emissions, reducing reliability risks, and staying in compliance with regulatory requirements.

J. SMART METER PROGRAM

➢ **Table 12 - Summary of Smart Meter Program Budgets ($'s in Thousands)**

J. SMART METER PROGRAM		**Estimated 2014**	**Estimated 2015**	**Estimated 2016**
4250	Smart Meter Project-Meter Development	1,116	0	0
Totals		**1,116**	**0**	**0**

➢ **Description Of Individual Budgets Within The Smart Meter Program Category ($'s in Thousands)**

1. 4250 – Smart Meter Project - Electric

The forecasts for the Smart Meter project for 2014, 2015, and 2016 are $1, $116, $0, and $0, respectively.

a. Project Description

The purpose of the Smart Meter project was to deploy "intelligent" meters that could be read/viewed and operated remotely. The Smart Meter project increased operational efficiency and reduced the need to have field personnel perform meter reading activities. Smart Meters also created the opportunity for the Distribution Operations center to gain better outage visibility. This project is required to replace the remaining smart meters that were unable to be installed by year end 2011. The remaining meters deployed post-2011 were the result of anticipated meter access issues, technology availability issues and additional system changes that are required to install electric meters requiring complex billing. The primary objective is to install as many of the remaining smart meters as possible.

Approximately 2,288,000 smart meters have been deployed to date in San Diego and South Orange County. The forecast in 2014 accounts for the installation of 2,800 more units, not including meters of residential customers who elected to opt-out of wireless Smart Meters. The project is scheduled to be completed in 2014.

The specific details regarding the Smart Meter project are found in my capital workpapers. See SDG&E-09-CWP at section 04250 – Smart Meter.

b. Forecast Method

The 2014 forecast reflects the cost estimate for the remaining work associated with the Smart Meter project. The estimate is based on actual historical costs and the projected remaining workload for 2014.

c. Supports Safety and Reliability Goals

Smart meters were deployed for efficiency reasons, data analytics reasons, operational benefits, and for enhanced meter visibility and control. This project was approved as part of the original smart meter project and petition for modification.[9] It is required to be completed in order to meet the business case requirements.

d. Cost Driver(s)

The majority of the smart meters remaining to be installed in 2014 are Commercial and Industrial meters. The costs for these installations were approved in a petition for modification extending the recovery period for the Advanced Metering Infrastructure balancing account.[10] The electric smart meter installations in this project include the replacement of legacy electric meters. The project covers all production types of meters and will cover technology related costs to provide remote communications to the meters.

K. TRANSMISSION/FERC DRIVEN PROJECTS

- **Table 13 - Summary of Transmission/FERC Driven Projects Budgets ($'s in Thousands)**

K. TRANSMISSION/FERC DRIVEN PROJECTS		Estimated 2014	Estimated 2015	Estimated 2016
100	Elec Trans Line Reliability Projects	1,045	1,045	1,045
102	Elec Trans Line Relocation Projects	50	50	50
6132	Relocate South Bay Substation	294	1,497	216
7139	Eco Substation	1,608	0	0
7144	Fiber Optic For Relay Protect & Telecom	2,136	2,136	2,136
8165	Cleveland National Forest Power Line Replacement Projects	180	4,101	2,222
9125	TL 637 CRE-ST Wood-to-Steel	1,859	0	0
	TL6914 Los Coches-Loveland Wood-to-Steel	58	2,396	0

[9] *See* A.05-03-015, Application of [SDG&E] for Adoption of an Advanced Metering Infrastructure Deployment Scenario and Associated Cost Recovery and Rate Design; *see also* September 9, 2010 Petition for Modification of Decision 07-04-043 by [SDG&E].
[10] *See* D.11-03-042, March 30, 2011 Order Approving Petition for Modification.

K. TRANSMISSION/FERC DRIVEN PROJECTS		Estimated 2014	Estimated 2015	Estimated 2016
9153	TL676 Mission To Mesa Heights Reconductor	52	0	0
9166	TL13821 & 28-Fanita Junction Enhance	8	620	0
10135	Los Coches Rebuild 138/69/12kV Substation	6,802	5,136	5,234
10150	TL13833 Wood-to-Steel	285	0	0
11126	TL663 Mission to Kearny Reconductor	49	17	0
11127	TL670 Mission to Clairemont Reconductor	52	0	0
12154	TL631 Reconductor Project	0	2,182	0
12156	TL600 Reliability Pole Replacements	130	0	0
13130	Loop TL674 into Del Mar and RFS TL666D	0	0	1,169
13143	TL 695B Reconductor	0	0	458
Totals		**14,608**	**19,180**	**12,530**

➢ **Description Of Individual Budgets Within The Transmission/FERC Driven Projects Category ($'s in Thousands)**

1. 100 – Electric Transmission Line Reliability Projects

The forecasts for the Electric Transmission Line Reliability project for 2014, 2015, and 2016 are $1,045, $1,045, and $1,045, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula ratemaking process. The distribution component of transmission projects are covered through the GRC process.

In the case of this project, the business purpose is to comply with the safety and reliability requirements promulgated by CPUC G.O. 95, A.B. 1890, A.B. 1017, North American Electric Reliability Criteria (NERC), and California Independent System Operator (CAISO) maintenance requirements. This project provides funds for several purposes, such as:

1. To restore degraded transmission facilities.
2. To repair the system in the event of disaster such as storm or fire.
3. To cover small (under $750,000) projects for restoring the system which are not identified during the annual review study process.

The specific details regarding the Electric Transmission Line Reliability project are found in my capital workpapers. See SDG&E-09-CWP at section 00100 – Electric Transmission Line Reliability.

b. Forecast Method

Activities in this budget tend to be the same from year to year, so a 5-year average was used to develop the forecast for this project.

c. Supports Safety, Reliability, and Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining adequate reliability levels, and compliance with federal, state and local regulations.

d. Cost Driver(s)

The activities in this blanket budget are consistent from year to year, so a 5-year average was used for the forecast. There are no expected incremental changes for this budget/project for this GRC forecast period.

2. 102 – Electric Transmission Line Relocation Projects

The forecasts for the Electric Transmission Line Relocation project for 2014, 2015, and 2016 are $50, $50, and $50, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects is covered through the GRC process. This budget provides a holding account for payments received from developers and government agencies for developer-/agency-requested relocation of SDG&E electric transmission facilities. While this budget is intended to be a zero-balance budget, there are times where incremental work is necessary due to unforeseen circumstances or to account for future electric system projects.

The specific details regarding the Electric Transmission Line Relocation project are found in my capital workpapers. See SDG&E-09-CWP at section 00102 – Electric Transmission Line Relocation.

b. Forecast Method

Activities in this budget tend to be the same from year to year, so a 5-year average was used to develop the forecast for this project. Also, activities in this area are difficult to anticipate, which makes the average even more appropriate.

c. Supports Safety, Reliability, and Compliance Goals

These forecasted capital expenditures support the goals of enhancing safety, maintaining adequate reliability levels, and compliance with Federal, State and local regulations.

d. Cost Driver(s)

The activities in this blanket budget are consistent from year to year, so a 5-year average was used for the forecast. There are no expected incremental changes for this budget/project for this GRC forecast period.

3. 6132 – Relocate South Bay Substation

The forecasts for the Relocate South Bay Substation project for 2014, 2015, and 2016 are $294, $1,497, and $216, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects is covered through the GRC process. The purpose of this CAISO and CPUC (Energy Division) approved project is to replace the existing 138/69kV substation with a new 230/69/12kV substation, and relocate the new Bay Boulevard substation to property south of the existing substation. The new substation will replace aging infrastructure, mitigate intra zonal congestion and provide for future load growth.

South Bay substation is over 50 years old and it has been a reliability concern for SDG&E for several years. South Bay bank 50 is on the SEA Team watch list, and all the circuit breakers are due for replacement. The 138kV bus is undersized, and the structural components are not built to modern seismic criteria. In addition, South Bay Power Plant retired at the end of 2009, which removed the strong source serving the 69kV bus at South Bay substation. A new source to serve 69kV load is needed without the generator that is presently connected to the South Bay 69kV bus. In addition, the City of Chula Vista has plans to redevelop their bayfront, so the substation will be moved .5 miles to the south.

The specific details regarding the Relocate South Bay Substation project are found in my capital workpapers. See SDG&E-09-CWP at section 06132 – Relocate South Bay Substation.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E

utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goals

These forecasted capital expenditures support the goal of enhancing reliability.

d. Cost Driver(s)

This is a specific capital transmission project, approved by the CAISO and the CPUC, to enhance the reliability of the South Bay area of San Diego.

4. 7139 – ECO Substation

The forecasts for the ECO Substation project for 2014, 2015, and 2016 are $1,608, $0, and $0, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process.

The purpose of this project is to install a 500/230/138kV substation (ECO Substation) on the Southwest Power Link (SWPL) in eastern San Diego County, install a new 14-mile 138kV transmission line from ECO Substation to Boulevard Substation, and rebuild Boulevard Substation to create a new 138/69/12kV substation. The primary purpose of this project is to integrate large scale renewables into the grid. This project provides two new points for renewable projects to interconnect 600MW at Boulevard and 1200MW at ECO. A secondary benefit is the creation of a new/second source to Boulevard Substation and Crestwood Substation, which are currently radially fed from the west.

The specific details regarding the ECO Substation project are found in my capital workpapers. See SDG&E-09-CWP at section 07139 – ECO Substation.

b. Forecast Method

This project is currently in construction, and scheduled to be completed by the end of 2014. This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. The remaining costs are known for this project, as contracts are in place, equipment has been purchased, and construction activities are being tracked closely.

c. Supports Reliability and Environmental Stewardship Goals

These forecasted capital expenditures support the goals of enhancing system reliability by creating a second transmission source to a substation that is currently radially fed (fed by one transmission line). The project also creates a hub for the interconnection of large-scale renewable generation projects.

d. Cost Driver(s)

This is a specific capital transmission project, which is currently in construction and scheduled to be completed by mid-2014.

5. 7144 – Fiber Optic for Relay Protection and Telecommunications

The forecasts for the Fiber Optic for Relay Protection and Telecommunications project for 2014, 2015, and 2016 are $2,136, $2,136, and $2,136, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process.

This project provides funds for the installation, upgrade, and expansion of SDG&E's Fiber Optic communication system for control and protection of transmission and distribution lines, and automation. Besides control and protection, secure fiber optic communication is required for transporting large amount of data at high speed for Condition Based Maintenance (CBM), Wide Area Measurement and Control (Synchrophasors/Phasor Measurement), Video Security and Surveillance, Smart Grid and Telecommunication.

Currently, many substations use telephone company lease circuits and copper wire for protective relaying, and SCADA. These circuits are antiquated, unreliable, and do not meet communication requirements for new digital protective relay systems that are being installed. The new fiber routes will provide communications media diversity for protective relaying throughout the SDG&E service territory. System protection is a key function in the electrical power grid, to guard against conditions that would severely harm the electric system infrastructure and cause extended outages. Highly reliable and available communications links are essential to functional protective relaying in the event of a system fault.

The specific details regarding the Fiber Optic for Relay Protection and Telecommunications project are found in my capital workpapers. See SDG&E-09-CWP at section 07144 – Fiber Optic for Relay Protection and Telecommunications.

b. Forecast Method

This is a blanket-like budget that covers critical communications for transmission and distribution facilities. A 3-year average was used instead of a 5-year average, because the last 3 years of work more accurately reflects the volume of work that is anticipated to occur in the future.

c. Supports Reliability Goals

These forecasted capital expenditures support the goal of maintaining and/or enhancing reliability by installing critical communications infrastructure.

d. Cost Driver(s)

The activities in this blanket budget are consistent from year to year, especially over the past few years, so a 3-year average was used for the forecast. There are no expected incremental changes for this budget/project for this GRC forecast period.

6. 8165 – Cleveland National Forest Power Line Replacement Projects

The forecasts for the Cleveland National Forest (CNF) Power Line Replacement Projects for 2014, 2015, and 2016 are $180, $4,101, and $2,222, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. This budget does not include the six distribution circuits covered under budget code 13282 – Future CNF Blanket Budget. The FERC projects that fall under the 8165 budget are funded though the formula rate making process, but the CPUC components of those projects are included in this GRC.

The purpose of these projects is to improve the reliability of transmission line 625, 626, 629, 682, and 6923 in a fire and wind-prone area by replacing approximately 1,384 wood poles with steel poles, and replacing approximately 105 circuit miles of line. Furthermore, the reliability of the currently underbuilt distribution circuits will be improved at the same time.

This project is part of the CNF Master Special Use Permit Wood-to-Steel effort. The entire project is scheduled for construction between 2015 and 2019. The costs shown in this forecast are only for the distribution component of the transmission project segments expected to be placed into service in 2016.

As a result of the fires in San Diego County in 2003, 324 wood transmission poles and 45 miles of transmission line were repaired at a cost of approximately $7 million. As a result of the fires in 2007, 309 wood transmission poles were replaced, and 56 miles of transmission line were repaired at a cost of approximately $16 million. Transmission line outages due to fires have a serious impact on utility electric system reliability and the resulting loss of electric service can debilitate emergency services and our customers' abilities to cope during the fire emergency. In an effort to enhance public and employee safety and the reliability of the transmission grid, and to reduce overall fire risks, SDG&E has been hardening the transmission grid within the Fire Threat Zone since 2008. SDG&E has hardened over 2,000 poles over the last 6 years, and has plans to complete the remainder of the transmission line hardening work over the next 6 years. This project hardens one of the transmission lines in the FTZ.

The specific details regarding the CNF Power Line Replacement Projects are found in my capital workpapers. The specific pole replacement projects include; TL 625B Loveland to Tap, TL 625C Barrett Tap to Descanso, TL625D Barrett Tap to Barrett, TL 626A Santa Ysabel to Boulder Creek, TL 626B Descanso to Boulder Creek, TL 629A Descanso to Glencliff, TL629C Glencliff to Boulevard Tap, TL 629D Cameron To Boulevard Tap, TL 629E Boulevard Tap to Crestwood, TL 682 Rincon To Warners, TL 6923 Barrett to Cameron. See SDG&E-09-CWP at section 08165 – Cleveland National Forest Power Line Replacement Projects.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goals of enhancing safety and reliability. The focus of this project is mitigating fire risk, enhancing the safety and reliability of the transmission lines, and distribution underbuild in the CNF. The transmission lines affected in this project traverse across some of the highest fire risk areas in San Diego County.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is fire safety.

7. 9125 – TL637 CRE-ST Wood-to-Steel

The forecasts for the TL637 CRE-ST Wood-to-Steel project for 2014, 2015, and 2016 are $1,859, $0, and $0, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process.

The purpose of this project is to fire harden transmission line TL637 between Creelman Substation and Santa Ysabel Substation. This transmission line traverses across one of the areas of highest fire risk in San Diego County. With this line hardened, the reliability at Santa Ysabel Substation and Warners Substation will be greatly enhanced.

This high priority fire hardening project will replace wood poles with steel poles from Creelman Substation to Santa Ysabel Substation for a distance of approximately thirteen miles. The scope of this project will mirror the other transmission hardening projects that have occurred over the last several years, including the replacement of wood poles with steel, replacement of the existing conductor with 636 ACSS/AW (Aluminum Conductor, Aluminum - Clad Steel Supported) conductor, installation of larger insulators to increase spacing, and installation of a 48-count ADSS fiber optic line for improved system protection capability.

As a result of the fires in San Diego County in 2003, 324 wood transmission poles and 45 miles of transmission line were repaired at a cost of approximately $7 million. As a result of the fires in 2007, 309 wood transmission poles were replaced and 56 miles of transmission line were repaired at a cost of approximately $16 million. Transmission line outages due to fires have a serious impact on utility electric system reliability, and the resulting loss of electric service can debilitate emergency services and our customers' abilities to cope during a fire emergency. In an effort to enhance public and employee safety and the reliability of the transmission grid, and to reduce overall fire risks, SDG&E has been hardening the transmission grid within the Fire Threat Zone since 2008. SDG&E has hardened over 2,000 poles over the last 6 years, and has plans to complete the remainder of the transmission line hardening work over the next 6 years. This project hardens one of the transmission lines in the FTZ.

The specific details regarding the TL637 CRE-ST Wood-to-Steel project are found in my capital workpapers. See SDG&E-09-CWP at section 09125 – TL637 CRE-ST Wood-to-Steel.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects. This project is scheduled to be completed by the end of 2014.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goals of enhancing safety and reliability. TL637 traverses across the High Risk Fire Area (HRFA), and a region known to experience extreme Santa Ana wind conditions.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is fire safety.

8. 9136 - TL6914 Los Coches-Loveland Wood-to-Steel

The forecasts for the TL6914 Los Coches-Loveland Wood-to-Steel project for 2014, 2015, and 2016 are $58, $2,396, and $0, respectively.

a. Project Description

The TL 6914 Los Coches to Loveland SW Pole Replacements project will improve the reliability of transmission line 6914 in fire-prone or wind-prone areas by replacing 125 wood poles with equivalent steel poles for a distance of approximately 8 miles. Furthermore, the reliability of the currently underbuilt distribution circuits will be improved. This project rebuilds TL 6914 with steel/wood (SW) equivalent structures for a distance of approximately 8 miles and reconductors the transmission line and portions of the distribution system by installing 636 ACSR/AW on the 69kV system and 636 ASCR/AW on the 12kV system.

The specific details regarding the TL6914 Los Coches-Loveland Wood-to-Steel project are found in my capital workpapers. See SDG&E-09-CWP at section 09136 – TL6914 Los Coches-Loveland Wood-to-Steel.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goals of enhancing safety and reliability. TL6914 traverses across fire prone areas of eastern San Diego County. The project will not only fire harden TL6914 and bring the line up to the latest standard for 69kV construction, it will also reduce future operation and maintenance expenses and improve system reliability by replacing wood poles with steel.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is fire safety.

9. 9153 – TL676 Mission to Mesa Heights Reconductor

The forecasts for the TL676 Mission to Mesa Heights Reconductor project for 2014, 2015, and 2016 are $52, $0, and $0, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process.

The purpose of this project is to provide a long term "wires" mitigation for the identified NERC Category B reliability criteria contingency scenario. The non-wires options of depending on the Kearny gas turbines, though effective short term, provide loading relief only for the few remaining years they are available to operate.

The scope of the project includes reconductoring 4.3 circuit miles of transmission line, replacing all 93 existing wood poles with steel poles, and other enhancements. Substation and distribution enhancements will also be necessary for this project. Substation equipment needs to be upgraded to meet the desired line rating, and the distribution facilities will need to be replaced or modified since the distribution circuits are underbuilt on the transmission line.

The specific details regarding the TL676 Mission to Mesa Heights Reconductor project are found in my capital workpapers. See SDG&E-09-CWP at section 09153 – TL676 Mission to Mesa Heights Reconductor.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goals

These forecasted capital expenditures support the goal of enhancing reliability. The goal of the TL676 project is to reduce the potential for a contingency situation. In conjunction with enhancing the reliability of the transmission line, the distribution facilities will be improved, so distribution reliability will be enhanced as well.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is electric system reliability.

10. 9166 – TL13821 & 28 – Fanita Junction Enhancement

The forecasts for the TL13821 & 28 – Fanita Junction Enhancement project for 2014, 2015, and 2016 are $8, $620, and $0, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process. The purpose of this project is to mitigate NERC Category B overloads forecasted for TL13821. This is a CAISO approved reliability project. This project will also replace wood structures with steel structures in high fire risk areas.

The specific details regarding the TL13821 & 28 – Fanita Junction Enhancement project are found in my capital workpapers. See SDG&E-09-CWP at section 09166 – TL13821 & 28 – Fanita Junction Enhancement.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goals of enhancing safety and reliability. This project enhances reliability by reconfiguring the 138kV lines between Sycamore Substation, Santee Substation, and Carlton Hills Substation traverses across fire prone areas of eastern San Diego County. This project also reduces fire risk by fire-hardening the transmission lines.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary drivers for this project are electric system reliability and fire safety.

11. 10135 – Los Coches Substation 138/69kV Rebuild

The forecasts for the Los Coches Rebuild project for 2014, 2015, and 2016 are $6,802, $5,136, and $5,234, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process.

In the case of this project, the business purpose is to rebuild Los Coches 138/69/12kV substation due to reliability concerns. Los Coches substation is an existing SDG&E 138/69/12kV substation that was constructed in the 1950's. Banks 50 and 51 are approaching end of their useful life; they are smaller than the current standard size transformers and under certain contingency situations, and one transformer out of service, the remaining transformer cannot handle the load requirements. The 138kV and 69kV buses are at capacity, undersized and do not meet current seismic specification. The 12kV yard is at capacity with no room for installing the fourth 69/12kV distribution transformer.

For this project, the substation scope of work includes building a new 138kV, 3000A bus outside the current fence on the SDG&E-owned property, in a breaker-and-a-half configuration. The new yard ultimately will accommodate four bays; only two bays will be installed initially in this project. The scope includes dismantling the existing 138kV bus to make room for the new 69kV, double breaker – double bus configuration. There will be a total of sixteen bays to accommodate the existing transmission and distribution transformers, lines and also positions for future additions. The new yard arrangement will make room for the fourth 69/12kV transformer, an additional four 12kV circuits, and shunt capacitors and reactors.

The specific details regarding the Los Coches Rebuild 138/69/12kV Substation project are found in my capital workpapers. See SDG&E-09-CWP at section 10135 – Los Coches Rebuild 138/69/12kV Substation.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goal

These forecasted capital expenditures support the goals of enhancing reliability. The primary objective of the Los Coches Substation is to mitigate reliability risk.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is electric system reliability.

12. 10150 – TL13833 Wood-to-Steel

The forecasts for the TL13833 Wood-to-Steel project for 2014, 2015, and 2016 are $259, $0, and $0, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process.

In the case of this project, the business purpose is to fire-harden transmission line TL13833 between Pico Substation and Trabuco Substation. As with the other transmission wood-to-steel projects, this line will only be hardened in areas where there is fire risk.

As a result of the fires in San Diego County in 2003, 324 wood transmission poles and 45 miles of transmission line were repaired at a cost of approximately $7 million. As a result of the fires in 2007, 309 wood transmission poles were replaced, and 56 miles of transmission line were repaired at a cost of approximately $16 million. Transmission line outages due to fires have a serious impact on utility electric system reliability and the resulting loss of electric service can debilitate emergency services and our customers' abilities to cope during the fire emergency. In an effort to enhance public and employee safety and the reliability of the transmission grid, and to reduce overall fire risks, SDG&E has been hardening the transmission grid within the Fire Threat Zone since 2008. SDG&E has hardened over 2,000 poles over the last 6 years and has plans to complete the remainder of the transmission line hardening work over the next 6 years. This project hardens one of the transmission lines in the FTZ.

The purpose of this project is to replace approximately 6 wood poles with steel poles and install high-strength multi-stranded steel core conductors in place of the existing conductor, as required. The final work scope will be further defined once detailed engineering is completed.

The specific details regarding the TL13833 Wood-to-Steel project are found in my capital workpapers. See SDG&E-09-CWP at section 10150 – TL13833 Wood-to-Steel.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety and Reliability Goals

These forecasted capital expenditures support the goals of enhancing safety and reliability and mitigating fire risk by fire-hardening TL13833. TL13833 traverses across fire prone areas of eastern San Diego County. The project will also reduce future O&M expenses and improve system reliability by replacing wood poles with steel.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is to mitigate fire risk and enhance public safety and reliability.

13. 11126 – TL663 Mission to Kearny Reconductor

The forecasts for the TL663 Mission to Kearny Reconductor project for 2014, 2015, and 2016 are $49, $17, and $0, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process.

In the case of this project, the business purpose is to provide a long term "wires" mitigation for the identified NERC Category B reliability criteria indications. Availability of the short-term non-wires option of depending on the pre-contingency dispatch of the Kearny gas turbines to provide loading relief is no longer available after 2013. Additionally, SDG&E does not consider reliance on pre-contingency gas turbine dispatch as a suitable long-term solution for sustained NERC reliability criteria indications.

The purpose of this project is to improve the 69kV transmission local area system within the Mission/Kearny/Mesa Heights load center and mitigate NERC Category B reliability criteria. The scope of work entails reconductoring the line to provide a new minimum continuous rating of 204MVA. The scope requires a complete reconductor of overhead line from 1-1033.5ACSR/AW and 2-336.4ACSR/AW to 2-636ACSS. The underground portion of the project requires pulling new cable through existing ducts to create bundled 1750MCM AL cable. Excluding the existing steel poles in the line, there will be a 100% wood pole change-out to accommodate the increased loading of the new conductors. The terminal equipment at both ends of the line were evaluated and only the Kearny substation end of TL663 will require equipment replacement to 2000A capacity to match the Mission end, in order to achieve the new required rating.

The specific details regarding the TL663 Mission to Kearny Reconductor project are found in my capital workpapers. See SDG&E-09-CWP at section 11126 – TL663 Mission to Kearny Reconductor.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goals

These forecasted capital expenditures support the goal of enhancing reliability. The goal of the TL663 project is to reduce the potential for a contingency situation. In conjunction with enhancing the reliability of the transmission line, the distribution facilities will be improved, so distribution reliability will be enhanced as well.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is electric system reliability.

14. 11127 – TL670 Mission to Clairemont Reconductor

The forecasts for the TL670 Mission to Clairemont Reconductor project for 2014, 2015, and 2016 are $52, $0, and $0, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process.

In the case of this project, the business purpose is to provide a long-term "wires" mitigation solution for the identified NERC Category B reliability criteria indications. Availability of the non-wires short-term mitigation options of depending on the Kearny gas turbines to provide loading relief will not be available after 2013. Additionally, SDG&E does not consider reliance on pre-contingency gas turbine dispatch as a suitable long-term mitigation for sustained NERC reliability criteria indications.

The scope of the project includes replacing approximately 8 miles of 4/0 copper overhead conductor with 8 miles of 636 ACSS conductor to achieve a minimum rating of 137MVA. The project will string approximately 3 miles of new conductor on existing steel pole and tower structures, which requires no pole change outs. The five miles of conductor that is currently on wood pole structures will require 100% structure change outs, due to the increased sag characteristics of 636ACSS conductor, the increased transverse wind loading on aging wood poles, and the existing 12kV circuit under built on approximately 50% of the existing poles. The substation terminal equipment ratings on both ends of TL670 were evaluated and determined to be adequate for the minimum rating required.

The specific details regarding the TL670 Mission to Clairemont Reconductor project are found in my capital workpapers. See SDG&E-09-CWP at section 11127 – TL670 Mission to Clairemont Reconductor.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goals

These forecasted capital expenditures support the goals of enhancing reliability. The goal of the TL670 project is to reduce the potential for a contingency situation. In conjunction with enhancing the reliability of the transmission line, the distribution facilities will be improved, so distribution reliability will be enhanced as well.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is electric system reliability.

15. 12154 – TL631 Reconductor Project

The forecasts for the TL631 Reconductor project for 2014, 2015, and 2016 are $0, $2,182, and $0, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects are covered through the GRC process.

This project will reconductor transmission line TL631, between El Cajon Substation and Los Coches Substation. This is a CAISO-approved project. This project was identified by the

Transmission Planning department due to NERC reliability criteria indications. Forecasted NERC Category B overload starts in 2013 for loss of any section of TL632 (GR-ML-LC). This project will replace existing conductor with new conductor for a distance of approximately 8 miles, to achieve a desired rating of 98MVA. Poles will be replaced as required to accommodate the new conductor.

The specific details regarding the TL631 Reconductor project are found in my capital workpapers. See SDG&E-09-CWP at section 12154 – TL631 Reconductor.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goals

These forecasted capital expenditures support the goal of enhancing reliability. The goal of the TL631 project is to reduce the potential for a contingency situation. In conjunction with enhancing the reliability of the transmission line, the distribution facilities will be improved, so distribution reliability will be enhanced as well.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is electric system reliability.

16. 12156 – TL600 Reliability Pole Replacements

The forecasts for the TL600 Reliability Pole Replacements project for 2014, 2015, and 2016 are $130, $0, and $0, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects is covered through the GRC process.

This project will enhance the reliability of transmission line TL600 (Claremont - Kearny - Rose Canyon). TL600 was analyzed to determine if fiber optic could be added to the poles. During the analysis and modeling, it was determined that approximately 20 poles were overloaded or heavily loaded in their current state. These poles were determined to need replacement for reliability reasons.

The specific details regarding the TL600 Reliability Pole Replacements project are found in my capital workpapers. See SDG&E-09-CWP at section 12156 – TL600 Reliability Pole Replacements.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability and Compliance Goals

These forecasted capital expenditures support the goals of enhancing reliability and compliance. The goal of the TL631 project is to reduce the potential for a contingency situation. In conjunction with enhancing the reliability of the transmission line, the distribution facilities will be improved, so distribution reliability will be enhanced as well.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary drivers for this project are electric system reliability and compliance.

17. 13130 – Loop TL674A into Del Mar and RFS TL666D

The forecasts for the Loop TL674A into Del Mar and RFS TL666D project for 2014, 2015, and 2016 are $0, $0, and $1,169, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects is covered through the GRC process.

This project purpose is to enhance reliability for Del Mar Substation, and to remove a segment of TL666 that runs through environmentally sensitive areas. TL674A will be tied into Del Mar Substation, removing a 3-terminal line between North City West, Rancho Santa Fe, and Encinitas Substation. The 3-terminal line will be replaced with two 2-terminal lines, one from North City West to Rancho Santa Fe, and the other from Encinitas to Del Mar. TL666D will be removed from service once the new facilities are energized. This is a CAISO-approved project.

The specific details regarding the Loop TL674A into Del Mar and RFS TL666D project are found in my capital workpapers. See SDG&E-09-CWP at section 13130 – Loop TL674A into Del Mar and RFS TL666D.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Safety, Reliability, and Environmental Stewardship Goals

This CAISO-approved project will not only enhance the reliability of Del Mar Substation, it will also result in poles being removed from service in environmentally sensitive lagoon areas. This project will greatly improve the environment and reduced future impacts related to the maintenance of lines in the areas the line traverses today.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is electric system reliability.

18. 13143 – TL695B Reconductor

The forecasts for the TL695B Reconductor project for 2014, 2015, and 2016 are $0, $0, and $458, respectively.

a. Project Description

This is a FERC project with associated distribution/CPUC forecasted spend. FERC projects are funded though the formula rate making process. The distribution component of transmission projects is covered through the GRC process.

This project will mitigate overloads on TL695B (segment of TL695 between Basilone Substation and Talega Tap) during an outage on TL690 (4-terminal line between Las Pulgas Substation, Oceanside Substation, Stuart Substation, and San Luis Rey Substation). The project will protect the system and mitigate reliability risk and costs by preventing the damage to conductors and equipment on the B-segment of TL695 that could occur as a result of the overload described above.

The scope of work includes reconductoring approximately 6 miles of the Transmission Line with 336 ACSR/AW. The scope involves replacing 124 wood poles with steel poles and replacing approximately 37,000 circuit feet of small copper conductor with 336 ACSR/AW conductor that meets the required line rating. This is a CAISO-approved project.

The specific details regarding the TL695B Reconductor project are found in my capital workpapers. See SDG&E-09-CWP at section 13143 – TL695B Reconductor.

b. Forecast Method

This is a FERC project with a CPUC component. The forecast is based on detailed cost estimates that were developed based on the specific scope of work for the project. SDG&E utilizes comprehensive cost estimating programs to develop detailed cost estimates, based on current construction labor rates, material costs, overhead rates, contract pricing/quotes, and other project specific details. When projects are completed, actual costs are compared to the estimate to assess whether estimates are accurate. Any significant variances between the estimated cost for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects.

c. Supports Reliability Goals

These forecasted capital expenditures support the goal of enhancing reliability. The goal of the TL695B project is to reduce the potential for a contingency situation. In conjunction with enhancing the reliability of the transmission line, the distribution facilities will be improved, so distribution reliability will be enhanced as well.

d. Cost Driver(s)

This is a specific capital transmission project. The forecasted costs are based on detailed cost estimates. The primary driver for this project is electric system reliability.

VI. CONCLUSION

My capital forecasts were carefully developed and scrutinized by my organization as representing a prudent level of funding for the critical activities and capital projects to take place in this GRC term. SDG&E continues to hold safety, reliability, and customer service as key tenets for day-to-day operations. The capital projects described above are scrutinized and prioritized by a cross-functional committee to address the most important risk concerns. Forecasts were developed by using both historical expenditures and specific project estimates, assessing upward pressures, and using all available information to develop reasonable forecasts.

As described in my testimony, many of the core business activities remain the same as described in previous rate cases (with increases in most cases, due to incremental cost drivers), but there are areas of expanded focus due to the ever-changing environment. One of those key areas is fire risk mitigation activities. Over the past 11 years, Southern California has seen a dramatic increase in catastrophic wildfire activity. Mitigating the risk associated with wildfires is a major focus for the IOUs in California, especially the Southern California utilities that experience extreme Santa Ana wind conditions. SDG&E has a comprehensive Fire Prevention Plan that describes many of the organizational and operational activities SDG&E undertakes to address the risk of fire. One of the significant differences between the capital testimony in this GRC versus past rate cases is the large scale effort to address known risks through the Fire Risk Mitigation program. That program follows the wood-to-steel model that has proven to be successful for the transmission system, and incorporates a comprehensive data set of equipment and/or line element risks in areas of high fire risk.

Another area of increased focus is on the integration of rooftop solar and distributed energy resources. SDG&E is obligated to maintain reliability and quality of service, regardless of what customers choose to do on their side of their meter. SDG&E continues to look at advanced technologies that can monitor the levels of customer generation and mitigate the various problems those systems can impart on the electric distribution system.

The compilation of capital projects described in this testimony are designed to meet SDG&E's service obligation to our customers and provide the safety and reliability that our customers have grown to expect and depend upon. I respectfully request the Commission to authorize the funding necessary to complete the projects described in my testimony.

This concludes my prepared direct testimony.

VII. WITNESS QUALIFICATIONS

My name is John D. Jenkins. I hold a Bachelor of Science degree in Electrical Engineering from the California Polytechnic University, San Luis Obispo. I am also a registered Professional Engineer in the state of California in the field of Electrical Engineering. I joined SDG&E in 1999 as an Associate Engineer and have held positions of increasing responsibility in electric transmission and distribution operations and engineering groups at SDG&E. I am presently Director of the Major Projects Department within the Electric Transmission and System Engineering Division. I have not testified previously to the Commission.

APPENDIX A – LIST OF BUDGET CODES IN NUMERICAL ORDER

Budget Code	Budget Name	Category	Estimated 2014	Estimated 2015	Estimated 2016
100	Elec Trans Line Reliability Projects	Transmission/FERC Driven Projects	1,045	1,045	1,045
102	Elec Trans Line Relocation Projects	Transmission/FERC Driven Projects	50	50	50
202	Electric Meters & Regulators	New Business	4,036	4,488	4,769
203	Distribution Substation Reliability	Reliability/Improvements	1,526	1,538	1,634
204	Electric Distribution Easements	New Business	3,968	4,857	5,084
205	Electric Dist. Street/Hwy Relocations	Franchise	6,079	6,079	6,079
206	Electric Distribution Tools/Equipment	Equip/Tools/Misc	1,372	1,372	1,372
209	Field Shunt Capacitors	Capacity/Expansion	594	594	594
210	Conversion From OH To UG Rule 20A	Franchise	13,025	13,025	13,025
211	Conversion From OH-UG Rule 20B 20C	New Business	1,806	1,985	2,184
213	City Of San Diego Surcharge Prog (20SD)	Franchise	22,660	22,660	22,660
214	Transformers	Materials	21,024	22,025	23,027
215	OH Residential NB	New Business	588	775	937
216	OH Non-Residential NB	New Business	1,129	1,490	1,802
217	UG Residential NB	New Business	9,084	11,988	14,503
218	UG Non-Residential NB	New Business	6,858	9,051	10,950
219	New Business Infrastructure	New Business	11,117	14,670	17,749
224	New Service Installations	New Business	5,184	6,840	8,274
225	Customer Requested Upgrades And Services	New Business	8,001	8,800	9,678
226	Management Of OH Dist. Service	Reliability/Improvements	9,273	9,273	9,273
227	Management Of UG Dist. Service	Reliability/Improvements	3,708	3,708	3,708
228	Reactive Small Capital Projects	Capacity/Expansion	1,448	1,448	1,448
229	Corrective Maintenance Program (CMP)	Mandated	8,652	8,464	8,954
230	Replacement Of Underground Cables	Reliability/Improvements	13,005	13,339	13,049
235	Transformer & Meter Installations	New Business	5,256	5,709	6,032
236	Capital Restoration Of Service	Reliability/Improvements	3,844	3,844	3,844
289	CMP UG Switch Replacement & Manhole Repair	Mandated	12,191	12,328	12,466

901	Local Engineering - ED Pool	Overhead Pools	84,987	93,688	92,593
904	Local Engineering - Substation Pool	Overhead Pools	15,328	15,147	7,045
905	Department Overhead Pool	Overhead Pools	3,319	3,727	4,139
906	Contract Administration Pool	Overhead Pools	4,918	5,795	6,447
1269	Rebuild Pt Loma 69/12kV Substation	Reliability/Improvements	234	11,042	0
1295	Load Research/DLP Electric Metering Project	Mandated	302	302	302
2252	Mira Sorrento 138/12KV Substation	Capacity/Expansion	12,218	0	0
2258	Salt Creek Substation & New Circuits	Capacity/Expansion	1,008	5,065	1,816
2264	Sustainable Community Energy Systems	New Business	1,565	0	0
4250	Smart Meter Project-Meter Development	Smart Meter Program	1,116	0	0
6132	Relocate South Bay Substation	Transmission/FERC Driven Projects	294	1,497	216
6247	Replacement Of Live-Front Equipment	Safety and Risk Management	843	843	843
6254	Emergency Transformer & Switchgear	Reliability/Improvements	386	386	386
6260	Remove 4kv Subs. From Service	Reliability/Improvements	3,096	3,032	2,965
7139	Eco Substation	Transmission/FERC Driven Projects	1,608	0	0
7144	Fiber Optic For Relay Protect & Telecom	Transmission/FERC Driven Projects	2,136	2,136	2,136
7245	Telegraph Canyon-138/12kV Bank & C1226	Capacity/Expansion	3,080	0	0
7249	San Ysidro- New 12kv Circuit 1202	Capacity/Expansion	748	0	0
7253	C1161 BD - New 12kV Circuit	Capacity/Expansion	1,315	0	0
8162	Substation Security	Reliability/Improvements	834	834	834
8165	Cleveland National Forest Power Line Replacement Projects	Transmission/FERC Driven Projects	180	4,101	2,222
8253	Substation 12kV Capacitor Upgrades	Capacity/Expansion	3,278	3,278	3,278
8259	C917, CC: New 12kV Circuit	Capacity/Expansion	1,450	0	0
8261	Vista 4kV Substation RFS	Reliability/Improvements	884	0	0
9125	TL 637 CRE-ST Wood-to-Steel	Transmission/FERC Driven Projects	1,859	0	0
9136	TL6914 Los Coches-Loveland Wood-to-Steel	Transmission/FERC Driven Projects	58	2,396	0
9153	TL676 Mission To Mesa Heights Reconductor	Transmission/FERC Driven Projects	52	0	0
9166	Tl13821 & 28-Fanita	Transmission/FERC Driven Projects	8	620	0

	Junction Enhance				
9271	C1259, MAR: New 12kV Circuit	Capacity/Expansion	0	961	0
9274	C1282 LC - New Circuit	Capacity/Expansion	4,031	0	0
9276	Poseidon - Cannon Substation Modification	Capacity/Expansion	9,402	808	0
10135	Los Coches Rebuild 138/69/12kV Substation	Transmission/FERC Driven Projects	6,802	5,136	5,234
10150	TL13833 Wood-to-Steel	Transmission/FERC Driven Projects	285	0	0
10261	Advanced Technology	Reliability/Improvements	12,264	12,360	12,324
10265	Avian Protection	Mandated	1,680	1,645	1,609
10266	C350, LI: Reconductor & Voltage Regulation	Capacity/Expansion	933	0	0
10270	C1049, CSW: New 12kV Circuit	Capacity/Expansion	2,506	0	0
10272	Middletown 4kV Substation RFS	Capacity/Expansion	734	0	0
11126	TL663 Mission to Kearny Reconductor	Transmission/FERC Driven Projects	49	17	0
11127	TL670 Mission to Clairemont Reconductor	Transmission/FERC Driven Projects	52	0	0
11243	SDG&E Weather Instrumentation Install	Safety and Risk Management	285	0	0
11244	C928, POM: New 12kV Circuit	Capacity/Expansion	734	0	0
11247	Advanced Energy Storage	Reliability/Improvements	2,562	0	0
11257	Camp Pendleton 12kv Service	Capacity/Expansion	612	0	0
11259	C100, OT: 12kV Circuit Extension	Capacity/Expansion	1,858	0	0
11261	Sewage Pump Station Rebuilds	Reliability/Improvements	2,228	1,616	0
12125	Sunnyside 69/12kv Rebuild	Reliability/Improvements	1,414	450	0
12154	TL631 Reconductor Project	Transmission/FERC Driven Projects	0	2,182	0
12156	TL600 Reliability Pole Replacements	Transmission/FERC Driven Projects	130	0	0
12256	Powerworkz	Safety and Risk Management	468	0	0
12265	C1215- Fire Risk Mitigation Project	Safety and Risk Management	186	0	0
12266	Condition Based Maintenance Program	Reliability/Improvements	3,852	3,876	3,780
13130	Loop TL674A into Del Mar and RFS TL666D	Transmission/FERC Driven Projects	0	0	1,169
13143	TL 695B Reconductor	Transmission/FERC Driven Projects	0	0	458
13242	Rebuild Kearny 69/12kV Substation	Reliability/Improvements	857	15,255	650
13247	Fire Risk Mitigation (FiRM) - Phases 1 and 2	Safety and Risk Management	13,056	12,780	12,496
13250	C108, B: 12kV Circuit Reconfiguration	Capacity/Expansion	619	0	0

13251	PO: Reconductor	Capacity/Expansion	0	657	0
13255	C441-Pole Loading Study/Fire Risk Mitigation	Safety and Risk Management	186	0	0
13259	C1243, RMV: Reconductor	Capacity/Expansion	0	1,341	0
13260	C1288, MSH: New 12kV Circuit	Capacity/Expansion	980	0	0
13263	C982: OL-Voltage Regulation	Capacity/Expansion	551	0	0
13266	Distribution Aerial Marking and Lighting	Safety and Risk Management	140	140	140
13282	Future CNF Blanket Budget	Safety and Risk Management	0	2,598	7,106
13285	C1090, JM: New 12kV Circuit	Capacity/Expansion	0	14,574	0
13286	C1120, BQ: New 12kV Circuit	Capacity/Expansion	0	0	2,965
13288	GH New 12kV Circuit	Capacity/Expansion	0	0	1,584
14243	Microgrid Systems for Reliability	Reliability/Improvements	5,628	5,796	5,676
14247	Fire Risk Mitigation (FiRM) - Phase 3	Safety and Risk Management	11,045	24,323	44,950
14249	SF6 Switch Replacement	Safety and Risk Management	0	0	9,888
87232	Pole Replacement And Reinforcement	Mandated	15,047	15,409	15,732
93240	Distribution Circuit Reliability Construction	Reliability/Improvements	10,218	10,611	10,380
94241	Power Quality Program	Reliability/Improvements	140	187	233
97248	Distribution System Capacity Improvement	Capacity/Expansion	2,556	2,556	2,556
99282	Replace Obsolete Substation Equipment	Reliability/Improvements	5,895	5,787	5,691
Totals			**443,612**	**486,399**	**474,033**

APPENDIX B - GLOSSARY OF ACRONYMS

ACSS/AW	Aluminum Conductor, Aluminum Clad Steel Supported
AES	Advanced Energy Storage
AFV	Alternate Fueled Vehicle
AMI	Advanced Meter Initiative
APLIC	Avian Power Line Interaction Committee
BQ	Batiquitos
BSMD	Borrego Springs Microgrid Demonstration
CA	Contract Administration
CAISO	California Independent System Operator
CARB	California Air Resources Board
CBD	Capital Budget Documentation
CBM	Condition Based Maintenance
CC	Chicarita
CCDC	Centre-City Development Corporation
CFSP	Community Fire Safety Program
CIAC	Contributions In Aid of Construction
CMP	Corrective Maintenance Program
CNF	Cleveland National Forest
CSW	Chollas West
DER	Distributed Energy Resource
DG	distributed generation
DLP	Dynamic Load Profile
DMS	Distribution Management System (sometimes with Outage Management System as OMS/DMS)
DOE	‘Do Not Operate Energized’ or U.S. Department of Energy
ECS	Enhanced cable strategy
ED	Electric Distribution
EMD	Electric Motor Drive
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EV	Electric Vehicle
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
FR3	Envirotemp FR3 fluid, a substitute for conventional transformer oils developed by Cooper Power Systems)
FSMSUP	US Forest Service Master Special Use Permit
FTZ	Fire Threat Zone
FiRM	Fire Risk Mitigation
GH	Grant Hill
GIS	Geographical Information System
GO	General Order
HRFA	Highest Risk Fire Area
JM	Jamacha
kV	kilovolt

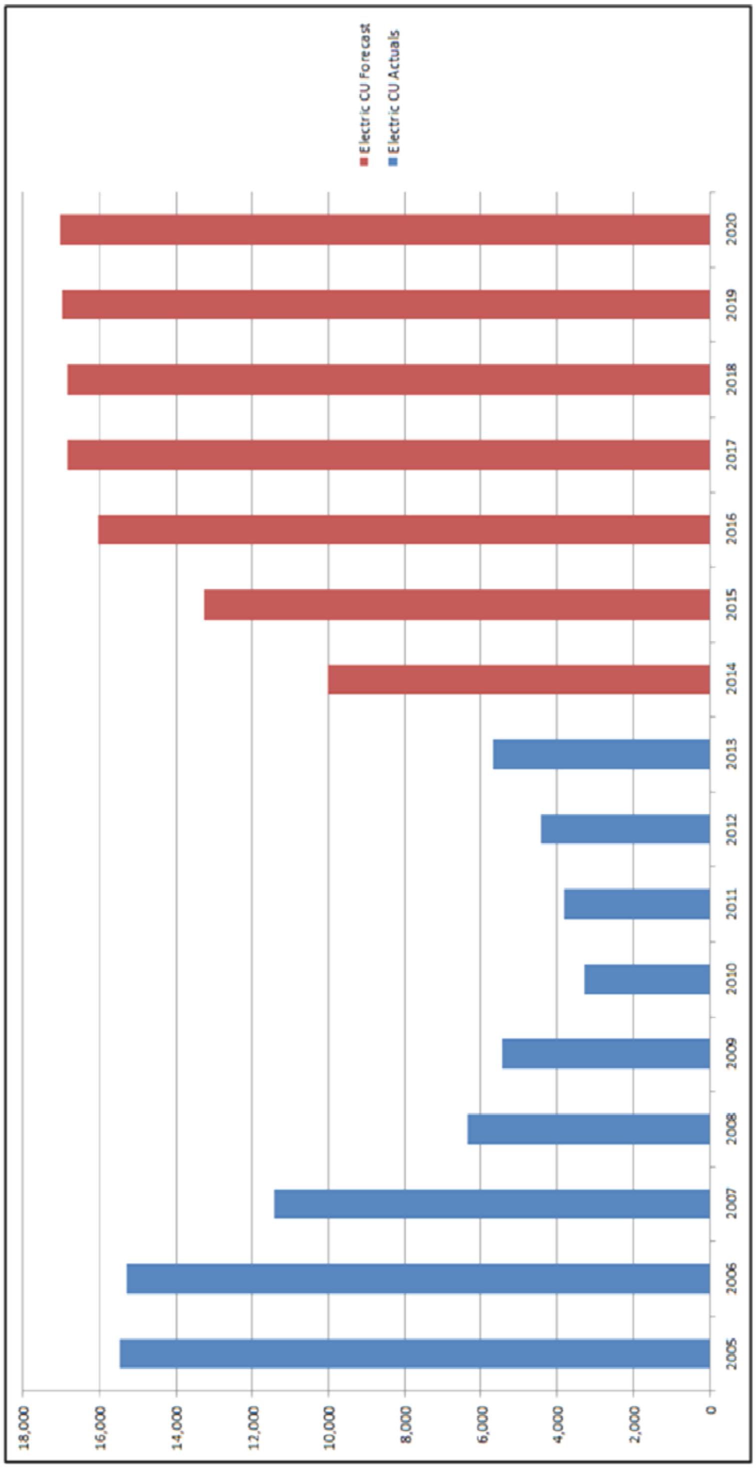
LC	Los Coches
LE	Local Engineering
LI	Lilac
LTC	Load Tap Changer
LiDAR	Light Detection And Ranging
MAR	Margarita
MIO	Mechanically Inoperable
MSH	Mesa Heights
MSPU	Master Special Use Permit
MTDB	Metropolitan Transit Development Board
MVA	Mega Volt Ampere (million VA)
MW	MegaWatt
NB	New Business
NCTD	North County Transit District
NEM	Net Energy Metering
NERC/CIP	North American Electric Reliability Corporation, Critical Infrastructure Protection
OES	San Diego County Office of Emergency Services
OH	overhead
OL	Otay Lakes
OMS	Outage Management System (sometimes with Distribution Management System as OMS/DMS)
OPEX GIS	Operational Excellence Geographic Information System
OT	Old Town
PFM	Petition For Modification
PLS	Point Loma Sewage Substation
PLS-CADD	Power Line Systems Computer Aided Design and Drafting
PLWTP	Point Loma waste water treatment plant
PMU	Phasor Measurement Unit
PO	Poway
POM	Pomerado
PQ	Power Quality
PV	Photovoltaic
RAT	Reliability Assessment Team
RFS	Remove From Service (sometimes Retire From Service)
RIRAT	Reliability Improvements in Rural Areas Team
RMS	Root-mean square
RMV	Rancho Mission Viejo
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SANDAG	San Diego County Association of Governments
SCADA	Supervisory Control and Data Acquisition
SEA	Substation Equipment Assessment
SF6	Sulfur Hexafluoride, a dielectric gas
SUP	special use permits
SW	Steel/Wood

SWPL	Southwest Power Link
SWPP	Storm Water Pollution Prevention Plan
TCM	Transmission Construction & Maintenance
TCO	total cost of ownership
TRC	Technical Review Committee
UCLA	University of California at Los Angeles
UG	underground
VAr	Volts-amps reactive (sometimes VAR)
WFI	Wireless Fault Indicator
WTS	Wood-to-Steel
20SD	SDG&E capital budget 20SD, the City Of San Diego Surcharge Program

APPENDIX C – CONSTRUCTION UNIT FORECAST

Construction Unit History & Forecast

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
ELECTRIC CU ACTUALS	15,482	15,282	11,434	6,346	5,466	3,277	3,819	4,441	5,685							
ELECTRIC CU FORECAST										10,035	13,271	16,039	16,832	16,836	16,983	17,031



- ***Construction Unit Forecast has been used for many years***
- ***Based on April, 2014 Forecast and Used in 2016 GRC***

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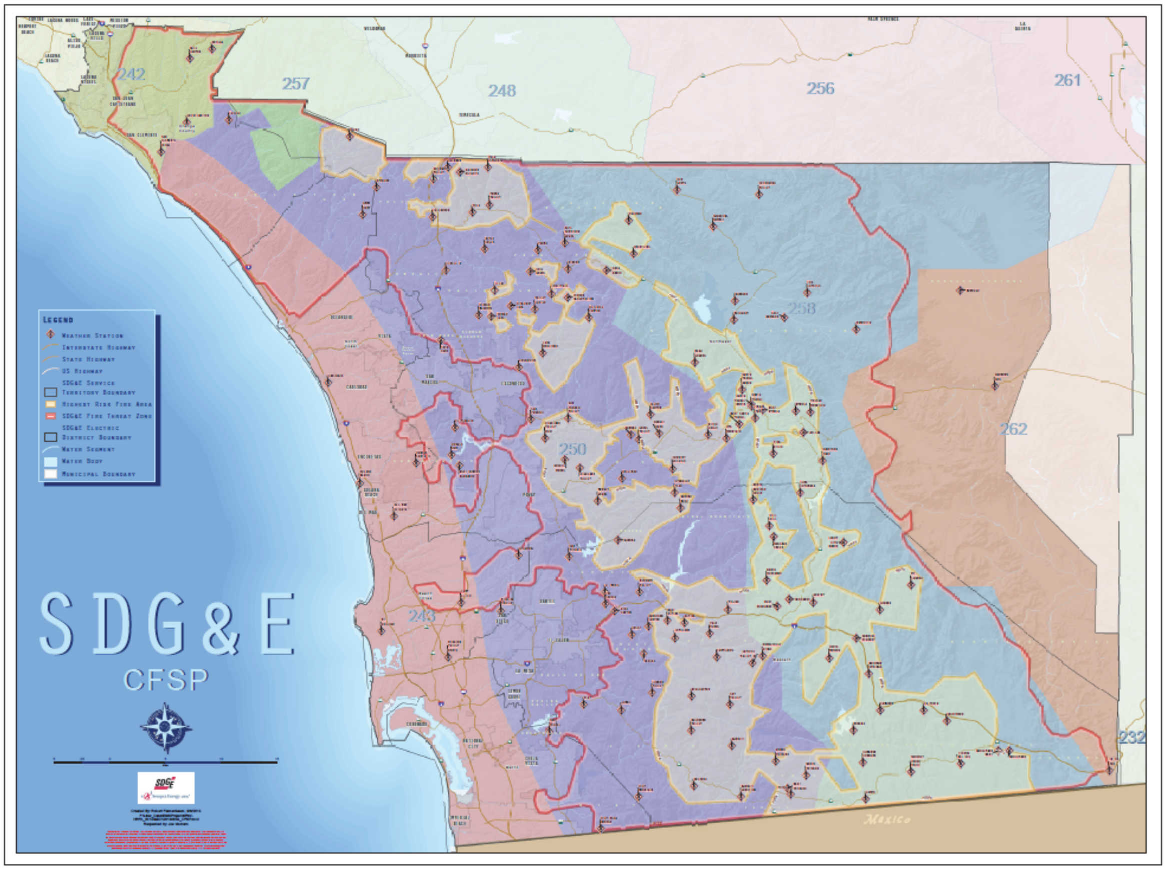
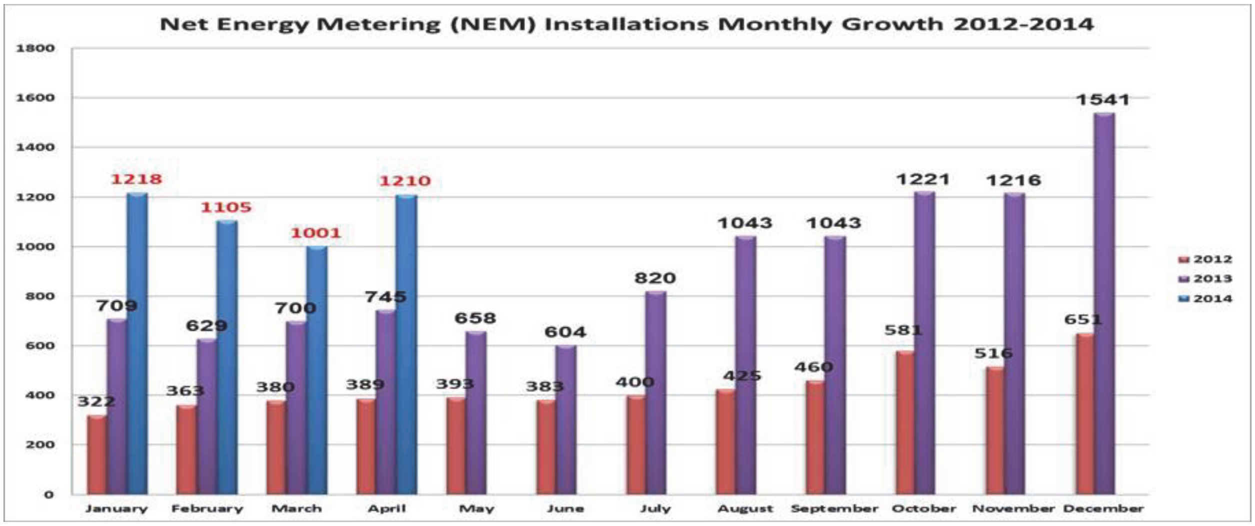
APPENDIX D – MAP OF SDG&E FIRE THREAT ZONE, HIGH RISK FIRE AREA, AND METEOROLOGICAL NETWORK



APPENDIX E – GROWTH IN ROOFTOP SOLAR AS OF APRIL, 2014



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