Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2024 General Rate Case
Application: A.22-05-016
Exhibit: SDG&E-11-R

REVISED

PREPARED DIRECT TESTIMONY OF

OLIVA REYES

(ELECTRIC DISTRIBUTION CAPITAL)

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

August 2022

TABLE OF CONTENTS

I. INTRODUCTION 1
A. Summary of Electric Distribution Capital Costs and Activities 1
B. Support To and From Other Witnesses 4
1. Electric Distribution O&M 4
2. Wildfire Mitigation and Vegetation Management 4
3. Sustainability Policy 5
4. Electric Customer Forecast 5
5. Rate Base 5
6. Regulatory Accounts 5
7. Clean Energy Innovations 5
C. Organization of Testimony 5
II. RISK ASSESSMENT MITIGATION PHASE INTEGRATION 6
A. Risk Overview 7
B. GRC Risk Activities 8
C. Changes from RAMP Report 14
III. SUSTAINABILITY AND SAFETY CULTURE 16
IV. ELECTRIC DISTRIBUTION CAPITAL PROJECT EVALUATION AND PRIORITIZATION 18
A. Capital Management Governance 18
1. Substation Equipment Assessment (SEA) Team 18
2. Strategic Reliability Enhancement Team (SRET) 18
3. Technical Review Council (TRC) 19
4. Electric Transmission & Distribution Capital Steering Committee 20
V. ELECTRIC DISTRIBUTION CAPITAL FORECASTS BY CATEGORY 22
A. CAPACITY/EXPANSION 25
1. Introduction 25
2. 209 – Field Shunt Capacitors 28
a. Description 28
b. Forecast Method 29
c. Cost Drivers 29
3. 228 – Reactive Small Capital Projects 29
a. Description 29
b. Forecast Method 30
c. Cost Drivers 30

4. 1295 – Load Research/DLP Electric Metering Project 30
a. Description 30
b. Forecast Method 31
c. Cost Drivers 31
5. 8253 – Distribution Capacitors 32
a. Description 32
b. Forecast Method 33
c. Cost Drivers 33
6. 8260 – Chollas West: New 12kV Circuit C1047 33
a. Description 33
b. Forecast Method 34
c. Cost Drivers 34
7. 18252 – Imperial Beach: New 12kV Circuit C724 34
a. Description 34
b. Forecast Method 35
c. Cost Drivers 35
8. 18261 – Vine: New 12kV Circuit C1480 35
a. Description 35
b. Forecast Method 35
c. Cost Drivers 36
9. 19256 – Carlton Hills: New 12kV Circuit C1191 36
a. Description 36
b. Forecast Method 36
c. Cost Drivers 36
10. 20247 – Planned Investments (Capacity) 37
a. Description 37
b. Forecast Method 37
c. Cost Drivers 37
11. 20252 – Old Town: Reconductor 12kV Circuit C493 38
a. Description 38
b. Forecast Method 38
c. Cost Drivers 38
12. 20260 –East Gate: New 12kV Circuit C1154 38
a. Description 38

b. Forecast Method 39
c. Cost Drivers 39
13. 21246 – Creelman: Reconductor 12kV Circuit C235 39
a. Description 39
b. Forecast Method 39
c. Cost Drivers 40
14. 21247 – Point Loma: Reconductor 12kV Circuit C50 & Capacitor 40
a. Description 40
b. Forecast Method 40
c. Cost Drivers 40
15. 21248 – Vine: 12 kV Circuit C139 Cutover to C138 41
a. Description 41
b. Forecast Method 41
c. Cost Drivers 41
16. 21251 – Border: New 12kV Circuit C1162 41
a. Description 41
b. Forecast Method 42
c. Cost Drivers 42
17. 21258 – Sampson: New 12kV Twin Circuit C369 42
a. Description 42
b. Forecast Method 42
c. Cost Drivers 43
18. 21276 – Future Capacity Projects 43
a. Description 43
b. Forecast Method 43
c. Cost Drivers 44
19. 97248 – Distribution System Capacity Improvement 44
a. Description 44
b. Forecast Method 44
c. Cost Drivers 45
B. EQUIPMENT/TOOLS 45
1. Introduction 45
2. 106 – Electric Transmission Tools & Equipment 45
a. Description 45

b. Forecast Method 46
c. Cost Drivers 46
3. 206 – Electric Distribution Tools & Equipment 46
a. Description 46
b. Forecast Method 47
c. Cost Drivers 47
C. FRANCHISE 47
1. Introduction 47
2. 205 – Electric Street & Highway Relocations 49
a. Description 49
b. Forecast Method 49
c. Cost Drivers 49
3. 210 – Conversion of Overhead to Underground Rule 20A 49
a. Description 49
b. Forecast Method 50
c. Cost Drivers 50
4. 213 – City of San Diego Surcharge Program (20SD) 51
a. Description 51
b. Forecast Method 51
c. Cost Drivers 52
5. 20257 – Conversion from Overhead to Underground Rule 20B 52
a. Description 52
b. Forecast Method 52
c. Cost Drivers 53
6. 21125 – TL681 Escondido Trails Customer Relocation 53
a. Description 53
b. Forecast Method 53
c. Cost Drivers 53
7. 21139 – TL634 Juniper Street Customer Relocation 54
a. Description 54
b. Forecast Method 54
c. Cost Drivers 54
D. MANDATED 55
1. Introduction 55

2. 229 – Corrective Maintenance Program (CMP) 56
a. Description 56
b. Forecast Method 57
c. Cost Drivers 57
3. 289 – Manhole, Handhole, and Vault Restoration 57
a. Description 57
b. Forecast Method 58
c. Cost Drivers 58
4. 10265 – Avian Protection (Non-HFTD) 58
a. Description 58
b. Forecast Method 59
c. Cost Drivers 60
5. 13264 – Distributed Generation Interconnect 60
a. Description 60
b. Forecast Method 60
c. Cost Drivers 61
6. 17262 – Street Light Modernization 61
a. Description 61
b. Forecast Method 61
c. Cost Drivers 62
7. 87232 – Pole Replacement and Reinforcement 62
a. Description 62
b. Forecast Method 63
c. Cost Drivers 63
E. MATERIALS 63
1. Introduction 64
2. 202 – Electric Meters & Regulators 64
a. Description 64
b. Forecast Method 64
c. Cost Drivers 65
3. 214 – Transformers 65
a. Description 65
b. Forecast Method 65
c. Cost Drivers 65

F. NEW BUSINESS 66
1. Introduction 66
2. 204 – Electric Distribution Easements 67
a. Description 67
b. Forecast Method 67
c. Cost Drivers 68
3. 215 – Overhead Residential New Business 68
a. Description 68
b. Forecast Method 68
c. Cost Drivers 69
4. 216 – Overhead Non-Residential New Business 69
a. Description 69
b. Forecast Method 70
c. Cost Drivers 70
5. 217 – Underground Residential New Business 70
a. Description 70
b. Forecast Method 71
c. Cost Drivers 71
6. 218 – Underground Non-Residential New Business 71
a. Description 71
b. Forecast Method 72
c. Cost Drivers 72
7. 219 – New Business Infrastructure 72
a. Description 72
b. Forecast Method 73
c. Cost Drivers 73
8. 224 – New Service Installations 74
a. Description 74
b. Forecast Method 74
c. Cost Drivers 74
9. 225 – Customer Requested Upgrades & Services 75
a. Description 75
b. Forecast Method 75
c. Cost Drivers 75

10. 235 – Transformer & Meter Installations 76
a. Description 76
b. Forecast Method 76
c. Cost Drivers 76
11. 18143 – 3 ROOTS TL6906, TL677 & TL668 Customer Relocation 77
a. Description 77
b. Forecast Method 77
c. Cost Drivers 77
12. 18242 – Pure Water Electric 78
a. Description 78
b. Forecast Method 78
c. Cost Drivers 79
13. 20256 – Camp Pendleton Stuart Mesa Housing – Electric 79
a. Description 79
b. Forecast Method 79
c. Cost Drivers 80
14. 21252 – Conversion from Overhead to Underground Rule 20B 80
a. Description 80
b. Forecast Method 80
c. Cost Drivers 81
15. 21253 – Conversion from Overhead to Underground Rule 20C 81
a. Description 81
b. Forecast Method 81
c. Cost Drivers 82
G. OVERHEAD POOLS 82
1. Introduction 82
a. One-Way Balancing Treatment of OH Pools is Constraining and Counterproductive 84
b. SDG&E's ED Capital Project Teams Have Effective Cost Oversight and Forecasting Processes That Obviate the Need for One-Way Balancing Account Treatment 85
c. SDG&E's OH Pool Costs are Managed in Proportion to its Capital Expenditures During the Year 86
2. 901 – Local Engineering Pool – ED Pool 87
a. Description 87

b. Forecast Method 88
c. Cost Drivers 88
3. 904 – Local Engineering Pool – Substation Pool 88
a. Description 88
b. Forecast Method 89
c. Cost Drivers 90
4. 905 – Department Overhead Pool – Electric 90
a. Description 90
b. Forecast Method 91
c. Cost Drivers 91
5. 906 – Contract Administration Pool – Electric 91
a. Description 91
b. Forecast Method 92
c. Cost Drivers 92
H. RELIABILITY IMPROVEMENTS 92
1. Introduction 93
2. 203 – Distribution Substation Reliability Projects 94
a. Description 94
b. Forecast Method 94
c. Cost Drivers 95
3. 226 – Management of Overhead Distribution Service 95
a. Description 95
b. Forecast Method 96
c. Cost Drivers 97
4. 227 – Management of Underground Distribution Service 97
a. Description 97
b. Forecast Method 98
c. Cost Drivers 99
5. 230 – Replacement of Underground Cables 99
a. Description 99
b. Forecast Method 100
c. Cost Drivers 100
6. 236 – Capital Restoration of Service 100
a. Description 100

b. Forecast Method 101
c. Cost Drivers 102
7. 238 – Planned Cable Replacements 102
a. Description 102
b. Forecast Method 103
c. Cost Drivers 103
8. 290 – Do Not Operate Energized (DOE) Switch Replacement 103
a. Description 103
b. Forecast Method 104
c. Cost Drivers 105
9. 6254 – Emergency Equipment Purchase 105
a. Description 105
b. Forecast Method 106
c. Cost Drivers 106
10. 11249 – SCADA Capacitors 106
a. Description 106
b. Forecast Method 107
c. Cost Drivers 108
11. 13244 – Streamview 69/12 kV Substation Rebuild 108
a. Description 108
b. Forecast Method 109
c. Cost Drivers 109
12. 14128 – Artesian 230kV Substation Expansion 109
a. Description 109
b. Forecast Method 110
c. Cost Drivers 111
13. 14143 – Poway 69kV Substation Rebuild 111
a. Description 111
b. Forecast Method 112
c. Cost Drivers 112
14. 15243 – Substation SCADA Expansion – Distribution 113
a. Description 113
b. Forecast Method 114
c. Cost Drivers 114

15. 17160 – San Marcos Substation 69kV Rebuild & 12kV Switchgear . 115
a. Description 115
b. Forecast Method 116
c. Cost Drivers 116
16. 17243 – Substation Modification to Support FLISR 116
a. Description 116
b. Forecast Method 117
c. Cost Drivers 118
17. 17261 – High Risk Switch Replacement 118
a. Description 118
b. Forecast Method 119
c. Cost Drivers 120
18. 17264 – North Harbor 120
a. Description 120
b. Forecast Method 121
c. Cost Drivers 121
19. 17269 – 4kV Modernization 121
a. Description 121
b. Forecast Method 123
c. Cost Drivers 123
20. 19252 – Urban Substation Rebuild 124
a. Description 124
b. Forecast Method 125
c. Cost Drivers 125
21. 20242 – Torrey Pines 12kV Breaker Replacements 125
a. Description 125
b. Forecast Method 127
c. Cost Drivers 127
22. 20245 – El Cajon 12kV Breaker Replacements 127
a. Description 127
b. Forecast Method 128
c. Cost Drivers 129
23. 20251 – Kettner Substation 69/12kV Rebuild Project 129
a. Description 129

b. Forecast Method 130
c. Cost Drivers 130
24. 20263 – Bernardo 12kV Breakers and Transformer Replacements ... 130
a. Description 130
b. Forecast Method 132
c. Cost Drivers 132
25. 20267 – Miramar 12kV Replacements 132
a. Description 132
b. Forecast Method 133
c. Cost Drivers 133
26. 20268 – Mission 12kV Replacements 134
a. Description 134
b. Forecast Method 135
c. Cost Drivers 135
27. 20270 – Stuart 12kV Transformer Replacements 135
a. Description 135
b. Forecast Method 136
c. Cost Drivers 136
28. 20274 – Coronado 69/12kV Transformer Replacement 136
a. Description 136
b. Forecast Method 137
c. Cost Drivers 137
29. 20275 – La Jolla 69/12kV Transformer Replacement 138
a. Description 138
b. Forecast Method 139
c. Cost Drivers 139
30. 20283 – CBM - 4.2 Firmware Upgrade for Transformers 139
a. Description 139
b. Forecast Method 140
c. Cost Drivers 140
31. 20288 – Non-HFTD Wireless Fault Indicators 140
a. Description 140
b. Forecast Method 141
c. Cost Drivers 142

32. 21275 – Cristianitos Substation Remove From Service (RFS) 142
a. Description 142
b. Forecast Methodology 143
c. Cost Drivers 143
33. 93240 – Distribution Circuit Reliability 143
a. Description 143
b. Forecast Method 144
c. Cost Drivers 144
34. 94241 – Power Quality Program 145
a. Description 145
b. Forecast Method 146
c. Cost Drivers 146
35. 99282 – Replace Substation Obsolete Equipment (Distribution) 147
a. Description 147
b. Forecast Method 148
c. Cost Drivers 148
I. SAFETY & RISK MANAGEMENT 148
1. Introduction 149
2. 6247 – Replacement of Live Front Equipment 149
a. Description 149
b. Forecast Method 150
c. Cost Drivers 150
3. 14249 – SF6 Switch Replacement 150
a. Description 150
b. Forecast Method 151
c. Cost Drivers 152
4. 16276 – SCADA Head-End Replacement 152
a. Description 152
b. Forecast Method 153
c. Cost Drivers 153
5. 16277 – Remote Terminal Unit (RTU) Modernization 153
a. Description 153
b. Forecast Method 154
c. Cost Drivers 155

6. 17255 – Tee Modernization Program 155
a. Description 155
b. Forecast Method 156
c. Cost Drivers 156
7. 17259 – Energized Test Yard 156
a. Description 156
b. Forecast Method 158
c. Cost Drivers 158
8. 19241 – Proactive Dead Front Terminator Deployment 158
a. Description 158
b. Forecast Method 159
c. Cost Drivers 160
9. 20241 – Overhead Public Safety (OPS) 160
a. Description 160
b. Forecast Method 161
c. Cost Drivers 161
10. 20287 – Rebuilding of Skills Training Yard 162
a. Description 162
b. Forecast Method 163
c. Cost Drivers 163
11. 21267 – Mission DCC Remodel Project 163
a. Description 163
b. Forecast Method 165
c. Cost Drivers 165
12. 22241 – Strategic Pole Replacement Program (Non-HFTD) 165
a. Description 165
b. Forecast Method 166
c. Cost Drivers 167
J. DISTRIBUTED ENERGY RESOURCES (DER) INTEGRATION 167
1. Introduction 167
K. TRANSMISSION/FERC-DRIVEN PROJECTS 167
1. Introduction 167
2. 6129 – South Orange County Reliability Enhancement (SOCRE) 168
a. Description 168

b. Forecast Method 168
c. Cost Drivers 169
3. 7144 – Fiber Optic for Relay Protection & Telecommunications 169
a. Description 169
b. Forecast Method 169
c. Cost Drivers 170
4. 12156 – TL600 Reliability Pole Replacements 170
a. Description 170
b. Forecast Method 170
c. Cost Drivers 170
5. 13130 – TL674A Del Mar Reconfigure/TL666D Remove From Service 171
a. Description 171
b. Forecast Method 171
c. Cost Drivers 172
6. 14137 – TL6975 Escondido - San Marcos 172
a. Description 172
b. Forecast Method 172
c. Cost Drivers 173
7. 17125 – Granite Substation 69kV Loop-In 173
a. Description 173
b. Forecast Method 173
c. Cost Drivers 174
8. 20126 – Transmission Corrective Maintenance Program (Non-HFTD) 174
a. Description 174
b. Forecast Method 174
c. Cost Drivers 174
9. 21135 – Electric Transmission Small Reliability Jobs (Non-HFTD) . 175
a. Description 175
b. Forecast Method 175
c. Cost Drivers 175
VI. IT PROJECTS SPONSORED BY ELECTRIC DISTRIBUTION 175
A. 00908A – Electric Material Traceability 176
1. Justification 176

B. 00920A – Microgrid Portal 176
1. Justification 176
C. 00920AO – Builder Services Customer Portal - Phase 3 177
1. Justification 177
D. 00921Y– Construction Management Software Integration with SAP 177
1. Justification 178
E. 00921Z– Automated Utility Design (AUD) 178
1. Justification 178
VII. CONCLUSION 178
VIII. WITNESS QUALIFICATIONS 180

APPENDICES

Appendix A – Glossary of Terms OR-A-1
Appendix B – Capital Projects Supporting RAMP Risks Sorted by Workpaper OR-B-1

SDG&E 2024 GRC Testimony Revision Log – August 2022

SUMMARY[1]

ELECTRIC DISTRIBUTION (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
NON-COLLECTIBLE (NC)	438,049	532,595	425,949
COLLECTIBLE (CO)	44,879	57,831	71,588
Total CAPITAL	**482,928**	**590,426**	**497,537**

Summary of Requests

San Diego Gas & Electric Company (SDG&E or Company) is requesting the California Public Utilities Commission (CPUC or Commission) adopt its test year 2024 (TY 2024) General Rate Case (GRC) ratepayer-funded (Non-Collectible) forecast of $416,276,000 for Electric Distribution Capital.[2] SDG&E is also requesting the Commission adopt its ratepayer-funded (Non-Collectible) forecast for capital expenditures in 2022 and 2023 of $431,297,000 and $520,599,000, respectively.

My testimony identifies the work requirements necessary to maintain clean, safe, and reliable operation of the electric distribution overhead (OH) and underground (UG) system. Within my testimony, I also break out the costs associated with Risk Assessment Mitigation Phase (RAMP) projects that increase safety by reducing risk exposure and exemplifies SDG&E's deep-rooted safety culture and commitment to reduce risk exposure through capital upgrades.

Many of the core business activities within my testimony remain the same as described in previous rate cases with increases in most cases due to incremental cost drivers, but there are also areas of new and expanded focus including sustainability and grid modernization while always maintaining a strong commitment to safety and reliability.

---

[1] Please refer to my capital workpapers (CWP) Exhibit (Ex.) SDG&E-11-CWP, for additional information about the activities described herein. Each capital workpaper includes a Summary of Adjustments to Forecast section and workpaper details that separate the portion that is forecasted to be ratepayer-funded (Non-Collectible) and the portion anticipated to be collected from third parties (Collectible), if applicable. The Collectible portion is necessary for calculating the proper allocation of overhead amounts to these projects, but the fully loaded Collectible amounts are not included in the requested revenue requirement.

[2] Includes the Electric Distribution Capital projects and programs that are not associated with wildfire mitigation, clean transportation, generation, and other specific areas covered in other witness areas.

REVISED PREPARED DIRECT TESTIMONY OF OLIVA REYES (ELECTRIC DISTRIBUTION CAPITAL)

I. INTRODUCTION

A. Summary of Electric Distribution Capital Costs and Activities

My testimony supports the TY 2024 GRC forecasts for capital costs for the forecast years 2022, 2023, and 2024, associated with the Electric Distribution Capital area for SDG&E and demonstrates why these expenditures are necessary and reasonable. Table OR-1 summarizes my sponsored costs.

TABLE OR-1[3]
Test Year 2024 Summary of Total Costs

ELECTRIC DISTRIBUTION (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
NON-COLLECTIBLE (NC)	438,049	532,595	425,949
COLLECTIBLE (CO)	44,879	57,831	71,588
Total CAPITAL	**484,928**	**590,426**	**497,537**

Electric Distribution Capital is responsible for a portfolio of projects and programs required to provide safe and reliable electric service to SDG&E customers. SDG&E prioritizes work to comply with applicable laws and regulations, and to provide system integrity and reliability in accordance with the Company's commitment to safety. SDG&E's longstanding commitment to safety focuses on three primary areas – public, customer, and employee safety. This safety-first culture is embedded in how the Company carries out its work and builds its systems – from initial employee training to the installation, operation, and maintenance of utility infrastructure, and to the Company's commitment to provide safe and reliable service to its customers.

[3] Please refer to my capital workpapers, Ex. SDG&E-11-CWP, for additional information about the activities described herein. Each capital workpaper includes a Summary of Adjustments to Forecast section and workpaper details that separate the portion that is forecasted to be ratepayer-funded (Non-Collectible) and the portion anticipated to be collected from third parties (Collectible), if applicable. The Collectible portion is necessary for calculating the proper allocation of overhead amounts to these projects, but the fully loaded Collectible amounts are not included in the requested revenue requirement.

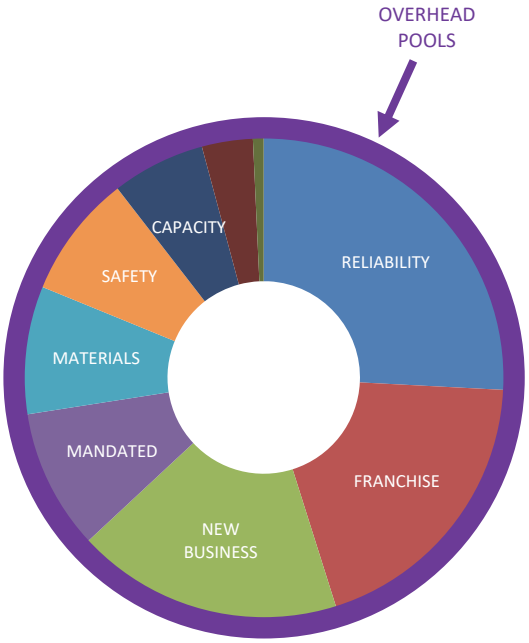
My testimony demonstrates SDG&E's need for this portfolio of projects through individual descriptions and analysis of each project's business justification, need, and support related to the safety and reliability for the Company's customers, employees, and communities. My testimony addresses the forecasted costs associated with the electric distribution capital work SDG&E deems necessary to provide safe, reliable, and high-quality service to its customers. The electric distribution capital forecasts are grouped into ten[4] primary cost categories:

- Capacity/Expansion
- Equipment/Tools
- Franchise
- Mandated
- Materials
- New Business
- Overhead Pools
- Reliability/Improvements
- Safety & Risk Management
- Transmission/Federal Energy Regulatory Commission (FERC) Driven Projects

Figure OR-1 below shows each category by the percentage of the overall forecast. Values include both collectible and non-collectible costs. Each specific work category is described in greater detail in my testimony under headings corresponding to these categories.

[4] An additional category for Distributed Energy Resources (DER) Integration is excluded from this list as there are no forecasted costs (historical costs only).

Figure OR-1
2022 – 2024 Capital Forecast by Percentage of Overall Forecast



Category	3 Year Total
OVERHEAD POOLS	33%
RELIABILITY	18%
FRANCHISE	13%
NEW BUSINESS	12%
MANDATED	6%
MATERIALS	6%
SAFETY/RISK	6%
CAPACITY	4%
FERC-DRIVEN	2%
TOOLS	<1%

In preparing our projections for TY 2024 requirements, SDG&E analyzed historical 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 derived from historical averages
- Forecasts derived from the base year 2021 (BY 2021) adjusted recorded spending
- Forecasts derived from zero-based cost estimates

My testimony identifies work requirements incremental to levels of historical spending and necessary to maintain the safe and reliable operation of the distribution system. Funding requirements for new or more extensive work elements are forecasted based on historical spending plus incremental expense requirements. Roughly 72% of the forecasts for electric distribution capital are zero-based and 28% are based on historical averages (predominantly a three-year average). Since a large portion of the electric capital distribution projects are specific projects that are non-recurring in nature, zero-based cost estimates or forecasts were used.

In addition to a focus on safety and reliability, some of the projects included in this portfolio also support sustainability and grid modernization efforts. For details related to

SDG&E's commitment to sustainability, please reference Sustainability Policy testimony of Estela de Llanos (Exhibit SDG&E-02). Additional information regarding how electric distribution capital projects and programs within my testimony support sustainability can be found in Section III – Sustainability, Climate Policy, and Safety Culture. Within this request there are increases to support activities discussed in SDG&E's 2021 Risk Assessment Mitigation Phase (RAMP) Report (the 2021 RAMP Report),[5] primarily the Electric Infrastructure Integrity (EII) chapter (SDG&E-Risk-2), addressed in more detail within Section II below.

B. Support To and From Other Witnesses

In addition to sponsoring my own organization's costs, my testimony also supports the business justification for Information Technology (IT) projects necessary to support Electric Distribution Capital projects and programs (*See* Section V) sponsored by SDG&E witness William J. Exon (Exhibit SDG&E-25, Chapter 2). Additionally, there are references to the testimony and workpapers of several other witnesses, either in support of their testimony or as referential support for mine.

1. Electric Distribution O&M

The Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12) provides the Grid Modernization Plan as well as support for O&M activities such as Corrective Maintenance Program (CMP) inspections and some repair work while major capital repairs and replacements are captured in my testimony.

2. Wildfire Mitigation and Vegetation Management

The Wildfire Mitigation and Vegetation Management testimony by Jonathan Woldemariam (Exhibit SDG&E-13) is referenced where there may be programs with similar scope but divided between those aligning to the Wildfire Mitigation Plan (WMP) focus versus programs included in my testimony typically scoped to assets located outside the High Fire-Threat District (HFTD), also denoted as "Non-HFTD" or "Non-WMP".

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

3. Sustainability Policy

The Sustainability Policy testimony by Estela de Llanos (Exhibit SDG&E-02), Chapter IV Addressing Climate Risks, is referenced within my testimony in support of the SF6 Switch Replacement program.

4. Electric Customer Forecast

The Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40) is referenced in my testimony in support of new business and capacity projects where forecasts for those capital projects and programs are impacted by customer growth.

5. Rate Base

The Rate Base testimony by Steven P. Dais (Exhibit SDG&E-35) references my testimony as it relates to overhead pools.

6. Regulatory Accounts

The Regulatory Accounts testimony by Jason Kupfersmid (Exhibit SDG&E-43) is referenced in my testimony as it relates to continuation of the Rule 20 balancing account, addition of the Litigated Project Cost Memorandum Account (LPCMA) for collectible projects, and removal of one-way balancing for the overhead pools.

7. Clean Energy Innovations

The Clean Energy Innovations testimony of Fernando Valero (Exhibit SDG&E-15) is referenced in my testimony as it relates to DER integration projects previously within the Electric Distribution Capital testimony. Completed projects with historical costs can be found in my capital workpapers. *See* Ex. SDG&E-11-CWP.

C. Organization of Testimony

My testimony describes estimated 2022, 2023, and 2024 capital expenditures for SDG&E's Electric Distribution Capital utility plant and demonstrates why these expenditures are necessary and reasonable. Section I of my testimony provides a brief introduction and summarizes the overall capital electric distribution forecast. Section II describes the RAMP integration into the GRC while Section III provides a discussion on Sustainability, Climate Policy, and Safety Culture initiatives within the testimony. Section IV explains SDG&E's project evaluation and prioritization process. Section V describes the details of plant additions, shows a summary of the requested costs by category, describes the details of the major capital budget categories for electric distribution, provides an explanation of changes affecting each

category of work, and then further details the requested costs by category and individual budget code. Each request by budget code includes a description of the applicable forecast methodology and cost drivers. Section VI describes IT projects sponsored by Electric Distribution, Section VII concludes my testimony, and Section VIII describes my witness qualifications.

The Appendices included additional details for reference. Appendix A provides a Glossary of Terms and Appendix B contains a list of capital projects by budget code supporting RAMP risks.

II. RISK ASSESSMENT MITIGATION PHASE INTEGRATION

Certain costs supported in my testimony are driven by activities described in Southern California Gas Company (SoCalGas) and SDG&E's respective 2021 RAMP Reports.[6] The 2021 RAMP Reports presented an assessment of the key safety risks for SoCalGas and SDG&E and proposed plans for mitigating those risks. As discussed in the testimony of the RAMP to GRC Integration witnesses R. Scott Pearson and Gregory S. Flores (Ex. SCG-03/SDG&E-03, Chapter 2), the costs of risk mitigation projects and programs were translated from the 2021 RAMP Reports into the individual witness areas.

In the course of preparing the Electric Distribution Capital GRC forecasts, SDG&E continued to evaluate the scope, schedule, resource requirements, and synergies of RAMP-related projects and programs. Therefore, the final presentation of RAMP costs may differ from the ranges shown in the 2021 RAMP Reports. Table OR-2 provides a summary of the RAMP-related costs supported in my testimony.

[6] Unless otherwise indicated, references to the 2021 RAMP Report refer to SoCalGas's /SDG&E's respective RAMP Report.

TABLE OR-2
Summary of RAMP Capital Costs

ELECTRIC DISTRIBUTION **Summary of RAMP Capital Costs (In 2021 $)**				
RAMP Report Chapter	**2022 Estimated RAMP Total ($000s)**	**2023 Estimated RAMP Total ($000s)**	**2024 Estimated RAMP Total ($000s)**	**2022-2024 Estimated RAMP Total ($000s)**
SDG&E-Risk-2 Electric Infrastructure Integrity (EII)	108,275	152,115	114,598	374,988
SDG&E-Risk-8 Incident Involving an Employee	808	0	0	808
Sub-total	109,083	152,115	114,598	375,796
RAMP Cross-Function Factor (CFF) Chapter				
SDG&E-CFF-1 Asset Management	105	132	132	369
Sub-total	105	132	132	369
Total RAMP Capital Costs	**109,188**	**152,247**	**114,730**	**376,165**

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

A. Risk Overview

As summarized in Table OR-2 above, my testimony includes costs to mitigate the risks and cross-functional factors (CFFs) included in the 2021 RAMP Report. These risks and factors are further described in Table OR-3 below:

TABLE OR-3
RAMP Risk and CFF Chapter Descriptions

SDG&E-Risk-2 – Electric Infrastructure Integrity (EII)	This chapter addresses the risk of an electric asset failure due to internal or external factors, which results in serious injuries, fatalities, or reliability impacts. This risk includes underground assets in the High Fire-Threat District (HFTD).
SDG&E-Risk-8 – Incident Involving an Employee	This chapter addresses the risk of an incident, involving one or more on-duty employees, that causes serious injuries or fatalities (as defined by OSHA) to a company employee.

SDG&E-CFF-1 Asset Management	An enterprise-wide framework that provides a standardized approach for managing risk and safety across assets and activities. The framework integrates people, processes, data, and technology to enable data-driven decision making through governance, strategy, data consolidation and analytics, and continuous improvement.

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

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

B. GRC Risk Activities

Table OR-4 below provides a narrative summary of the forecasted RAMP-related activities that I sponsor in my testimony.

TABLE OR-4
Summary of RAMP Risk Activities

RAMP ID	Activity	Description
SDG&E-Risk-2-C01	Overhead Public Safety (OPS) Program	This program involves proactively replacing high-risk overhead (OH) conductors prone to wire down events measured as tracked by failure rates, historic wire down events, CMP records and lack of protection (fuse or advanced) that are in proximity to the public (schools, freeways, high profile areas) that could put the public at risk of energized contact.
SDG&E-Risk-2-C02	General Order (GO) 165 Pole Replacement Reinforcement	This program involves pole replacements after identifying compromised poles from pole intrusive inspections complying to GO 165.
SDG&E-Risk-2-C03	4kV Modernization Program – Distribution	This program involves converting remaining OH 4kV infrastructure in SDG&E's service territory to 12kV infrastructure. These conversions will address both the safety and reliability issues associated with 4kV circuits being relatively more susceptible than 12kV circuits to wire down events

RAMP ID	Activity	Description
SDG&E-Risk-2-C04	Distribution Overhead Switch Replacement Program	Install supervisory control and data acquisition (SCADA)[7] system, gang switches, and overhead hook switches.
SDG&E-Risk-2-C05	Management of Overhead Distribution Service (Non-CMP)	This project reinforces the electric OH distribution system infrastructure by responsive action to system damages, deterioration and unsafe conditions outside normal restoration of service. This project provides for the reconstruction of existing overhead distribution facilities as necessary.
SDG&E-Risk-2-C07	Restoration of Service	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.
SDG&E-Risk-2-C08	Avian Protection Program	This program focuses on building SDG&E's distribution system in a manner that complies with State and Federal regulations to prevent the electrocution of birds.
SDG&E-Risk-2-C09	Underground Cable Replacement Program – Reactive	Reactive cable program to replace equipment during outages on the distribution system.
SDG&E-Risk-2-C10-T1	Underground Cable Replacement Program – Proactive	Proactive replacement of at-risk underground cable that is prone to failures (UG Feeder and Branch).
SDG&E-Risk-2-C10-T3	Underground Cable Replacement Program – Proactive – North Harbor Project	Proactive infrastructure replacement of unjacketed feeder cable and collapsed ducts and system updates (SCADA switches).
SDG&E-Risk-2-C11	Tee Modernization Program	Proactive replacement of at-risk underground cable that is prone to failures.
SDG&E-Risk-2-C12	Replacement of Live Front Equipment - Reactive	Continued use of live front terminators causes risks to workers who rely on limited tools (*e.g.*, "VCT") to operate the live equipment. As an alternative to using this equipment, switching plans can consider operating deadfront or remote operated equipment elsewhere on the system to create electric isolation for a job or for safe operation of the live front equipment, however this would likely cause unnecessary outage exposure to additional customers. If the limited switching tools are

[7] SCADA is a system of software and hardware elements that allows industrial organizations to: Control industrial processes locally or at remote locations. Monitor, gather, and process real-time data.

RAMP ID	Activity	Description
		insufficient, workers may be dangerously exposed to live primary voltage, causing serious risks for injury or death.
SDG&E-Risk-2-C13	Replacement of Live Front Equipment - Proactive	Continued use of live front terminators causes risks to workers who rely on limited tools (*e.g.*, "VCT") to operate the live equipment. As an alternative to using this equipment, switching plans can consider operating deadfront or remote operated equipment elsewhere on the system to create electric isolation for a job or for safe operation of the live front equipment, however this would likely cause unnecessary outage exposure to additional customers. If the limited switching tools are insufficient, workers may be dangerously exposed to live primary voltage, causing serious risks for injury or death.
SDG&E-Risk-2-C14	DOE Switch Replacement – Underground	Actively replacing "do not operate energized" (DOE) distribution switches, switch inoperability reduces electric reliability by potentially causing greater customer impact (larger area of outage impact and lower effectiveness of fault isolation/switching plan). Worker safety is at high risk for arc flash, causing injury or death, if DOE switches are not properly addressed in a timely manner.
SDG&E-Risk-2-C15	GO 165 Corrective Maintenance Program – Underground	In lieu of the existing program in place, short and long term deterioration of underground or overhead equipment could increase likelihood of asset failure (e.g., broken cable rack) and cause potential risks, including injury or death, to the public and workers. Degraded equipment would also increase volume and frequency of forced distribution outages, creating risks for public safety. As this program is mandated per GO 165, non-compliance poses risk of regulatory action, including fines. Underground connectors are inspected by infrared technology per ESP 120 (upon entry of facility) and replaced accordingly. OH switch operation, opening and closing switch for maintenance.
SDG&E-Risk-2-C16	GO 165 Manhole, Vault Restoration Program	In lieu of the existing program in place, short and long term structural deterioration of manholes and degradation of distribution switches cause potential risks, including injury or death, to the public and workers. Degraded equipment would also increase volume and frequency of forced distribution outages, creating risks for public safety. As this program is mandated per GO 165, non-compliance poses risk of regulatory action, including fines.

RAMP ID	Activity	Description
SDG&E-Risk-2-C17	Management of Underground Distribution Service (Non-CMP)	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' • Install fault indicators / fusing / switching equipment as necessary to maintain service reliability
SDG&E-Risk-2-C18	Distribution Circuit 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 an aging infrastructure. The budget funds projects that mitigate existing electric system deficiencies, projects for system performance improvements.
SDG&E-Risk-2-C19	Minor Distribution Substation Reliability Projects	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 $500K. This program 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.
SDG&E-Risk-2-C20-T2	Substation Reliability for Distribution Components – Bernardo 12kV Breakers Replacements	Reliability Project to replace circuit breakers and switchgear in the substation due to aging infrastructure.
SDG&E-Risk-2-C20-T5	Substation Reliability for Distribution Components –	Reliability Project to replace circuit breakers and switchgear in the substation due to aging infrastructure.

RAMP ID	Activity	Description
	Miramar 12kV Replacements	
SDG&E-Risk-2-C20-T8	Substation Reliability for Distribution Components – Coronado 69/12kV Transformer Replacements	Replace aging infrastructure of a 69/12kV transformer and disconnects past the life expectancy to improve reliability.
SDG&E-Risk-2-C21	Distribution Substation Obsolete Equipment	Improve safety and reliability related to the replacement of obsolete and problematic substation equipment. SDG&E will focus primarily on distribution substation bank transformers and circuit breaker replacements. Equipment that is truly obsolete, such as equipment that cannot be maintained (no spare parts available) or that poses a safety risk will be replaced.
SDG&E-Risk-2-C22	Emergency Transformer and Switchgear	Restoration of service to distribution customers following outages caused by equipment failures by purchasing additional emergency spare and mobile equipment. Lead times for replacement units continue to be extended. This project will provide additional 69/12kV transformers and 12kV switchgear to maintain the level of spare equipment required to support the aging fleet of transformers and switchgear. SDG&E currently does not have any mobile 12kV regulators or a section of 12kV switchgear. This project will address that with the purchase of both of those items. A failure inside of any existing metal clad switchgear could result in a lengthy outage without an available mobile unit. All mobile equipment is usually connected using portable 69kV and 12kV cables this budget will allow funding to maintain the required number of portable cables required to connect all portable equipment.
SDG&E-Risk-2-C24	Urban Substation Rebuild	Rebuild substation 12kV switchgear due to historical failures.
SDG&E-Risk-2-C26	Power Quality Monitor Deployment and Replacement	Continued deployment of substation distribution bank power quality monitors that can remotely monitor and capture data that supports transmission, distribution, and substation asset management and power quality investigations. On-going use cases supports momentary or incipient fault detection, and fault location for better asset management and reliability functions.

RAMP ID	Activity	Description
SDG&E-Risk-2-C27	Distribution Substation SCADA Expansion	Installation, upgrades, and expansion of the SCADA system at SDG&E's distribution substations. Benefits of installing SCADA include faster faulted circuit identifications, faster isolation of faulted electric distribution circuits, faster load restoration when system disturbances occur and improved system performance by mitigating electric system deficiencies. Also replaces obsolete relays.
SDG&E-Risk-2-C28	Field SCADA RTU Replacement	Older SCADA Remote Terminal Units (RTUs) that support communication to distribution field devices such as switches, regulators and capacitors have poor reliability often complicating outages or requiring field crews to manually switch devices that could normally be switched remotely. Project will replace field RTUs (RMS900) which are past the end of life and over 20 yrs older and no longer supported by vendor.
SDG&E-Risk-2-C29	SCADA Capacitors	Convert existing distribution line capacitors to SCADA control to improve operability. SCADA controls will also alert utility personnel of capacitor failures and/or fuse operations. This will increase capacitor bank reliability, minimize downtime, and expedite repair work. SCADA controlled capacitor banks will provide local and remote control, failure prediction and detection, reduced operating cost, and should enhance distribution system performance through improved voltage and reactive power control. SCADA online capacitors will improve SDG&E's ability to dynamically adjust reactive power flow, which is critical to accommodating evolving technologies, including less predictable Distributed Energy Resources. SCADA controlled capacitors will also allow early indications of problems and potential failures of line capacitors.
SDG&E-Risk-2-M01	Non-HFTD Wireless Fault Indicator OH	SDG&E has 3500 manual switches outside the High Fire-Threat District (HFTD) Tier 2 and 3 areas which do not have any communication. Adding wireless fault indicators (WFI) to the conductors at these switches will allow Distribution Operators to know that there is a fault or outage downstream. This will allow an electric troubleshooter lineman to go directly to the switch, open it, and have all the customers upstream of the switch restored.
SDG&E-CFF-1-3	AIMDAT (Data Analytics)	Includes predictive machine learning models and asset health. Risk scores will continue to be developed for additional electric system assets and will be used to

RAMP ID	Activity	Description
		prioritize maintenance and replacement activities to stay informed on situations that might lead to potential outages or failures.

These activities are discussed further below in Sections V.D, V.H, and V.I as well as in my capital workpapers (*See* Ex. SDG&E-11-CWP). For additional information and a roadmap, please refer to Appendix B, which contains a table identifying by workpaper the TY 2024 forecast dollars associated with activities in the 2021 RAMP Report that are discussed in this testimony.

The RAMP risk mitigation efforts are associated with specific actions, such as programs, projects, processes, and utilization of technology. For each of these mitigation efforts, an evaluation was made to determine the portion, if any, that was already performed as part of historical activities (*i.e.*, embedded base costs) and the portion, if any, that was incremental to base year activities. Furthermore, for the incremental activities, a review was completed to determine if any portion of incremental activity was part of the workgroup's base forecast methodology. The result is what SDG&E considers to be a true representation of incremental increases over the base year.

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

C. Changes from RAMP Report

As discussed in more detail in the RAMP to GRC Integration testimony of Messrs. Pearson and Flores (Ex. SCG-03/SDG&E-03, Chapter 2), in the RAMP Proceeding, the Commission's Safety Policy Division (SPD) and intervenors provided feedback on the Companies' 2021 RAMP Reports. Appendix B in Ex. SCG-03/SDG&E-03, Chapter 2 provides a complete list of the feedback and recommendations received and the Companies' responses.

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

Changes from the 2021 RAMP Report presented in my testimony, including updates to forecasts and the amount and timing of planned work, are summarized as follows:

- In response to stakeholder feedback received in the RAMP Proceeding, SDG&E performed additional "tranching" analysis at a more granular level for some of the risk mitigations described in my testimony.[8] SDG&E identified four new tranches in this GRC applicable to the mitigations in the EII risk chapter: manhole/handhole, underground distribution, overhead distribution, and substation, as compared to the 2021 RAMP Report.
- Three Distribution Overhead Switch Replacement Programs (SDG&E-02-C04-T1, C04-T2, and C04-T3) were presented as discrete controls in the 2021 RAMP Report. For purposes of the GRC, SDG&E has incorporated those into one activity.
- Two Proactive Underground Cable Replacement Programs (SDG&E-02-C10-T1 and C10-T2) were presented as discrete controls in the 2021 RAMP Report. For purposes of the GRC, SDG&E has incorporated those into one activity.
- After the 2021 RAMP Report had been filed, SDG&E performed a detailed review of its risk mitigation programs. SDG&E determined that ten additional programs mitigate the EII risk including the projects of Poway 69kV Substation Rebuild, San Marcos Substation 69kV Rebuild & 12kV Switchgear, Substation Modification to Support Fault Location, Isolation, and Service Restoration (FLISR), Torrey Pines 12kV Breaker Replacements, Granite 12kV Breaker and Switchgear Replacements, El Cajon 12kV Breaker Replacements, Mission 12kV Replacements, Stuart 12kV Breakers and Transformer Replacements, La Jolla 69/12kV Transformer Replacement, and Strategic Pole Replacement Program. Accordingly, these projects are included in my testimony.
- Further, for six activities that were presented in the 2021 RAMP Report (SDG&E-Risk-2, C20-T1, C20-T3, C20-T4, C20-T6, C20-T7, and C23), SDG&E is not seeking funding in this GRC because the in-service date is beyond this GRC forecasting period.

[8] Decision (D.) 18-12-014 at 18, "Tranching" refers to "[a] logical disaggregation of a group of assets (physical or human) or systems into subgroups with like characteristics for purposes of risk assessment."

- The GO 165 Pole Replacement Reinforcement mitigation was updated in the GRC to reflect an expanded scope of work due to the inspections moving out of the High Fire-Threat District (HFTD) Tier 3 and Tier 2 areas, resulting in additional poles being replaced through this program as opposed to those within the Wildfire Mitigation and Vegetation Management (Exhibit SDG&E-13). Accordingly, the GRC forecasted units and costs have increased compared to the 2021 RAMP Report.
- The Urban Substation Rebuild mitigation was updated in the GRC to reflect revised pricing for the project as design has progressed since the RAMP filing. Initial scope only addressed replacement of the 12kV switchgear, however additional analysis and design identified the need for expanding to the property line, resulting in increased scope and permitting requirements for upper and lower walls, distribution getaways with associated structures and cabling, and coordination with the City of San Diego for a future adjacent park. Accordingly, the GRC forecasted costs have increased compared to the 2021 RAMP Report.
- The Emergency Transformer and Switchgear mitigation was updated in the GRC to reflect the procurement of additional emergency spare and mobile equipment and increased costs for that equipment. Supply chain delays have resulted in delivery delay to 2022 of a spare transformer that was previously scheduled to be delivered and installed in 2021. An additional power transformer will be delivered and installed in 2022 to backfill an existing spare transformer that was energized in 2021 to replace a transformer that failed. Costs have increased for three mobile 12kV circuit breakers and a portable 12/4kV transformer due to higher-than-anticipated bid prices from manufacturers. Accordingly, the GRC forecasted costs and units have increased compared to the 2021 RAMP Report.

III. SUSTAINABILITY AND SAFETY CULTURE

Sustainability, safety, and reliability are the cornerstones of SDG&E's core business operations and are central to SDG&E's GRC presentation. SDG&E is committed to not only deliver clean, safe, and reliable electric and gas service, but to do so in a manner that supports California's climate policy, adaptation, and mitigation efforts. For details related to SDG&E's commitment to sustainability and climate policy please reference the Sustainability Policy

testimony of Estela de Llanos (Exhibit SDG&E-02). Specific information regarding Electric Distribution Capital programs supporting sustainability within my testimony are described in Section V.I at 14249 – SF6 Switch Replacement. In support of California Air Resources Board Resolution 20-28, SDG&E is committed to reducing emission rates from its switches insulated by sulfur hexafluoride (SF6) gas. A specific program has been established to remove or replace these switches as it has been identified as a large contributor to greenhouse gas levels. These switch replacements are more environmentally friendly and reduce the Company's contribution to greenhouse gas.

SDG&E's established safety-first culture focuses on in three primary areas – public, customer, and employee and contractor safety – by integrating employee training, system operations and maintenance, and safe and reliable service. Electric distribution capital investments are designed to meet SDG&E safety, reliability, and customer service objectives by developing and implementing capital investment mitigation efforts that aggressively address identified risks.

SDG&E's safety culture includes a process that identifies, prioritizes, analyzes, and approves capital investment projects designed to meet our safety-first culture objectives.

This process was formalized in 2020 when SDSG&E commenced development and deployment of a Safety Management System (SMS), which aligns and integrates safety, risk, assets, and emergency management across the entire organization. As discussed within my testimony, SDG&E Electrical Distribution's safety process involves several review committees of peers and executives. Each committee has a charter with one or several of the objectives to assess the value of these investments to customers, prioritize the spend based on several criteria (including safety and risk management), evaluate mitigation proposals and alternatives, analyze the rate impact, and review the risk mitigation effectiveness. Integrating this established process specific to Electric Distribution with SDG&E's enterprise-wide holistic and pro-active SMS based approach to expand beyond "traditional" occupational safety principles to include asset safety, system safety, cyber safety, and psychological safety provides SDG&E the ability to manage and reduce risk and promote continuous learning and improvement in safety performance through deliberate, routine, and intentional processes. Please see the Safety, Risk and Asset Management Systems testimony of Kenneth J. Deremer (Ex. SDG&E-31) for additional details on SDG&E's SMS.

IV. ELECTRIC DISTRIBUTION CAPITAL PROJECT EVALUATION AND PRIORITIZATION

The projects and programs presented in my testimony are developed across many different groups and departments. These projects are all reviewed, approved, and prioritized by multiple cross-functional teams and committees described in more detail below.

A. Capital Management Governance

1. Substation Equipment Assessment (SEA) Team

The SEA Team consists of individuals from Substation Engineering and Design, Kearny Maintenance and Operations, System Protection Automation & Control Engineering (SPACE), and Distribution and Transmission Planning groups. The SEA Team examines transmission and distribution substations and equipment for potential risks and potential failures. The team has developed a forum for assessing reliability 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 and the needs identified by the planning groups. In support of daily operations, the Kearny Maintenance and Operations group maintains a database to track and process key operating information that is then discussed with the SEA team. 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 used to assess risk when discussed at the SEA Team meetings. Approved projects are prioritized by the team, and those that exceed a dollar threshold require a second presentation and approval by the Technical Review Council (TRC) in order to proceed.

2. Strategic Reliability Enhancement Team (SRET)

The Strategic Reliability Enhancement Team (SRET), formerly known as the Reliability Assessment Team (RAT), is comprised of technical leaders from various groups in the Company, including Distribution Operations, Electric Reliability, Distribution Planning, System Protection & Maintenance (SPM), Electric Regional Operations (ERO), and Electric Distribution Engineering (EDE). The team also consults with Substation Engineering and Design, System Protection Automation & Control Engineering (SPACE), and Kearny Maintenance and Operations. The SRET focuses primarily on providing strategy and guidance for continuously

improving distribution system reliability performance, providing integrated planning support, and overseeing program budgets for approved reliability improvement projects.

Proposals for reliability improvement projects are presented to the SRET in the form of a circuit analysis. The circuit analysis considers the reliability risks for the individual circuit, options for reliability enhancements, reliability benefits for each mitigation option, and a recommended approach to enhancing reliability on the circuit. After the project presentation, the SRET either requests further analysis or approves the project. Approved projects are prioritized by the team, and those that exceed a dollar threshold require a second presentation and approval by the Technical Review Council (TRC) in order to proceed.

3. Technical Review Council (TRC)

Capacity and reliability capital projects that exceed a dollar threshold are reviewed by the Technical Review Council (TRC). The TRC serves as a council of technical experts that assess the prudence and technical merits of transmission, substation, and distribution capacity and reliability projects. The TRC is made up of representatives from Electric Transmission Planning, Electric Distribution Planning, Electric Distribution Engineering, Civil & Structural Engineering, Substation Engineering & Design, SPACE, Transmission Engineering & Design, Electric System Hardening, and Distributed Energy Resources. The TRC meets bi-weekly to review and approve projects. The purpose of the TRC is to perform the following tasks:

- Analyze all projects submitted to TRC for alignment with company strategies;
- Determine whether project alternatives have been thoroughly described, assessed, and prioritized to move forward and request funding;
- Determine whether project risks are reasonable and whether mitigation plans have been developed to minimize project risks related to delays or project alternatives;
- Assess whether project drivers and customer impacts have been addressed within the project scope; and
- Assist in prioritizing projects for the Electric Transmission & Distribution Capital Steering 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 bring the project back to the TRC for further discussion. Projects that have been approved by the TRC are

reviewed by the Electric Transmission & Distribution Capital Steering Committee for consideration and prioritization.

4. Electric Transmission & Distribution Capital Steering Committee

All projects approved by the technical teams identified above are reviewed and prioritized by the Electric Transmission & Distribution Capital Steering Committee (ET&D Committee) for capital budget allocations. The ET&D Committee is comprised of Directors from the following functional areas: Portfolio & Project Management, Electric Engineering, Asset Management, Electric System Planning & Grid Modernization, Construction Management, Electric Regional Operations, Kearny Maintenance & Operations, Financial & Business Planning, and Enterprise Risk Management. The primary role of the ET&D Committee is to establish priorities among the internal project requests within their areas of expertise to allocate the proper funding necessary to complete the highest priority work aligned with the funding authorization and Company goals. Projects are first classified as Responsive, Proactive, or Strategic as follows:

- Responsive projects are those where SDG&E has limited or no control over the initiation, scope, schedule, and/or other aspects of the project such as service restoration, reactive cable replacement, and new business. Also included is anything mandated by law or regulatory decision. For example, programs mandated by the CPUC are included in this category.
- Proactive projects are related to routine and planned work required to proactively maintain system operations necessary to provide safe and reliable electric service.
- Strategic projects are those where the utility has flexibility over if and when the project is completed. There is no specific law, regulatory directive, or operational requirement that requires the project to be completed at a specific time or at all. However, there can be significant benefits from these projects that would provide sufficient justification for their implementation.

There is a validation process where the Directors review and can "challenge" the categorization of specific projects or programs across different functional areas and business units. Once these challenge sessions are completed, projects categorized as "Responsive" are funded in alignment with historical spend as well as future year forecasts. For "Proactive" and "Strategic" capital projects, SDG&E currently uses a software application called REVEAL to

document each project's business purpose, description, scope, schedule, justification, and estimated cost. REVEAL assists with the prioritization of these projects submitted by project managers based upon the approved risk metrics. This cross-functional prioritization is further scrutinized by the Directors to refine the allocation based on several additional factors including project driver, stage gate (i.e., where the project is at in its lifecycle), other funding considerations, and project risk and complexity. Project driver is divided into four main groups below:

1. Safety and Compliance: Fire risk reduction projects, like overhead conductor replacement and strategic undergrounding projects, and compliance programs like the Corrective Maintenance Program (CMP) mandated by General Order (GO) 165.
2. Regulatory Commitment: Projects and programs committed to at a regulatory, state, or federal level above and beyond or outside of the GRC, such as Power Your Drive.
3. Customer-Driven: Projects initiated and completed at the request of third parties, such as customers, developers, and municipalities. Includes new business, customer relocations, requested conversion projects, etc.
4. Reliability & Capacity: Planned work that proactively addresses potential overload conditions or continuity of service to customers.

Beyond establishing the annual funding allocations by project or program, the ET&D Committee also monitors the monthly status of its portfolio of approved projects. Priorities are adjusted, depending on whether risks are adequately being addressed, if new risks materialize based on new data, and on overall funding status to maintain alignment with authorized levels and company priorities. A project manager is assigned to each project and is responsible for the documentation submitted through the review processes of the planning committees. Each capital project or program is assigned a unique budget code number. While many projects are "individual" or "specific" projects, there are also "blanket" programs that continue from year to year and encompass many related, smaller capital projects.

For additional details and context around the various projects and programs, please see Section V of my testimony.

V. ELECTRIC DISTRIBUTION CAPITAL FORECASTS BY CATEGORY

Electric distribution plant additions on SDG&E's system include capital projects to construct or modify facilities for the distribution of electricity at 12,000 volts (12kV) and below, projects to construct or modify facilities that transform energy from transmission voltage levels to distribution voltage levels, and projects to improve safety and system reliability. Protective relaying, circuit breakers, substation switchgear, and associated equipment for distribution substations and equipment on the 12kV and below systems are also included in the electric distribution plant additions. For an overall description of the electric distribution system, please see the Electric Distribution O&M testimony of Tyson Swetek (Exhibit SDG&E-12).

Electric distribution capital projects are driven by safety and risk management, reliability, capacity needs, and customer requests or system needs, such as new customer requests for service, SDG&E's Tariff 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) and those with estimated costs exceeding a high dollar threshold are identified by their own specific capital project designations.

The project Capital Budget Documentation (CBD) may include more than one category of capital expenditures within the authorization for expenditures, 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, on a particular transmission project, the distribution work may account for less than 10% of the total project cost. This request would exclude the other approximately 90% 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.

While there are several factors tied to the increase in forecasted costs, heightened regulations continue to be implemented that add to the cost of capital projects. One example is the requirement for environmental monitors who possess specific skill sets, education, and expertise to be present during construction activities and to oversee and provide direction for work that may affect environmental resources, including archaeological resources, Native American artifacts and burial sites, biological nesting, hydro-modification requirements, and hauling construction waste to special material sites. These monitors enforce regulations, which require modifications to designs to promote compliance during construction. 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 and evolving requirements.

SDG&E requests approval of a Litigated Project Costs Memorandum Account (LPCMA) to record the capital costs for projects that are intended to qualify as a collectible project to be recovered from third-party customers instead of ratepayers, but later are deemed by a court to be non-collectible from third-parties customers.[9] Such a situation may arise in the context of utility disputes with public entities over who should pay for the relocation of utility facilities necessitated by municipal or other public entity projects, such as water, sewer, or transit projects. For instance, while the utility may argue in a litigated proceeding that the public entity should bear the relocation costs, courts may rule otherwise.

If a court rules that a utility must bear the costs of the activity – effectively deeming the costs as non-collectible – SDG&E will record to the LPCMA any historical capital-related costs (*i.e.*, depreciation, return, and taxes) based on the timing of when the project went into service, no earlier than the effective date of SDG&E's TY 2024 GRC Decision. For example, if a court rules a project is non-collectible in late 2024 and it had gone into service in 2023, capital-related

[9] Collectible costs are costs that SDG&E expects to collect from third-parties (*i.e.*, not to be collected from ratepayers). For example, in some situations, a local governmental entity (*e.g.*, San Diego) may be responsible for certain costs associated with relocating utility infrastructure as part of a development project. In this example, such costs are considered collectible because they are to be collected from the city. Non-collectible costs are costs that are not expected to be collected from a third-party and instead are treated as costs to be collected from ratepayers.

costs would be recorded to the LPCMA as of January 1, 2024, or the effective date of the TY 2024 GRC. Memorandum account treatment for these costs is reasonable and just as it will allow SDG&E the opportunity to litigate, where appropriate, whether the third-party customer should bear the costs at issue, while preserving the ability to later seek recovery of the incremental capital-related costs from ratepayers associated with projects that can no longer be collected from a third-party customer, if the litigation proves unsuccessful.

SDG&E would not record revenue requirement prior to any ruling for tracking purposes and would treat it as a collectible project consistent with its understanding. If thereafter a court rules that the utility must bear the costs of the activity – effectively deeming the costs as non-collectible – SDG&E proposes to record any historical revenue requirement associated with the project based on the timing of when the project went into service, no earlier than January 1, 2024. Any costs recorded to the memo account would be subject to a reasonableness review prior to inclusion in rates and rate base. Additionally, costs recorded in the LPCMA may be addressed in a GRC or other applicable proceeding. SDG&E seeks authorization for the LPCMA in this GRC to avoid the prohibition against retro-active ratemaking, and therefore, requests Commission approval of the LPCMA. Refer to Mr. Kupfersmid's Regulatory Accounts testimony for details on the LPCMA (Exhibit SDG&E-43).

To continue to provide safe and reliable service, while mitigating associated risks, SDG&E requests the Commission adopt forecast non-collectible capital costs of $431,297,000, $520,599,000, and $416,276,000 for 2022, 2023, and 2024 respectively.[10]

Table OR-5 summarizes the total capital forecasts for 2022, 2023, and 2024 by Category.

[10] Please refer to my capital workpapers, Ex. SDG&E-11-CWP, for additional information about the activities described herein. Each capital workpaper includes a Summary of Adjustments to Forecast section and workpaper details that separate the portion that is forecasted to be ratepayer-funded (Non-Collectible) and the portion anticipated to be collected from third parties (Collectible), if applicable. The Collectible portion is necessary for calculating the proper allocation of overhead amounts to these projects, but the fully loaded Collectible amounts are not included in the requested revenue requirement.

TABLE OR-5
Capital Expenditures Summary of Forecasts by Category

ELECTRIC DISTRIBUTION (In 2021 $)			
Categories of Management	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
A. CAPACITY/EXPANSION	23,793	21,442	17,977
B. EQUIP/TOOLS/MISC	2,542	2,542	2,542
C. FRANCHISE	44,112	70,370	88,512
D. MANDATED	31,943	33,761	33,761
E. MATERIALS	28,827	30,255	31,755
F. NEW BUSINESS	69,603	60,381	58,435
G. OVERHEAD POOLS	169,428	196,603	152,003
H. RELIABILITY/IMPROVEMENTS	77,681	130,398	68,343
I. SAFETY & RISK MANAGEMENT	22,310	32,343	33,025
J. DER INTEGRATION	0	0	0
K. TRANSMISSION/FERC DRIVEN	12,689	12,331	11,185
Total CAPITAL	**482,928**	**590,426**	**497,537**
NON-COLLECTIBLE (NC)	438,049	532,595	425,949
COLLECTIBLE (CO)	44,879	57,831	71,588

A. CAPACITY/EXPANSION

TABLE OR-6[11]
Summary of Capacity/Expansion Forecasts

A. CAPACITY/EXPANSION (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
NON-COLLECTIBLE (NC)	22,566	20,215	16,750
COLLECTIBLE (CO)	1,227	1,227	1,227
Total CAPITAL	**23,793**	**21,442**	**17,977**

1. Introduction

Every year, SDG&E conducts an annual Distribution Planning Process (DPP). This process accounts for requests for new service ("known loads") as well as forecast loads, identifies the locations on SDG&E's distribution system where existing and planned distribution

[11] Please refer to my capital workpapers, Ex. SDG&E-11-CWP, for additional information about the activities described herein. Each capital workpaper includes a Summary of Adjustments to Forecast section and workpaper details that separate the portion that is forecasted to be ratepayer-funded (Non-Collectible) and the portion anticipated to be collected from third parties (Collectible), if applicable. The Collectible portion is necessary for calculating the proper allocation of overhead amounts to these projects, but the fully loaded Collectible amounts are not included in the requested revenue requirement.

infrastructure needs to be upgraded in order to mitigate system overloads, and determines the specific upgrades that will cost-effectively address the identified distribution needs.

The 2024 GRC will utilize data from the most recently completed 2021 Distribution Planning Process (DPP), which uses the 2019 Mid-Low CEC IEPR 1-in-10 adverse weather peak load forecast and incorporates the California Energy Commission's (CEC's) forecast of load modifying components such as Additional Achievable Energy Efficiency, transportation electrification loads, and Behind-The-Meter (BTM) solar photovoltaic and storage additions. These loads are disaggregated to individual circuits and buses using sophisticated economic and geospatial modeling technology. The primary drivers for distribution upgrades identified through the annual DPP are anticipated thermal overloads, unacceptable voltage, and the need for back-tie capability.

Distribution capital requirements are linked requests for new distribution service (e.g., new customers) and to forecast load growth; but year-over-year requirements are not necessarily proportional to the year-over-year changes in anticipated loads. Variations are due to the specific locations of the anticipated loads and the challenges of upgrading the distribution system in those locations. As the population within the SDG&E service territory grows and urban land utilization is maximized or priced at a premium, increased greenfield commercial and residential construction in rural areas is forecasted to occur, potentially leading to increases in customer numbers and load growth. To accommodate these load increases, SDG&E must add circuits and substations to augment the outlying infrastructure. Construction in these areas can be challenging due to difficulty of obtaining rights-of-way and rugged terrain. Challenges are also present in densely populated urban areas where distribution upgrades must coexist with other underground utilities and space is at a premium.

Customer growth forecasts, requests for new service, per-customer demand forecasts, and distribution substation assessments are all used to develop the best estimates of future capital requirements for electrical distribution capacity. SDG&E's Electric Customer Forecast projects a compound annual growth rate of 0.9% from 2021 to 2024. Refer to the Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40).

An essential element of the planning process is evaluating peak loads. Peak load evaluations consider weather conditions, distribution-level generation, and operational changes that may have taken place during peak conditions. This evaluation considers hourly load and

generation profiles at the circuit and bus levels to fully assess the peak load for which capacity relief projects will be needed. After the peak load is established, and weather factors along with forecasted growth applied, the existing capacity of substations and field equipment is then evaluated against the forecasted peak power flows on the circuits and substation busses.

SDG&E forecasts projected loads on each circuit and substation within the system on an annual basis, utilizing real-time data and incorporating the estimated impact of net energy metering (NEM) customers, which results in potentially reducing or shifting the peak. Planning forecasts consider historical growth rates, adjusted recorded loads, identification of large project developments, new load additions submitted, and local economic conditions. Forecasts for both substations and circuits are established for a ten-year planning window. For short-term planning forecasts (roughly one to two years), site-specific customer load additions are considered.

SDG&E evaluates load forecasts against system capabilities to determine whether system modifications are required. Planning studies are performed on radial circuits as part of this evaluation. This analysis often includes computer simulations or power flow analysis to model both peak and contingency situations. Once a piece of equipment is projected to exceed allowable limits, SDG&E reviews and considers alternative system modifications. Various project alternatives are considered, including reconfiguring the system, installing new facilities, and modifying existing facilities, as appropriate. Substations are evaluated to minimize risk, such that thermal loading limits for transformers, breakers, conductor capacities, and other substation equipment are not exceeded.

SDG&E evaluates every piece of equipment during the distribution planning process, from the low side of transmission-distribution transformers, through every substation bus and low-side breaker and distribution line. SDG&E evaluates equipment not only to determine adequate capacity, but also to maintain appropriate voltages established in SDG&E's Tariff Rule 2 (Description of Service) during steady state and contingency situations. This evaluation considers operating criteria for transformers and other equipment that prevent equipment damage due to thermal overload, established criteria for normal load and for emergency conditions (if applicable for the associated equipment flagged), and equipment limits established by the manufacturer of the equipment (including 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.

To account for possible generation outages, SDG&E models large distribution-level generators as off-line during peak periods. Large distribution generation is considered any generation larger than 500kW. This approach is necessary because the distribution generation on the distribution system does not contain any physical assurance or a guarantee of performance by the customer. Applying this method allows SDG&E to evaluate a worst-case condition for large units, which could potentially cause problems for the distribution system when taken off-line for scheduled maintenance or for internal issues outside of SDG&E's control. This method assists with determining whether the generation could possibly affect the reliability, safety, and power quality of the system.

Capacity projects typically consist of load transfers, reconductors, circuit extensions, new circuits, and substations to mitigate the capacity deficiency. The Distribution Substation projects include the expansion of existing substations (*e.g.*, substation bank additions) or 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 forecast load-growth needs.

As part of complying with Public Utilities Code Section 353.5, during the DPP SDG&E assesses distributed energy resources (DERs) as potential cost-effective alternatives to traditional wire solutions. As with traditional wires solutions, DERs must have the ability to deliver safe and reliable distribution service.

For additional details on DER integration projects, please refer to the Clean Energy Innovations testimony of Fernando Valero (Exhibit SDG&E-15).

Additional details including description, forecast method, and cost drivers can be found in each budget code below.

2. 209 – Field Shunt Capacitors

a. Description

The forecasts for Field Shunt Capacitors for 2022, 2023, and 2024 are $695 thousand, $695 thousand, and $695 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

This blanket budget code provides funding for shunt capacitors to be installed on electric distribution circuits in accordance with SDG&E standards. Reactive power requirements

increase with load growth, and shunt capacitors improve the power factor and reduce the ampere loading on distribution circuits, substation transformers, transmission lines, and generators. Capacitors installed on distribution circuits also improve system voltage and voltage control on both distribution circuits and transmission lines. These projects are required to achieve the present design standard of 0.995 (lagging) power factor at the substation bus and to maintain this standard in future years. This program is also required to provide funding for relocating existing capacitors that do not comply with SDG&E current standards in capacitor placement.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002090 – Field Shunt Capacitors.

b. Forecast Method

The forecast method developed for this cost category is a five-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The five-year average levels out the peaks and valleys in this blanket budget code over a longer period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program. Projects in this budget code are similar in scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is voltage support and voltage control of the electrical system.

3. 228 – Reactive Small Capital Projects

a. Description

The forecasts of Reactive Small Capital Projects for 2022, 2023, and 2024 are $1.258 million, $1.258 million, and $1.258 million, respectively. This is an ongoing program that is expected to continue through the test year.

This blanket program provides funding for Reactive Small Capital Projects that are required to address primary distribution system overloads, voltage related issues, and meeting and maintaining current SDG&E design standards that require quick modifications to the system. It is intended for projects that are not part of the distribution planning process. This type of project often requires a short turnaround time to address the system needs.

These projects provide the reconstruction, extension, and cutover of overhead and underground distribution facilities to replace overloaded conductors and correct primary voltage problems.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002280 – Reactive Small Capital Projects.

b. Forecast Method

The forecast method developed for this cost category is a five-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The five-year average levels out the peaks and valleys in this blanket budget code over a longer period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program. Projects in this budget are small in scope.

c. Cost Drivers

The underlying cost driver associated with this program are to replace overloaded equipment to correct primary voltage problems and to transfer load to balance circuits and substations.

4. 1295 – Load Research/DLP Electric Metering Project

a. Description

The forecast for the Load Research/DLP Electric Metering Project for 2022, 2023, and 2024 are $392 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in-service by 2022.

SDG&E plans to install 600 load research smart meters by the end of 2022 to collect data that will be utilized to conduct an analysis of the impact of rooftop solar and electric vehicle charging interconnected to the system. The installation of these non-billing meters will provide 15-minute interval data into the Company's data systems.

These forecasted capital expenditures support the Company's goal of excellent service to its customers. Solar generation data has been gathered by the Load Research team via a sample size of sub-meters for approximately ten years supporting strategic efforts, long-term forecasting models, electric energy and capacity procurement, and has also been utilized by the California Energy Commission (CEC) and in Net Energy Metering (NEM) Reform proceedings. Accurate forecasts that incorporate solar production minimize under and over procurement, as well as

contribute to setting appropriate rates. The solar generation data gathered by the existing sub-meters is a crucial input to SDG&E's dynamic load profiles, mandated by the CPUC, which is used for California Independent System Operator (CAISO) settlement by Energy Service Providers (ESPs) and Community Choice Aggregators (CCAs), in addition to being used internally to support forecasting and strategic analysis. It is necessary to supplement this sample periodically due to an evolving population and sample deterioration. The last time SDG&E installed rooftop solar sub- meters was in 2016, and SDG&E has seen a significant increase in residential rooftop solar adoption since then, putting at risk the accuracy of the existing sub-meters. Attrition has led to a reduced number of rooftop solar measuring sub-meters versus what was originally installed, which is due to panel upgrades and customer requests to have the research meter removed. In addition, SDG&E does not currently have electric vehicle representative sub-meters, thus limiting the data available for multiple electric vehicle analysis including the statewide IOU EV load study, electrification analysis support, forecasted demands, and others.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 012950 – Load Research/DLP Electric Metering Project.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Load/Research/DLP Electric Metering program largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for much of this program relies on scopes of work and estimates originating from vendor/contractor quotations and would not benefit from historical cost analysis.

c. Cost Drivers

The underlying cost driver associated with this project is to have sufficient data for researching, analyzing, and concluding impacts on SDG&E's electric grid and rates from rooftop

solar and electric vehicle charging. The costs include both hardware such as meters, adapters, and wiring, as well as the installation labor.

5. 8253 – Distribution Capacitors

a. Description

The forecasts of Substation 12kV Capacitor Upgrades for 2022, 2023, and 2024 are $1.722 million, $1.283 million, and $1.285 million, respectively. This is an ongoing program that is expected to continue through the test year.

These forecasted capital expenditures support the Company's goal of providing quality service to customers. This program is to improve load power factor at the substations, decrease loading of the distribution transformers to delay the need for future bank additions, decrease loading of the transmission system to delay the need for line and bulk power transformer upgrades, upgrade obsolete equipment, improve transmission voltage profile during heavy load conditions, and improve customer power quality. Projects are selected according to reactive power deficiencies identified by Grid Operations during system studies. These deficiencies are primarily due to poor power factor at distribution substations. Substation and distribution line capacitors being out of service or operating improperly contribute to this situation. Adding new substation capacitor banks, replacing obsolete substation capacitor banks, and adding monitoring of substation capacitor banks can all contribute to improving the electric system operation by:

- Improving the profile of transmission voltage, delaying or eliminating the need for transmission capacitors
- Improving the customer power quality by adding capacitors in a 2x3600 kVAR two-step configuration instead of a single 6000 kVAR one-step configuration
- Significantly decreasing the apparent power loading on the distribution transformers, transmission lines, and bulk power transformers by improving the load power factor, which delays the need for system upgrades

Replacing existing single step capacitor banks at selected substations with banks of increased capacity and adding switched capacitor banks will help correct the power factor at the substation. This equipment will help control the reactive power flow at the substation and increase the transmission voltages under heavy load conditions. This program's forecast reflects installing an annual average of four capacitor banks to the system.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 082530 – Substation 12kV Capacitor Upgrades.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for the Distribution Capacitor program largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for much of this program relies on specific scopes of work and estimates originating from vendor / contractor quotations and would not benefit from historical cost analysis.

c. Cost Drivers

The underlying cost driver for this capital program is to maintain voltage stability and improve power factor by replacing substation single-step capacitor banks where the power factor is below minimum requirements. Additionally, in the past funds were shifted to emergent and/or higher priority projects and the forecasts account for that reduced historical work done as well as ensuring SDG&E can meet future targets/demands.

6. 8260 – Chollas West: New 12kV Circuit C1047

a. Description

The forecast of Chollas West-New 12kV circuit 1047 for 2022, 2023, and 2024 are $1.452 million, $0, and $0, respectively. SDG&E plans to build and place this project in-service by 2022.

The purpose of this project is to install a new circuit (C1047) at the Chollas West substation to relieve other heavily loaded circuits and substation equipment. Load from the heavily loaded circuits and substation equipment will be transferred to this new circuit. This project will install 11,000 feet of cable, trench and install 2,600 feet of conduit, install three switches, and install one capacitor bank. This project will mitigate forecasted overloads on circuits C160 and C166 and on Streamview Bank 3031.

Remaining work in 2022 includes installation of 11,000 feet of cable, installing three switches, and one capacitor bank.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 082600- Chollas West – New 12kV C1047.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for New 12kV Circuit C1047 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this project is to eliminate overloads and heavily loaded equipment by constructing a new circuit to transfer existing and additional load.

7. 18252 – Imperial Beach: New 12kV Circuit C724

a. Description

The forecast of Imperial Beach New 12kV Circuit C724 for 2022, 2023, and 2024 are $653 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in-service by 2022.

The purpose of this project is to install a new 12kV circuit (C724) at Imperial Beach substation. The forecast of new load in the Imperial Beach/Coronado area will result in overloading the existing circuit (C376) and this new circuit will mitigate these new additional loads. The project will install 8,500 feet of cable, trench and install 7,700 feet of conduit, two switches and one capacitor bank.

Remaining work in 2022 includes installing 200 feet of cable and trenching 100 feet of conduit.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 182520 – C724 IB: New 12kV Circuit.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Imperial Beach: New 12kV Circuit C724 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to eliminate overloads by constructing a new circuit to transfer existing and additional load.

8. 18261 – Vine: New 12kV Circuit C1480

a. Description

The forecast of Vine: New12kV Circuit C1480 for 2022, 2023, and 2024 are $4.333 million, $311 thousand, and $0, respectively. SDG&E plans to build and place this project in-service by 2023.

The purpose of this project is to install a 12kV circuit at the Vine substation. The new circuit will accommodate load growth in the area. The project will install approximately 6,300 feet cable, trench approximately 3,000 feet of conduit, install four switches, and install one capacitor. Existing circuit C105 is projected to be overloaded with a new load in the Morena area and the installation of a new circuit in conjunction with transferring load from C105 is the most feasible solution for accommodating the additional specific new load.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 18261A – C1480 VN: New Circuit C1480.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as

applicable. A zero-based forecast was used for Vine: New 12kV Circuit C1480 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to accommodate a new specific load addition by constructing a new circuit.

9. 19256 – Carlton Hills: New 12kV Circuit C1191

a. Description

The forecast of Carlton Hills: New 12kV Circuit C1191 for 2022, 2023, and 2024 are $0, $3.226 million, and $0, respectively. SDG&E plans to build and place this project in-service by 2023.

The purpose of this project is to install a new 12kV circuit at the Carlton Hills substation to relieve forecasted overloading on an existing circuit (C280) due to new load in the area. The project will install 4,800 feet of cable, trench and install 3,600 feet of conduit, and three switches. The installation of a new circuit in conjunction with transferring load is the most feasible solution to allow future growth in the area.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 192560 – C1119 CH: New 12kV Circuit.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Carlton Hills: New 12kV Circuit C1191 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to eliminate overloads by constructing a new circuit to transfer existing and additional load.

10. 20247 – Planned Investments (Capacity)

a. Description

The forecast of Planned Investments for 2022, 2023, and 2024 are $3.536 million, $3.536 million, and $3.536 million, respectively. This is an ongoing program that is expected to continue through the test year.

This blanket budget code provides funding for planned small capacity-driven capital projects. These projects are new planned investments to address system needs identified through the annual distribution planning process. These projects are required to address primary distribution system overloads, voltage related issues and meeting and maintaining current SDG&E design standards.

These projects generally involve the reconstruction and extension of existing overhead and underground distribution facilities to relieve overloaded conductors and correct primary voltage problems.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202470 – Planned Investments (Capacity).

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Planned Investments (Capacity) largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. This is a new budget code that will capture small projects identified on the annual distribution planning process.

c. Cost Drivers

The underlying cost driver associated with this new budget code is to eliminate existing or forecasted overloads and voltage related issues by reconstructing, extending, and transferring load between existing circuits.

11. 20252 – Old Town: Reconductor 12kV Circuit C493

a. Description

The forecast of Old Town: Reconductor 12kV Circuit C493 for 2022, 2023, and 2024 are $1.744 million, $0, and $0, respectively. SDG&E plans to build and place this project in-service by 2022.

The purpose of this project is to reconduct circuit C493 at Old Town substation to address a forecasted overload due to new load in the area. Reconductoring this circuit will increase its load carrying capacity which will mitigate overloading on the circuit. The project will install 6,700 feet of cable, and trench and install 1,700 feet of conduit.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 20252A – C493 OT: Reconductor.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Old Town: Reconductor 12kV Circuit C493 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to eliminate overloads and heavily loaded equipment by reconductoring as a result of new load in the area.

12. 20260 –East Gate: New 12kV Circuit C1154

a. Description

The forecast of East Gate: 12kV Circuit C1154 for 2022, 2023, and 2024 are $2.184 million, $0, and $0, respectively. SDG&E plans to build and place this project in-service by 2022.

The purpose of this project is to install a new 12kV Circuit (C1154) at East Gate substation to address overloading of multiple circuits and equipment associated with forecasted new load in the area. The project will install 9,900 feet of cable, trench and install 3,800 feet of

conduit, install one switch, and install one capacitor bank. The new circuit will relieve overloading on circuits C272 and C744 and the Genesee 12kV East Bus.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202600 – C1154 EG Offload GE3233.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for East Gate: New 12kV Circuit C1154 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to eliminate overloads by constructing a new circuit to cut over the additional load.

13. 21246 – Creelman: Reconductor 12kV Circuit C235

a. Description

The forecast of Creelman: Reconductor 12kV Circuit C235 for 2022, 2023, and 2024 are $81 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in-service by 2022.

The purpose of this project is to reconductor circuit C235 at Creelman substation to relieve overloading associated with forecasted new load in the area. The project will replace 850 feet of cable.

Remaining work in 2022 is for trailing charges to close out the project.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 212460 – C235 CRE: Reconductor.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed

from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Creelman: Reconductor 12kV Circuit C235 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to eliminate overloads and heavily loaded equipment by reconductoring as a result of new load in the area.

14. 21247 – Point Loma: Reconductor 12kV Circuit C50 & Capacitor

a. Description

The forecast of Point Loma: Reconductor 12kV Circuit C50 and install a new Capacitor for 2022, 2023, and 2024 are $597 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in-service by 2022.

The purpose of this project is to reconductor existing 12kV circuit C50 at Point Loma substation to relieve overloading associated with forecasted new load in the area. The project will replace 1,800 feet of cable and install one capacitor bank.

Additional information can be found in the capital workpapers. *See* SDG&E-11-CWP at section 212470 – C50 PTL: Reconductor and Capacitor.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Point Loma: Reconductor 12kV Circuit C50 & Capacitor largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to eliminate overloads by reconductoring as a result of new load in the area.

15. 21248 – Vine: 12 kV Circuit C139 Cutover to C138

a. Description

The forecast of Vine: 12kV Circuit C139 Cutover to C138 for 2022, 2023, and 2024 are $336 thousand, $0, and $0, respectively. SDG&E plans to build and place in service by 2022.

The purpose of this project is to transfer load from circuit C139 at Vine substation to circuit C138 at Vine substation to relieve overloading on C139 due to forecasted new load in the area. Remaining work in 2022 includes installing 1000 feet of cable and one switch.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 212480 – C139 VN: Cutover to C138.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Vine: 12 kV Circuit C139 Cutover to C138 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to eliminate overloads by constructing a tie to offload as a result of new load in the area.

16. 21251 – Border: New 12kV Circuit C1162

a. Description

The forecast of Border: New 12kV Circuit C1162 for 2022, 2023, and 2024 are $689 thousand, $1.117 million, and $0, respectively. SDG&E plans to build and place this project in-service by 2023.

The purpose of this project is to install a new 12kV circuit (C1162) at Border substation to relieve overloading on circuit C536 associated with forecasted new load in the area. The project will reconductor 5,700 feet of wire, trench and install 450 feet of conduit, and install one switch.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 21251A – C1162 BD: New C1162.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Border: New 12kV Circuit C1162 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to eliminate overloads by constructing a new circuit to transfer existing and additional load.

17. 21258 – Sampson: New 12kV Twin Circuit C369

a. Description

The forecast of Sampson: New 12kV Twin Circuit C369 for 2022, 2023, and 2024 are $617 thousand, $116 thousand, and $0, respectively. SDG&E plans to build and place this project in-service by 2023.

The purpose of this project is to install a new 12kV twin circuit C369 at Sampson substation to relieve overloading on an existing circuit associated with forecasted new load in the area. The project will reconductor 2,500 feet of cable, trench and install 100 feet of conduit, install one switch, and install one capacitor.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 212580 – C369 S: New 12kV Twin Circuit.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as

applicable. A zero-based forecast was used for Sampson: New 12kV Twin Circuit C369 largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for this project relies on a specific scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to eliminate overloads by constructing a new circuit to transfer existing and additional load.

18. 21276 – Future Capacity Projects

a. Description

The forecast of planned investments for 2022, 2023, and 2024 are $0, $6.396 million, and $7.699 million, respectively. This is an ongoing program that is expected to continue through the test year.

The forecasts for this budget code are to support future large-scale distribution system capacity improvement projects exceeding a specified dollar threshold and will be fully scoped within the 2023 and 2024 distribution planning process. Projects that require specific budgets can only be developed when enough data is available to substantiate individual circuit or substation projects and after completion of the annual planning cycle. Smaller projects with forecasts below the threshold are managed out of the blanket programs.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 212760 – Future Capacity Projects.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from anticipated scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for Future Capacity Projects budget code because it does not have historical costs, however past jobs with similar size and complexity were used to determine forecasts for future years.

c. Cost Drivers

The underlying cost driver associated with this program is to mitigate overloaded circuits and banks that are identify during the distribution planning process and have not been identified as an individual capital project.

19. 97248 – Distribution System Capacity Improvement

a. Description

The ratepayer-funded (Non-Collectible) forecast of the Distribution System Capacity Improvement program for 2022, 2023, and 2024 are $2.277 million, $2.277 million, and $2.277 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers for additional capacity, sectionalizing capability, and benefits for small project upgrades to the distribution system. It provides funding for additional reliability on the distribution system, including reducing high customer counts. Projects identified within this program are small in cost, have a quick turnaround time, and can consist of minor modifications or upgrades to the distribution system.

Construction may include feeder and branch reconductoring, installation of appropriate switches, and other equipment as necessary to increase the tie capacity and sectionalizing of the distribution system for reliability and operating concerns. This program may also include projects to install infrastructure for future circuit projects in conjunction with road improvements, transmission system upgrades or other upgrade activities. This program is needed to maintain reliability and sectionalizing tie capacity.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 972480 – Distribution System Capacity Improvement.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within

this budget code while accounting for recent changes in the program. The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Projects in this budget are small in scope.

c. Cost Drivers

The underlying cost driver associated with this budget code is to add system and sectionalizing capability to enhance reliability on the distribution system, including reducing high customer counts.

B. EQUIPMENT/TOOLS

TABLE OR-7
Summary of Equipment/Tools Forecasts

B. EQUIP/TOOLS/MISC (In 2021 $)			
	Estimated 2022 (000s)	Estimated 2023 (000s)	Estimated 2024 (000s)
Total CAPITAL	2,542	2,542	2,542

1. Introduction

This cost category is to purchase new electric distribution tools and equipment required for field personnel to safely and effectively construct, inspect, operate, and maintain the electric distribution system including those within substation facilities. Having the proper tools and equipment will help increase safety, improve reliability, and meet regulatory compliance requirements.

Additional details including description, forecast method, and cost drivers can be found in each budget code below.

2. 106 – Electric Transmission Tools & Equipment

a. Description

The forecasts for Electric Transmission Tools & Equipment for 2022, 2023, and 2024 are $443 thousand, $443 thousand, and $443 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

Specialized tools and testing equipment are necessary to properly inspect and operate substation facilities consisting of transmission and distribution pieces of equipment. The tools purchased through this program are allocated between FERC and CPUC, however the forecasted

costs provide funding for the distribution component. Failure to replace deteriorated or obsolete tools and testing equipment will decrease productivity, create exposure to accidents, and will forgo benefits associated with improved technologies for equipment condition monitoring or diagnosis.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 001060 – Electric Transmission Tools & Equipment.

b. Forecast Method

The forecast method developed for this cost category is base-year. The expenditures for 2021 reflect recent changes in this program and is the best representation of the starting point for 2022-2024 forecasted costs.

c. Cost Drivers

This budget code supports tool purchases for ongoing construction and maintenance activities on the substation and transmission system. As regulatory rules change, new tools are required to maintain the highest level of safety and compliance. Acquisition of new types or additional tools will enable flexibility necessary for completing maintenance and construction goals. The alternative is to rent or lease tools, if they are available, and prolong the use of outdated or deteriorated tools currently in inventory. If no tools are available, there is no practical alternative.

3. 206 – Electric Distribution Tools & Equipment

a. Description

The forecasts for Electric Distribution Tools/Equipment for 2022, 2023, and 2024 are $2.099 million, $2.099 million, and $2.099 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding to purchase new electric distribution tools and equipment required by field personnel to safely construct, inspect, operate, and maintain the electric distribution system. Standard tools and equipment will be acquired to maintain compliance with safety regulations and promote optimal performance. In addition, tools and equipment will be purchased for evaluating the latest technological advancements. All purchases will be in accordance with individual user needs and compliance requirements. When new work methods or pieces of equipment are introduced onto the system, new tools are required to perform the necessary operational tasks.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002060 – Electric Distribution Tools/Equipment.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program. The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in material costs.

c. Cost Drivers

The underlying cost driver for this capital project is to purchase new electric distribution tools and equipment required by field personnel to safely construct, inspect, operate and maintain the electric distribution system.

C. FRANCHISE

TABLE OR-8[12]
Summary of Franchise Forecasts

C. FRANCHISE (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
NON-COLLECTIBLE (NC)	22,379	26,055	28,082
COLLECTIBLE (CO)	21,733	44,315	60,430
Total CAPITAL	**44,112**	**70,370**	**88,512**

1. Introduction

The Franchise category of projects is required to perform municipal overhead to underground conversion work or work in accordance with SDG&E's franchise agreements. The

[12] Please refer to my capital workpapers, Ex. SDG&E-11-CWP, for additional information about the activities described herein. Each capital workpaper includes a Summary of Adjustments to Forecast section and workpaper details that separate the portion that is forecasted to be ratepayer-funded (Non-Collectible) and the portion anticipated to be collected from third parties (Collectible), if applicable. The Collectible portion is necessary for calculating the proper allocation of overhead amounts to these projects, but the fully loaded Collectible amounts are not included in the requested revenue requirement.

two categories of projects in the franchise category are (i) those devoted to conversion of overhead distribution systems to underground and (ii) street and highway relocations due to improvements by governmental agencies.

Rule 20A conversion 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. Rule 20B conversion projects sponsored by local governments are partially funded by ratepayers in the form of credits equal to cost of a new equivalent overhead system and the cost of removing the overhead system being converted. Street and highway relocations are also included in this category and performed at ratepayer 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 limits. The proceeds from this surcharge are used by the City of San Diego to fund overhead-to-underground conversion projects within the city limits. *See* 213 – City of San Diego Surcharge Program (20SD) below.

Franchise budget codes have a "collectible" component, where some funds are received from customers prior to construction through a mechanism called Contributions in Aid of Construction (CIAC). The total project cost to do the work, independent from any collectible portion is included in each individual budget code. Rate base modeling performed on these values still credits the collectible portion so that ratepayer impact is unchanged from the way SDG&E has demonstrated the cost of collectible projects.

The Rule 20 Balancing Account (R20BA) is a one-way balancing account to track the difference between the actual and authorized capital expenditures and expenses associated with completing overhead to underground conversion projects as required by the Rule 20 program. Refer to the Regulatory Accounts testimony of Jason Kupfersmid (Exhibit SDG&E-43) for additional information regarding this balancing account.

Additional details including description, forecast method, and cost drivers can be found in each budget code below.

2. 205 – Electric Street & Highway Relocations

a. Description

The forecasts for Electric Distribution Street & Highway Relocations for 2022, 2023, and 2024 are $6.358 million, $6.358 million, and $6.358 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the relocation of existing electric 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 Metropolitan Transit System, North County Transit District, and the Port of San Diego. This budget code covers relocations of electric distribution facilities, including both overhead and underground, that conflict with public street and highway improvements and other infrastructure improvement projects having rights superior to those of SDG&E.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002050 – Electric Dist. Street/Hwy Relocations.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program. The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs.

c. Cost Drivers

The underlying cost drivers for the various capital projects are dictated by and dependent on various governmental agencies (*e.g.*, cities, counties, or the state).

3. 210 – Conversion of Overhead to Underground Rule 20A

a. Description

The forecasts for Conversion of Overhead to Underground Rule 20A for 2022, 2023, and 2024 are $15.536 million, $15.536 million, and $15.536 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding to convert overhead facilities to underground based on requirements of SDG&E's Rule 20A conversion program, a CPUC-mandated program defined in case 8209 dated 09-27-67 (effective 01-01-68) and franchise agreements with the cities of San Diego and Chula Vista. Additional customers who participate in the program are 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, Santee and the Counties of Orange and San Diego.

This program provides for replacement of existing overhead electric facilities with new comparable underground electric facilities at the request of the governing body in the city or county in which such electric facilities are located as long as the conversion area selected by the governing body meets the criteria as set forth in Rule 20A. This is a CPUC-mandated program and is also incorporated into the SDG&E Franchises with the cities of San Diego and Chula Vista. Total program allocations are based on the San Diego Agreement, with each other city/county receiving an amount proportional to their electric meter count in accordance with the methodology specified in Rule 20A. Expenditures in San Diego are also mandated by the Memorandum of Understanding (MOU).

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002100 – Conversion of Overhead to Underground Rule 20A.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program. The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs.

c. Cost Drivers

The underlying cost driver of this budget is the request to underground existing overhead facilities as mandated by CPUC Rule 20A.

4. 213 – City of San Diego Surcharge Program (20SD)

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the City of San Diego Surcharge Program (20SD) for 2022, 2023, and 2024 are $0, $0, and $0, respectively, as the costs of this project are borne by the requestor. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding, at the City of San Diego's expense, to replace existing overhead electric facilities with comparable new underground electric facilities. Replacement is implemented at the request of the City of San Diego. This is a separate and distinct program from and unrelated to the Rule 20A Undergrounding Program, Budget Code 210 – Conversion from OH to UG Rule 20A. This program, Budget Code 213, is associated with SDG&E 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. 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 for the conversion, no net capital or O&M expenditures are anticipated.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002130 – City of San Diego Surcharge Program (20SD).

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program. The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, this is the most

appropriate methodology because a new Franchise Agreement was entered into with the City of San Diego in 2021, and a subsequent undergrounding MOU is currently being negotiated.

c. Cost Drivers

The underlying cost driver for this budget is the City of San Diego's schedule for requesting conversion work be performed to underground existing electric distribution and transmission facilities within the bounds of their territory.

5. 20257 – Conversion from Overhead to Underground Rule 20B

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Conversion from Overhead to Underground Rule 20B program for 2022, 2023, and 2024 are $405 thousand, $3.779 million, and $6.188 million, respectively. This is an ongoing program that is expected to continue through the test year

This budget code provides funding for the portion of expenses to be borne by ratepayers associated with projects (not related to New Business) replacing existing overhead electric facilities with new comparable underground electric facilities as stipulated by the requirements of Rule 20B and using established SDG&E standards and processes; the criteria for Rule 20B are typically applied when a project is not eligible for Rule 20A. Replacement is implemented at the request of the governing body in the city or county in which the electric facilities are located, and the conversion area selected by the governing body meets the criteria as set forth in Rule 20B.

Rule 20B projects are municipally-driven with primary funding by a local government that is typically supported by community involvement. SDG&E coordinates closely with local municipalities in scheduling and prioritizing projects according to available funds, community support, and a variety of other factors affecting scope and schedule.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 202570 – Conversion from OH to UG Rule 20B.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (e.g., an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed

from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this budget code is dictated by the governing body of the city or county in which the electric facilities are located and proposed to be converted to underground under Rule 20B.

6. 21125 – TL681 Escondido Trails Customer Relocation

a. Description

The forecasts for TL681 Escondido Trails Customer Relocation for 2022, 2023, and 2024 are $40 thousand, $211 thousand, and $0, respectively. SDG&E plans to build and place this project in-service by the test year.

This project includes the relocation of one transmission pole with distribution underbuild due to a franchise relocation for the City of Escondido since existing facilities are in conflict with a new sidewalk.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 21125A – TL681 Escondido Trails Customer Relocation.

b. Forecast Method

The forecast method used is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work specific to this project.

c. Cost Drivers

The underlying cost drivers of this capital project relate to labor and non-labor components (materials and construction) to perform the scope of work requested by the municipality under the franchise agreement to relocate the electric facilities. Documentation of these cost drivers are included as supplemental workpapers.

7. 21139 – TL634 Juniper Street Customer Relocation

a. Description

The forecast for TL634 Juniper Street Customer Relocation for 2022, 2023, and 2024 are $40 thousand, $171 thousand, and $0, respectively. SDG&E plans to build and place this project in-service by the test year.

This project includes the relocation of four transmission poles with distribution underbuild and three distribution poles due to a franchise relocation for the City of Escondido since existing facilities are in conflict with Juniper Street improvements.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 21139A – TL634 Juniper Street Customer Relocation.

b. Forecast Method

The forecast method used is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work specific to this project.

c. Cost Drivers

The underlying cost drivers of this capital project relate to labor and non-labor components (material and construction) to perform the scope of work requested by the municipality under the franchise agreement to relocate the electric facilities. Documentation of these cost drivers are included as supplemental capital workpapers.

D. MANDATED

TABLE OR-9[13]
Summary of Mandated Forecasts

D. MANDATED (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
NON-COLLECTIBLE (NC)	30,174	31,992	31,992
COLLECTIBLE (CO)	1,769	1,769	1,769
Total CAPITAL	**31,943**	**33,761**	**33,761**

1. Introduction

Mandated projects are those required by the CPUC and other regulatory agencies. Mandated programs help promote public 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 includes, among others, the replacement of equipment from SDG&E's Corrective Maintenance Program (CMP), the replacement/reinforcement of wood distribution poles, and manhole/handhole/vault restoration. These three programs are driven by CPUC GO 165, which governs the inspection and maintenance program for a utility distribution system in furtherance of overhead and underground construction's compliance with GO 95 (Rules for Overhead Electric Line Construction) and GO 128 (Rules for Construction of Underground Electric Supply and Communications Systems). SDG&E's CMP compliance plan was submitted to the CPUC on July 1, 1997 and GO 165 became effective on January 1, 1998. General Order 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 GO 95 and GO 128 and must be cleared within twelve months of the initial inspection. Infractions identified in SDG&E's High

[13] Please refer to my capital workpapers, Ex. SDG&E-11-CWP, for additional information about the activities described herein. Each capital workpaper includes a Summary of Adjustments to Forecast section and workpaper details that separate the portion that is forecasted to be ratepayer-funded (Non-Collectible) and the portion anticipated to be collected from third parties (Collectible), if applicable. The Collectible portion is necessary for calculating the proper allocation of overhead amounts to these projects, but the fully loaded Collectible amounts are not included in the requested revenue requirement.

Fire-Threat District (HFTD) Tier 3 will be cleared within six months of the initial inspection in compliance with GO 95. Imminent safety hazards found on the inspections are immediately addressed. The programs included in this category represent the capital expenditures necessary to correct those infractions.

Additional details including description, forecast method, and cost drivers can be found in each budget code below.

2. 229 – Corrective Maintenance Program (CMP)

a. Description

The forecasts for the Corrective Maintenance Program (CMP) for 2022, 2023, and 2024 are $11.225 million, $11.225 million, and $11.225 million, respectively. This program, ongoing since January 1998, is expected to continue through the test year.

This budget primarily provides funding for the maintenance of underground electric distribution facilities and a small portion of the electric distribution overhead system that does not require a pole replacement. This program is mandated by GO 165 to promote safe, high-quality electrical service and compliance with SDG&E and CPUC construction standards found in GO 95 and GO 128. Inspections are performed on a cyclical basis and conditions found during inspections are repaired in compliance with SDG&E's CMP plan. All electric distribution facilities are visually patrolled on an annual basis in urban and rural areas and inspected in detail every three or five years depending on the equipment type. Conditions found during the inspections may require only labor to repair equipment, may require replacement of equipment that may potentially fail based on condition, or may compromise safety to the general public in the near future. Inspections and some repairs are captured under O&M funding requests included in the Electric Distribution O&M testimony of Tyson Swetek (Exhibit SDG&E-12). This program is mandated by the CPUC and is designed to provide reliable service and a safe environment for SDG&E's employees, contractors, and the public.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002290 – RAMP – Corrective Maintenance Program (CMP).

The Corrective Maintenance Program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C15 GO 165 Corrective Maintenance Program – UG. Accordingly, this budget code in its entirety aligns with a RAMP activity.

For the Corrective Maintenance Program, Table OR-10 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-10: RAMP Activity Capital Forecasts by Workpaper In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
2290.001	SDG&E-Risk-2	C15	GO 165 Corrective Maintenance Program Underground	11,225	11,225	11,225	3

b. Forecast Method

The forecast method used for the Corrective Maintenance Program is a five-year average based on historical data. This is the most appropriate methodology, as workload can vary from year to year. The five-year average levels out the peaks and valleys in this blanket budget code over a larger period, and still provides for the necessary level of funding for the work that falls within this budget.

c. Cost Drivers

The underlying cost driver for this program is the CMP inspections. This budget code is used to fund work resulting from those inspections.

3. 289 – Manhole, Handhole, and Vault Restoration

a. Description

The forecasts for Manhole, Handhole, and Vault Restoration for 2022, 2023, and 2024 are $4.311 million, $4.311 million, and $4.311 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding to structurally restore subsurface (manhole and handhole) and vault type structures, all of which impact system integrity and employee and public safety. This will allow SDG&E to continue to operate distribution equipment and facilities for the safety and well-being of both employees and the general public and to comply with GO 128 and 165. Failure to implement this program would reduce reliability and limit operational flexibility, while increasing the risk of injury to field personnel and the public. Without implementing such a program, SDG&E may increase the risk of equipment and structural failures, prolonged outages, and potential safety issues. Funding for the CMP UG

Switch Replacement program that was previously a part of this budget code was moved to BC290 – Do not Operate Energized (DOE) Switch Replacement as part of my testimony.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002890 – RAMP – Manhole, Handhole, and Vault Restoration.

The Manhole Vault Restoration Program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C16 GO 165 Manhole Vault Restoration Program. Accordingly, this budget code in its entirety aligns with a RAMP activity.

For the Manhole, Handhole, and Vault Restoration Program, Table OR-11below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-11: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
002890.001	SDG&E-Risk-2	C16	GO 165 Manhole Vault Restoration Program	4,311	4,311	4,311	34

b. Forecast Method

The forecast method developed for this cost category is base-year. The expenditures for 2021 reflect recent changes in this program and is the best representation of the starting point for 2022-2024 forecasted costs.

c. Cost Drivers

The underlying cost driver for this budget is based on the number of substructures requiring structural restoration.

4. 10265 – Avian Protection (Non-HFTD)

a. Description

The forecasts for Avian Protection for 2022, 2023, and 2024 are $149 thousand, $187 thousand, and $187 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for identifying and retrofitting, rearranging, or building-to-standard distribution poles in SDG&E's service territory outside the High Fire-Threat District (HFTD) to prevent electrocution of birds and to facilitate compliance with

following Federal and State Laws: Migratory Bird Treaty Act (16 USC §§ 703-712), Bald and Golden Eagle Protection Act (16 USC §§ 668-668d), and the California Fish and Game Code (Cal Fish and Game Code §§ 3503, 3503.5, 3511, 3513).

The program 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 Guidelines. The program will include projects that will systematically retrofit distribution lines and poles in the overhead distribution system that either lie within the Avian Protection Zone, or have associated known bird contacts, in which case the Company will identify and resolve potential avian risks.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 102650 – RAMP – Avian Protection.

The Avian Protection Program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C08 Avian Protection Program. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Avian Protection Program, Table OR-12 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-12: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
102650.001	SDG&E-Risk-2	C08	Avian Protection Program	149	187	187	39

b. Forecast Method

The forecast method used is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for the Avian Protection program because it does not have significant or consistent historical costs which would otherwise provide reliable certainty in generating a forecast based on program spend over previous years. However, the unit cost estimate provided

in workpapers does consist of cost components derived from historical experience on the program over previous years.

c. Cost Drivers

The underlying cost drivers for this capital project are the need to reduce the potential for bird electrocutions and comply with Federal and State laws.

5. 13264 – Distributed Generation Interconnect

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Distributed Generation Interconnect program for 2022, 2023, and 2024 are $0, $0, and $0, respectively, as the costs of this project are borne by the requestor. This is an ongoing program that is expected to continue through the test year.

This program facilitates the interconnection of customer or developer owned generation to SDG&E's electric distribution system. SDG&E performs engineering, design, and construction of interconnection facilities from generator switchgear to the point of interconnection on the distribution system. Most generators interconnected under this budget code are 0.5MW to 10MW in size.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 132640 – Distributed Generation Interconnect.

b. Forecast Method

The forecast method used is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for the Distributed Generation Interconnect program because it does not have significant or consistent historical costs and is dependent upon customer requests. However, the unit cost estimate provided in workpapers does consist of cost components derived from historical experience on the program over previous years.

c. Cost Drivers

The underlying cost driver for this program is the number of customers or developers who request an interconnection onto SDG&E's distribution system according to mandates by the CPUC under Electric Rule 21 and FERC Wholesale Distribution Open Access Tariff.

6. 17262 – Street Light Modernization

a. Description

The forecasts for Street Light Modernization for 2022, 2023, and 2024 are $1.780 million, $3.560 million, and $3.560 million, respectively. This is an ongoing program that is expected to continue through the test year.

This project targets modernizing the street lighting system owned by SDG&E by proactively converting the system to light emitting diodes (LEDs). In addition, based on the location and current condition of the associated poles, pole replacement might be required when the lighting system is being replaced. Pursuant to Assembly Bill 719, SDG&E filed Advice Letter 3263-E-B, which was approved July 2, 2019 and effective July 29, 2019, by the CPUC, stating that SDG&E was adopting LED technology as a standard for LS-1 lights and was embarking on a LED conversion program of LS-1 lights. The current scope will cover locations within SDG&E's service territory where SDG&E owns the street lights and proactively replaces the street lights on a block by block approach rather than the existing plan of replacing upon failure.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 172620 – Street Light Modernization.

b. Forecast Method

The forecast method used is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for the Street Light Modernization program because it does not have significant or consistent historical costs which would otherwise provide reliable certainty in generating a forecast based on program spend over previous years. However, the unit cost

estimate provided in workpapers does consist of cost components derived from historical experience on the program over previous years.

c. Cost Drivers

The underlying cost drivers for this project are to improve environmental performance by lowering consumption of power, longer lifespan, and improved product reliability.

7. 87232 – Pole Replacement and Reinforcement

a. Description

The forecasts for Pole Replacement and Reinforcement for 2022, 2023, and 2024 are $12.709 million, $12.709 million, and $12.709 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the pole restoration and replacement program for in-service distribution poles utilizing primarily steel and fiberglass poles. These replacements are incorporated into routine CMP pole replacements. In addition, all significant work affecting the overhead distribution system must be accompanied by a pole loading calculation. If the pole loading calculation fails and require a pole replacement, these replacements will be incorporated into this budget code. 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 repairs are captured under O&M budgets included in the Electric Distribution O&M testimony of Tyson Swetek (Exhibit SDG&E-12).

The pole inspection/restoration/replacement program is designed to comply with GO 95, GO 165 and SDG&E's compliance plan submitted on July 1, 1997. In addition, this program protects SDG&E's capital investments of overhead distribution facilities by maintaining GO 95 mandated safety factors for the applicable grades of construction. This program promotes SDG&E's compliance with GO 95 and 165 and is expected to improve the life expectancy of the overhead distribution system, minimize 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 replacement.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 872320 – RAMP – Pole Replacement and Reinforcement.

The Pole Replacement and Reinforcement Program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C02 GO 165 Pole Replacement and Reinforcement. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Pole Replacement and Reinforcement mitigation, Table OR-13 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-13: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
872320.001	SDG&E-Risk-2	C02	GO 165 Pole Replacement Reinforcement	$ 12,709	$ 12,709	$ 12,709	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is base-year. The expenditures for 2021 reflect recent changes in this program and is the best representation of the starting point for 2022-2024 forecasted costs.

c. Cost Drivers

The underlying cost driver for this program is related to compliance with GO requirements and an increased emphasis on pole loading analysis.

E. MATERIALS

TABLE OR-14
Summary of Materials Forecasts

E. MATERIALS (In 2021 $)			
	Estimated 2022 (000s)	Estimated 2023 (000s)	Estimated 2024 (000s)
Total CAPITAL	**28,827**	**30,255**	**31,755**

1. Introduction

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

Additional details including description, forecast method, and cost drivers can be found in each budget code below.

2. 202 – Electric Meters & Regulators

a. Description

The forecasts for the Electric Meters and Regulators project for 2022, 2023, and 2024 are $4.802 million, $5.042 million, and $5.294 million, respectively. This is an ongoing program that is expected to continue through the test year.

These forecasts provide funding to purchase new watt-hour meters and regulators used to service the electric distribution customers. Inventory levels for the meters and regulators are maintained at each of the electric distribution service centers. The meters could be used for new business installations or installed as replacements for meters that are damaged or not properly functioning.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002020 – Electric Meters & Regulators.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is new business growth and projected replacement needs that require the installation of meters and regulators.

3. 214 – Transformers

a. Description

The forecasts for the Transformers for 2022, 2023, and 2024 are $24.025 million, $25.213 million, and $26.461 million, respectively. This is an ongoing program that is expected to continue through the test year.

This forecast provides funding to purchase distribution transformers necessary to operate and maintain the electric distribution system. SDG&E purchases the new transformers, supplies new and replacement equipment, and maintains inventory at each electric distribution service center.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002140 – Transformers.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is directly related to the required need of transformers related to the various work being performed.

F. NEW BUSINESS

TABLE OR-15[14]
Summary of New Business Forecasts

F. NEW BUSINESS (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
NON-COLLECTIBLE (NC)	49,453	49,861	50,273
COLLECTIBLE (CO)	20,150	10,520	8,162
Total CAPITAL	**69,603**	**60,381**	**58,435**

1. Introduction

Most capital expenditures associated with New Business budget codes are a direct result of 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 also has some budget codes with collectible components.

New Business work is subject to a quick turnaround, as it is in direct response to customer requests. New customers seeking service from SDG&E submit requests with time frames based on their own needs, the urgency of which will vary.

The New Business forecasts are developed based on leveraging historical average spend with adjustments based on information from the Customer Forecast data. For additional information on this forecast refer to the Electric Customer Forecast testimony of Kenneth E. Schiermeyer (Exhibit SDG&E-40).

New Business budget codes have a "collectible" component, where some funds are received from customers prior to construction through a mechanism called Contributions in Aid of Construction (CIAC). The total project cost to do the work, independent from any collectible

[14] Please refer to my capital workpapers, Ex. SDG&E-11-CWP, for additional information about the activities described herein. Each capital workpaper includes a Summary of Adjustments to Forecast section and workpaper details that separate the portion that is forecasted to be ratepayer-funded (Non-Collectible) and the portion anticipated to be collected from third parties (Collectible), if applicable. The Collectible portion is necessary for calculating the proper allocation of overhead amounts to these projects, but the fully loaded Collectible amounts are not included in the requested revenue requirement.

portion is included in each individual budget code. Rate base modeling performed on these values still credits the collectible portion so that ratepayer impact is unchanged from the way SDG&E has demonstrated the cost of collectible projects.

The Rule 20 Balancing Account (R20BA) is a one-way balancing account to track the difference between the actual and authorized capital expenditures and expenses associated with completing overhead to underground conversion projects as required by the Rule 20 program. Refer to the Regulatory Accounts testimony by Jason Kupfersmid (Exhibit SDG&E-43) for additional information regarding this balancing account.

Additional details including description, forecast method, and cost drivers can be found in each budget code below.

2. 204 – Electric Distribution Easements

a. Description

The forecasts for the Electric Distribution Easements for 2022, 2023, and 2024 are $2.263 million, $2.263 million, and $2.263 million, respectively. This is an ongoing program that is expected to continue through the test year.

This program provides funding to obtain new electric distribution easements necessary to provide service to new customers, accommodate street and highway relocations, underground conversions, and other capital improvement projects to improve electrical service. SDG&E 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 or public lands. The program also allows for the acquisition of real property easement rights to install new business electric facilities on private property to provide service for new customer loads. There is no reasonable alternative to this program if the Company must install or maintain electric facilities on, under, or over private property or public lands.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002040 – Electric Distribution Easements.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an

appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program. The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing price increases.

c. Cost Drivers

The underlying cost driver for this budget code is related to the requirement to operate and maintain the existing and new electric distribution system and services.

3. 215 – Overhead Residential New Business

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Overhead Residential New Business program for 2022, 2023, and 2024 are $741 thousand, $748 thousand, and $754 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers associated with the extension of new overhead electric distribution systems to new residential electric customers requesting service from SDG&E. This program includes third wire bring ups (bringing in a neutral to a two-phase circuit) and transmission underbuilds to serve new residential customers. This project is in accordance with the "Rules for the Sale of Electric Energy" filed with and approved by the CPUC, as electric facilities must be provided to qualified applicants.[15]

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002150 – OH Residential NB.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an

[15] *See, e.g.,* Electric Rule 15 and Electric Rule 16.

appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

The volume of future overhead residential line extension work can be very difficult to predict, as customer requests for overhead line extensions can be sporadic. They can also vary dramatically in size and complexity, therefore a historical average coupled with Customer Forecast data provides the most appropriate forecast of costs for this program. Refer to the Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40). The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years.

c. Cost Drivers

The underlying cost driver for this program is residential customer growth.

4. 216 – Overhead Non-Residential New Business

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Overhead Non-Residential New Business program for 2022, 2023, and 2024 are $935 thousand, $943 thousand, and $951 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers associated with the extension of new overhead electric distribution systems to new non-residential electric customers requesting service from SDG&E. This program provides for the extension of the overhead distribution system, including third wire bring ups (bringing in a neutral to a two-phase circuit) and transmission underbuilds, that serve new non-residential customers. This program is in accordance with the "Rules for the Sale of Electric Energy" filed with and approved by the CPUC, as electric facilities must be provided to qualified applicants.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002160 – OH Non-Residential NB.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

The volume of future overhead non-residential line extension work can be very difficult to predict, as customer requests for overhead line extensions can be sporadic. They can also vary dramatically in size and complexity, therefore a historical average coupled with Customer Forecast data provides the most appropriate forecast of costs for this program. Refer to the Electric Customer Forecast testimony by Ken Schiermeyer (Exhibit SDG&E-40). The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years.

c. Cost Drivers

The underlying cost driver for this program is non-residential customer growth.

5. 217 – Underground Residential New Business

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Underground Residential New Business program for 2022, 2023, and 2024 are $6.487 million, $6.542 million, and $6.599 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers associated with extending new underground electric distribution systems to new residential electric customers requesting service from SDG&E. This program is in accordance with the "Rules for the Sale of Electric Energy" filed with and approved by the CPUC, as electric facilities must be provided to qualified applicants.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* SDG&E-11-CWP at section 002170 – UG Residential NB.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

The volume of future underground residential new business work can be very difficult to predict and can vary in size and complexity, therefore a historical average coupled with Customer Forecast data provides the most appropriate forecast of costs for this program. Refer to the Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40). The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years.

c. Cost Drivers

The underlying cost driver for this program is residential customer growth. Despite 2020 being an anomaly year due to COVID-19, the housing industry continues to recover and SDG&E forecasts the requests for underground residential line extension work to increase associated with the Rule 15 requirement that all new residential developments be served by underground electric systems.

6. 218 – Underground Non-Residential New Business

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Underground Non-Residential New Business program for 2022, 2023, and 2024 are $6.569 million, $6.625 million, and $6.681 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers associated with the extension of new underground electric distribution systems to new non-residential electric customers requesting service from SDG&E. This program is in accordance

with the "Rules for the Sale of Electric Energy" filed with and approved by the CPUC, as electric facilities must be provided to qualified applicants.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002180 – UG Non-Residential NB.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

The volume of future underground non-residential new business work can be very difficult to predict and can vary in size and complexity, therefore a historical average coupled with Customer Forecast data provides the most appropriate forecast of costs for this program. Refer to the Electric Customer Forecast testimony by Ken Schiermeyer (Exhibit SDG&E-40). The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years.

c. Cost Drivers

The underlying cost driver for this program is non-residential customer growth. The non-residential industry continues to recover, and SDG&E forecasts the requests for non-residential line extension work to increase due to Rule 15 as all new non-residential developments are required to be served by underground electric systems.

7. 219 – New Business Infrastructure

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the New Business Infrastructure program for 2022, 2023, and 2024 are $3.954 million, $3.988 million, and $4.022 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers associated with the installation of facilities for new electric customers to be served from both the overhead and underground distribution system and facilitates various future development needs. This project is in accordance with the "Rules for the Sale of Electric Energy" filed with and approved by the CPUC, as electric facilities must be provided to qualified applicants.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002190 – New Business Infrastructure.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

Projects under this program provide infrastructure support consistent with activities in the other line extension categories, including overhead and underground, residential and non-residential as needed. Some projects in this program can be very large and can take a long time to complete, which makes the timing of customer payments inconsistent with the timing of the work. As such, the net expenditures vary from year to year, sometimes significantly, therefore a historical average coupled with Customer Forecast data provides the most appropriate forecast of costs for this program. Refer to the Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40). The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years.

c. Cost Drivers

The underlying cost driver for this program is new business customer growth.

8. 224 – New Service Installations

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the New Service Installations program for 2022, 2023, and 2024 are $6.566 million, $6.620 million, and $6.675 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers associated with delivering electric service to new customers from new or existing electric distribution systems and facilitates the installation of new overhead and underground electric services for new customers. The installation of distribution facilities is to be installed on Budgets Codes 215, 216, 217, 218, or 219. This program is in accordance with the "Rules 18 for the Sale of Electric Energy," filed with and approved by the CPUC, as electric facilities must be provided to qualified applicants.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002240 – New Service Installations.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years. Refer to the Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40).

c. Cost Drivers

The underlying cost driver for this program is the customer growth. Despite 2020 being an anomaly year due to COVID-19, the volume of electric service work (services only, no distribution) has been increasing steadily associated with a growing construction industry.

9. 225 – Customer Requested Upgrades & Services

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Customer Requested Upgrades and Services program for 2022, 2023, and 2024 are $9.906 million, $9.988 million, and $10.071 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers to replace, relocate, rearrange, or remove existing electric distribution and service facilities as requested by customers. This program is in accordance with the rules for the sale of electric energy filed with and approved by the CPUC, as modifications to existing electric facilities may be required due to customer requests and in conjunction with new business projects.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002250 – Customer Requested Upgrades and Services.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

Net expenditures for customer requested relocation, rearrangements, and removals have varied significantly over the past several years, therefore a historical average coupled with Customer Forecast data provides the most appropriate forecast of costs for this program. Refer to the Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40). The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years.

c. Cost Drivers

The underlying cost driver for this program is the customer growth.

10. 235 – Transformer & Meter Installations

a. Description

The ratepayer-funded (Non-Collectible) forecasts for Transformer and Meter Installations for 2022, 2023, and 2024 are $8.896 million, $8.981 million, and $9.066 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers associated with 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. SDG&E Electric Rule 16 provides that modification to existing electric facilities may be required in conjunction with new business projects and due to customer request.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 002350 – Transformers & Meter Installations.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

A historical average coupled with Customer Forecast data provides the most appropriate forecast of costs for this program. Refer to the Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40). The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years.

c. Cost Drivers

The underlying cost driver for this program is the customer growth.

11. 18143 – 3 ROOTS TL6906, TL677 & TL668 Customer Relocation

a. Description

The ratepayer-funded (Non-Collectible) forecasts for 3 Roots TL6906, TL677 & TL668 Customer Relocation for 2022, 2023, and 2024 are $0, $0, and $0, respectively, as the costs of this project are borne by the requestor.

3 Roots is a developer-initiated project within the Mira Mesa community consisting of 1,800 residential units including single family detached homes, attached and detached townhomes, apartments and over 156,000 square feet of commercial/multi use space. To accommodate the new development, SDG&E is required to relocate approximately 5,700 feet of three 69kV transmission lines. The realignment of TL6906, TL677, and TL668 will consist of 400 feet of overhead lines and 5,700 feet of underground lines. SDG&E will also decommission an existing substation that is not feeding any customers.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 181430 – 3 Roots TL6906 TL677 TL668 Customer Relocation.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work specific to this project.

c. Cost Drivers

The underlying cost drivers for this project relate to labor and non-labor components (material and construction) and the need to relocate electric facilities to accommodate the customer's project. Documentation of these cost drivers are included in the supplemental workpapers.

12. 18242 – Pure Water Electric

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Pure Water Electric project for 2022, 2023, and 2024 are $0, $0, and $0, respectively, as the costs of this project are borne by the requestor.

The Pure Water San Diego program is the City of San Diego's ("City") phased, multi-year program that will provide more than 40% of San Diego's water supply locally by the end of 2035. The Pure Water San Diego Program will use proven water purification technology to clean recycled water to produce safe, high-quality drinking water. Phase 1 of the City's Pure Water San Diego Program includes 11 different projects that will clean recycled water to produce 30 million gallons per day of high-quality purified water, reducing the City's dependence on imported water. The City's eleven Phase 1 projects include installation of two pump stations, multiple underground pipelines, and the expansion of the reclamation facility. SDG&E must relocate infrastructure (electric distribution, electric transmission, and gas distribution lines) so the City can install their Phase 1 projects. Work will be phased in accordance with the City's priority work schedule. SDG&E shall perform the work in accordance with SDG&E's standard operating procedures and methods, pursuant to the relocation design for the work approved by both the City and SDG&E. For additional details related to this project, please go to the City of San Diego's website.[16]

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 182420 – Pure Water Electric.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction

[16] SanDiego.gov, Pure Water San Diego, available at https://www.sandiego.gov/public-utilities/sustainability/pure-water-sd.

labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work specific to this project. Over the course of the project, actual SDG&E relocation costs are deducted from the deposit provided by the City.

c. Cost Drivers

The underlying cost drivers of this project relate to labor and non-labor components (materials and construction) and the need to relocate gas and electric facilities to accommodate the customer's project. Documentation of these cost drivers are included as supplemental capital workpapers.

13. 20256 – Camp Pendleton Stuart Mesa Housing – Electric

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Camp Pendleton Stuart Mesa Housing project for 2022, 2023, and 2024 are $0, $0, and $0, respectively, as the costs of this project are borne by the requestor.

The Stuart Mesa Housing Community includes 1,498 residential units, an elementary school, community recreation center, administration housing offices, convenience store and various maintenance buildings. SDG&E currently provides Stuart Mesa Housing Community with electric and gas services via master meters. This project will replace the existing base-owned underground electrical and gas distribution system that provides electrical power and gas service to the Stuart Mesa Housing Area. All expenses associated with this project will be prepaid by the Federal Government. No net capital or O&M expenditures are anticipated.

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 202560 – Camp Pendleton Stuart Mesa Housing – Electric.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as

applicable. This method is most appropriate because of the unique scope of work specific to this project.

c. Cost Drivers

The primary cost driver for this project was the Federal Government's request to convert the Stuart Mesa Housing Community from primary metering to individual meters.

14. 21252 – Conversion from Overhead to Underground Rule 20B

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Conversion from Overhead to Underground Rule 20B program for 2022, 2023, and 2024 are $1.634 million, $1.648 million, and $1.663 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers to convert existing electric overhead distribution lines to underground distribution lines upon customer request. This program reflects SDG&E's portion of the costs for installing new underground facilities to replace existing overhead facilities for projects meeting the criteria for Rule 20B (not associated with Franchise). SDG&E is responsible for a portion of the costs associated with converting overhead distribution lines to underground distribution lines to comply with the "Rules for the Sale of Electric Energy."

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 212520 – Conversion from OH-UG Rule 20B New Business.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

Various aspects of new business, such as permits mandating conversions for developers or a customer seeking to have overhead lines in their neighborhood removed, make it challenging to predict the volume of future conversion work, therefore a historical average

coupled with Customer Forecast data provides the most appropriate forecast of costs for this program. Refer to the Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40). The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years.

c. Cost Drivers

The underlying cost driver for this budget code is 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.

15. 21253 – Conversion from Overhead to Underground Rule 20C

a. Description

The ratepayer-funded (Non-Collectible) forecasts for the Conversion from Overhead to Underground Rule 20C program for 2022, 2023, and 2024 are $1.502 million, $1.515 million, and $1.528 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the portion of expenses to be borne by ratepayers to convert existing electric overhead distribution lines to underground distribution lines upon customer request. This program reflects SDG&E's portion of the costs for installing new underground facilities to replace existing overhead facilities for projects meeting the criteria for Rule 20C. SDG&E is responsible for a portion of the costs associated with converting overhead distribution lines to underground distribution lines to comply with the "Rules for the Sale of Electric Energy."

For this cost category, SDG&E's proposed LPCMA, discussed above, would apply if associated costs are later deemed to be non-collectible.

Additional information can be found in capital workpapers. *See* Ex. SDG&E-11-CWP at section 212530 – Conversion from OH-UG Rule 20C.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an

appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

Various aspects of new business, such as permits mandating conversions for developers or a customer seeking to have overhead lines in their neighborhood removed, make it challenging to predict the volume of future conversion work, therefore a historical average coupled with Customer Forecast data provides the most appropriate forecast of costs for this program. Refer to the Electric Customer Forecast testimony by Kenneth E. Schiermeyer (Exhibit SDG&E-40). The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs. Additionally, the current customer forecast shows a positive trend more closely aligned with what was seen in the last three versus five years.

c. Cost Drivers

The underlying cost driver for this budget code is based on the amount of conversion work currently awaiting construction, changing trends toward the use of 20C conversions by municipalities and the forecasted level of new customer growth.

G. OVERHEAD POOLS

TABLE OR-16
Summary of Overhead Pool Forecasts

G. OVERHEAD POOLS (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
Total CAPITAL	**169,428**	**196,603**	**152,003**

1. Introduction

Overhead Pools (OH Pools) reflect the costs that originate from central activities, which are allocated to different capital projects such as costs for engineering capacity studies, reliability analysis, and preliminary design work (among others). Many of these costs cannot be attributed to a single capital project and are therefore spread to projects that are ultimately constructed and placed into service. These central activity costs are referred to as "pooled costs." There are four workgroups that make up OH Pools within my testimony: (a) Local Engineering – Electric Distribution Pool; (b) Local Engineering – Substation Pool; (c) Department Overhead Pool –

Electric; and (d) Contract Administration (CA) Pool – Electric.[17] These four pools perform various functions and are comprised of planners, designers, engineers, support personnel, managers, supervisors, dispatchers, field employees, clerical employees, and contract administrators.[18]

In the TY 2019 GRC, the Commission approved SDG&E's OH Pools procedure for charging costs to capital projects.[19] Although the Commission found SDG&E's forecast methodology to be reasonable, it concluded that SDG&E should reduce its forecast of OH Pools based on the amount of capital projects that are being authorized in the TY 2019 GRC Decision as opposed to its forecasts.[20] For example, if 80 percent of SDG&E's capital projects requested were authorized, then the forecast for Overhead Pools should also be reduced to 80 percent of the original forecast.[21] In addition, the Commission found it reasonable to apply a one-way balancing account treatment to the funding authorized for OH Pools (Overhead Pools Balancing Account, OPBA) to ensure that funds associated with engineering, reliability analysis, preliminary design work, etc. relating to specific capital projects that are cancelled or postponed are not reassigned to other areas.[22]

In the TY 2024 proceeding, SDG&E requests that the Commission again authorize its OH Pools forecasts as reasonable, but *without* one-way balancing treatment. SDG&E is requesting that the OPBA be closed, please see the Regulatory Accounts testimony of Jason Kupfersmid (Exhibit SDG&E-43). The Commission has already determined in the prior GRC that SDG&E's use of the OH Pools accounting treatment is reasonable. However, as detailed below, the one-way balancing treatment for the OH Pools should be removed for the following reasons: (a) One-way balancing treatment of OH Pool funding for engineering activities at the conceptual and beginning stages of a project is constraining and counterproductive; (b) SDG&E's ED Capital project teams have effective cost oversight and forecasting processes and

---

[17] D.19-09-051 at 286.

[18] *Id*.

[19] *Id.* at 287.

[20] *Id.*

[21] *Id*.

[22] *Id*.

procedures in place eliminating the need for one-way balancing account treatment; and (c) The data shows that SDG&E's OH Pool costs are managed in proportion to its capital expenditures during the year; capping OH Pool costs with one-way balancing treatment does not take into account the growth in the capital projects and is therefore unwarranted.

a. One-Way Balancing Treatment of OH Pools is Constraining and Counterproductive

It is imperative to have efficient planning at the conceptual and beginning stages of a construction project. When a project is in its preliminary phase, it is important to encourage engineers and designers to be creative in order to enable them to develop projects that are more beneficial and less costly to implement. One-way balancing treatment of OH Pools constrains the planning and design process as it limits the amount of time engineers and designers can dedicate to developing project improvements and efficiencies prior to the construction phase.

In SDG&E's 2019 GRC Decision, the Commission reduced its forecast for OH Pools based on the amount of capital projects being authorized: "For example, if 80 percent of SDG&E's capital projects requested are authorized, then the forecast for Overhead Pools should also be reduced to 80 percent of the original forecast."[23] Putting such a constraint on the OH Pools that include engineering and design activities is counterproductive. To continue to look for ways to reduce the ultimate costs of capital projects, spending more time in the engineering and design phase can lead to a more efficient and well-planned construction phase that helps reduce the overall cost of a project. The one-way balancing treatment has the unintended consequence of discouraging or restricting SDG&E by limiting the expenditure that can be attributed to this critical planning phase of the project, only to then to spend more during the construction phase.

SDG&E notes that it has moved to more direct charging of electric distribution projects that are of a larger scale. However, the remaining smaller dollar and higher volume of electric distribution projects will continue to have the engineering (*i.e.*, capacity studies, reliability analysis, and preliminary design work) charged into OH Pools, which are then loaded out to projects as they are being constructed. Using overhead pools in these situations is an efficient business practice that is supported by the Code of Federal Regulations, as recognized by the

[23] *Id.*

Commission.[24] When a preliminary engineering project is cancelled that has been recording costs to FERC Account 183 (Preliminary Survey & Engineering) the direct and indirect costs are written off to expense and the indirect costs are not recirculated back into a pool to be loaded on other projects.[25]

b. SDG&E's ED Capital Project Teams Have Effective Cost Oversight and Forecasting Processes That Obviate the Need for One-Way Balancing Account Treatment

The stated reason why the Commission imposed one-way balancing account treatment on OH Pools was to ensure that central activities costs related to specific capital projects that might be cancelled or postponed are not reassigned to other areas.[26] SDG&E has since instituted and/or improved several oversight and control measures to address this concern.

Throughout the TY2019 GRC cycle, SDG&E has continued to refine and enhance its capital cost tracking, reporting and forecasting models, processes and methodologies. Significant improvements have been achieved in all of these areas, which have resulted in tighter cost controls, increased transparency, and accountability across the Electric Distribution Capital portfolio. This includes the OH Pools, which are a function of the direct capital costs they support.

The Electric distribution Capital project Teams, whose projects receive allocations from the pools, have the following cost oversight and monitoring controls in place:

- Routine cost/invoice reviews by Managers and Team Leads
- Focus on irregular spend as well as random spot checks
- Distribution of monthly vendor spend and internal labor reports to Managers and Directors
- Monthly review of actual results against a budget/plan and a rolling forecast

All of these factors have improved SDG&E's oversight and forecasting process, which in turn have eliminated the need for the OPBA.

---

[24] *Id.* ("SDG&E applies the Overhead Pools procedure as provided in the Code of Federal Regulations and based on the evidence submitted, we find that ORA does not provide compelling reason to prohibit the use of SDG&E's proposed procedure.") (citation omitted).

[25] *See* 18 CFR § 367.1830 – Account 183.

[26] *Id*.

c. SDG&E's OH Pool Costs are Managed in Proportion to its Capital Expenditures During the Year

The data shows that SDG&E's OH Pool costs are managed in proportion to its capital expenditures during the year. Capping OH Pool costs with one-way balancing treatment does not take into account the growth in the capital projects and is therefore unwarranted.

The table below shows an annual summary of the four Electric Distribution pools that are subject to the one-way balancing account treatment as authorized in the 2019 GRC. This table indicates that although the average annual loading rate for each of the individual pool has moved up and down on a short-term basis, it has nonetheless remained fairly constant over time. If the costs were not being properly managed in proportion to the capital expenditures during the year, then the rate would be increasing, which has not been the case.

Year	Pool	Pool Expense	Capital Base	Loaded out	Average Loading Rate
2018	CA	7,718,345	74,014,792	(7,024,625)	9%
2019	CA	16,489,681	97,866,941	(12,867,870)	13%
2020	CA	13,297,829	129,128,020	(20,906,216)	16%
2021	CA	14,809,150	158,682,110	(14,783,834)	9%
2018	DOH	11,176,895	86,361,546	(10,290,276)	12%
2019	DOH	10,923,922	94,274,520	(11,327,466)	12%
2020	DOH	11,906,336	87,148,972	(11,036,056)	13%
2021	DOH	15,973,719	91,098,842	(16,050,842)	18%
2018	LE ED	125,291,068	170,638,714	(110,867,060)	65%
2019	LE ED	96,373,521	155,001,190	(125,945,817)	81%
2020	LE ED	115,307,689	204,511,996	(91,145,410)	45%
2021	LE ED	137,801,292	234,688,008	(116,741,780)	50%
2018	LE SUB	3,752,497	14,178,652	(2,713,962)	19%
2019	LE SUB	2,328,465	8,313,698	(2,786,361)	34%
2020	LE SUB	3,645,000	13,210,800	(4,342,944)	33%
2021	LE SUB	3,084,317	12,941,784	(3,009,608)	23%

Again, this demonstrates that SDG&E is managing its OH Pool costs in proportion to its capital expenditures during the year, and thus, making the OPBA unnecessary moving forward.

Additional details including description, forecast method, and cost drivers for each OH pool can be found below.

2. 901 – Local Engineering Pool – ED Pool

a. Description

The forecasts for the Local Engineering – ED Pool for 2022, 2023, and 2024 are $120.972 million, $123.304 million, and $82.749 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the Local Engineering – ED Pool, which 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 per 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 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 using the overhead pools. It is not feasible to charge directly for each electric distribution job due to the tremendous volume of work orders.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP-R at section E09010 – Local Engineering Pool – ED Pool.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast for this pool is a function of its eligible capital base. Historically, as the capital base has expanded or contracted, the pool activity has followed accordingly. A seven-year historical study was performed to determine, on average, how much the pool shifts in relation to its eligible base. In other words, for each percent increase in the base, the corresponding percent increase in the pool was calculated. This factor was then multiplied by the projected Year-Over-Year percent change of the capital base and then by the previous year's pool forecast to arrive at the projected pool balance for each year.

This is the most appropriate forecasting methodology as it aligns the pool activity with the direct costs that drive it. By utilizing direct costs as the forecast base, timing and undulation of spending should coincide with project spending schedules.

c. Cost Drivers

The underlying cost driver in the growth of expenditures for this pool is due to industry trends increasing the use of detailed engineering studies or designs, instead of relying solely on standards.

3. 904 – Local Engineering Pool – Substation Pool

a. Description

The forecasts for the Local Engineering – Substation Pool for 2022, 2023, and 2024 are $5.147 million, $5.074 million, and $4.077 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the Local Engineering – Substation Pool. This pool consists of planners, designers, 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 using 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.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP-R at section E09040 – Local Engineering Pool – Substation Pool Elec.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast for this pool is a function of its eligible capital base. Historically, as the capital base has expanded or contracted, the pool activity has

followed accordingly. A seven-year historical study was performed to determine, on average, how much the pool shifts in relation to its eligible base. In other words, for each percent increase in the base, the corresponding percent increase in the pool was calculated. This factor was then multiplied by the projected year-over-year percent change of the capital base and then by the previous year's pool forecast to arrive at the projected pool balance for each year.

This is the most appropriate forecasting methodology as it aligns the pool activity with the direct costs that drive it. By utilizing direct costs as the forecast base, timing and undulation of spending should coincide with project spending schedules.

c. Cost Drivers

The underlying cost driver for this pool is capital substation work.

4. 905 – Department Overhead Pool – Electric

a. Description

The forecasts for the Department Overhead Pool – Electric for 2022, 2023, and 2024 are $19.030 million, $20.738 million, $21.271 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for Department Overheads. Costs included in this budget code are 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 project, but benefit many projects, or the C&O districts. C&O managers, construction managers, construction supervisors, dispatchers, operations assistants and other clerical C&O employees charge to 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 electric capital activities. Typical activities included in this account are:

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

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP-R at section E09050 – Department Overhead Pool – Elec.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast for this pool is a function of its eligible capital base. Historically, as the capital base has expanded or contracted, the pool activity has followed accordingly. A seven-year historical study was performed to determine, on average, how much the pool shifts in relation to its eligible base. In other words, for each percent increase in the base, the corresponding percent increase in the pool was calculated. This factor was then multiplied by the projected Year-Over-Year percent change of the capital base and then by the previous year's pool forecast to arrive at the projected pool balance for each year.

This is the most appropriate forecasting methodology as it aligns the pool activity with the direct costs that drive it. By utilizing direct costs as the forecast base, timing and undulation of spending should coincide with project spending schedules.

c. Cost Drivers

The underlying cost drivers in the Department Overhead Pool align with the costs in the other capital categories.

5. 906 – Contract Administration Pool – Electric

a. Description

The forecasts for the Contract Administration (CA) Pool – Electric for 2022, 2023, and 2024 are $24.279 million, $47.487 million, $43.906 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code provides funding for the CA Pool and consists of those expenses necessary for the administration of projects that are performed by contractors at SDG&E. The expenses to this pool consist of labor for CA, Field Construction Advisors 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. Typical activities included in this account are:

- Working with contractors to develop fixed price bids 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 using the CA Pool. It is not feasible to charge directly for each electric distribution job due to the tremendous volume of work orders.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP-R at section E09060 – Contract Administration Pool.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast for this pool is a function of its eligible capital base. Historically, as the capital base has expanded or contracted, the pool activity has followed accordingly. A seven-year historical study was performed to determine, on average, how much the pool shifts in relation to its eligible base. In other words, for each percent increase in the base, the corresponding percent increase in the pool was calculated. This factor was then multiplied by the projected Year-Over-Year percent change of the capital base and then by the previous year's pool forecast to arrive at the projected pool balance for each year.

This is the most appropriate forecasting methodology as it aligns the pool activity with the direct costs that drive it. By utilizing direct costs as the forecast base, timing and undulation of spending should coincide with project spending schedules.

c. Cost Drivers

The underlying cost drivers for this pool align with the cost drivers described in all other capital categories.

H. RELIABILITY IMPROVEMENTS

TABLE OR-17
Summary of Reliability/Improvement Forecasts

H. RELIABILITY/IMPROVEMENTS (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
Total CAPITAL	**77,681**	**130,398**	**68,343**

1. Introduction

Customer expectations about the availability of service continues to increase. SDG&E has been proactive in trying to address this increased expectation and aging infrastructure. SDG&E has been recognized for having a very reliable electric system. From 2005 through 2021, SDG&E has been ranked "Best in the West" in reliability by PA Consulting Group, earning their regional ReliabilityOne award sixteen consecutive years.[27] Delaying responsive action could ultimately result in a decline in reliability and an increased number of customer complaints, regulatory fines, and higher long-term repair costs.

Cable failures remain a large contributor to the 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 1,003 circuit miles of high-failure rate unjacketed cable. Over the last five years, cable failure has caused approximately 20% of all distribution outage minutes, and this continues to burden the workforce and impact customers. SDG&E is beginning to see a rise in the number of failures of jacketed cable as well, as the various types of jacketed cable approach their manufacturer-recommended service life. SDG&E predicts a steady uptrend of jacketed cable failures over the next five-years.

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

Additional details including description, forecast method, and cost drivers can be found in each budget code below.

---

[27] MarketScreener.com, Sempra Operating Company SDG&E Wins National Award for Electric Reliability in the U.S. (November 19, 2021) available at https://www.marketscreener.com/quote/stock/SEMPRA-ENERGY-14471/news/Sempra-Operating-Company-SDG-E-Wins-National-Award-for-Electric-Reliability-in-the-U-S-37084247/.

2. 203 – Distribution Substation Reliability Projects

a. Description

The forecast for Distribution Substation Reliability Projects for 2022, 2023, and 2024 are $1.376 million, $1.376 million, and $1.376 million, respectively. This is an ongoing program that is expected to continue through the test year.

This program provides funding for reactive improvements to electrical distribution substation facilities. General project categories include safety related improvements, replacement of failed/obsolete equipment, and capital additions typically under $500,000. This program 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.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002030 – RAMP – Distribution Substation Reliability.

The Distribution Substation Reliability Projects mitigate safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C19 Distribution Substation Reliability Projects. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Distribution Substation Reliability Projects mitigation, Table OR-18 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-18: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
002030.001	SDG&E-Risk-2	C19	Distribution Substation Reliability Projects	1,376	1,376	1,376	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is a 3-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The 3-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within

this budget code while accounting for recent changes in the program. As aging infrastructure continues to be replaced, the need for this emergency program has decreased in recent years. Due to this downward trend, the three-year average was selected as the most appropriate reflection of need for this program.

c. Cost Drivers

The underlying cost driver for this program is the need to address safety issues and replace failed equipment in SDG&E's substations.

3. 226 – Management of Overhead Distribution Service

a. Description

The forecast for Management of Overhead Distribution Service for 2022, 2023, and 2024 is $8.117 million, $8.117 million, and $8.117 million, respectively. This is an ongoing program that is expected to continue through the test year.

These forecasted capital expenditures support the Company's goals of reliability by reinforcing the electric overhead distribution system infrastructure with real-time responsive action to system damages, deterioration, and unsafe conditions. The most notable construction activity associated with this responsive work is overhead transformer replacements under emergency protocols following an equipment failure. The overall objective is to maintain continuity of safe and reliable customer service.

This program also supports the reconstruction of existing overhead distribution facilities as necessary to mitigate public and personnel safety hazards, correct improper voltage conditions, and facilitate small-scale reliability enhancements, typically affecting 1-2 structures per job. These construction activities are urgent in nature, targeting engineering, design, and construction within one year and include:

- Replacing [structurally] overloaded overhead facilities (i.e., same-day emergencies).
- Replacing [thermally] overloaded overhead facilities (e.g., wires, transformers exceeding emergency ratings).
- Making emergency repairs not associated with ongoing outages.
- Repairing or replacing deteriorated or unsafe equipment not found through the Corrective Maintenance Program.
- Installing protective equipment such as fusing and switches.

The most notable construction activities associated with this program are the replacement of poles, wires, switches, and/or transformers.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002260 – RAMP – Management of OH Dist. Service.

The Management of OH Distribution Service mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C05 Management of Overhead Distribution Service (Non-CMP). Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Management of Overhead Distribution Service mitigation, Table OR-19 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-19: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
002260.001	SDG&E-Risk-2	C05	Management of Overhead Distribution Service	$ 8,177	$ 8,177	$ 8,177	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over a longer period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

The forecast method has shifted from a five-year average used in the 2019 GRC to 3-year average based on historical data. This change is driven by the need to capture activities in recent years, where increased amounts of locally managed (engineered, designed, and constructed) work have occurred due to an increased focus on expeditiously mitigating imminent safety, reliability, and compliance risks. These findings are generally the result of forced outages that are restored under emergency protocols, however, require planned follow-up work to mitigate outstanding risks. These mitigations are expected to be implemented as soon as practical and

generally not to exceed one year from the original incident. As these activities are implemented as short-term responsive actions, there are notable year-over-year volatilities in work scope and volume which are also subject to the initial input of first responders.

c. Cost Drivers

The underlying cost drivers for this program is the responsive need to make overhead equipment repairs and upgrades necessary to maintain continuity of safe and reliable electric service to SDG&E customers.

4. 227 – Management of Underground Distribution Service

a. Description

The forecast for Management of Underground Distribution Service for 2022, 2023, and 2024 is $3.353 million, $3.353 million, and $3.353 million, respectively. This is an ongoing program that is expected to continue through the test year.

These forecasted capital expenditures support the Company's goals of reliability by reinforcing the electric underground distribution system infrastructure with real-time responsive action to system damages, deterioration, and unsafe conditions. The most notable construction activity associated with this responsive work is underground transformer replacements under emergency protocols following an equipment failure. The overall objective is to maintain continuity of safe and reliable customer service.

This program also provides for the responsive reconstruction of existing overhead distribution facilities as necessary to mitigate public and personnel safety hazards, correct improper voltage conditions, and facilitate small-scale reliability enhancements, typically affecting 1-2 structures per job. These construction activities are urgent in nature, targeting engineering, design, and construction within one year and include:

- Replacing [thermally] overloaded underground facilities (e.g., cables, transformers exceeding emergency ratings);
- Making emergency repairs not associated with ongoing outages;
- Replacing damaged sectionalizing devices;
- Repairing or replacing deteriorated or unsafe equipment not found through the Corrective Maintenance Program; and
- Installing protective equipment such as fusing and switches.

The most notable construction activities associated with this responsive work are the replacement of cables, switches, terminators, and/or transformers.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002270 – RAMP – Management of UG Dist. Service.

The Management of Underground Distribution Service mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C17 Management of Underground Distribution Service. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Management of Underground Distribution Service mitigation, Table OR-20 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-20: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
002270.001	SDG&E-Risk-2	C17	Management of Underground Distribution Service	3,353	3,353	3,353	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is a base-year approach. The expenditures for 2021 reflect recent changes in this program and is the best representation of the starting point for 2022-2024 forecasted costs.

The forecast method has shifted from a 5-year average based on historical data, to a base-year approach. This change is driven by the need to capture activities in the most recent year, where increased amounts of locally managed (engineered, designed, and constructed) work have occurred due to an increased focus on expeditiously mitigating imminent safety, reliability, and compliance risks. These findings are generally the result of forced outages that are restored under emergency protocols, however, require planned follow-up work to mitigate outstanding risks. These mitigations are expected to be implemented as soon as practical and generally not to exceed one year from the original incident. As these activities are implemented as short-term

responsive actions, there are notable year-over-year volatilities in work scope and volume which are also subject to the initial input of first responders.

c. Cost Drivers

The underlying cost driver for this program is the responsive need to make underground equipment repairs and upgrades necessary to maintain continuity of safe and reliable electric service to customers.

5. 230 – Replacement of Underground Cables

a. Description

The forecast for Replacement of Underground Cables for 2022, 2023, and 2024 is $5.799 million, $5.799 million, and $5.799 million, respectively. This is an ongoing program that is expected to continue through the test year.

The scope of work is primarily focused on replacing failed cables; however, it may also require other coincident infrastructure replacements such as racks, elbows, tees, transformers, lids, etc. The overall objective is to maintain continuity of safe and reliable customer service. In prior rate cases there was one budget code to account for both planned and reactive cable replacement activities; however, beginning with the TY 2024 GRC a separate budget code is being used for proactive cable replacement to allow for improved and more granular work management and cost tracking (*See* Ex. SDG&E-11-CWP at section 002380 – RAMP – Planned Cable Replacements).

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002300 – RAMP – Replacement of Underground Cables.

The Replacement of Underground Cable mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C09 Underground Cable Replacement Program – Reactive. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Replacement of Underground Cable mitigation, Table OR-21 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-21: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
002300.001	SDG&E-Risk-2	C09	Replacement of Underground Cable - Reactive	$ 5,799	$ 5,799	$ 5,799	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over a longer period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs.

c. Cost Drivers

The underlying cost driver for this program is the responsive need to provide quality customer service and reliability to existing customers by reactively replacing cable in the underground cable system.

6. 236 – Capital Restoration of Service

a. Description

The forecast for Capital Restoration of Service for 2022, 2023, and 2024 is $9.522 million, $9.522 million, and $9.522 million, respectively. This is an ongoing program that is expected to continue through the test year.

These forecasted capital expenditures provide funds to restore electric service due to system interruptions caused by severe inclement weather conditions, fires, extensive equipment failures (*e.g.*, in excess of a single transformer), vandalism, and damages caused by a third party. It also provides for the reconstruction of existing overhead and underground distribution facilities as necessary to restore electric service to customers. The funds within this program cover all costs associated with the following factors:

- Storm damage (*e.g.*, rain/wind/fire);

- Damage to electric distribution facilities by others (*e.g.*, car/equipment contacts);[28] and
- Emergency replacements of major units of property that are required for service restoration (*e.g.*, poles, wires, cables, switches, tees, and/or other equipment failures).

The program provides reactive repairs to SDG&E's distribution facilities as necessary to restore electric service to customers in a timely manner and in compliance with the CPUC General Orders.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP-R at section 002360 – RAMP – Capital Restoration of Service.

The Capital Restoration of Service mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C07 Restoration of Service. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Capital Restoration of Service mitigation, Table OR-22 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-22: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
002360.001	SDG&E-Risk-2	C07	Restoration of Service	9,522	9,522	9,522	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over a longer period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

[28] These are billable to the appropriate responsible parties and therefore carry no capital risks.

The three-year historical average is being used as the costs reflected in more recent years are a closer reflection of future costs due to ongoing increases in labor and material costs.

c. Cost Drivers

The underlying cost driver for this program relates to storm activity or extreme weather events.

7. 238 – Planned Cable Replacements

a. Description

The forecast for the Planned Cable Replacements program for 2022, 2023, and 2024 are $4.260 million, $3.485 million, and $3.431 million, respectively. This is an ongoing program that is expected to continue through the test year.

This program takes a proactive approach by replacing underground cable that has been identified to have a high failure rate or consequence based on electric reliability circuit analysis and cable failure data. It also provides quality customer service and reliability to existing customers by proactively replacing cable in the underground system before it fails and an outage occurs. In addition, this proactive control will assist in mitigating future outages caused by the failure of cable to major customers. In prior rate cases there was one budget code to account for both planned and reactive cable replacement activities; however, beginning with the TY 2024 GRC a separate budget code is being used for reactive cable replacement to allow for improved and more granular work management and cost tracking (*See* Ex. SDG&E-11-CWP at section 002300 – RAMP – Replacement of Underground Cables).

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002380 – RAMP – Planned Cable Replacements.

The Planned Cable Replacements mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C10-T1: Underground Cable Replacement Program – Proactive – UG Feeder, and C10-T2: Underground Cable Replacement Program – Proactive – UG Branch. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Planned Cable Replacements mitigation, Table OR-23 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-23: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
002380.001	SDG&E-Risk-2	C10-T1 & T2	Underground Cable Replacements Program - Proactive	$ 4,260	$ 3,485	$ 3,431	2082

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This program selects specific projects to be addressed each year. Historical data is used for applicable unit costs along with the specific scope of the projects selected to develop forecasts.

c. Cost Drivers

Increases have been observed in the price of commodities (steel, copper, aluminum) that impact transformers, cable, and steel poles. These are likely to lead to increased project cost. In the past funds were shifted to emergent and/or higher priority projects and the forecasts account for that reduced historical work done as well as ensuring SDG&E can meet future targets/demands.

8. 290 – Do Not Operate Energized (DOE) Switch Replacement

a. Description

The forecasts for the "Do Not Operate Energized" (DOE) Switch Replacement program for 2022, 2023, and 2024 are $3.898 million, $9.327 million, and $5.782 million, respectively. This is an ongoing program that is expected to continue through the test year.

SDG&E's DOE Switch Replacement Program aims to systematically replace underground and overhead switches that are deemed unsafe for energized operation of the internal mechanical units. SDG&E utilizes inspection programs to identify these switches. These inspections include visual inspections, infrared (IR) inspection to detect points of potential

overheating, measurement of switch lubrication, and physical exercising. Upon inspection, if a switch is found to not be safe for continued operation, field experts will make the determination to replace the switch with an appropriately superior or equivalent asset, depending on field conditions and reliability impact. This program also improves worker safety while operating these switches and prevents premature failures of these assets, avoiding potential for injuries and damages to adjacent facilities. In addition, replacement of these switches allows for a reduced customer impact when isolation devices are needed during planned and unplanned outages.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 002900 – RAMP – DOE Switch Replacement.

The DOE Switch Replacement program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C14: DOE Switch Replacement – Underground. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the DOE Switch Replacement program mitigation, Table OR-24 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-24: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
002900.001	SDG&E-Risk-2	C14	DOE Switch Replacement - Underground	$ 3,898	$ 9,327	$ 5,782	162

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This program selects specific projects to be addressed each year. Historical data is used for applicable unit costs along with the specific scope of the projects selected to develop forecasts.

c. Cost Drivers

Increases observed in the price of commodities (steel, copper, aluminum) that impact transformers, cable, and steel poles are likely to lead to increased project cost.

9. 6254 – Emergency Equipment Purchase

a. Description

The forecast for Emergency Equipment Purchases for 2022, 2023, and 2024 are $3.275 million, $334 thousand, and $334 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

This program provides funding to support the restoration of service to the Company's distribution customers following outages caused by substation equipment failures by purchasing additional emergency spare and mobile equipment. The number of aging transformers on SDG&E's system is at a level that additional failures are expected despite efforts to replace the equipment before failure. Lead times for replacement units continue to be extended farther out every year. This project will provide two additional 69/12kV transformer for this purpose. SDG&E's existing mobile transformers are frequently utilized for routine maintenance and construction activities due to the high loading of its substations. This project will refurbish and replace major equipment on an aging 12/4kV mobile transformer to allow the rapid restoration of service. A failure of an existing 12kV circuit breaker could result in a lengthy outage. This project will a that with the purchase of three mobile 12kV circuit breakers which can quickly be deployed to a substation to restore electric service to customers in the event of a circuit breaker failure.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 062540 – RAMP – Emergency Transformer & Switchgear.

The Emergency Transformer and Switchgear mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C22: Emergency Transformer and Switchgear. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Emergency Transformer and Switchgear mitigation, Table OR-25 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-25: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
062540.001	SDG&E-Risk-2	C22	Emergency Transformer and Switchgear	3,275	334	334	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. Forecasted costs are based on anticipated emergency spare and mobile equipment needs each year. In 2022, increased forecasted costs are due to the type and quantity of equipment that will be procured, including the 12/4 kV portable transformer, two 69/12kV transformers and three portable circuit breakers.

c. Cost Drivers

The underlying cost driver associated with this program is the safe and rapid restoration of service following an outage caused by equipment failures.

10. 11249 – SCADA Capacitors

a. Description

The forecast for the SCADA Capacitors program for 2022, 2023, and 2024 are $983 thousand, $984 thousand, and $984 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

The SCADA capacitors program will replace existing non-SCADA capacitors with more modern SCADA switchable capacitors. The current non-SCADA capacitors are designed to provide voltage and power factor correction for the distribution system. During a failure of a capacitor from either mechanical, electrical, or environmental overstress, an internal fault is created resulting in internal pressure and the potential to rupture the casing, which could create a potential safety hazard to employees and the public.

The modernization of these capacitors will introduce a monitoring system to check for imbalances and internal faults and to open based on the protection settings. In addition, the SCADA capacitor will provide a method for remote isolation and monitoring of the system, providing additional situational awareness during extreme weather conditions. The program first prioritizes replacing fixed capacitors within the system and then addressing capacitors with switches. Both types of capacitors will be modernized to a SCADA switchable capacitor. SDG&E expects that system faults and ignitions associated with capacitor failures would decrease over time as a result of this program.

The project also supports SDG&E's grid modernization efforts and is part of the Grid Modernization Plan, Appendix C of the Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12).

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 112490 – RAMP – Install SCADA On Line Capacitors.

The SCADA Capacitors program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C29 SCADA Capacitors program. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the SCADA Capacitors program mitigation, Table OR-26 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-26: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
112490.001	SDG&E-Risk-2	C29	SCADA Capacitors	$ 983	$ 984	$ 984	-

* Tranche level RSEs and additional details are available in SDG&E-11-CWP 11249.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as

applicable. This program selects specific projects to be addressed each year. Historical data is used for applicable unit costs along with the specific scope of the projects selected to develop forecasts.

c. Cost Drivers

The underlying cost driver for this capital project is to enhance system capacity and circuit reliability on the system by increasing the operating capabilities of the Company's distribution capacitors. Increases observed in the price of commodities (steel, copper, aluminum) that impact transformers, cable, and steel poles are likely to lead to increased project cost. Additionally, in the past funds were shifted to emergent and/or higher priority projects and the forecasts account for that reduced historical work done as well as ensuring SDG&E can meet future targets/demands.

11. 13244 – Streamview 69/12 kV Substation Rebuild

a. Description

The forecast for Streamview 69/12 kV Substation Rebuild for 2022, 2023, and 2024 is $6.013 million, $18.613 million, and $159 thousand, respectively. SDG&E plans to build and place this project in-service by 2024.

These forecasted capital expenditures provide funding for the distribution component of this reliability-driven project related to expansion of the substation yard and rebuilding the existing substation on an expanded parcel of property. The scope of work entails the replacement of the 69kV & 12kV bays and the control shelter to bolster future reliability for the community of Streamview Substation and the surrounding area while also updating all systems to meet current substation design standards. Existing major substation equipment to be replaced include: Two 69/12kV transformer banks, one switchgear, three 69kV breakers, seven 12kV breakers, two 12kV cap banks, and one 69/12 control shelter. The existing equipment is non-standard. There currently is no bus tie for either the 69kV or 12kV bus, and there is no way to fit a bus tie in the current substation configuration. The reconfiguration to include a bus tie as part of this project will significantly reduce the impact of an outage.

These improvements were deemed necessary after an animal contact incident on the 69kV bus that resulted in an entire bus outage at the station. The lack of bus tie or bank breaker exacerbated the outage and resulted in a high SAIDI event. This substation is more prone to animal contacts due to the fact the bus spacing is relatively small compared to modern standards.

Streamview Substation also does not have SCADA devices, limiting the ability to perform remote operations and contributing to increased outage response times.

In addition to the reliability benefit, this rebuild will provide the substation with additional capacity to serve existing area load and future customer-driven electrical load growth and enhance the distribution and power network to minimize the potential for service disruptions to existing customers. Rebuilding Streamview Substation will allow Operations to offload customers from an adjacent substation (Station F) as well as account for the future load growth from San Diego universities. Station F is forecasted to be loaded at 86% capacity and currently serves the highest number of customers in the SDG&E service territory at approximately 43,000 customers.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 132440 – Streamview 69/12kV Sub Rebuild.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (e.g., an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A historical average or base year approach was not selected as the forecast method because there were no applicable historical costs given the infancy of this project.

c. Cost Drivers

The primary underlying cost drivers for this capital project relate to land acquisition required to safely and reliably expand the existing 69/12kV substation.

12. 14128 – Artesian 230kV Substation Expansion

a. Description

The forecast for Artesian 230kV Substation Expansion for 2022, 2023, and 2024 is $36 thousand, $0, and $0, respectively. SDG&E plans to build and place this project into service by 2024.

These forecasted capital expenditures provide funding for the distribution component of this reliability-driven project related to the remaining information technology (IT) scope which entails wiring, testing, and post-configuration work to complete communication to the substation

and have it remotely controlled and monitored. This follows the core project in which the objectives are listed below:

- Meet mandatory North American Electric Reliability Criteria (NERC) reliability criteria and mitigate existing NERC thermal violation identified in the Poway Area Load Pocket. The project would result in the Artesian Substation being expanded into a 230/69Kv substation and includes upgrades to the existing 69kV system, that combined with the 230kV expansion at the Artesian Substation, will provide an additional 230kV source sufficient to supply power to the Poway Area Load Pocket.
- Alleviate ongoing 69kV congestion at the Sycamore Canyon 230/138/69kV Substation.
- Locate proposed facilities within existing transmission corridors, SDG&E ROW, and utility owned property

The IT network at Artesian Ranch follows the Substation External Routable Connectivity-Hybrid design. Newer remote terminal units (RTUs) and phasor data concentrators (PDCs) are deployed with redundant communications to the IT network as a means to eliminate the single point of failure inside the control house. Also, the external communications from the RTUs and PDCs are internet protocol (IP) based, which will increase the network capacity and availability to these circuits. Protection for the 230kV and 69kV relays was designed to the Transmission Communication Reliability Improvements standard of using fully diverse paths with no single points of failure across the IT network. Improved IT architecture and functionality has a direct impact on the network with direct results on reliability of the system and greatly improved communication and protection of the grid.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 141280 – Artesian 230kV Expansion.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (e.g., an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as

applicable. A historical average or base year approach was not selected as the forecast method because only limited and specialized scope of work remains.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the union labor and vendor services required for phase II cutover support.

13. 14143 – Poway 69kV Substation Rebuild

a. Description

The forecasts for Poway 69kV Substation Rebuild for 2022, 2023, and 2024 are $1.517 million, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

These forecasted capital expenditures provide funding for the distribution component of this project. The purpose of the rebuild at Poway Substation is to improve reliability by replacing aging infrastructure and increasing capacity by building a new and upgraded 69kV bus that can accept four 69kV transmission lines and four 69kV/12kV 28MVA transformers (previous 69kV bus could only accept three 69kV transmission lines and two 69/12kV 28MVA transformers), replacing the older 69kV circuit breakers (69kV infrastructure was replaced in 2017 as part of this project) and disconnect switches with new 69kV circuit breakers and disconnect switches, building a new control shelter with new and upgraded relays and communications devices, upgrading the older Alternating Current (AC) and Direct Current (DC) sources with new standardized sources, replacing two 69/12kV 28MVA transformers with two new 69/12kV 28MVA transformers (one of these is a Wye-Delta Zig-Zag transformer needed to improve protection), and by replacing the older 12kV bus and 12kV circuit breakers with the latest 12kV metal-clad enclosed switchgear technology. Circuit breaker scope consists of the replacement of six 12kV oil circuit breakers with an average age of 45 years as well as two 12kV vacuum circuit breakers with an average age of 44 years. Based on manufacturer recommendations and SDG&E equipment failure history, the average age of these breakers is within five years of the end-of-life expectancy for these circuit breakers which is 50 years for oil, and 30 years for vacuum.

Remaining work in 2022 includes energizing the two (2) new 69/12kV transformers, two (2) 12kV metal clad switchgear, two (2) 12kV 7200MVAR cap banks, and cutting over all 12kV circuits to the new switchgear sections. Finally, demolition and removal of the older 12kV and

69kV racks in addition to removal of all older 12kV yard equipment. All work is scheduled to be completed in 2022.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 141430 – RAMP – Poway Substation Rebuild.

The Poway 69kV Substation Rebuild project is a mitigation measure supporting safety risks identified in the 2021 RAMP Report, however this specific project was not included in the filing. *See* Section II.D – Changes from RAMP Report within this testimony for additional details.

For the Poway 12kV Substation Rebuild project, Table OR-27 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-27: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
141430.001	SDG&E-Risk-2	New 04	Poway 69kVSubstation Rebuild	1,517	0	0	0

* An RSE is not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this capital project is to improve reliability by replacing aging infrastructure and adding SCADA to the substation.

14. 15243 – Substation SCADA Expansion – Distribution

a. Description

The forecasts for Substation SCADA Expansion – Distribution for 2022, 2023, and 2024 are $1.201 million, $2.527 million, and $1.776 million, respectively. This is an ongoing program that is expected to continue through the test year.

This program will provide funding for the engineering, design, equipment procurement and installation of both protective relay and SCADA equipment within SDG&E's distribution substations as a means of replacing aging infrastructure which has reached its end of useful life. Aging infrastructure installed and/or replaced as a part of this program includes protective relays, controllers, RTUs, auxiliary equipment, and associated substation communication systems. Obsolete electro-mechanical relays and controls along with early-microprocessor equipment comprises the majority of infrastructure replaced, as vintages in these categories are either end-of-life, have antiquated protective capabilities, or have little to no SCADA functionality.

Expected useful relay life depends on the type of relay and has been based on SDG&E's experiences and information on failure rates available in industry. Numerous electromechanical relays have served reliably for more than 50 years but offer limited features, have settings that can drift, and can fail silently without alarm notification to system control operators. Solid-state relays, referred to as "lost generation" relays, have a 20-year expected useful life and are being phased out at most electrical utilities. Solid-state relays have high failure rates and are known to experience false trips. Microprocessor relays are the currently preferred type of relay to install, but these potentially have a shorter (20 years) expected life than electromechanical relays and early generations have known operational issues.

The benefits of installing/upgrading SCADA equipment include faster faulted circuit identification, faster isolation of faulted electric distribution circuits, faster load restoration after system disturbances and improved system performance by mitigating electric system deficiencies. These SCADA system upgrades, including replacement of protective relays, result in reduced risk of unplanned failures, interruptions, and outages along with minimizing the number of customers impacted by loss of electric service.

The project also supports SDG&E's grid modernization efforts and is part of the Grid Modernization Plan, Appendix C of the Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12).

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 152430 – RAMP – Substation SCADA Expansion – Distribution.

This program is designated as RAMP. The Substation SCADA Expansion – Distribution program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C27 Distribution Substation SCADA Expansion. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Substation SCADA Expansion – Distribution program mitigation, Table OR-28 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-28: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
152430.001	SDG&E-Risk-2	C27	Distribution Substation SCADA Expansion	$ 1,201	$ 2,527	$ 1,776	0

* An RSE is not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A historical average or base year approach was not selected as the forecast method because those actuals do not accurately depict the program's trajectory.

c. Cost Drivers

The underlying cost drivers for this program relate to the relays and relay panels required to perform this scope of work. In the past, funds were shifted to emergent and/or higher priority projects and the forecasted spend represents a higher production level to ensure SDG&E's future targets/demands.

15. 17160 – San Marcos Substation 69kV Rebuild & 12kV Switchgear

a. Description

The forecasts for the San Marcos Substation 69kV Rebuild & 12kV Switchgear project for 2022, 2023, and 2024 are $93 thousand, $3.755 million, and $101 thousand, respectively. SDG&E plans to build and place this project in service by 2024.

These forecasted capital expenditures provide funding for the distribution component of this project. This project will provide funding to rebuild the San Marcos substation and bring it to current standards in order to improve reliability by upgrading the structures and increasing the phase spacing. The substation was originally constructed in 1968. Currently, the 69kV bus is undersized and consists of non-seismic rated pin and cap insulators and disconnects. The existing control shelter is too small for future additions of 69kV tieline positions and associated telecommunications upgrades. The control shelter will also undergo various upgrades to the existing relay and protection to support the infrastructure upgrades. In addition, four 69kV oil-filled breakers (installed in 1977,1977,1978, and 1980) and Bank 32 12kV switchgear (installed in 1989, breakers are air metal clad and were installed between 1988-1990) have reached the end-of-life expectancy. Based on manufacturer recommendations and SDG&E equipment failure history, these breakers are approaching their end-of-life expectancy of 40 years. The current condition can lead to equipment failure and subsequent safety and reliability concerns. The main driver of this project is aging infrastructure, and the proactive replacements are critical to maintain the reliability of the system.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 171600 – RAMP – San Marcos Sub Rebuild 69kV & 12kV.

The San Marcos Substation 69kV Rebuild & 12kV Switchgear project is a mitigation measure supporting safety risks identified in the 2021 RAMP Report, however this specific project was not included in the filing. *See* Section II.D – Changes from RAMP Report within this testimony for additional details.

For the San Marcos Substation 69kV Rebuild and 12kV Switchgear project, Table OR-29 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-29: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
171600.001	SDG&E-Risk-2	New 05	San Marcos Substation 69kV Rebuild and 12kV Switchgear	93	3,755	101	6

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this capital project is to improve reliability by replacing aging infrastructure.

16. 17243 – Substation Modification to Support FLISR

a. Description

The forecasts for the Substation Modification to Support Fault Location, Isolation, and Service Restoration (FLISR) project for 2022, 2023, and 2024 are $887 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

This project will modernize substation equipment that will help provide safe, reliable, and quality customer service by enabling the deployment of FLISR technology. With FLISR technology, fault location, fault isolation, and customer restoration on a distribution circuit occurs automatically without the intervention of a distribution system operator. This results in safely improving the distribution circuit impact on system reliability. This project will deploy FLISR technology to improve distribution system reliability when an outage occurs on a distribution circuit by allowing for:

1. Faster faulted circuit identifications

2. Faster isolation of faulted electric distribution circuits

3. Faster load restoration when system disturbances occur

4. Better system performance by mitigating electric system deficiencies

The conclusion of this project will help SDG&E continue to provide safe, reliable, and quality customer service by enabling the deployment of FLISR technology at San Ysidro substation.

Remaining work in 2022 will include replacing 12kV breakers, installing two new 12kV bus tie disconnects, installation of 50kV station light and power transformer, replacing two 12kV capacitor banks, and demolition/removal of de-energized 12kV bus, equipment, and below grade infrastructure.

The project also supports SDG&E's grid modernization efforts and is part of the Grid Modernization Plan, Appendix C of the Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12)

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 172430 – RAMP – Substation Mod to Support FLISR.

The Substation Modification to Support FLISR project is a mitigation measure supporting safety risks identified in the 2021 RAMP Report, however this specific project was not included in the filing. *See* Section II.D – Changes from RAMP Report within this testimony for additional details.

For the Substation Modification to Support FLISR project, Table OR-30 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-30: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
172430.001	SDG&E-Risk-2	New 06	Substation Modification to Support FLISR	887	0	0	0

* An RSE is not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total

dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this capital project is to improve reliability by modernizing substation equipment at San Ysidro substation.

17. 17261 – High Risk Switch Replacement

a. Description

The forecasts for the High Risk Switch Replacement program for 2022, 2023, and 2024 are $873 thousand, $832 thousand, and $832 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

SDG&E's distribution High Risk Switch Replacement program aims to replace overhead distribution switches that have shown signs of severe or quickly emerging corrosion that may lead to catastrophic switch failure. SDG&E has identified various data attributes that characterize high-risk switches and has prioritized several switches that can be removed in the near term to avoid failure. For example, SDG&E's engineering analyses of failed overhead switches have determined that various switches, such as hook-sticks, often fail due to excessive corrosion of major components. Switches have failed in as little as eight years of operation along the dense salt fog coast.

Distribution switches have a higher propensity for failure and/or inoperability in high corrosion areas, for example, in the area SDG&E identifies as "Contamination District One" (which includes assets within two miles of the coast). While switches within Contamination District One experience the highest rate of failure, failures can and do occur across the service territory. Distribution switch inoperability during an outage can extend the impact of an outage to the next upstream protection device, causing a prolonged forced outage when crews are required to install additional jumpers or other workarounds. Switches that are not consistently operated are at increased risk of being inoperable when needed. The inoperable state of the switch poses safety risks to field operating personnel due to potential flash from the switch or overexertion by the employee. Antiquated single phase disconnect switches are targeted to be replaced with newer model disconnects with superior material specifications, three-phase gang-

operated switches (mitigating ferroresonance[29] over-voltages and flashovers, both SCADA and Non-SCADA), as well as remote operable SCADA tie switches, for improved reliability. Switch replacements may also require simultaneous or subsequent upgrades to relevant equipment such as poles, crossarms, wires, guys, and other hardware.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 172610 – RAMP – High Risk Switch Replacement Project.

The High Risk Switch Replacement program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C04-T1: Distribution Overhead Switch Replacement Program – SCADA, C04-T2: Distribution Overhead Switch Replacement Program – Gang, and C04-T3: Distribution Overhead Switch Replacement Program – Hook. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the High Risk Switch Replacement program, Table OR-31 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-31: RAMP Activity Capital Forecasts by Workpaper In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
172610.001	SDG&E-Risk-2	C04	Distribution Overhead Switch Replacement Program	873	832	832	276

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This program selects specific projects to be addressed each year. Historical data is

[29] Ferroresonance is a type of resonance in electric circuits which occurs when a circuit containing a nonlinear inductance is fed from a source that has series capacitance, and the circuit is subjected to a disturbance such as opening of a switch.

used for applicable unit costs along with the specific scope of the projects selected to develop forecasts.

c. Cost Drivers

The underlying cost drivers for this program are the reduction of employee safety risk and the improvement of overall operational reliability. Increases have been observed in the price of commodities (steel, copper, aluminum) that are likely to lead to increased project cost. Additionally, in the past funds were shifted to emergent and/or higher priority projects and the forecasts account for that reduced historical work done as well as enabling SDG&E to meet future targets/demands.

18. 17264 – North Harbor

a. Description

The forecast for North Harbor for 2022, 2023, and 2024 is $0, $23.281 million, and $7.761 million, respectively. SDG&E plans to build and place this project in service by the test year.

These forecasted capital expenditures support the Company's goals of reliability by replacing aging infrastructure supporting the San Diego Regional Airport. This project will install approximately 15,000 feet of new trench and 50,000 feet of cable along North Harbor Drive near the San Diego Regional Airport. The circuits impacted are C124, C367, C468, C405.

In the worst-case failure event, the restoration time would be prolonged due to the amount of spare conduit that could be predominately collapsed, and the limited internal knowledge for splicing lead cable.

The new circuit will replace mixed cable types (which includes paper insulated, lead covered, vintage unjacketed, and jacketed cables), install new SCADA sectionalizing switches, and eliminate lead-poly cable splices. These improvements bolster each circuit's reliability by minimizing the restoration time to critical customers fed by this circuit and improves operational flexibility. Employee safety is also anticipated to improve by installing infrastructure that meets the latest engineering standards. The existing conduit contains asbestos and many of the existing manholes and handholes do not have sufficient space to safely work in or expand.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 17264A – RAMP – North Harbor.

The North Harbor project mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C10-T3: Underground Cable Replacement Program – Proactive – North Harbor Project. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the North Harbor project, Table OR-32 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-32: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
17264A.001	SDG&E-Risk-2	C10-T3	Underground Cable Replacement Program – Proactive – North Harbor	$ 0	$ 23,281	$ 7,761	1

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A historical average or base year approach was not selected as the forecast method as there were no applicable historical costs given the infancy of this project.

c. Cost Drivers

The underlying cost drivers for this capital project relates to challenges with airport traffic, groundwater, and contaminated soil.

19. 17269 – 4kV Modernization

a. Description

The forecasts for the 4kV Modernization program for 2022, 2023, and 2024 are $4.179 million, $6.632 million, and $6.542 million, respectively. This is an ongoing program that is expected to continue through the test year.

The purpose of SDG&E's 4kV Modernization program is to systematically remove the 4kV distribution system from service and replace it or upgrade to modern 12kV standards. The

4kV system comprises over 20% of SDG&E's distribution circuits by circuit count, supplies approximately 5% of SDG&E's system load, and constitutes 5% of overall distribution system length. Half of the 4kV substations are more than 50 years old, which has resulted in replacement components no longer being available. The operation of 4kV substations poses safety concerns, for example, because the Company is facing a shortage of qualified crews and electricians who are familiar with and knowledgeable about design and operation of those aging and obsolete substations. The maintenance cost for the 4kV substations is unusually high and continues to increase. The 4kV substations also present reliability and safety risks for customers due to higher failure rates, and limited options to transfer load to adjacent circuits. All of these factors create the potential for more frequent and extended duration outages.

In addition, 4kV overhead circuits are more likely to experience a wire-down event compared to 12kV circuits due to a higher percentage of small, *i.e.*, more fragile wire (*e.g.*, #6 Copper and #4 Copper), aging conductors, and smaller conductor spacing clearances. SDG&E's 4kV modernization plan addresses all areas of 4kV substation and distribution infrastructure removals and upgrades.

Many of the 4kV substations are old "package units" in which the transformer and circuit breakers are enclosed by an entire metal-clad structure for which there are no replacement parts, especially for the circuit breakers. In the event of any component failure, the entire enclosure must be de-energized, resulting in an outage to all customers supplied from the substation versus independently located transformer and circuit breakers which can be isolated and replaced independently resulting in fewer customers out of service. Another issue is that most of the 4kV circuits do not have tying circuits that can partially offload an isolated number of customers from the failed circuit to an adjacent circuit unlike 12kV circuits which have many more adjacent tying circuits that can be offloaded and reduce the number of customers affected by an outage.

The scope of the program includes removing the 4kV package unit substations, modernizing other aging substation infrastructure as needed, cutting over existing 4kV assets to 12kV assets, replacing small and aging wire, and completely rebuilding, if deemed necessary, based on the asset.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 172690 – RAMP – 4kV Modernization.

The 4kV Modernization program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C03 4kV Modernization Program – Distribution. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the 4kV Modernization program, Table OR-33 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-33: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
172690.001	SDG&E-Risk-2	C03	4kV Modernization - Distribution	$ 4,179	$ 6,632	$ 6,542	27

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This program selects specific projects to be addressed each year. Historical data is used for applicable unit costs along with the specific scope of the projects selected to develop forecasts.

c. Cost Drivers

The underlying cost driver for this program is to increase reliability, improve overall operational flexibility, safety risk reductions, environmental benefits, and strategic drivers including reduced long-term operational and maintenance costs, added capacity for distributed energy resources, reduced energy losses (improved energy efficiency), and opportunities to repurpose land. Historical spend for this project was related to a ramp up of the program and the forecasted spend represents a higher production level. Increases have also been observed in the price of commodities (steel, copper, aluminum) that impact transformers, cable and steel poles. These are likely to lead to increased project cost.

20. 19252 – Urban Substation Rebuild

a. Description

The forecast for Urban Substation Rebuild for 2022, 2023, and 2024 is $5.570 million, $16.018 million, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

This rebuild will replace aging infrastructure at Urban Substation and modernize existing controls and protections. The driver behind this rebuild was a high SAIDI event in 2018 that significantly damaged the condition of the switchgear. The unit currently has temporary repairs to the roof, which crews must inspect prior to every rainfall event. Furthermore, during maintenance on the switchgear extra care must be taken as several employees have indicated that due to the violent flashover, some equipment maybe friable, such as test switches, insulators, and control wires.

This project will replace the existing 12kV switchgear, capacitors, and associated electric distribution circuits getaways and manholes. In order to accomplish this, the existing substation footprint will be expanded to the property line. The increased substation land area provides room to safely and reliably continue energizing the fourteen existing 12kV circuits while building the new 12kV switchgear.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 192520 – RAMP – Urban Substation Rebuild.

This project is designated as RAMP. The Urban Substation Rebuild program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C24 Urban Substation Rebuild. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Urban Substation Rebuild program, Table OR-34 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-34: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
192520.001	SDG&E-Risk-2	C24	Urban Substation Rebuild	5,570	16,018	0	0

* An RSE is not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A historical average or base year approach was not selected as the forecast method because there were no applicable historical costs given the infancy of this project.

c. Cost Drivers

The underlying cost drivers for this project relate to expanding the substation fence line to the property line and replacing the existing switchgear, capacitors, and associated electric distribution circuits getaways and manholes to safely and reliably replace aging infrastructure serving the San Diego downtown area.

21. 20242 – Torrey Pines 12kV Breaker Replacements

a. Description

The forecasts for the Torrey Pines 12kV Breaker Replacements project for 2022, 2023, and 2024 are $1.169 million, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

This project will provide funding for the replacement of fourteen 12kV distribution breakers at Torrey Pines substation. This project will improve substation reliability by primarily replacing outdated oil-filled breakers with a modern vacuum switch model and the associated control and protection from electromechanical to microprocessor based. These upgrades reduce the Company's risk of safety incidents and environmental concerns.

The driver behind the replacements is aging infrastructure. The oldest oil breaker being replaced was installed in 1964 and the average install year is 1978. The oldest vacuum breaker being replaced was installed in 1974 and the average install year is 1981. The oldest breakers are past their life expectancy, while the average breakers are also either past their life expectancy of 50 years for oil and 30 years for vacuum or nearing their end of life. Based on manufacturer recommendations and SDG&E equipment failure history, these breakers were identified for replacement.

These proactive replacements are critical as it takes careful planning to perform this scope of work. Foundation modifications are required due to the increase in circuit breaker size and seismic requirements throughout the years. Trenching is required to bring new cables to each asset. The cable runs at legacy substations are often direct buried, so it is not feasible to utilize an existing conduit package to pull new cable to each asset. Control shelter modifications are also required to support this degree of infrastructure upgrades. Like circuit breakers, the associated control and protection have seen an increase in footprint over the past half century. The original control shelter constructed in 1968 is not able to accommodate modern size relay panels. The accumulation of this work performed reactively would result in a prolonged equipment restoration time.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202420 – RAMP – Torrey Pines 12kV Breaker Replacement.

The Torrey Pines 12kV Breaker Replacements project is a mitigation measure supporting safety risks identified in the 2021 RAMP Report, however this specific project was not included in the filing. *See* Section II.D – Changes from RAMP Report within this testimony for additional details.

For the Torrey Pines 12kV Breaker Replacements project, Table OR-35 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-35: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
202420.001	SDG&E-Risk-2	New 07	Torrey Pines 12kV Breaker Replacements	1,169	0	0	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is to improve reliability by replacing existing aging distribution infrastructure at Torrey Pines substation.

22. 20245 – El Cajon 12kV Breaker Replacements

a. Description

The forecasts for the El Cajon 12kV Breaker Replacements project for 2022, 2023, and 2024 are $821 thousand, $880 thousand, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

This project will provide funding for the replacement of ten 12kV oil circuit breakers with an average age of 48 years as well as four 12kV vacuum circuit breakers with an average age of 24 years. Based on manufacturer recommendations and SDG&E equipment failure history, the average age of these breakers will be within five years of the end-of-life expectancy for these circuit breakers which is 50 years for oil and 30 years for vacuum by the time this work commences. The current condition can lead to equipment failure and subsequent safety & reliability concerns. The main driver of this project is aging infrastructure, and the proactive replacements will add 12kV system reliability as well as environmental benefits by replacing the

oil-filled breakers with a vacuum switch model. In addition, the manufacturer is no longer used, which creates concerns with spare stock item availability.

This project will also address non-standard and aged AC panels and safety switches. In addition, the scope will address multiple site development concerns as well as upgrades to two station light and power transformers to support increased station load. The site has been identified as having deficient site drainage which has resulted in puddles leading to potential grounding concerns. Scope will include drainage swales and new combined oil containment for two 69/12kV banks in order to be compliant with Spill Prevention, Control, and Countermeasure regulations. This project will increase the safety of the substation and reduce environmental concerns.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202450 – RAMP – El Cajon 12kV Beaker Replacements.

The El Cajon 12kV Breaker Replacements project is a mitigation measure supporting safety risks identified in the 2021 RAMP Report, however this specific project was not included in the filing. *See* Section II.D – Changes from RAMP Report within this testimony for additional details.

For the El Cajon 12kV Breaker Replacements project, Table OR-36 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-36: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
202410.001	SDG&E-Risk-2	New 08	El Cajon 12kV Breaker Replacements	821	880	0	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction

labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is to improve reliability of existing infrastructure.

23. 20251 – Kettner Substation 69/12kV Rebuild Project

a. Description

The forecast for Kettner Substation 69/12kV Rebuild Project for 2022, 2023, and 2024 is $1.376 million, $619 thousand, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

Kettner Substation has aging infrastructure requiring equipment upgrades to improve the safety, reliability of operational limitations, and environmental concerns to meet current standards.

The purpose of this project is to replace two 69kV oil circuit breakers, three 69kV single phase potential transformer, six 12kV oil circuit breakers, and replace the container shelter with a Concrete Masonry Unit (CMU) Control shelter. The Substation will become an ultimate single bank substation with four 12kV circuits.

The six 12kV oil circuit breakers are an average 56 years old and have past their end-of-life expectancy of 50 years based on manufacturer recommendations and SDG&E equipment failure history. The 69kV bus potential transformers model is also no longer manufactured. There are no spare parts in storage or manufacturer support for the equipment to be replaced.

The control shelter is a retrofitted shipping container which had temporary repairs completed due to rusting and leaking. The replacement of the control shelter is needed to bring the facility up to SDG&E standards for system protection, safety, and grid reliability. The implications of a control shelter failure would impact approximately 4,100 customers in downtown San Diego, consisting of eight essential customers, one urgent customer and 19 sensitive customers, for an indefinite period of time.

A grounding study was conducted during the engineering phase of the project and it was determined that the current fence and grounding does not adequately meet Institute of Electrical and Electronics Engineers (IEEE) and internal standards. The current condition of the fence

poses a potential safety hazard to employees and the public. The new fence and CMU wall will be built to current SDG&E safety standards to eliminate unsafe conditions.

These forecasted capital expenditures support the Company's goals of reliability by providing funds for the replacement of the control shelter and the aging infrastructure.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202510 – Kettner Rebuild.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A historical average or base year approach was not selected as the forecast method because there were no applicable historical costs given the infancy of this project.

c. Cost Drivers

The underlying cost drivers for this project relate to the replacement of aged 69kV oil circuit breakers, aged 12kV oil circuit breakers, and a 69kV bus potential transformer. The control shelter is a retrofitted shipping container which recently had temporary repairs completed to address rusting and leaking issues. This project will remove 12kV bus sections that are no longer in use and install a new concrete block control shelter, replacing the current shipping container control shelter. This will also allow SDG&E to modernize the current controls and modernize its protection schemes.

24. 20263 – Bernardo 12kV Breakers and Transformer Replacements

a. Description

The forecasts for the Bernardo 12kV Breaker project for 2022, 2023, and 2024 are $0, $0, and $927 thousand, respectively. SDG&E plans to build and place this project in service by the test year.

This project will provide funding for the replacement of fifteen 12kV distribution breakers at Bernardo substation. The breakers in scope have reached the end-of-life expectancy. This condition can lead to equipment failure and subsequent safety & reliability concerns.

The driver behind the replacements is aging infrastructure. The oldest 12kV oil circuit breaker being replaced was installed in 1967 with the average age being 48 years. The oldest 12kV vacuum circuit breaker being replaced was installed in 1974 with the average age being 30 years. The oldest breakers are past their life expectancy, while the average breakers are either at or near their life expectancy of 50 years for oil and 30 years for vacuum. Based on manufacturer recommendations and SDG&E equipment failure history, these breakers were identified for replacement.

This project will improve substation reliability by primarily replacing outdated oil-filled breakers with a modern vacuum switch model and the associated control and protection from electromechanical to microprocessor based. These upgrades reduce the Company's risk of safety incidents and environmental concerns.

These proactive replacements are critical as it takes careful planning to perform this scope of work. Foundation modifications are required due to the increase in circuit breaker size and seismic requirements throughout the years. The cable runs at legacy substations are often direct-buried so it is not feasible to utilize an existing conduit package to pull new cable to each asset, thus necessitating trenching to bring new cables to each asset. Control shelter modifications are also required to support this degree of infrastructure upgrades. Like circuit breakers, the associated control and protection equipment have seen an increase in footprint over the past half century resulting in the original control shelter not being able to accommodate modern size relay panels. The accumulation of this work performed reactively would result in a prolonged equipment restoration time.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 20263A – RAMP – Bernardo 12kV Breakers and Transformer.

The Bernardo 12kV Breaker project mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C20-T2 Substation Reliability for Distribution Components – Bernardo 12kV Breakers Replacements. Accordingly, this project in its entirety, aligns with a RAMP activity.

For the Bernardo 12kV Breaker project, Table OR-37 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-37: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
20263A.001	SDG&E-Risk-2	C20-T2	Bernardo 12kV Breaker Replacements	0	$ 0	927	4

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is to improve reliability by replacing existing aging infrastructure at Bernardo substation.

25. 20267 – Miramar 12kV Replacements

a. Description

The forecasts for the Miramar 12kV Replacements project for 2022, 2023, and 2024 are $72 thousand, $1.218 million, and $99 thousand, respectively. SDG&E plans to build and place this project in service by the test year.

This project will provide funding to replace and upgrade distribution infrastructure located at Miramar substation. Circuit breaker scope includes the replacement of ten 12kV oil circuit breakers. The oldest of these circuit breakers was manufactured in 1972, with an average age of 44 years, as well as six 12kV vacuum circuit breakers with an average age of 34 years. Based on manufacturer recommendations and SDG&E equipment failure history, all sixteen 12kV breakers will be near or past the five-year range of their end-of-life expectancy of 30 years for vacuum and 50 years for oil circuit breakers. The replacement of the aging circuit breakers will lead to providing safe, reliable power for homes and businesses.

This project will also address non-standard and aged AC panels and safety switches. In addition, the scope will address multiple site development concerns. The site has been identified as having insufficient class two base compaction which has resulted in forming puddles and leading to potential grounding concerns. This project will increase the safety of the substation and reduce environmental concerns.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 20267A – RAMP – Miramar 12kV Replacements.

The Miramar 12kV Replacements project mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C20-T5 Substation Reliability for Distribution Components – Miramar 12kV Replacements. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Miramar 12kV Replacements project, Table OR-38 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-38: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
20267A.001	SDG&E-Risk-2	C20-T5	Miramar 12kV Replacements	72	1,218	99	40

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is to improve reliability of existing infrastructure.

26. 20268 – Mission 12kV Replacements

a. Description

The forecasts for the Mission 12kV Replacements project for 2022, 2023, and 2024 are $2.066 million, $556 thousand, and $0, respectively. SDG&E plans to build and place this project in service by 2023.

Circuit breaker scope consists of the replacement of seven 12kV oil circuit breakers with an average age of 55 years as well as nine 12kV vacuum circuit breakers with an average age of 38 years. Based on manufacturer recommendations and SDG&E equipment failure history, all sixteen 12kV breakers are within five years of their end-of-life expectancy of 50 years for oil, and 30 years for vacuum. The replacement of the aging circuit breakers will lead to providing safe, reliable power for homes and businesses. This is the last station to use distribution protection unit (DPU) relays that have recently failed raising future reliability concerns as this site feeds nearly 30,000 customers, the fifth largest customer base in the SDG&E service territory. This replacement will add 12kV system reliability, as well as environmental benefits by replacing the oil-filled breakers with a vacuum switch model.

Project scope will also include the replacement of several 12kV disconnects with known mechanical issues causing operational limitations along with aged brown-glass insulators that have been known to fail. Additionally, scope will address non-standard and aged AC panels and safety switches. In addition, the scope will address upgrades to 2 ea. Station light and power transformers to support increased station load.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202680 – RAMP – Mission 12kV Replacements.

The Mission 12kV Replacements project is a mitigation measure supporting safety risks identified in the 2021 RAMP Report, however this specific project was not included in the filing. *See* Section II.D – Changes from RAMP Report within this testimony for additional details.

For the Mission 12kV Replacements project, Table OR-39 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-39: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
202680.001	SDG&E-Risk-2	New 01	Mission 12kV Replacements	2,066	566	0	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is to improve reliability of existing infrastructure.

27. 20270 – Stuart 12kV Transformer Replacements

a. Description

The forecasts for the Stuart 12kV Transformer Replacement project for 2022, 2023, and 2024 are $0, $657 thousand, and $870 thousand, respectively. SDG&E plans to build and place this project in service by 2024.

This project will provide funding for the replacement of a 69/12kV distribution transformer that was installed at the Stuart substation in 1954. Based on manufacturer recommendation and failure history, distribution transformers have an estimated life span of 40-60 years. The current transformer is seven years past its life expectancy. This proactive replacement will add 12kV system reliability as it will be replacing aging infrastructure.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 20270A – RAMP – Stuart 12kV Transformer Replacement.

The Stuart 12kV Transformer Replacements project is a mitigation measure supporting safety risks identified in the 2021 RAMP Report, however this specific project was not included

in the filing. *See* Section II.D – Changes from RAMP Report within this testimony for additional details.

For the Stuart 12kV Transformer Replacements project, Table OR-40 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-40: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
20270A.001	SDG&E-Risk-2	New 02	Stuart 12kV Transformer Replacement	0	657	870	1

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is to improve reliability of existing infrastructure.

28. 20274 – Coronado 69/12kV Transformer Replacement

a. Description

The forecasts for the Coronado 69/12kV Transformer Replacement project for 2022, 2023, and 2024 are $526 thousand, $976 thousand, and $695 thousand, respectively. SDG&E plans to build and place this project in service by 2024.

This project will provide funding for the replacement of a 69/12kV distribution transformer bank located at Coronado substation. The existing transformer was manufactured in 1981, making the bank 40 years old. This bank is currently on the transformer watch list, showing failing insulating material, overheating in the load tap changer (LTC), increased oil gassing, and degrading winding and bushing power factors. This substation feeds over 11,000

customers, with approximately 20% coming from this particular transformer bank. Scope will also include a modified pad foundation as well as a new secondary oil containment. This transformer was also selected for replacement because it is within five years of its expected life span per manufacturer recommendations. This replacement will add 69/12kV system reliability, as well as provide environmental benefits by fixing the gassing concerns and adding secondary oil containment.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202740 – RAMP – Coronado 69/12kV Transformer Replacement.

The Coronado 69/12kV Transformer Replacement project mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C20-T8 Substation Reliability for Distribution Components – Coronado 69/12kV Transformer Replacements. Accordingly, this project in its entirety, aligns with a RAMP activity.

For the Coronado 69/12kV Transformer Replacement project, Table OR-41 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-41: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
202740.001	SDG&E-Risk-2	C20-T8	Coronado 69/12kV Transformer Replacements	526	976	695	3

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is to improve reliability of existing infrastructure.

29. 20275 – La Jolla 69/12kV Transformer Replacement

a. Description

The forecasts for the La Jolla 69/12kV Transformer Replacement project for 2022, 2023, and 2024 are $1.258 million, $1.763 million, and $108 thousand, respectively. SDG&E plans to build and place this project in service by 2024.

This project will provide funding for the replacement of a 69/12kV distribution transformer, capacitor banks, disconnects, and station light and power banks located at La Jolla substation. Transformer Bank 31 has exceeded its life expectancy with a high asset health index with an age of 48 years which is past the life expectancy of 40 years. This station has a limited footprint and would benefit from a zig-zag transformer; an economical and space saving alternative compared to a standard 69/12kV transformer with a grounding bank. There is also a potential of breakdown of insulation for single line-to-ground faults due to the rise in voltage on un-faulted phases.

The capacitor banks were installed in 1973 and have since corroded requiring immediate replacement. Additionally, several 69kV disconnects have had mechanical issues with two disconnects having repeated repairs and no spare parts which will be replaced on this project.

La Jolla is a two-terminal substation feeding the La Jolla community requiring these immediate upgrades to improve system reliability to local customers and businesses, where unplanned outages could impact tourism to the area. The manufacturer of the transformer is also no longer utilized by SDG&E which can create issues with spare part availability. Due to the challenges associated with the location and proximity to the main thoroughfare, emergency replacement of this transformer would result in permitting delays. Proactive planning is required for the replacement of this equipment.

Additionally, the scope will address non-standard and aged AC panels and safety switches, and address upgrades to two station light and power transformers to support increased station load.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202750 – RAMP – La Jolla 69/12kV Transformer Replacement.

The La Jolla 69/12kV Transformer Replacement project is a mitigation measure supporting safety risks identified in the 2021 RAMP Report, however this specific project was

not included in the filing. *See* Section II.D – Changes from RAMP Report within this testimony for additional details.

TABLE OR-42: RAMP Activity Capital Forecasts by Workpaper In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
202750.001	SDG&E-Risk-8	New -03	La Jolla 69/12kV Transformer Replacement	1,258	1,763	108	10

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

The underlying cost driver for this project is to improve reliability of existing infrastructure.

30. 20283 – CBM - 4.2 Firmware Upgrade for Transformers

a. Description

The forecasts for CBM – 4.2 Firmware Upgrade for Transformers for 2022, 2023, and 2024 are $571 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

This project provides funding to replace the firmware within the condition-based monitoring (CBM) system on all power transformers at various substations. This monitoring system is the nucleus of all the data being collected at each transformer. The system includes the dissolved gas analysis (DGA) monitor and the bushing health monitoring (BHM) system. DGA monitoring provides information on the gases forming inside the main tank oil & the LTC tank oil. Awareness of dissolved gases provides advance warning on transformer issues, such as paper degradation and leaks, that would ultimately lead to a transformer's failure if not

addressed. The BHM systems installed on all 69kV and above bushings provides information such as capacitance and percent imbalance that would be a precursor to failure. In addition to the DGA and BHM data into the CBM monitor, additional diagnostic information is also being computed within this monitor such as temperatures, fans, current & power readings. Assessing these data points individually and in totality allows the CBM monitor to issue real-time alerts on the Company's transformers, allowing personnel to address any critical alarms prior to a catastrophic failure.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202830 – CBM – 4.2 Firmware Upgrade for Transformer.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A historical average or base year approach was not selected as the forecast method because there were no applicable historical costs given the infancy of this project.

c. Cost Drivers

The underlying cost driver for this project relates to the number of power transformers requiring the firmware upgrade and the cost to replace and reprogram each unit. The key benefits for the firmware upgrade are improved user interface with the unit and performance of the unit, compatibility of communication and speed of downloads of log files, improved alarm and error reporting, and faster ability to fix bugs and troubleshoot remotely.

31. 20288 – Non-HFTD Wireless Fault Indicators

a. Description

The forecasts for the Non-HFTD Wireless Fault Indicators (WFI) program for 2022, 2023, and 2024 are $23 thousand, $1.243 million, and $1.243 million, respectively. This is an ongoing program that is expected to continue through the test year.

This program installs wireless fault indicators and necessary network devices and software to strengthen and modernize the low power communication network coverage and reliability on SDG&E's electric distribution system outside of the High Fire-Threat District

(HFTD). This sensing capability is foundational to SDG&E's ability to monitor and sense faults and normal loading on its system, providing enhanced situational awareness. These installations may also require simultaneous or subsequent upgrades to relevant equipment such as poles and other hardware to conform to existing construction standards. Wireless fault indicators are a proven technology that help narrow the search area to determine where a system failure has occurred, enabling SDG&E to quickly identify a search area and dispatch crews to find system failures. In instances where large areas are de-energized due to protective relay settings, wireless fault indicators are used to concentrate focus on a much smaller portion of the electric circuit, which allows for a faster response to the site; and a greater chance of determining and correcting a fault cause (when damage on the overhead electric system is not immediately obvious).

The project also supports SDG&E's grid modernization efforts and is part of the Grid Modernization Plan, Appendix C of the Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12).

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202880 – RAMP – Non-HFTD Wireless Fault Indicators.

The Non-HFTD WFI program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – M01 Non-HFTD Wireless Fault Indicator. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Non-HFTD WFI program, Table OR-43 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-43: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
202880.001	SDG&E-Risk-2	M01	Non-HFTD WFI	$ 23	1,243	1,243	0

* An RSE was not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction

labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This program selects specific projects to be addressed each year. Historical data is used for applicable unit costs along with the specific scope of the projects selected to develop forecasts.

c. Cost Drivers

The underlying cost driver for this program is the need to enhance system restoration times and overall system reliability by employing wireless communication technologies to remotely monitor line faults. Historical spend for this project was related to a ramp up of the program and the forecasted spend represents a higher production level.

32. 21275 – Cristianitos Substation Remove From Service (RFS)

a. Description

The forecasts for Cristianitos Substation RFS for 2022, 2023 and 2024 are $986 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

The forecasted costs provide funding for the distribution component of this project. The project will remove from service aging infrastructure at the Cristianitos substation including ancillary work involving distribution and transmission assets. The current load at Cristianitos substation is relatively low, servicing approximately 23 customers, and transferring the load to the Pico substation will support the reliability of service to customers.

This project will transfer all distribution load from C204, C338 & C339 at Cristianitos substation to Pico Sub C991. This will allow substation engineering to RFS Cristianitos substation and transmission engineering to RFS Tie Line 695 (69 kV). Four pole structures will be topped above distribution and one structure will be replaced with a distribution steel pole within HFTD Tier 2. Three locations are being topped above distribution and reframed from armless construction to crossarm construction. All facilities being transferred from C204, C338 and C339 to C991 will be retagged. Approximately 0.20 miles of remaining distribution conductor and equipment for C338 & C339 will be removed from Cristianitos substation. Once the circuits are connected, the Cristianitos substation and TL695 from Talega substation to Cristianitos substation will be removed from service.

These forecasted capital expenditures support the Company's goals of safety and reliability by removing from service the aging infrastructure at Cristianitos substation and

transferring the existing load to the Pico substation. This will support the reliability of service to customers currently fed from the Cristianitos substation.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 212750 – Cristianitos RFS.

b. Forecast Methodology

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A historical average or base year approach was not selected as the forecast method because there were no applicable historical costs given the infancy of this project.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the removal of aging structures and conductors and installation of distribution underground and overhead infrastructure.

33. 93240 – Distribution Circuit Reliability

a. Description

The forecasts for the Distribution Circuit Reliability program for 2022, 2023, and 2024 are $3.454 million, $4.124 million, and $4.124 million, respectively. This is an ongoing program that is expected to continue through the test year.

This program provides funding for the addition of equipment necessary to improve service reliability of electric customers and maintain corporate reliability standards. The electric service reliability will deteriorate in the absence of comprehensive remedial solutions offered by these projects, and electric reliability performance is negatively impacted by system deficiencies and an aging infrastructure. This program funds projects identified through consistent review of distribution circuits that mitigate existing electric system deficiencies and improve system performance.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 932400 – RAMP – Distribution Circuit Reliability Construction.

The Distribution Circuit Reliability program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C18 Distribution Circuit Reliability. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Distribution Circuit Reliability program, Table OR-44 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-44: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
932400	SDG&E-Risk-2	C18	Distribution Circuit Reliability	3,454	4,124	4,124	-

* Tranche level RSEs and additional details are available in SDG&E-11-CWP 93240.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This program selects specific projects to be addressed each year. Historical data is used for applicable unit costs along with the specific scope of the projects selected to develop forecasts.

c. Cost Drivers

The underlying cost drivers for this program are mitigating existing electric system deficiencies and projects for system performance improvements. In the past funds were shifted to emergent and/or higher priority projects and the forecasts account for that reduced historical work done as well as ensuring SDG&E can meet future targets/demands.

34. 94241 – Power Quality Program

a. Description

The forecasts for Power Quality (PQ) Program for 2022, 2023, and 2024 are $2.300 million, $2.300 million, and $2.300 million, respectively. This is an ongoing program that is expected to continue through the test year.

The forecasted costs provide funding for the distribution component of this program, which provides funding for the expansion of the substation PQ monitoring systems (PQ Nodes), field & customer PQ monitoring, associated communication systems, and for the replacement of aging and failed PQ devices. The replacement strategy identifies condition and performance by providing a health index, probability of failure, and prioritization score for each PQ monitoring device. Expected useful life of early PQ devices is 15 years and newer PQ devices is 20 years. System improvements that PQ monitors provide:

- Distribution system health information. System parameters including RMS voltage, voltage & current transient events, system harmonics (including spectra), real & reactive power flow, power factor, flicker, etc.
- Event logging and notification for events occurring on transmission, distribution and customer systems that are perceptible at the distribution substation.
- Advanced analytics processes, system monitoring and notification for pre-established conditions, pre-fault analytics and location of existing or incipient faults, and anticipation and advanced fault locating.
- A data source with analytics for historical events and steady state trends.
- An increase of data collected which results in a more effective grid reliability assessment.

The benefit of using PQ monitors connected to the network is so SDG&E engineers, technicians and maintenance personnel can obtain real-time data, view the analysis, and make timely decisions to protect equipment assets from premature failure and extend the life of the asset. The PQ monitoring system also provides system monitoring and notification for pre-established conditions, pre-fault analytics and location of existing or incipient faults. SDG&E's objective is to connect all monitors to the network to eliminate the need to visit substation sites to download this information.

The project also supports SDG&E's grid modernization efforts and is part of the Grid Modernization Plan, Appendix C of the Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12)

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 942410 – RAMP – Power Quality Program.

The Power Quality Program - Distribution program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C26 Power Quality Monitor Deployment and Replacement. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Power Quality Program - Distribution program, Table OR-45 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-45: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
942410	SDG&E-Risk-2	C26	Power Quality Program - Distribution	2,300	2,300	2,300	0

* An RSE is not calculated for this activity.

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over a longer period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program.

c. Cost Drivers

The underlying cost drivers for this program relate to services required to replace aging infrastructure, improve system reliability, improve system restoration, and mitigate distribution system deficiencies.

35. 99282 – Replace Substation Obsolete Equipment (Distribution)

a. Description

The forecasts for the Replace Substation Obsolete Equipment (Distribution) program for 2022, 2023, and 2024 are $2.107 million, $2.107 million, and $2.107 million, respectively. This is an ongoing program that is expected to continue through the test year.

This program provides funding to improve safety and reliability related to the replacement of obsolete and problematic substation equipment. SDG&E will focus primarily on distribution substation bank transformers and circuit breaker replacements. The SEA 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 evaluate projects. Equipment that is truly obsolete, such as equipment that cannot be maintained (due to no available spare parts) or that poses a safety risk will be replaced. Each year, the average age of all substation equipment increases, with the oldest transformer currently over 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 circuit 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 substations with distribution equipment contains a total of 648 transformers with an average age of approximately 20 years and 1,557 circuit breakers, with an average age of 20 years. All work under this program is below a certain threshold to address the need to replace identified obsolete equipment, whereas those exceeding the threshold have a specific budget code opened and are managed as a separate project for improved visibility, work management, and cost tracking.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 992820 – RAMP – Replace Obsolete Substation Equipment.

The Replace Substation Obsolete Equipment (Distribution) program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C21 Distribution Substation Obsolete Equipment. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Replace Substation Obsolete Equipment (Distribution) program, Table OR-46 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-46: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
992820.001	SDG&E-Risk-2	C21	Replace Substation Obsolete Equipment (Distribution)	2,107	2,107	2,107	1

b. Forecast Method

The forecast method developed for this cost category is a three-year average based on historical spend. This is the most appropriate methodology, as workload can vary from year to year. The three-year average levels out the peaks and valleys in this blanket budget code over an appropriate period of time to forecast the necessary level of funding for the work that falls within this budget code while accounting for recent changes in the program. Many projects over the past three years were carved out into their own budget codes as their scope increased. The remaining smaller projects that were left under this budget are more aligned with the three-year average rather than the five-year average based on that change.

c. Cost Drivers

The underlying cost drivers for this program are the need to replace obsolete equipment and/or to add new equipment to enhance substation reliability.

I. SAFETY & RISK MANAGEMENT

TABLE OR-47
Summary of Safety & Risk Management Costs

I. SAFETY & RISK MANAGEMENT (In 2021 $)			
	Estimated 2022 (000s)	Estimated 2023 (000s)	Estimated 2024 (000s)
Total CAPITAL	**22,310**	**32,343**	**33,025**

1. Introduction

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 programs in this category are focused on increasing safety by replacing aging infrastructure which is prone to failure. There are also programs within this category that aim to upgrade SDG&E facilities which either facilitate field personnel training or directly impact the safe operation of the electric system. In general, the programs and projects in this category reduce safety risk by performing capital upgrades to SDG&E infrastructure and facilities.

Additional details including description, forecast method, and cost drivers can be found in each budget code below.

2. 6247 – Replacement of Live Front Equipment

a. Description

The forecasts for Replacement of Live Front Equipment for 2022, 2023, and 2024 are $365 thousand, $365 thousand, and $365 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

This program provides funding to replace live front padmounted distribution equipment with dead front padmounted distribution equipment when these facilities are encountered during normal SDG&E work. Live front equipment contains electrical components enclosed in a protective (usually steel) cabinet that does not have additional protective barriers. Live electrical connections are exposed when live-front equipment cabinets are opened, an action that is supposed to only be performed by qualified electric personnel. Replacing live front equipment with dead front equipment that has additional safety barriers such as removable fiberglass or composite plates, protective covers or additional compartmentalization will improve operational flexibility, reliability, and safety for SDG&E field personnel and the general public.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 062470 – RAMP – Replacement of Live Front Equipment.

The Replacement of Live Front Equipment Program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C12 Replacement of Live Front Equipment - Reactive. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Replacement of Live Front Equipment mitigation, Table OR-48 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-48: RAMP Activity Capital Forecasts by Workpaper

In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
062470.001	SDG&E-Risk-2	C12	Replacement of Live Front Equipment - Reactive	365	365	365	0

* An RSE is not provided for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This program selects specific projects to be addressed each year. Historical data is used for applicable unit costs but new forecasts are developed based on the specific scope of the projects selected.

c. Cost Drivers

The underlying cost driver for this budget relates to the forecasted number of replacements of live-front pad-mounted distribution equipment with dead-front pad-mounted distribution equipment from year to year.

3. 14249 – SF6 Switch Replacement

a. Description

The forecasts for SF6 Switch Replacement for 2022, 2023, and 2024 are $3.631 million, $7.598 million, and $6.282 million, respectively. This is an ongoing program that is expected to continue through the test year.

This budget code will provide funding to proactively remove or replace sulfur hexafluoride (SF6) gas insulated distribution switchgear. SF6 switches were primarily installed on SDG&E's electric distribution system during the 1980s and through the 2000s, as SF6 was

the best insulation medium 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. Due to the increase in regulation and requirements to reduce the use of SF6 gas, alternative insulation mediums must be adopted. This project will reduce environmental risks associated with the potential for emissions.

All switches removed or replaced as a part of this program are pad-mounted or sub-surface installed apparatus. With new technologies, many of the units can be replaced with similar, non-gas insulated switches; however, some switches will simply be removed, while others may require a more involved switch change-out and potential circuit reconfiguration. The primary objective of this program is to reduce environmental risks associated with the potential for SF6 emissions. Sulfur hexafluoride is now known to have a global warming potential of 23,900 times that of carbon dioxide, and associated emission rate regulations are becoming more restrictive each year. Both the Environmental Protection Agency and the California Air Resources Board require utilities to track the "life" of a gas switch from "cradle-to-grave," as well as 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 emission rates. The switch change-outs will also reduce the amount of recordkeeping required, therefore reducing errors and increasing accuracy. Other efforts at SDG&E are underway to reduce SF6 emissions risks, including leak detection and monitoring of substation gas circuit breakers.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 142490 - SF6 Switch Replacement.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

c. Cost Drivers

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

4. 16276 – SCADA Head-End Replacement

a. Description

The forecasts for SCADA Head-End Replacement for 2022, 2023, and 2024 are $1.085 million, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

The first phase of the SCADA Head-End Replacement project resolved technical constraints and issues with the previous SDG&E SCADA head-end system from vendor Advanced Control Systems, as the new SCADA head-end system allows SDG&E to address issues and move away from unsupported legacy communication protocol. The new system also allows for a more transparent view to the distribution grid, enhancing reliability and security of the distribution system.

Remaining work to be completed in 2022 will create a full duplicate of the system at the back-up control center from operations to maintenance, provide simulation to allow testing and training capability, and prepare for SCADA system growth by adding additional RTU licenses and SCADA data points. Additionally, the remaining work will migrate outdated field serial communication protocol with new and more reliable distributed network protocol (DNP) 3.0 internet protocol (IP) communications, and balance SCADA communication mountaintops.

The project also supports SDG&E's grid modernization efforts and is part of the Grid Modernization Plan, Appendix C of the Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12).

The SCADA Head-end Replacement will 1) add both a SCADA Program Development System (PDS) and Quality Assurance System (QAS) to the backup control center; 2) migrate all serial communication to DNP 3.0 internet protocol; 3) segment data acquisition control server processes from front end processor processes; 4) add a network management system integration server; 5) purchase additional RTU licenses and SCADA points for future SCADA system growth, applicable licensing for the for PDS, QAS, and integration servers, additional channel licenses for migration from serial to DNP 3.0 internet protocol, and a secure DNP license to meet the new secure DNP 3.0 standard; 6) add a simulator environment for EDOT development

testing and training; and 7) add a SCADA simulator environment for electric distribution operations technology (EDOT) development testing and training.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 162760 – SCADA Head-End Replacement.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for the SCADA Head-end Replacement program largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for much of this program relies on specific scopes of work and estimates originating from vendor / contractor quotations and would not benefit from historical cost analysis.

c. Cost Drivers

At post go-live of the new SCADA Head-End system, all maintenance of the SCADA system will need to be performed in the production environment if the primary control center is unavailable, as only the SCADA production system, and none of the maintenance system is available at the backup control center. Phase 2 of the SCADA Headend Replacement will add the necessary components to the SCADA system located at the Distribution Operations back-up control center, thus allowing maintenance and SCADA testing to resume in the event the primary control center is unavailable for an extended period of time. Converting SCADA serial communication to DNP 3.0 internet protocol will allow more secure messaging and monitoring capabilities, improving system performance and reliability.

5. 16277 – Remote Terminal Unit (RTU) Modernization

a. Description

The forecasts for the Remote Terminal Unit (RTU) Modernization program for 2022, 2023, and 2024 are $1.118 million, $622 thousand, and $632 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

This project will: Retrofit legacy RTUs which are past or towards the end of their life cycle and are no longer supported by the vendor; Retrofit existing RTUs with updated technology at prioritized PME SCADA Cabinets; Re-establish communications with SCADA master; Re-commission SCADA cabinets and place them into operation with upgraded functionality.

The project also supports SDG&E's grid modernization efforts and is part of the Grid Modernization Plan, Appendix C of the Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12).

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 162770 – RAMP – RTU Modernization.

The RTU Modernization project mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C28 Field SCADA RTU Replacement. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the RTU Modernization project, Table OR-49 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-49: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
162770.001	SDG&E-Risk-2	C28	Field SCADARTU Replacement	1,118	622	632	1137

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for the RTU Modernization program because it does not have significant or consistent historical costs which would otherwise provide reliable certainty in generating a forecast based on program spend over previous years. However, the

unit cost estimate provided in work papers does consist of cost components derived from historical experience on the program over previous years.

c. Cost Drivers

The underlying cost driver for this capital program relates to the need to replace end of life RTUs on the electric distribution system to enable adequate situational awareness for SDG&E's Electric Distribution Operations.

6. 17255 – Tee Modernization Program

a. Description

The forecasts for the Tee Modernization Program for 2022, 2023, and 2024 are $3.734 million, $3.585 million, and $3.535 million, respectively. This is an ongoing program that is expected to continue through the test year.

The main purpose of this program is to remove and replace at-risk 600A Tee connectors with upgraded devices. The upgraded and replacement devices may also be deployed in strategic areas to improve reliability.

This program will replace at-risk 600A Tees with a new connector that will allow for quicker restorations and increased sectionalizing capabilities during outages. The 600A Tees have been failing at an accelerated rate and have become a safety and reliability concern. These Tees are located on cable on the main feeder and when they fail, the circuit breaker is often the isolating device, taking all or many customers on the circuit out for a sustained outage.

Tee connector failures have become one of the largest contributors to system SAIDI and SAIFI over the last few years. One of the most frequently failed components of Tees are the double-ended plug, which is not used with the modern replacement tee connector. This new design will improve reliability by removing the known common point of failure and provide additional sectionalizing capabilities for overall circuit operation.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 172550 – RAMP – Tee Modernization Program.

The Tee Modernization program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C11 Tee Modernization Program - Underground. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Tee Modernization program, Table OR-50 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-50: RAMP Activity Capital Forecasts by Workpaper

In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
172550.001	SDG&E-Risk-2	C11	Tee Modernization Program	3,734	3,585	3,535	1406

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for the Tee Modernization program because it does not have significant or consistent historical costs which would otherwise provide reliable certainty in generating a forecast based on program spend over previous years. However, the unit cost estimate provided in work papers does consist of cost components derived from historical experience on the program over previous years.

c. Cost Drivers

The underlying cost driver for this capital program relates to the need to replace aging underground electric tee infrastructure to reduce SAIDI and SAIFI impacts to customers.

7. 17259 – Energized Test Yard

a. Description

The forecasts for the Energized Test Yard for 2022, 2023, and 2024 are $808 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

This project establishes the initial required systems (including equipment, structures, site development) to test and evaluate all equipment related to the Electric Distribution System prior to field installation. These collaborative efforts with Skills Training Center, Electric Regional Operations, System Protection, Kearny Maintenance & Operations, and Distribution Planning aim to provide enhancements to training, engineering/design, and quality control processes, which are expected to result in improved safety, operational efficiencies, and long-term cost

savings. This Energized Test Yard will provide an enhanced controlled environment for SDG&E to safely energize new equipment and train staff appropriately on operations of the equipment.

In collaboration with the Skills Training Center and Facilities personnel, a site has been identified to accommodate the development of the Energized Test Yard. The site will contain overhead and undergrounding primary electric facilities to be energized. For underground, this would allow the capability of utilizing existing conduit where present, new conduit, packages, and cable trays with handholes, manholes, and pad-mounted equipment. The overhead capability would allow the installation of different classes of poles and incorporate different equipment challenges. The site will also include equipment evaluation test beds to be used for analysis of failed distribution equipment. Additional equipment (*i.e.*, relays, communication equipment, etc.) may be purchased for testing at other SDG&E facilities when necessary to be incorporated at this yard at a later time.

Remaining work in 2022 includes the commissioning of pad mount switchgear, SDR recloser, and primary metered switchgear are the main scope. There are also plans to remove an abandoned gas transmission line that is encroaching on the proposed construction site at the Skills Training Yard.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 172590 – RAMP – Energized Test Yard.

The Energized Test Yard project mitigates safety risks identified in the 2021 RAMP Report: Incident Involving an Employee – C16 Energized Skills Training and Testing Yard. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Energized Test Yard project, Table OR-51 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-51: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE*
172590.001	SDG&E-Risk-8	C16	Energized Test Yard	808	0	0	0

* An RSE is not calculated for this activity

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

A zero-based forecast was used for the Energized Test Yard largely because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for much of this program relies on specific scopes of work and estimates originating from vendor / contractor quotations and would not benefit from historical cost analysis. Historical unit costs may be applied within the forecast depicted in work papers where applicable.

c. Cost Drivers

With an increase in retirements, reliability and personnel safety are at risk due to lack of sufficient training facilities and an effective means of transferring field knowledge. Modeled after other California IOUs who already have such facilities, the proposed site aims to enhance the simulated field environment at Skills Training Center, providing a world-class hands-on training environment for apprentices and journeymen alike. With improved effectiveness in training and development, Standards, Practices and Work Methods can be improved reducing risks in reliability and safety.

8. 19241 – Proactive Dead Front Terminator Deployment

a. Description

The forecasts for Proactive Dead Front Terminator Deployment for 2022, 2023, and 2024 are $706 thousand, $706 thousand, and $706 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

The Proactive Dead Front Terminator Deployment program strategically deploys dead front terminators for increased safety and reliability. This program encompasses system-wide proactive deployments of dead front terminator devices to improve reliability by increasing sectionalizing capabilities on both 600A and 200A distribution systems and reducing safety risks

associated with existing live front terminator devices through proactive replacement where applicable.

New dead front terminators are deployed in strategic locations to improve distribution circuit reliability, such as where large customer segments can be further sectionalized in small padmount applications. Sectionalizing to reduce the number of customers by segment allows for swifter restoration of service during system outages and results in fewer sustained customer outages during troubleshooting. Forecasts provided for this program target 15 locations where live front terminators currently exist. Limited cable replacements will be included in this work as directly related to making up new cable terminations. This program differs from secondary budget 6247, which is currently utilized to replace live front infrastructure when encountered while performing other work such as cable replacements.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 192410 – RAMP – Proactive Dead Front Terminator Deployment.

The Proactive Dead Front Terminator Deployment program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C13 Replacement of Live Front Equipment - Proactive. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Proactive Dead Front Terminator Deployment program, Table OR-52 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-52: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
192410.001	SDG&E-Risk-2	C13	Replacement of Live Front Equipment - Proactive	$ 706	$ 706	$ 706	19

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed

from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

A zero-based forecast was used for the Proactive Dead Front Terminator Deployment program because it does not have significant or consistent historical costs which would otherwise provide reliable certainty in generating a forecast based on program spend over previous years. However, the unit cost estimate provided in work papers does consist of cost components derived from historical experience on the program over previous years.

c. Cost Drivers

The underlying cost driver for this capital program relates to the need to provide better sectionalizing on 600A and 200A segments of the distribution system through the installation of new dead front terminators in padmount applications.

9. 20241 – Overhead Public Safety (OPS)

a. Description

The forecasts for Overhead Public Safety for 2022, 2023, and 2024 are $5.259 million, $6.160 million, and $6.752 million, respectively. This is an ongoing program that is expected to continue through the test year.

These forecasted capital expenditures support the Company's safety goals. This program aims to proactively replace high risk overhead conductors prone to wire down events that are in proximity to the public (*e.g.*, schools, freeways, high profile areas) that could put the public at risk of energized contact. This program will also evaluate overhead distribution lines that cross major or high traffic freeways.

The main scope of this program is to replace remaining small wire with conductor that is known to be statistically less prone to failure, such as #2 5/2 AWAC conductor and depending on vegetation in the area covered conductor. In other areas, where small wire may not feasibly be replaced, at-risk connectors, sleeves, and single-phase spans of small wire (*i.e.*, commonly known failure points) will be replaced as needed.

Preceding and subsequent engineering analyses of historic wire down events show aged small wire conductors present the largest wire down risk and can remain energized after touching an unapproved surface due to high ground impedances. Removing long spans, antiquated wire,

poor connectors and increasing detection methods can reduce likelihood of future wire down events that could remain energized.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202410 – RAMP – Overhead Public Safety (OPS).

The Overhead Public Safety program mitigates safety risks identified in the 2021 RAMP Report: Electric Infrastructure Integrity (EII) – C01 Overhead Public Safety Program. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Overhead Public Safety program, Table OR-53 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-53: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
202410.001	SDG&E-Risk-2	C01	Overhead Public Safety Program	$ 5,259	$ 6,160	$ 6,752	30

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for the Overhead Public Safety program because it does not have significant or consistent historical costs reflective of the latest work done in this area which would otherwise provide reliable certainty in generating a forecast based on program spend over previous years. However, the unit cost estimate provided in work papers does consist of cost components derived from historical experience on the program over previous years.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the need to replace conductors that are prone to wire down events, as well as associated upgrades to support this new conductor, such as pole replacements.

10. 20287 – Rebuilding of Skills Training Yard

a. Description

The forecasts for the Rebuilding of Skills Training Yard for 2022, 2023, and 2024 are $4.860 million, $2.950 million, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

This project is to rebuild and modernize SDG&E's Skills Training Center outdoor yards with upgraded equipment in order to bring them in alignment with the latest equipment and standards that are being utilized in the field in support of programs such as WMP and other safety, reliability, and strategic initiatives. This project also enables SDG&E to continue its efforts toward achieving Target Zero to reduce injuries within its workforce, reduce attrition due to injury or poor physical readiness for apprentice classes, and support the long-term sustainability of its workforce. This project also includes the addition of an outdoor physical fitness area to support strength and resistance training.

In support of underground electric system training needs, this project includes expanding the Fault-Finding Specialist training yard to better support fault location, isolation, and restoration for unplanned outages. This means replacing the cable, transformers, switches, fuse cabinets in the Fault-Finding Yards. In support of this, SDG&E will need the installation of new hand holes and substructures.

In support of overhead electric system training needs, this project includes revamping the Company's entire overhead system and equipment to what is currently out in the field in support of WMP and new SCADA technologies. SDG&E is rebuilding its tall yard with six 50-foot class three poles and twelve 45-foot class three poles. The 50-foot poles will have 500 feet to 750 feet of 1000mcm UG cable run to simulate an OH to UG conversion. There will be sections in excess of 500 feet of transmission underground cable installed at both 69kV and 230kV voltage classes and will help transmission crews learn underground cable construction standards as well as assist in training fault finding crews how to locate cable faults.

Additionally, SDG&E will outfit the yards with an overhead protection cover for its line trucks to enable proper working condition and preservation of the dielectric properties. SDG&E will also expand its field personnel awareness around electric vehicle integration by building out an area dedicated to training its workforce with charging stations to simulate maintenance and installation. SDG&E will install primary metering stations to expand and better train its electric

troubleshooters in support of commercial customers as well as integrating scenarios simulating alternate power sources.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 202870 – Rebuilding of Skills Training Yard.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

A zero-based forecast was used for the Rebuilding of Skills Training Yard because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for much of this program relies on specific scopes of work and estimates originating from contractor quotations and would not benefit from historical cost analysis. Historical unit costs may be applied within the forecast depicted in workpapers where applicable.

c. Cost Drivers

The underlying cost driver for this project is the need to replace aging overhead and underground infrastructure contained within the existing training yard at Skills Training Center which has not been updated since the 1990s and no longer supports long-term sustainability in terms of adequately supporting and training SDG&E's frontline responders to electric system events.

11. 21267 – Mission DCC Remodel Project

a. Description

The forecasts for the Mission Distribution Control Center (DCC) Remodel for 2022, 2023, and 2024 are $744 thousand, $9.278 million, and $8.760 million, respectively. SDG&E plans to build and place this project in service by the test year.

The Mission Distribution Control Center (DCC) Remodel will provide a state-of-the-art distribution control center that will mirror SDG&E's position as a leader in electric reliability and safety. The modernized DCC will improve operator consoles and display technologies to enhance and increase situational awareness of the electric distribution system.

The project scope includes construction of an approximate 12,000 square foot, two-story structure that will adjoin and connect to SDG&E's existing Mission Control Facility, and tenant improvements to roughly 8,000 square feet of space within the Mission Control Facility. The 2nd story of the new structure will house the modernized DCC and include a state-of-the-art direct view LED video wall, modern ergonomically adjustable operator consoles, as well as new finishes, lighting, and supporting mechanical, plumbing, electrical and data support infrastructure. The first story will be dedicated to parking, storage and other operational support functions. Tenant improvements to existing space will include an expansion of open office area to address Electric Distribution Operations staff growth, new finishes and ergonomically adjustable furniture, wellness and rest rooms, and additional collaboration and conference areas.

These forecasted capital expenditures support the Company's goals of ensuring the reliability and safety of the electric distribution system through increased capability, flexibility, and enhanced situational awareness. Considering the aging building infrastructure, end-of-life equipment and support technologies, inefficient room and space positioning, and the inadequate space for collaboration capabilities and unilateral situation awareness, the current DCC lacks the amenities necessary to support 24/7 operations, and no longer provides "fit for Duty" essentials for Operations Personnel. The Mission DCC Remodel project will provide an essential workspace for Distribution System Operators and leaders to work, think, respond, and effectively collaborate. The DCC remodel will update situational awareness screens and platforms to display real-time information, departing from dependence on static data, and will allow operators to visualize more detailed amounts of data on a larger and clearer platform. New technology will allow monitoring capability and awareness of distributed energy resources and improve situational awareness of system disturbances enabling quicker decision making when responding to outage and storm management. This will lead to reducing SAIDI and SAIFI impacts and safety risks to SDG&E field employees and customers. Overall, the new DCC will be purposely built and provide a dynamic solution to situational awareness, reduce the man-hours required to maintain changing system content through video and data source aggregation, and fit the overall needs of the Distribution System Operators.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 212670 – Mission DCC Remodel Project.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable.

A zero-based forecast was used for the Mission DCC Remodel Project because it does not have historical costs or precedent to rely on in terms of estimating current and future costs. Forecasting for much of this program relies on specific scopes of work and estimates originating from vendor / contractor quotations and would not benefit from historical cost analysis. Historical unit costs may be applied within the forecast depicted in work papers where applicable.

c. Cost Drivers

The underlying cost drivers for this capital project depends on requirements for equipment, code requirements, and vendor estimates including, but not limited to, those for construction, audiovisual, security, information technology and furniture. Documentation of these cost drivers is included in the capital work papers.

12. 22241 – Strategic Pole Replacement Program (Non-HFTD)

a. Description

The forecasts for the Strategic Pole Replacement Program for 2022, 2023, and 2024 are $0, $1.079 million, and $5.993 million, respectively. This is an ongoing program that is expected to continue through the test year.

The forecasts include the material costs for the pole and associated equipment and SDG&E or contractor labor to perform the work. These forecasted capital expenditures support the Company's goal of safety, reliability, and the risk of failure by identifying high risk poles.

SDG&E is prioritizing replacement of gas-treated poles in combination with both steel reinforcement and encased in concrete. Based on research, it has been determined that the gas-treated poles are at a higher risk for deterioration due to the pole interaction with the moisture in the soil. In addition to the properties of these poles, SDG&E plans to prioritize based on age. In

combination with identified rot and inspection limitations of poles being in concrete, SDG&E believes these are the highest risk group of poles to target for replacement.

Current inspection practices for wood poles set in native soil are to dig below ground to identify any rot. Another risk category that will be targeted is when a pole is embedded in concrete, it is often difficult to perform a below grade inspection to verify the integrity of the pole. SDG&E has nearly 2,500 wood poles set in concrete with steel reinforcement that will be prioritized and assessed for further action. As SDG&E investigates further, there may be other contributing factors that presents risks that are not necessarily found during the typical inspection cycle that need to be mitigated and/or prioritized. The program will replace 50 poles in 2023, increasing to 225 poles annually for the next eight years

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 222410 – RAMP – Strategic Pole Replacement Program (Non-HFTD).

The Strategic Pole Replacement Program (Non-HFTD) project is a mitigation measure supporting safety risks identified in the 2021 RAMP Report, however this specific project was not included in the filing. *See* Section II.D – Changes from RAMP Report within this testimony for additional details. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

For the Strategic Pole Replacement Program (Non-HFTD), Table OR-54 below shows the TY 2024 forecast dollars and RSE associated with the activities in the 2021 RAMP Report.

TABLE OR-54: RAMP Activity Capital Forecasts by Workpaper
In 2021 Dollars ($000s)

Workpaper	Risk Chapter	ID	Description	2022 Estimated RAMP Total	2023 Estimated RAMP Total	2024 Estimated RAMP Total	GRC RSE
222410.001	SDG&E-Risk-2	New 09	Strategic Pole Replacement Program (Non-HFTD)	0	1,079	5,993	710

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction

labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. A zero-based forecast was used for the Strategic Pole Replacement Program Non-HFTD because it does not have significant or consistent historical costs which would otherwise provide reliable certainty in generating a forecast based on program spend over previous years. However, the unit cost estimate provided in work papers does consist of cost components derived from historical experience on the program over previous years.

c. Cost Drivers

The cost driver for this activity is driven by the number of pole replacements performed in a given year.

J. DISTRIBUTED ENERGY RESOURCES (DER) INTEGRATION

TABLE OR-55
Summary of DER Integration Forecasts

J. DISTRIBUTED ENERGY RESOURCES (DER) INTEGRATION (In 2021 $)			
	Estimated 2022 (000s)	Estimated 2023 (000s)	Estimated 2024 (000s)
Total CAPITAL	0	0	0

1. Introduction

For 2022, 2023, and 2024 forecasts and additional details related to DER integration projects, please refer to the testimony of Fernando Valero (Exhibit SDG&E-15). Historical cost data for the projects within this category can be found in my capital workpapers. *See* Ex. SDG&E-11-CWP.

K. TRANSMISSION/FERC-DRIVEN PROJECTS

TABLE OR-56
Summary of Transmission/FERC-Driven Project Forecasts

K. TRANSMISSION/FERC DRIVEN PROJECTS (In 2021 $)			
	Estimated 2022 (000s)	Estimated 2023 (000s)	Estimated 2024 (000s)
Total CAPITAL	12,689	12,331	11,185

1. Introduction

This category covers transmission projects with a distribution component. Many transmission lines have distribution underbuild facilities, such as a 69kV transmission line with a 12kV distribution circuit on a second level below or under the transmission infrastructure. 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. When a new transmission substation is being built, or an existing transmission substation is being modified, there is often a distribution component in the work.

The FERC costs for the transmission portion of the work are recovered through the FERC ratemaking process. The distribution component of transmission projects is included in the overall request within this GRC. For most of the FERC projects with CPUC components, the percentage of CPUC costs is low.

Additional details including description, forecast method, and cost drivers can be found in each budget code below.

2. 6129 – South Orange County Reliability Enhancement (SOCRE)

a. Description

The forecasts for the South Orange County Reliability Enhancement (SOCRE) project for 2022, 2023, and 2024 are $1.501 million, $341 thousand, and $90 thousand, respectively. SDG&E plans to build and place this project in service by the test year.

The forecasted costs provide funding for the distribution component of this transmission/FERC driven project. The project will replace the existing 138/12kV Capistrano Substation with a new 230/138/12kV Gas Insulated Substation and replace an existing 138kV transmission line with two 230kV transmission lines. For 2022-2024, the remaining work consists of distribution substation activities at San Juan Capistrano Substation, which will complete this multi-year project.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 061290 – South Orange County Reliability Enhancement (SOCRE).

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work specific to this

project, and the zero-based forecast methodology for SOCRE is in alignment with the 2019 GRC submission.

c. Cost Drivers

The underlying cost driver of this project relate to labor and non-labor components (materials and construction) needed to update and replace existing distribution equipment in Capistrano substation to increase reliability in the South Orange County area. Documentation of these cost drivers are included as supplemental workpapers.

3. 7144 – Fiber Optic for Relay Protection & Telecommunications

a. Description

The forecasts for the Fiber Optic for Relay Protection and Telecommunications for 2022, 2023, and 2024 are $5.090 million, $7.122 million, and $7.122 million. This is an ongoing program that is expected to continue through the test year.

The forecasted costs provide funding for the distribution component of this transmission/FERC driven program. This funding is for the upgrade and expansion of SDG&E's fiber optic communication system for system protection control and automation of transmission and distribution lines. The fiber optic infrastructure build continues to increase quality of service to support safety and reliability to all operational equipment in the non-HFTD specific areas.

The project also supports SDG&E's grid modernization efforts and is part of the Grid Modernization Plan, Appendix C of the Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12).

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 071440 - Fiber Optic for Relay Protection & Telecom.

b. Forecast Method

The forecast method used is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent (*e.g.,* five-year average) is no longer applicable for this item. The forecast is based on cost estimates developed from the scope of work for the planned projects in the overall program that varies year to year. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work each year in this program.

c. Cost Drivers

The underlying cost drivers of this program are associated labor and non-labor components (materials and construction) to install all dielectric self-supporting fiber in order to maintain and enhance reliability by installing critical highspeed communications infrastructure. Documentation of these cost drivers are included as supplemental workpapers.

4. 12156 – TL600 Reliability Pole Replacements

a. Description

The forecasts for TL600 Reliability Pole Replacement for 2022, 2023, and 2024 are $450 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

The forecasted costs provide funding for the distribution component of this transmission/FERC driven project. This project includes remaining construction for replacing a single wood pole with a new steel pole and restringing conductor across a highway.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 121560 - TL600 - Reliability Pole Replacements.

b. Forecast Method

The forecast method used is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work specific to this project.

c. Cost Drivers

The underlying cost drivers of this project relate to labor and non-labor components (materials and construction) to improve safety and reliability. Documentation of these cost drivers are included as supplemental workpapers.

5. 13130 – TL674A Del Mar Reconfigure/TL666D Remove From Service

a. Description

The forecasts for the TL674A Del Mar Reconfigure/TL666D Remove From Service (RFS) project for 2022, 2023, and 2024 are $1.231 million, $1.368 million, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

The forecasted costs provide funding for the distribution component of this transmission/FERC driven project, including distribution facilities that will need to be replaced or modified as part of the reconfiguration work on TL674A. This is a CAISO-approved project that also removes aging infrastructure in environmentally sensitive areas. The Del Mar Reconfiguration project will remove approximately six miles of existing overhead 69kV transmission line (TL666D) between the existing Del Mar Substation and an existing steel pole. In order to remove TL666D from service, an existing 69kV transmission line (TL674A) will be reconfigured, extended to the Del Mar Substation, and renamed as TL6973. In addition, two portions of separate existing 12kV distribution lines will be converted from an overhead to underground configuration.

Remaining work in 2022 and 2023 includes: 1 mile of underground 69kV transmission line (TL6973), installation of one cable pole and one tangent pole, removal of one span of overhead 69kV transmission line, and reconfiguration of the existing line will be converted to underground to Del Mar Substation. Additionally, this project will convert two portions of distribution circuits from overhead to underground. This will also include installation of cable poles at either end of the circuits as well as new handholes for fiber. Moreover, approximately 6 miles of transmission lines and 35 transmission poles will be removed. For portions of the transmission line that have distribution underbuild (approximately 50 poles), poles will either be topped off or reconfigured.

Additional information can be found in the capital workpapers. *See* SDG&E-11-CWP at section 131300 – TL674A Del Mar Reconfigure/TL666D RFS.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction

labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work specific to this project, and the zero-based forecast methodology for TL674A Loop-in Del Mar is in alignment with the 2019 GRC submission.

c. Cost Drivers

The underlying cost drivers of this capital project relate to labor and non-labor components (materials and construction) to enhance reliability for Del Mar Substation and to remove facilities that run through environmentally sensitive areas. Documentation of these cost drivers are included as supplemental workpapers.

6. 14137 – TL6975 Escondido - San Marcos

a. Description

The forecasts for the TL6975 Escondido – San Marcos project for 2022, 2023, and 2024 are $750 thousand, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

The forecasted costs provide funding for the distribution component of this transmission/FERC driven project. The TL6975 project involves the construction and reconductor of approximately 12 miles of new 69kV transmission lines between the existing San Marcos and Escondido substations. The three main segments to be completed include: upgrading and fire hardening approximately 1.8 miles of existing wood-pole single-circuit 69kV transmission line to double-circuit steel-pole 69kV transmission lines, constructing approximately 2.8 miles of new steel-pole single-circuit 69kV transmission lines within an existing 150-foot wide 138kV transmission corridor, and reconductoring approximately 7.4 miles of existing 138kV lattice structures with new larger and stronger conductor. Remaining work in 2022 includes reconductoring 0.4 miles of distribution underbuild.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 141370 – TL6975 Escondido – San Marcos.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction

labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work specific to this project.

c. Cost Drivers

The underlying cost drivers of this capital project relate to labor and non-labor components (materials and construction) needed to resolve NERC violations, eliminate congestion, and improve reliability. This project was also identified in the CAISO planning process. Documentation of these cost drivers are included as supplemental workpapers.

7. 17125 – Granite Substation 69kV Loop-In

a. Description

The forecasts for the Granite Substation 69kV Loop-In project for 2022, 2023, and 2024 are $0, $61 thousand, and $141 thousand, respectively. SDG&E plans to build and place this project in service by the test year.

The forecasted costs provide funding for the distribution component of this transmission/FERC driven project. In an effort to mitigate NERC P1 thermal violations on Granite Substation and connected transmission lines, the Granite Substation Loop-in Project will replace the existing TL632 tap and provide a third source into Granite Substation. This also provides operational flexibility for Granite Substation, as this substation is heavily loaded with only two sources carrying 100MW of load, which includes critical facilities such as schools and hospitals.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 171250 - Granite Substation 69kV Loop-In.

b. Forecast Method

The forecast method developed for this cost category is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the project. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work specific to this project.

c. Cost Drivers

The underlying cost drivers of this capital project are labor and material, such as communication and relay equipment associated with replacing an existing transmission tap with a third transmission source. Documentation of these cost drivers are included as supplemental workpapers.

8. 20126 – Transmission Corrective Maintenance Program (Non-HFTD)

a. Description

The forecasts for Transmission Corrective Maintenance Program (Non-HFTD) for 2022, 2023, and 2024 are $3.007 million, $3.007 million, and $3.007 million, respectively. This is an ongoing program that is expected to continue through the test year.

This program provides funding for the forecasted distribution component of electric transmission line compliance projects in the non-HFTD, complying with the safety and reliability requirements of GO 95, AB 1890, AB 1017, NERC, and CAISO maintenance requirements. This program provides funds for the replacement of poles, insulators, conductor, and other electric infrastructure when compliance issues are identified.

Additional details can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 201260 - Transmission Corrective Maintenance Program (Non-HFTD).

b. Forecast Method

The forecast method used is base year. The expenditures for 2021 reflect recent changes in this program and is the best representation of the starting point for 2022-2024 forecasted costs. The work included in this program is in response to required compliance inspections, which cannot be predicted and therefore does not readily allow for a zero-based method and detailed scope of work for future years. These program costs were previously included in BC100 in the TY 2019 GRC, which has since been split into several budget codes including BC20126 to manage the work and costs at a more granular level.

c. Cost Drivers

The underlying cost drivers for this capital program relate to labor and non-labor components (materials and construction) to replace transmission poles and associated distribution underbuild in order to comply with SDG&E's obligation to serve and to meet safety requirements set by GOs and other regulations, as detailed above.

9. 21135 – Electric Transmission Small Reliability Jobs (Non-HFTD)

a. Description

The forecasts for Electric Transmission Small Reliability Jobs (Non-HFTD) for 2022, 2023, and 2024 are $660 thousand, $432 thousand, and $825 thousand, respectively. This is an ongoing program that is expected to continue through the test year.

This program provides funds for the replacement of poles, insulators, conductor, and other electric infrastructure when reliability issues are identified.

Additional information can be found in the capital workpapers. *See* Ex. SDG&E-11-CWP at section 211350 - Electric Transmission Small Reliability Jobs Non-HFTD.

b. Forecast Method

The forecast method used is zero-based. While historic-based data (*e.g.*, an applicable unit cost) may be utilized to develop the forecast, use of historic total dollars spent is not applicable for this item. The forecast is based on cost estimates developed from the scope of work for the planned projects in the overall program that may vary year to year. SDG&E develops cost estimates based on construction labor rates, material costs, contract pricing/quotes, and other project specific details, as applicable. This method is most appropriate because of the unique scope of work each year in this program. These program costs were previously included in BC100 in the TY 2019 GRC, which has since been split into several budget codes including 21135.

c. Cost Drivers

The underlying cost driver of this program relate to labor and non-labor (material and construction) to replace transmission poles and associated distribution underbuild to improve system reliability. Documentation of these cost drivers are included as supplemental workpapers.

VI. IT PROJECTS SPONSORED BY ELECTRIC DISTRIBUTION

TABLE OR-57
Summary of IT Capital Projects Sponsored by Elec Dist Capital

INFORMATION TECHNOLOGY (In 2021 $)			
Electric Distribution - Capital	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
Total IT CAPITAL	**6,782**	**718**	**0**

The following IT Capital projects are being sponsored by Electric Distribution Capital with business justifications provided below. The summary cost of these IT projects is reflected in William J. Exon's Testimony (SDG&E-25, Chapter 2), and additional details can be found in the IT capital workpapers. *See* Ex. SDG&E-25-CWP.

A. 00908A – Electric Material Traceability

The workpapers of William J. Exon WP # 00908A reflect the forecasts for the Electric Material Traceability project for 2022, 2023, and 2024 as $1.098 million, $86 thousand, and $0, respectively. SDG&E plans to build and place this project into service by the test year.

1. Justification

The material traceability project for Electric Distribution will provide data capture and storage of information related to the Electric Distribution's high-risk assets and lay the foundation of information required to support current initiatives, such as the Enterprise Asset Management Platform project, and provide needed information to conduct more thorough reporting, such as equipment failure tracking, in the future. Current complex manual data collection processes and tools result in missing or incorrect data and increased cycle times resulting in rework, additional construction costs and inability to perform asset health performance related analytics. The use of barcodes will provide improved material traceability. Allowing field crews to scan materials will provide more complete and accurate data resulting in improved system analytics capabilities.

B. 00920A – Microgrid Portal

The workpapers of William J. Exon WP # 00920A reflect the forecasts for the Microgrid Portal project for 2022, 2023, and 2024 as $594, $389, and $0, respectively. SDG&E plans to build and place this project into service by the test year.

1. Justification

This project will allow compliance with the CPUC Order Instituting Rulemaking Regarding Microgrids Pursuant to Senate Bill 1339 and Resiliency Strategies (Rulemaking 19-09-009). This project supports local and tribal efforts to promote community resiliency.

The proposed solution is to develop a separate access-restricted data portal for sharing information with local & tribal governments enabling the development of higher quality interconnection applications that take less process cycle time for utilities to approve. The portal will leverage data and other GIS Portal functionality where applicable to provide information

through the portal on (a) planned grid investments, (b) high fire threat districts, (c) electrical infrastructure and (d) Weather-related factors that led to the decision to de-energize from each prior Public Safety Power Shutoff events and resulting distribution and transmission line outages.

The project also supports SDG&E's grid modernization efforts and is part of the Grid Modernization Plan, Appendix C of the Electric Distribution Operation and Maintenance (O&M) testimony by Tyson Swetek (Exhibit SDG&E-12).

C. 00920AO – Builder Services Customer Portal - Phase 3

The workpapers of William J. Exon WP # 00920AO reflect the forecasts for the Builder Services Customer Portal - Phase 3 project for 2022, 2023, and 2024 as $1.522 million, $243 thousand, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

1. Justification

SDG&E Builder Services plays a critical role in bringing new rate payers online through nearly all major residential, commercial, retail, and industrial construction projects. Builder services is responsible for new construction, while also providing service to current rate base customers for requested infrastructure improvements that keep the Company's systems safe and reliable. Demand on SDG&E continues to increase. However, the workload is unpredictable, and in many cases complex, leading to unforeseen peaks and valleys and significant challenges in cycles times and staffing levels.

To keep pace with customer demand for speed and transparency, this project implements new self-service options that improve the customer experience and creates business efficiencies. The portal provides user-authentication, a project and application dashboard, the ability for customers to upload documents, scheduling and payments.

D. 00921Y– Construction Management Software Integration with SAP

The workpapers of William J. Exon WP # 00921Y reflect the forecasts for the Construction Management Software Integration with SAP project for 2022, 2023, and 2024 as $972, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

1. Justification

Procore is the preferred platform for management and tracking of work tasks performed by external construction contractors and currently in use by multiple SDG&E departments within the Electric Engineering and Construction Organizations. Currently, Procore is a stand-alone solution with integration to source data solutions, including SAP/Construction Planning & Design and SAP/Construction Contracting Management System. This project is to request key system information to be passed between Procore and these source systems to reduce manual entry, improve data accuracy and improve overall efficiency for SDG&E and construction contractors.[30]

E. 00921Z– Automated Utility Design (AUD)

The workpapers of William J. Exon WP # 00921Z reflect the forecasts for the SDG&E Automated Utility Design (AUD) project for 2022, 2023, and 2024 as $2.597 million, $0, and $0, respectively. SDG&E plans to build and place this project in service by the test year.

1. Justification

This project implements a new AUD tool into the existing AutoCAD application to expand the core capability of SDG&E's construction designs while providing engineering tools, automated standards validation and bill and material generation. The new software is designed to streamline applications and enable design standardization to increase consistency and reduce design lead times.

VII. CONCLUSION

The Electric Distribution Capital budget code forecasts represent a prudent level of funding for the critical activities and capital projects to take place in the TY 2024 GRC cycle. SDG&E continues to hold safety, reliability, and customer service as key tenets for day-to-day operations while incorporating aspects of its Sustainability policy and Grid Modernization Plan. 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 available information to develop reasonable forecasts.

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

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 also areas of new and expanded focus. SDG&E's established safety-first culture focuses on three primary areas – public, customer, and employee safety – by integrating employee training, system operations and maintenance, and safe and reliable service. Electric distribution capital investments are designed to meet SDG&E safety, reliability, and customer service objectives by developing and implementing capital investment mitigation efforts that aggressively address identified risks. My testimony describes SDG&E's transparent focus on mitigation activities that address key safety risks through the RAMP process, which has led to funding requests for RAMP-related capital projects in this proceeding.

The compilation of capital projects described in this testimony are designed to meet SDG&E's service obligation to its customers and provide the clean, safe and reliable energy service that its 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.

VIII. WITNESS QUALIFICATIONS

My name is Oliva Reyes, and my business address is 8315 Century Park Ct, San Diego, CA 92123. I am employed by SDG&E as Director of Construction and Vegetation Management. I have been employed by SDG&E for fifteen years, holding numerous positions within distribution construction and operations.

My present responsibilities include providing leadership to a team of professionals that provides safety management, construction management, project controls, technical management and quality assurance services on electric and gas infrastructure projects with the SDG&E service territory. As part of these duties, we provide oversight of financial project performance, environmental stewardship, regulatory compliance and customer service for these projects.

I hold a Bachelor of Science degree in Electrical Engineering, and I am also a registered Professional Engineer in the state of California in the field of Electrical Engineering. I sponsor the TY 2024 General Rate Case Testimony for SDG&E's Electric Distribution Capital spending plan, and I have not previously testified before the Commission.

APPENDIX A

GLOSSARY OF TERMS

AC	Alternating Current
AUD	Automated Utility Design
BC	Budget Code
BHM	Bushing Health Monitoring
BY	Base Year
C&O	Construction & Operation
CA	Contract Administrator/Contract Administration
CAISO	California Independent System Operator
CBD	Capital Budget Documentation
CBM	Condition Based Monitoring
CCA	Community Choice Aggregator
CEC	California Energy Commission
CIAC	Contribution in Aid of Construction
CMP	Corrective Maintenance Program
CMU	Concrete Masonry Unit
CPUC	California Public Utilities Commission
CWP	Capital Work Paper
DC	Direct Current
DCC	Distribution Control Center
DER	Distributed Energy Resource
DGA	Dissolved Gas Analysis
DNP	Distribution Network Protocol
DOE	Do not Operate Energized
DPU	Distribution Protection Unit
ED	Electric Distribution
EDOT	Electric Distribution Operations Technology
EII	Electric Infrastructure Integrity
ERO	Electric Regional Operations
ESP	Energy Service Providers
ET&D	Electric Transmission & Distribution
FERC	Federal Energy Regulatory Commission
FLISR	Fault Location, Isolation, and Service Restoration
GO	General Order
GRC	General Rate Case
HFTD	High Fire-Threat District
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
IR	Infrared
IT	Information Technology
kV	Kilovolt

LED	Light Emitting Diode
LTC	Load Tap Changer
MAVF	Multi-Attribute Value Framework
MVA	Mega-Volt Amperage
NEM	Net Energy Metering
NERC	North American Electric Reliability Corporation
OH	Overhead
OSHA	Occupational Safety and Health Administration
PDC	Phase Data Concentrators
PDS	Program Development System
PQ	Power Quality
QAS	Quality Assurance System
RAMP	Risk Assessment Mitigation Phase
RAT	Reliability Assessment Team
RFS	Remove From Service
RSE	Risk Spend Efficiency
RTU	Remote Terminal Unit
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SDG&E	San Diego Gas & Electric
SEA	Substation Equipment Assessment
SF6	Sulfur Hexafluoride
SoCalGas	Southern California Gas
SOCRE	South Orange County Reliability Enhancement
SPACE	System Protection Automation & Control Engineering
SPD	Safety Policy Division
SPM	System Protection & Maintenance
SWPPP	Storm Water Pollution Prevention Plan
TL	Transmission Line
TRC	Technical Review Council
UG	Underground

APPENDIX B

CAPITAL PROJECTS SUPPORTING RAMP RISKS SORTED BY WORKPAPER

Capital Projects Supporting RAMP Risks Sorted by Workpaper

ELECTRIC DISTRIBUTION RAMP Activity Capital Forecasts by Workpaper (In 2021 $)						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE*†**
002030.001	SDG&E-Risk-2 - C19	Minor Distribution Substation Reliability Projects	1,376	1,376	1,376	0
002260.001	SDG&E-Risk-2 - C05	Management of Overhead Distribution Service (Non-CMP)	8,117	8,117	8,117	0
002270.001	SDG&E-Risk-2 - C17	Management of Underground Distribution Service	3,353	3,353	3,353	0
002290.001	SDG&E-Risk-2 - C15	GO 165 Corrective Maintenance Program – Underground	11,225	11,225	11,225	3
002300.001	SDG&E-Risk-2 - C09	Underground Cable Replacement Program – Reactive	5,799	5,799	5,799	0
002360.001	SDG&E-Risk-2 - C07	Restoration of Service	9,522	9,522	9,522	0
002380.001	SDG&E-Risk-2 - C10-T1&T2	Underground Cable Replacement Program – Proactive	4,260	3,485	3,431	2082
002890.001	SDG&E-Risk-2 - C16	GO 165 Manhole, Vault Restoration Program	4,311	4,311	4,311	34
002900.001	SDG&E-Risk-2 - C14	DOE Switch Replacement – Underground	3,898	9,327	5,782	162
062470.001	SDG&E-Risk-2 - C12	Replacement of Live Front Equipment - Reactive	365	365	365	0
062540.001	SDG&E-Risk-2 - C22	Emergency Transformer and Switchgear	3,275	334	334	0
102650.001	SDG&E-Risk-2 - C08	Avian Protection Program	149	187	187	39
112490.001	SDG&E-Risk-2 - C29	SCADA Capacitors	983	984	984	-

ELECTRIC DISTRIBUTION RAMP Activity Capital Forecasts by Workpaper (In 2021 $)						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE*†**
141430.001	SDG&E-Risk-2 - New04	Poway 69kV Substation Rebuild	1,517	0	0	0
152430.001	SDG&E-Risk-2 - C27	Distribution Substation SCADA Expansion	1,201	2,527	1,776	0
162770.001	SDG&E-Risk-2 - C28	Field SCADA RTU Replacement	1,118	622	632	1137
171600.001	SDG&E-Risk-2 - NEW05	San Marcos Substation 69kV Rebuild & 12kV Switchgear	93	3,755	101	6
172430.001	SDG&E-Risk-2 - NEW06	Substation Modification To Support FLISR	887	0	0	0
172550.001	SDG&E-Risk-2 - C11	Tee Modernization Program	3,734	3,585	3,535	1406
172590.001	SDG&E-Risk-8 - C16	Energized Skills Training and Testing Yard	808	0	0	0
172610.001	SDG&E-Risk-2 - C04-T1&T2&T3	Distribution Overhead Switch Replacement Program	873	832	832	276
17264A.001	SDG&E-Risk-2 - C10-T3	Underground Cable Replacement Program – Proactive – North Harbor Project	0	23,281	7,761	1
172690.001	SDG&E-Risk-2 - C03	4kV Modernization Program – Distribution	4,179	6,632	6,542	27
192410.001	SDG&E-Risk-2 - C13	Replacement of Live Front Equipment - Proactive	706	706	706	19
192520.001	SDG&E-Risk-2 - C24	Urban Substation Rebuild	5,570	16,018	0	0
202410.001	SDG&E-Risk-2 - C01	Overhead Public Safety (OPS) Program	5,259	6,160	6,752	30

ELECTRIC DISTRIBUTION RAMP Activity Capital Forecasts by Workpaper (In 2021 $)						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE*†**
202420.001	SDG&E-Risk-2 - NEW07	Torrey Pines 12kV Breaker Replacements	1,169	0	0	0
202450.001	SDG&E-Risk-2 - NEW08	El Cajon 12kV Breaker Replacements	821	880	0	0
20263A.001	SDG&E-Risk-2 - C20-T2	Substation Reliability for Distribution Components – Bernardo 12kV Breakers Replacements	0	0	927	4
20267A.001	SDG&E-Risk-2 - C20-T5	Substation Reliability for Distribution Components – Miramar 12kV Replacements	72	1,218	99	40
202680.001	SDG&E-Risk-2 - NEW01	Mission 12KV Replacements	2,066	556	0	0
20270A.001	SDG&E-Risk-2 - NEW02	Stuart 12kV Transformer Replacement	0	657	870	1
202740.001	SDG&E-Risk-2 - C20-T8	Substation Reliability for Distribution Components - Coronado 69/12kV Transformer Replacements	526	976	695	3
202750.001	SDG&E-Risk-2 - NEW03	La Jolla 69/12kV Transformer Replacement	1,258	1,763	108	10
202880.001	SDG&E-Risk-2 - M1	Non-HFTD Wireless Fault Indicator	23	1,243	1,243	0
222410.001	SDG&E-Risk-2 - NEW09	Strategic Pole Replacement Program (Non-HFTD)	0	1,079	5,993	710
872320.001	SDG&E-Risk-2 - C02	GO 165 Pole Replacement Reinforcement	12,709	12,709	12,709	0
932400.001	SDG&E-Risk-2 - C18	Distribution Circuit Reliability	2,867	3,422	3,422	-
932400.002	SDG&E-Risk-2 - C18	Distribution Circuit Reliability	587	702	702	-

ELECTRIC DISTRIBUTION RAMP Activity Capital Forecasts by Workpaper (In 2021 $)						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE*†**
942410.001	SDG&E-Risk-2 - C26	Power Quality Monitor Deployment and Replacement	602	602	602	0
942410.002	SDG&E-Risk-2 - C26	Power Quality Monitor Deployment and Replacement	198	198	198	0
942410.003	SDG&E-Risk-2 - C26	Power Quality Monitor Deployment and Replacement	1,500	1,500	1,500	0
992820.001	SDG&E-Risk-2 - C21	Distribution Substation Obsolete Equipment	2,107	2,107	2,107	1
E09010.002	SDG&E-CFF-1 - 3	AIMDAT (Data Analytics)	105	132	132	0
Total			**109,188**	**152,247**	**114,730**	

***** An activity with a "0" RSE value did not have an RSE value calculated.

† Please refer to the workpapers for tranche level RSE values for activities with "-".

SDG&E 2024 GRC Testimony Revision Log –August 2022

Exhibit	Witness	Page	Line or Table	Revision Detail
SDG&E-11	*Oliva Reyes*	*OR-xvi*	*Summary Table*	*Updated Non-Collectible to reflect changes:* *New (2022-2024): $438,049, $532,595, $425,949* *Old (2022-2024): $432,297, $520,599, $416,276* *Updated Totals to reflect changes:* *New (2022-2024): $482,928, $590,426, $497,537* *Old (2022-2024): $476,176, $578,430, $487,864*
SDG&E-11	*Oliva Reyes*	*OR-1*	*Table OR-1*	*Updated Non-Collectible to reflect changes:* *New (2022-2024): $438,049, $532,595, $425,949* *Old (2022-2024): $432,297, $520,599, $416,276* *Updated Totals to reflect changes:* *New (2022-2024): $482,928, $590,426, $497,537* *Old (2022-2024): $476,176, $578,430, $487,864*
SDG&E-11	*Oliva Reyes*	*OR-3*	*Figure OR-1*	*Updated table to changes:* *OH Pools: to 33% from 32%; Tools: to <1% from 1%*
SDG&E-11	*Oliva Reyes*	*OR-7*	*Table OR-2*	*Updated to reflect changes to BC 236* *EII dollars:* *New (2022-2024, Totals): $108,275, $152,115, $114,598, $374,988* *Old (2022-2024, Totals): $106,697, $150,564, $113,047, $370,308* *Total RAMP dollars:* *New (2022-2024, Totals): $109,188, $152,247, $114,730, $376,165* *Old (2022-2024, Totals): $106,697, $150,564, $113,047, $370,308*
SDG&E-11	*Oliva Reyes*	*OR-25*	*Table OR-5*	*Updated table to reflect changes* *Capacity/Expansion:* *New (2024): $17,977* *Old (2024): $21,062* *Overhead Pools:* *New (2022-2024): $169,428, $196,603, $152,003* *Old (2022-2024): $164,359, $128,715, $66,659* *Reliability/Improvements:* *New (2022-2024): $77,681, $130,398, $68,343*

Exhibit	Witness	Page	Line or Table	Revision Detail
				Old (2022-2024): $75,998, $128,715, $66,659 *Total Capital:* *New (2022-2024): $482,928, $590,426, $497,537* *Old (2022-2024): $476,176, $578,430, $487,864* *Non-Collectible:* *New (2022-2024): $438,049, $532,595, $425,949* *Old (2022-2024): $432,297, $520,599, $416,276*
SDG&E-11	*Oliva Reyes*	*OR-25*	*Table OR-6*	*Update to reflect removal of BC 21262* *Non-Collectible:* *New (2024): $16,750* *Old (2024): $19,835* *Total Capital:* *New (2024): $17,977* *Old (2024): $21,062*
SDG&E-11	*Oliva Reyes*	*OR-42 in Original Testimony*		*Removed BC 21262 – North City West: New 12kV Circuit C837*
SDG&E-11	*Oliva Reyes*	*OR-59*	*Table OR-12*	*Corrected RSE value for C08: Avian Protection Program. Changed from 328 to 39*
SDG&E-11	*Oliva Reyes*	*OR-82*	*Table OR-16*	*Update to reflect changes to Total Overhead Pools* *New (2022-2024): $169,428, $196,603, $152,003* *Old (2022-2024): $164,359, $186,290, $140,928*
SDG&E-11	*Oliva Reyes*	*OR-86*	*Table*	*Updated Pool Expense values table to reflect corrected OH Pool values*
SDG&E-11	*Oliva Reyes*	*OR-87*	*Line 6*	*Update to reflect changes to Overhead Pool - ED Pool* *New (2022-2024): $120.972 million, $123.304 million, $82.749 million* *Old (2022-2024): $120.184 million, $122.610 million, $80.397 million*
SDG&E-11	*Oliva Reyes*	*OR-88*	*Line 26*	*Update to reflect changes to Overhead Pool – Substation Pool* *New (2022-2024): $5.147 million, $5.074 million, $4.077 million* *Old (2022-2024): $4.903 million, $4.832 million, $3.862 million*
SDG&E-11	*Oliva Reyes*	*OR-90*	*Line 14*	*Update to reflect changes to Overhead Pool – Electric* *New (2022-2024): $19.030 million, $20.738 million, $21.271 million* *Old (2022-2024): $18.719 million, $20.286 million, $20.773 million*

Exhibit	Witness	Page	Line or Table	Revision Detail
SDG&E-11	*Oliva Reyes*	*OR-91*	*Line 20*	*Update to reflect changes to Contract Administration Pool - Electric* *New (2022-2024): $24.279 million, $47.487 million, $43.906 million* *Old (2022-2024): $20.553 million, $38.562 million, $35.896 million*
SDG&E-11	*Oliva Reyes*	*OR-92*	*Table OR-17*	*Update to reflect changes to Total Reliability/Improvements associated with changes to BC236* *New (2022-2024): $77,681, $130,398, $68,343* *Old (2022-2024): $75,998, $128,715, $66,659*
SDG&E-11	*Oliva Reyes*	*OR-100*	*Lines 18-19*	*Update to reflect changes to Capital Restoration of Service (BC 236)* *New (2022-2024): $9.522 million, $9.522 million, $9.522 million* *Old (2022-2024): $7.839 million, $7.839 million, $7.839 million*
SDG&E-11	*Oliva Reyes*	*OR-101*	*Table OR-22*	*Update to reflect changes to SDG&E-Risk-2-07: Restoration of Service* *New (2022-2024): $9,522, $9,522, $9,522* *Old (2022-2024): $7,839, $7,839, $7,839*
SDG&E-11	*Oliva Reyes*	*OR-103*	*Table OR-23*	*Corrected RSE value for C10-T1: UG Cable Replace (Proactive). Changed to 2082 from 2139*
SDG&E-11	*Oliva Reyes*	*OR-B-1*	*Appendix B*	*Updated dollars for SDG&E-Risk-2-C07: Restoration of Service* *New (2022-2024): $9,522, $9,522, $9,522* *Old (2022-2024): $7,839, $7,839, $7,839*
SDG&E-11	*Oliva Reyes*	*OR-B-1*	*Appendix B*	*Corrected RSE value for C10-T1: UG Cable Replace (Proactive). Changed to 2082 from 2139*
SDG&E-11	*Oliva Reyes*	*OR-B-4*	*Appendix B*	*Updated total RAMP dollars* *New (2022-2024): $109,188, $152,247, $114,730* *Old (2022-2024): $107,505, $150,564, $113,047*