Safety-Related Spending Accountability Report for Pacific Gas and Electric

Energy Division

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Contents

I. Executive Summary

The California Public Utilities Commission's (CPUC) goal is to ensure that Californians receive safe, reliable utility service at reasonable rates, with a commitment to environmental enhancement and a healthy California economy. In 2014, the Commission approved its Safety Policy Statement. The policy statement clarified the CPUC's safety strategy and included a commitment to enacting a Safety Action Plan that lays out clear, measurable steps for integrating safety into all aspects of the Commission's work. Among the action items included in the 2016 Safety Action Plan was a requirement that Energy Division prepare a staff report on how Pacific Gas and Electric Company (PG&E) spent the safety related funding approved in its 2014 General Rate Case (GRC). Similar reports for each of the other large energy utilities are to be prepared by the Energy Division six months after a GRC is filed. With these reports, parties participating in a GRC will have information readily available on how a utility spent its safety-related funding authorized by the Commission in the last GRC.

Similar to other large electric and gas investor-owned utilities, PG&E submits a general rate case filing at the CPUC every three years to request funding for its electric and gas infrastructure and operations. Parties to the proceeding examine the utility's proposals and contest programs and spending that they find unreasonable or unnecessary. The Commission then decides whether or not to approve the proposed programs and at what level of funding. Once the GRC decision is issued, the utility is allowed the flexibility to reprioritize the authorized funds in order to ensure safe and reliable operations. However, any reprioritization of funds must be reasonable, and the Commission looks critically at programs that are re-presented for funding at a subsequent GRC after having been funded in an earlier proceeding and then deferred.

Utilities are given budgets through the GRC proceedings for expenses as well as capital costs. The distinction between capital and "expense spending" is important because they affect the utility's profits over time differently. For expenses, the utility does not earn a return on the spending and recovers the entire authorized expense amount for the year in rates in the same year. For capital spending, the utility recovers the actual cost of the investment over time (knowns as "depreciation") as well as a return on the investment. If a utility underspends its authorized capital budget over time it will lower its long term profits. Thus, while underspending

on both expenses and capital costs can provide short term shareholder profits, underspending on capital costs diminishes the utility's long term profits. Inversely, while overspending on both expenses and capital costs can lower short term shareholder profits, higher spending on capital can increase the utility's long term profits.

This Safety Spending Accountability Report, which is the first to be completed by Energy Division, compares PG&E's actual spending in the years 2014 and 2015 to what was authorized by the Commission in Decision (D.) 14-08-032, the 2014 GRC decision. This report provides a detailed examination of which projects were carried out as planned and which projects were deferred or abandoned. Energy Division staff examines safety-related spending in four categories: Electric Distribution, Electric Generation, Gas Distribution, and Other. Major Work Categories (MWCs) are chosen for review depending on the impact of the variance as measured by the percentages or the absolute amounts of variance between authorized and actual spending.

Major Findings

1. This report finds (Table 1-1 below) that overall PG&E underspent its electric GRC budget in 2014 by 8% and overspent it by 7% in 2015. Summed over the two years (Table 1-2 below), actual safety-related spending was just 1% below what was authorized, or $70 million below the total authorized amount of $8.058 billion.
2. While the over- and underspending over the two years appear to be nearly a "wash", approximately $172 million of the 2014 and 2015 overspending is either recoverable through the Catastrophic Event Memorandum Account (CEMA) or a two way balancing account. Because balancing account treatment authorizes the company to recover these funds in a later true-up, they can effectively be considered as funds not spent, from the perspective of shareholder profits. Incorporating balancing account balances into the picture (Table 1-2 below), the company's actual safety-related spending over the two-year period was $242 million (3%) less than the authorized amount of $8.058 billion.
3. According to PG&E, two factors account for the underspending in 2014 and overspending in 2015. First, the 2014 GRC was not finalized until August of that year. By that time, PG&E had already created an internal 2014 budget based on its own estimates. Second, in the GRC decision, the Commission authorized 2015-2016 capital

spending based on a historical, seven-year nominal average of capital costs. This funding mechanism resulted in a decline in 2015 and 2016 authorized capital spending compared to 2014.To avoid ramping work up and down over the three-year GRC period, PG&E states that it smoothed capital expenditures by underspending in 2014 and overspending in 2015-2016 relative to authorized amounts.

Table 1-1: 2014-2015: Comparison of Authorized vs. Actual Expense and Capital ($000s)

	(a) 2014 Authorized	(b) 2014 Actual	(b-a)/(a) Percent Change	(c) 2015 Authorized	(d) 2015 Actual	(d-c)/(c) Percent Change
Electric Distribution						
Expense	$584,511	$585,953	0%	$600,196	$681,902	14%
Capital	$1,021,431	$1,002,446	-2%	$881,683	$1,073,325	22%
Electric Generation						
Expense	$521,569	$491,755	-6%	$536,674	$510,285	-5%
Capital	$491,819	$413,245	-16%	$424,530	$436,818	3%
Gas Distribution						
Expense	$358,487	$366,120	2%	$365,641	$378,204	3%
Capital	$539,302	$403,278	-25%	$465,517	$484,447	4%
Other						
Expense	$353,606	$305,335	-14%	$364,456	$329,933	-9%
Capital	$294,447	$246,423	-16%	$254,162	$278,577	10%
Total	**$4,165,172**	**$3,814,555**	**-8%**	**$3,892,859**	**$4,173,491**	**7%**
Expense	**$1,818,173**	**$1,749,163**	**-4%**	**$1,866,967**	**$1,900,324**	**2%**
Capital	**$2,346,999**	**$2,065,392**	**-12%**	**$2,025,892**	**$2,273,167**	**12%**

Table 1-2: 2014-2015: Combined Spending, with Balancing Account Impact ($000s)

	Authorized	Actual	Difference	Percent
2014	$4,165,172	$3,814,555	-$350,617	-8%
2015	$3,892,859	$4,173,491	$280,632	7%
Two year total	$8,058,031	$7,988,047	-$69,984	-1%
Balancing Account and CEMA	$0	$172,300	$172,300	N/A
Total Less BA, CEMA Recovery	$8,058,031	$7,815,747	-$242,284	-3%

Other Findings

4. In 2014 PG&E expense spending was $3.5 million, or 89% less than what was authorized, on Electric Distribution Mapping and Records Management. In 2015, the utility spent $6.4 million, or 80%, below authorized levels. Underspending was due to rescheduling of Records and Information Management (RIM) projects and lower than expected base mapping costs. The lower mapping costs were due to decreased non-project-related mapping costs resulting from technology updates within PG&E's organizational functions.
5. In 2014, PG&E underspent its Electric Distribution total safety-related capital authorized allowance by $19.0 million, or 2% of the amount authorized. This was due to rescheduling of Rule 20A (undergrounding) projects, delays in projects requested by third parties or governmental agencies, three Bay Area switchgear replacements deferred to 2015, and lower than planned asset replacements. In contrast, there was higher than expected spending on pole replacement projects, substation Supervisory Control and Data Acquisition (SCADA), and routine emergency recovery. In 2015, Electric Distribution overspent its 2015 capital budget by $191.6 million, or 22%. The higher than expected spending was mainly due to major emergencies, substation capacity projects, and substation emergency equipment replacement.
6. PG&E's capital spending on Electric Distribution Transformer Replacement for 2014 was under-budget by $33.6 million or 52%; in 2015, it underspent by $9.1 million, or 26%.
7. The Electric Distribution Major Emergency capital category was underspent by $0.2 million in 2014. By contrast, this capital category overspent its 2015 budget by $86.4 million or 204% in 2015. However, the 2015 recorded amount of $128.7 million includes costs that are eligible for recovery through the CEMA.
8. In 2014, the Commission approved a total of $1.013 billion in expense and capital programs for Electric Generation, approximately 95% of PG&E's forecast. Actual spending (expense plus capital) in 2014 was $905 million, about 89% of authorized spending. PG&E spent less than authorized amounts on both capital and expense in the Electric Generation area. In 2014, PG&E spent $30 million and $79 million less in expense and capital respectively. In 2015, PG&E spent $27 million less in expense but $11 million more in the capital cost category.

9. In 2014, total safety-related expense expenditures for Electric Generation were $492 million, which is $30 million (about 6%) lower than the total authorized budget of $522 million. This decline was partially offset by Operate Diablo Canyon Power Plant spending, which was $6.6 million (or about 7% higher than authorized).
10. The Maintain Diablo Canyon Power Plant (DCPP) Assets (MWC BS) capital category includes preventive and corrective maintenance and surveillance testing of DCPP's mechanical and electrical equipment, instrumentation, and controls. Actual spending in this category in 2014 and 2015 was approximately $17.6 million and $38.8 million (10% and 21%) below the authorized level of $182.9 million and $188.3 million, respectively. The authorized amount for Maintain DCPP Assets includes costs for the second refueling outage and outage costs generally. PG&E noted that the authorized amount for the second refueling outage in 2014 was $37.7 million. There was only one refueling outage in 2015. Actual spending on DCPP Capital in 2014 was $171.1 million, which was approximately $66.4 million, or 28%, less than the $237.5 million authorized. In 2015, actual spending was $178.4 million, which was $26.6 million, or 13%, below the $205.0 million authorized.
11. For Install/Replace Reservoirs, Dams, and Waterways category, in 2014, actual capital spending was $49.1 million, which was $30.0 million, or 38%, lower than the $79.1 million authorized. In 2015, actual spending was $52.2 million, which was $16 million, or 24%, below the authorized level of $68.3 million.
12. For Gas Distribution, PG&E forecast a total of $413.1 million in safety program expense spending for test year 2014. Of that total, the Commission ultimately approved $358.5 million. Actual expense spending for 2014 was $366.1 million, or 2% more than authorized. For 2015, PG&E was authorized about $365.6 million, while actual spending was $378.2 million, or 3% more than authorized.
13. For the year 2014, PG&E forecast a total of $603.5 million in capital expenditures for Gas Distribution, of which the Commission ultimately approved $539.3 million. PG&E's actual safety program capital expenditures for 2014 amounted to $403.3 million, or 25% less than authorized. For the year 2015, PG&E forecast a total of $ 613.5 million in capital expenditures, of which the Commission ultimately approved $465.5 million. PG&E's actual safety program-related capital expenditures for 2015 amounted to $484.4 million, or 4% more than authorized.

14. Gas Distribution Integrity Management program's actual program expense spending was 19% less than authorized for 2014, and was 38% less than authorized in 2015.
15. Although the Commission identified Gas Distribution mapping as a priority safety activity, and though nearly all of PG&E's 2014 request was approved, PG&E's actual expense spending in the area was only 43% of authorized in 2014, and 44% in 2015. PG&E's 2017 forecast for gas distribution mapping is in line with actual spending in 2014-2015, at $6.2 million in 2016 and $6.4 million in 2017.
16. Total Gas Distribution safety-related capital expenditures were 25% less than authorized in 2014 and 4% more than authorized in 2015
17. PG&E spent substantially less than was authorized for the Gas Distribution Pipeline Replacement program in 2014 and 2015. In testimony for the 2014 GRC, PG&E had forecast $331.2 million in 2014 and $336.6 in 2015. The Commission authorized $304 million in 2014 and $262.4 million in 2015. PG&E's actual spending was $188.2 and $235.6 million respectively, or 38% and 10% less than authorized. PG&E explained that there was a 2014 shift in policy towards replacing rather than repairing leaking steel, copper, Aldyl-A and pre-1985 plastic gas services, and that funding authorized for the Gas Pipeline Replacement Program was reprioritized to facilitate these service line replacements. As a result, fewer mains were replaced, while more service lines were replaced. Service line replacements are accounted under the Gas Distribution Reliability category, and this category saw a 2014 and 2015 combined increase of actual capital over authorized expenditures of about $90 million.
18. When the Gas Distribution spending for years 2014-2015 are taken together, PG&E spent 3% more than authorized for expense and 12% less than authorized for capital.
19. For the test year 2014, for Other safety-related programs, the Commission approved a total of $353.6 million expense for 2014. Actual 2014 expense spending was $305.3 million, or 14% less than authorized. For 2014 capital expenditures, PG&E forecast $317.4 million, of which the Commission ultimately approved $294.4 million, or about 93% of the amount forecasted. Actual capital spending was $246.4 million in 2014 which is 16% less than authorized.
20. The Safety, Engineering, and OSHA Compliance expense category was significantly overspent: by 18% in 2014 and by 51% in 2015. In 2014, PG&E spent $2.8 million more

than the $15.7 million authorized; in 2015, PG&E spent $8.2 million more than the $16.2 million authorized.

21. Capital spending on the three safety-related projects in Information Technology was also lower than forecasted: 35% less in 2014 and 25% less in 2015. The Disaster Recovery project, which is intended to ensure the availability of "mission critical processes such as emergency field support and monitoring, operations, and control of the gas and electric systems," was underspent by $12.6 million in 2014 and $10.4 million in 2015. PG&E states that this project has increased in scope and will continue into 2017. Telecommunications Network Enhancements was underspent by $13.4 million in 2014 and $10.5 million in 2015. Underspending on this project was caused by rescheduling due to "vendor constraints."[1]

[1] GRC-2017-PhI_DR_ED_004-Q10.

II. Introduction

a. Background

The California Public Utilities Commission's (CPUC) goal is to ensure that Californians receive safe, reliable utility service and infrastructure at reasonable rates, with a commitment to environmental enhancement and a healthy California economy. In 2014, the Commission renewed its commitment to safety with the issuance of its Safety Policy Statement. The policy statement clarified the CPUC's safety strategy and included a commitment to enacting a Safety Action Plan.

The CPUC released the first iteration of its Safety Action Plan in 2015 with the goal of creating clear, measurable steps for integrating safety into all aspects of the Commission's work. The Action Plan established the following four safety management "pillars" to guide the Commission's safety-related work:

I. **Safety Compliance and Enforcement**: Audit, investigation and penalty assessment activities
II. **Risk Management**: Risk assessment and risk mitigation strategies
III. **Safety Policy**: Commission decision-making and development of rules and regulations
IV. **Safety Promotion**: Communication, collaboration and outreach

An update to the Safety Action Plan was issued in February 2016 and included nine additional steps that the Commission would take to continue to build a safety culture, including two addressing risk management. One of the new action items supporting the risk management pillar is for the CPUC's Energy Division to prepare staff reports on the utilities' safety-related expenditures. These Spending Accountability Reports are to be completed within six months of a

utility filing a general rate case (GRC).[2] This Spending Accountability Report, which is the first to be completed by Energy Division, compares Pacific Gas and Electric Company's (PG&E) actual spending in the years 2014-2015 to what was authorized by the Commission in D. 14-08-032, the 2014 GRC decision.

Similar to other large electric and gas investor-owned utilities, PG&E submits a general rate case filing at the CPUC every three years to request funding for its electric and gas infrastructure and operations. Parties to the proceeding examine the utility's proposals and contest programs and spending that they find unreasonable or unnecessary. The Commission then decides whether or not to approve the proposed programs and at what level of funding. Once the GRC decision is issued, the utility is allowed the flexibility to reprioritize the authorized funds in order to ensure safe and reliable operations. However, any reprioritization of funds must be reasonable, and the Commission looks critically at programs that are re-presented for funding at a subsequent GRC after having been funded in an earlier proceeding and then deferred.

D. 11-05-018 provides an in-depth discussion of this balancing between the utilities' need for flexibility and the Commission's requirement that any deferrals be reasonable. The following excerpts from that decision illustrate the balance the Commission seeks.

> It is generally recognized that when a utility files a GRC, expenditure estimates are based on plans and preliminary budgets developed at least two years in advance of when they will actually be incurred. When the utility finalizes its budget just prior to the year when costs will be incurred or adjusts the budget during the year, new programs or projects may come up, others may be

[2] 2016 Update: Safety Action Plan and Regulatory Strategy, p. 6.
http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M158/K448/158448011.PDF

> cancelled, and there may be reprioritization. This process is expected and is necessary for the utility to manage its operations in a safe and reliable manner.[3]
>
> While we reaffirm that it is the utility management's prerogative and responsibility to provide safe and reliable service by reprioritizing and deferring activities as necessary, the Commission must be assured that the process is reasonable. We have concerns in that respect. For instance, despite any financial implications of exceeding authorized cost levels, the utility does have the responsibility to spend what is necessary to ensure safe and reliable service. To the extent a utility uses authorized cost levels as a reason for deferring activities, the Commission must be assured that such deferrals are otherwise reasonable especially with respect to safe and reliable service. Also, justified or not, reprioritization and deferrals undermine the basis for the Commission's determination of the reasonableness of the utility's GRC request and the extent of the authorized revenue requirement. Much of what is authorized is based on the utility's depiction of its needs and associated costs. Those needs and costs are tested by the GRC process. Reprioritized needs and associated costs may not be so tested and may not result in the most efficient use of funds.[4]

In the Rate Case Plan proceeding (R.13-11-006), the Commission issued D.14-12-025 which directed the utilities to incorporate a risk-based decision-making framework into the GRC process. That decision requires the utilities to prepare two annual verification reports: the Risk Mitigation Accountability and the Risk Spending Accountability Reports. The Risk Mitigation Accountability Report compares the projected costs and benefits of risk mitigation programs adopted in the GRC to their actual costs and benefits. The Risk Spending Accountability Report compares authorized spending on safety related projects with actual spending and explains any

[3] D.11-05-018, p. 27.
[4] D.11-05-018, p. 29.

discrepancies. After the utilities file these reports, the Commission's Safety and Enforcement Division (SED) and Energy Division, respectively, must review the reports and then issue their own reports on their findings.

> Recognizing that the CPUC staff will be reviewing four Risk Mitigation Accountability and four Risk Spending Accountability Reports each year, the decision staggered the required filing dates. Per the Rate Case Plan decision, the first Risk Mitigation Report and the Risk Spending report for PG&E is due on March 31, 2018.We recognize that each of the large energy utilities will be filing these two reports on an annual basis … [W]e adopt the following deadlines for the filing of these reports by the large energy utilities: PG&E's reports to be filed by March 31 after the applicable reporting period; SCE's reports to be filed by May 31 after the applicable reporting period; SoCalGas' reports to be filed by July 31 after the applicable reporting period; and SDG&E's reports to be filed by September 30 after the applicable reporting period….
>
> SED and Energy Division are required to file their respective reports in the applicable GRC proceeding within 120 days from the date each utility files these two reports.[5]

This Energy Division report on PG&E's safety-related spending, prepared in response to the CPUC's 2016 Safety Action Plan, represents a proactive way for the Commission to begin implementing the spending accounting report requirement sooner than the schedule contemplated in the Rate Cast Plan decision.

b. Translating Commission Authorization into Project Funding

This report looks at safety-related spending in four categories: Electric Distribution, Electric Generation, Gas Distribution, and Other Safety-Related Projects. Within each category,

[5] D.14-12-025 at 46 and 47.

both expense and capital spending is reviewed. Major Work Categories that exhibit significant variance between authorized and actual spending are chosen for more in-depth review.

i. Major Work Categories

PG&E's general rate case testimony is typically organized by its Lines of Business (LOB) (e.g. Electric Distribution, Electric Generation, Gas Distribution, Customer Care). Within each of the LOB exhibits, expense and capital costs are presented separately. The expense and capital forecasts are then further broken down into Major Work Categories (MWCs) to represent different types of work for the LOB. Then, within each Major Work Category, individual projects are described for consideration by the Commission.

Each Major Work Category is given a two-character alphanumeric code. All expense codes contain two letters, while all capital codes begin with a digit. For example, in the Electric Distribution LOB expense forecast, there is a Major Work Category representing Patrol and Inspections costs whose code is MWC BF. Projects/activities within this Major Work Category include: Infrared Inspections of Overhead and Underground Facilities, Distribution Line Equipment Inspections and Tests, Post-Outage Inspection Patrols, and Other Maintenance Work.

In the GRC decision, the Commission authorizes funding at the Major Work Category level and not at the project level. The utility must then allocate the authorized funds to individual projects through its own internal budgeting process. When the amount authorized is less than the amount forecasted in the GRC testimony, the utility must prioritize which projects will be funded and at what level. As mentioned above, there is a tension between completing the projects proposed in the GRC and reprioritizing projects either due to the authorized funding being less than forecast or because of changed circumstances.

It is also worth noting that the Corporate Services Line of Business is handled differently in the GRC. Corporate Services costs are Administrative and General (A&G) costs, and as such, they are not directly attributable to any specific utility function. Therefore, most are not given Major Work Category codes. Rather, most data is presented at the department level. However, some specific Corporate Services projects, such as information technology projects, do have MWC codes.

ii. Expense vs. Capital

Utilities are given budgets through the GRC proceedings for expenses as well as capital costs. The distinction between capital and "expense spending" is important because they affect the utility's profits over time differently. For expenses, the utility does not make a return on the spending and recovers the entire authorized expense amount for the year in rates in the same year. For capital spending, the utility recovers the actual cost of the investment over time (knows as "depreciation") as well as a return on the investment. If a utility underspends its authorized capital budget, over time it will lower its long term profits. Thus, while underspending on both expenses and capital costs can provide short term shareholder profits, underspending on capital costs diminishes the utility's long term profits. Inversely, while overspending on both expenses and capital costs can lower short term shareholder profits, higher spending on capital can increase the utility's long term profits.

For expense spending, the utility typically includes a forecast for only the test year, in this case 2014. After the Commission decides how much of the test year forecast to grant, the utility uses the imputation methodology authorized by the GRC to escalate the test year amount for the attrition years (2015-2016). At the Major Work Category level, the imputation method is complex because a separate escalation factor is used for each component of the expenses, e.g. labor, material, and medical. However, taken as a whole, the imputation method resulted in expense revenues increasing by 2.8% for 2015 and 2.9% for 2016**.**

In rare cases, PG&E does include an attrition-year forecast for expense costs. Usually this occurs when the utility expects there to be a large difference between the test year and the attrition years. For example, in the 2014 GRC, PG&E forecast significant attrition-year increases in Gas Leak Survey and Repair due to the implementation of new leak survey technology.[6]

[6] Email from Minci Han, 9/8/2016.

For capital spending, PG&E includes forecasts for the test year and the attrition years in the General Rate Case. The Commission then authorizes funding levels for each year. In the 2014 GRC decision, the Commission authorized 2015-2016 capital spending based on a historical, seven-year nominal average of capital costs. This funding mechanism resulted in the authorization of lower levels of capital spending in the attrition years than in the test year: $3.5 billion in 2014, $3.0 billion in 2015, and $3.1 billion in 2016.

iii. Balancing Account Implications

Some of the utility's spending is subject to two-way balancing account treatment[7], which means that if the utility's expenses in that category exceed the authorized level for that category, the utility is authorized to recoup those over-expenditures from ratepayers in a later true-up, provided that the over-expenditure is deemed to be reasonable. Thus, from a shareholder perspective, a dollar overspent in an account with two-way balancing account treatment is not of concern. Similarly, underspending on projects where the underspent money is returned to ratepayers is not of as much ratepayer concern.

This report finds (Table 1-1 above) that overall PG&E underspent its electric GRC budget in 2014 by 8% and overspent it by 7% in 2015. Summed over the two years (Table 1-2 above), actual safety-related spending was just 1% below what was authorized, or $70 million below the total authorized amount of $8.058 billion.

While the over- and underspending over the two years appear to be nearly a "wash", approximately $172 million of the 2015 overspending is either recoverable through the Catastrophic Event Memorandum Account (CEMA) or a two way balancing account[8]. Because

[7] One-way balancing account treatment requires the utility to reimburse ratepayers for any underspending in an account and does not allow recouping of expenses beyond a pre-designated cap, and thus places shareholders on the hook for those overages.

[8] Per PG&E's Minci Han's email to Energy Division on October 13, 2016, overspending in 2015 on nuclear safety and security (Major Work Category: MWC IG), and Major Emergency Category (MWC 95 and MWC

balancing account treatment authorizes the company to recover these funds in a later true-up, they can effectively be considered as funds not spent, from the perspective of shareholder profits. Incorporating balancing account balances into the picture (Table 1-2 above), the company's actual safety-related spending over the two-year period was $242 million (3%) less than the authorized amount of $8.058 billion.

iv. Utilities' Internal Planning Process

As mentioned above, the Commission authorizes spending at the Major Work Category level. Individual Lines of Business receive a budget based on the funds allocated at that level and must prioritize their projects based on that budget. In this way, an internal budget is created that does not necessarily match the per-project spending forecast in the GRC.

IF) is recoverable through the GRC balancing account if it is non-CEMA related and through the pending CEMA filing for CEMA related overspending. Additional data was provided in October 21, 2016 email.

III. Electric Distribution

In response to Energy Division discovery, PG&E identified a total of 37 electric distribution safety-related work categories and programs in 2014 and 2015. Seventeen of those are expense categories, and 20 are capital programs.

For test year 2014, PG&E requested funding for a total of $1.726 billion in safety spending for electric distribution activities (see Table 3-1 and Table 3-2). Of that, $589 million was for expense costs and $1.137 billion was for capital. For 2014, the Commission approved a total of $1.606 billion in both expense and capital, or about 93% of PG&E's $1.726 billion requested. In 2014, $1.588 billion was actually spent on safety which was 1% short of authorized. Out of what was spent, $585 million was expense and $1.002 billion was for capital expenditures.

For 2015, PG&E requested $1.727 billion in safety spending for both expense and capital projects. The total authorized spending for 2015 amounted to $1.482 billion, while actual safety-related expenditures amounted to $1.755 billion, or 22% more than authorized.

Table 3-1: 2014 Electric Distribution Expense and Capital ($000s)

	2014 Forecast	(a) **2014 Authorized**	(b) **2014 Actual**	(b-a)/(a) **Percent Change**
Expense Safety Program	$589,411	$584,511	$585,953	0%
Capital Safety Program	$1,136,660	$1,021,431	$1,002,446	-2%
Total	$1,726,070	$1,605,941	$1,588,399	-1%

Table 3-2: 2015 Electric Distribution Expense and Capital ($000s)

	2015 Forecast	(a) 2015 Authorized	(b) 2015 Actual	(b-a)/(a) Percent Change
Expense Safety Program	$595,917	$600,196	$681,902	14%
Capital Safety Program	$1,131,573	$881,683	$1,073,325	14%
Total	$1,727,490	$1,481,879	$1,755,228	22%

a. Electric Distribution Expense Spending

Overview

Energy Division selected four expense programs to discuss in detail in this section. They were chosen based on the substantial difference between 2014 actual and authorized amounts (Table 3-3). These four programs are (1) Patrol and Inspections, which was overspent by $10.3 million, or 22%: (2) Corrective Maintenance, which was overspent by $9.1 million, or 12%; (3) Electric Mapping and Records Management, which was underspent by $27.87 million, or 89%; and (4) Technology, which was underspent by $6.76 million, or 61%.

These significantly underspent and overspent programs were chosen based on the divergence between actual and authorized spending. Even though the variance in percentage terms was relatively small compared with other programs, the actual dollar amount of the variance was substantial. In other categories, the percentage variance was large but the actual dollar amount was small: as can be seen in Table 3-3, although Electric Distribution Operations Technology Activities overspent its budget by 100%, the total amount of overspending is only $776,000.

Despite variations in spending at the Major Work Category level, overall the Electric Distribution business spent 100% of its 2014 authorized expense budget of $585 million. In 2014

the major safety activities included vegetation management, corrective maintenance, and overhead and underground preventive maintenance (Table 3-3).[9]

In 2015, the Electric Distribution LOB overspent its authorized budget by $81.7 million, or 14%. The primary driver of higher spending was a greater than anticipated number of major emergencies, which ranged from weather events to wildfires[10]. As shown in Table 3-4 below, the Major Emergency category was overspent by $84.8 million, or 203%, in 2015. Other increases were due to overhead and underground maintenance work and a greater volume of new business and customer requests for field service. These increases were somewhat offset by lower than expected spending on the pole intrusive inspection program.[11]

Figure 3-1 illustrates PG&E's authorized and actual safety program expense spending for 2014 and 2015 by expense category. As shown in the figure, the actual spending for some categories varies substantially from authorized.

[9] GRC-2017-PhI_DR_ED_002-Q01Atch03
[10] Conversation with Minci Han from PG&E.
[11] GRC-2017-PhI_DR_ED_002- Q01Atch03

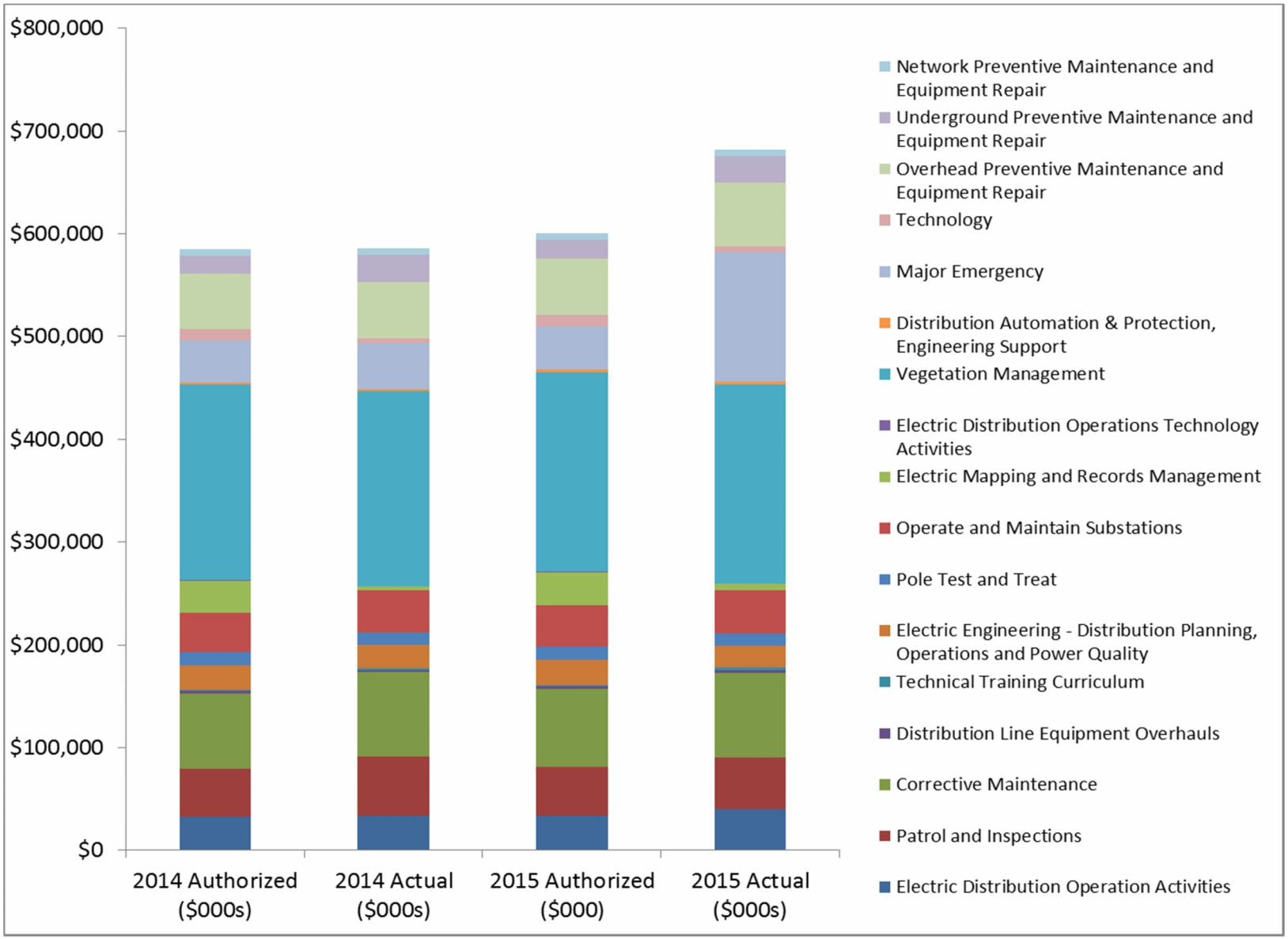
Table 3-3: 2014 Electric Distribution Expense Spending ($000s)

Major Work Category	2014 Forecast	(a) 2014 Authorized	(b) 2014 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Electric Distribution Operation Activities	$32,743	$32,931	$34,227	$1,296	4%
Patrol and Inspections	$46,286	$46,545	$56,810	$10,264	22%
Corrective Maintenance	$72,608	$73,193	$82,319	$9,126	12%
Distribution Line Equipment Overhauls	$2,713	$2,731	$2,161	-$570	-21%
Technical Training Curriculum	$684	$688	$1,336	$647	94%
Electric Engineering - Distribution Planning, Operations and Power Quality	$23,722	$23,919	$23,660	-$259	-1%
Pole Test and Treat	$15,050	$12,440	$11,076	-$1,365	-11%
Operate and Maintain Substations	$38,621	$38,842	$41,751	$2,910	7%
Electric Mapping and Records Management	$31,117	$31,405	$3,538	-$27,868	-89%
Electric Distribution Operations Technology Activities	$796	$776	$0	-$776	-100%
Vegetation Management	$190,000	$190,000	$189,673	-$327	0%
Distribution Automation & Protection, Engineering Support	$2,027	$2,042	$2,155	$114	6%
Major Emergency	$41,083	$40,848	$44,916	$4,067	10%
Technology	$12,953	$10,870	$4,198	-$6,671	-61%
Overhead Preventive Maintenance and Equipment Repair	$55,763	$53,893	$55,335	$1,442	3%
Underground Preventive Maintenance and Equipment Repair	$17,253	$17,360	$26,222	$8,862	51%
Network Preventive Maintenance and Equipment Repair	$5,992	$6,028	$6,577	$549	9%
Total	**$589,411**	**$584,511**	**$585,953**	**$1,443**	**0%**

Table 3-4: 2015 Electric Distribution Expense Spending ($000s)

Major Work Category	2015 Forecast	(c) 2015 Authorized	(d) 2015 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Electric Distribution Operation Activities	$38,489	$33,868	$40,203	$6,335	19%
Patrol and Inspections	$49,913	$47,866	$50,235	$2,370	5%
Corrective Maintenance	$81,063	$75,478	$82,638	$7,161	9%
Distribution Line Equipment Overhauls	$2,582	$2,812	$2,718	-$94	-3%
Technical Training Curriculum	$3,132	$709	$2,073	$1,364	192%
Electric Engineering - Distribution Planning, Operations and Power Quality	$20,421	$24,685	$21,156	-$3,529	-14%
Pole Test and Treat	$16,229	$12,777	$12,490	-$287	-2%
Operate and Maintain Substations	$41,642	$39,989	$41,662	$1,673	4%
Electric Mapping and Records Management	$8,044	$32,422	$6,443	-$25,979	-80%
Electric Distribution Operations Technology Activities	$0	$801	$0	-$801	-100%
Vegetation Management	$194,200	$194,153	$194,094	-$59	0%
Distribution Automation & Protection, Engineering Support	$2,010	$2,104	$2,088	-$15	-1%
Major Emergency	$44,230	$41,863	$126,637	$84,774	203%
Technology	$3,400	$11,160	$5,113	-$6,046	-54%
Overhead Preventive Maintenance and Equipment Repair	$60,214	$55,446	$62,548	$7,102	13%
Underground Preventive Maintenance and Equipment Repair	$23,259	$17,863	$25,358	$7,496	42%
Network Preventive Maintenance and Equipment Repair	$7,089	$6,201	$6,444	$243	4%
Total	**$595,917**	**$600,196**	**$681,902**	**$81,707**	**14%**

Figure 3-1: 2014-2015 Electric Distribution Expense: Comparison of Authorized and Actual Spending by Major Work Category



The following sections i-iv consist of individual program analyses for the expense spending which showed substantial variance of actual from authorized.

i. Patrol and Inspections (MWC BF)

Decision 14-08-032 outlines Electric Distribution Maintenance (EDM) programs which include inspection, testing, repair and replacement of distribution facilities as well as replacing aging infrastructure. PG&E's EDM expense funding request for 2014 was $128 million, which is $13 million higher than 2011 costs due to new programs. One of these new programs is the Patrols and Inspections program (MWC BF).[12]

The 2014 and 2015 expense spending for the Patrol and Inspections program was $10.3 and $2.3 million, or 22% and 5%, respectively, above authorized levels. This was due to four main factors:

1) An increase in the volume of patrol and inspection units from new asset installations in map updates. This means maintenance plans were updated to account for the new installed assets to ensure maps were on the appropriate annual/biennial patrol cycle;

2) A change in the frequency of wildfire patrols and inspections in high wildfire risk areas such as Santa Barbara County. In response to high fire risk due to drought years, PG&E changed the requirement to reflect annual detailed inspections;

3) Increased labor rates for internal and external inspections; an increase in training for quality and consistency; and an increase in the amount of minor maintenance work performed during inspections. PG&E claims that performing minor maintenance during overhead or underground inspection is an overall cost savings for PG&E as it eliminates the cost of sending out a crew on a separate trip;

[12] D 14-08-032, at pp. 162.

4) The addition of work such as infrared inspections, the collection of inventory data, a pilot for non-wood streetlight inspections, and an increase in post-outage review patrols to identify equipment issues.[13]

ii. Corrective Maintenance (MWC BH)

PG&E's Electric Emergency Recovery Program (ERP) is responsible for electric emergency recovery work due to outages. PG&E's emergency-related expenditures are separated into two categories: normal emergency (Level 1) and major emergency (Levels 2-3).[14] Level 1 emergency costs are included in Corrective Maintenance (MWC BH). In 2014, Corrective Maintenance was overspent by $9.13 million dollars, or 12% above authorized. In 2015, Corrective Maintenance overspent its budget by $7.16 million dollars, or 9%. The overspending in 2014 and 2015 is due to an increase in the volume of routine emergencies in those years. Routine emergency work is driven by unpredictable factors such as weather events that do not meet major emergency criteria, third-party damage to PG&E facilities, and unplanned outages.[15] In layman's terms, there were unpredicted severe weather conditions in 2014 and 2015 which led to the high spending.

iii. Electric Mapping and Records Management (MWC GE)

Electric Mapping and Records Management (MWC GE) includes creating new maps, recording updates, maintaining the electric distribution system maps, and mapping and records management initiatives.[16] PG&E requested $31.1 million for this category in 2014 (and was authorized $31.4 million), which is an increase of 825% over 2011 authorized.[17] The increase was due to four new initiatives: 1) Records Quality Assurance program; 2) Field Asset Inventory (FAI); 3) conversion of paper records to electronic format, also referred to as Convert Paper

[13] GRC-2017-PhI_DR_ED_002-Q03
[14] D 14-08-032, at pp. 209-210.
[15] GRC-2017-PhI_DR_ED_002-Q04
[16] March 31, 2016 Budget Report in Compliance with CPUC 14-08-032 (page B3-5)
[17] D 14-08-032, at pp. 158

Records (CPR); and 4) electronic records update also known as Migrate Electronic Records (MER). These new programs were intended to provide information for planning new services, analyzing existing services, and forecasting maintenance of PG&E's facilities.[18] PG&E also proposed conducting an inventory of its Electric Distribution system overhead and underground facilities to correct any discrepancies between actual conditions and its maps.

In 2014 PG&E spent $3.5 million or 89% less than authorized, on Electric Mapping and Records Management. In 2015, the utility spent $6.4 million, or 80%, below authorized levels. Underspending was due to rescheduling of Records and Information Management (RIM) projects and lower than expected base mapping costs. The lower mapping costs were due to decreased non-project-related mapping costs resulting from technology updates within PG&E's organizational functions.

Some of the electric distribution mapping and RIM projects that were delayed and are now included in the 2017 forecast include: (1) FAI, (2) CPR, and (3) MER.[19]

(1) The FAI project aims to support accuracy and completeness of asset information, which includes mapping and records in a database that is the source for critical asset data. The FAI project is currently delayed because it is contingent upon completion of the Electric Distribution Asset Management/Geographic Information System (ED AM/GIS) project. FAI is expected to begin in 2016 and is scheduled to continue to 2019.[20]
(2) The CPR and (3) MER initiatives are delayed because activities similar to CPR have been included into the Enterprise Records and Information Management (ERIM) program.

In the 2017 General Rate Case, PG&E filed testimony that included an explanation of the rescheduled RIM improvement, as it is a component of the Enterprise Content Management

[18] D.14-08-032, at pp. 158
[19] GRC-2017-PhI_DR_ED_Oral010-Q02Atch03
[20] GRC-2017-PhI_DR_ED_002-Q01Atch02

System Documentum, and RIM improvement will be contingent on changes to Documentum. Documentum is an enterprise record retention and information management tool that is used in the utility and natural resource industry.[21]

Due to these interdependent system infrastructure updates, PG&E's spending on MWC GE has been consistently below authorized levels since 2011 (Table 3-5). PG&E explained that Mapping and Records Management's schedule was pushed back due to designation of other safety projects as higher priority. PG&E adjusted the scope of the FAI project to include only a portion of its electric distribution assets rather than all assets in the system.[22] The utility believes the reduced FAI project scope will be less costly overall to customers while still achieving the targeted benefits.

Table 3-5: Mapping and Records Management Authorized and Actual Spending ($000s)

Year	Authorized	Actual	Variance Explanation
2011	$7,114	$3,364	Decrease primarily due to lower electric mapping labor costs and a reduction in low-priority mapping improvement projects to support higher priority work.
2012	$7,327	$4,302	
2013	$7,547	$4,324	
2014	$31,405	$3,538	See above explanation.
2015	$32,422	$6,443	

iv. Technology (MWC JV)

The Technology category, which is assigned the code MWC JV, includes expenses for work to maintain Information Technology (IT) applications and infrastructure. It includes costs for ongoing maintenance, operations, and repair for PG&E's IT applications, systems, and infrastructure.[23] Spending for Technology was below authorized levels for 2014 and 2015 by $6.7 million, or 61%, and $6.0 million, or 54%, respectively. Lower than authorized spending was

[21] GRC-2017-PhI_DR_ED_Oral010-Q03
[22] GRC-2017-PhI_DR_ED_002-Q01Atch02
[23] March 31, 2016 Budget Report in Compliance with CPUC 14-08-032 (page B3-5)

due to deferral of several Mobile projects to leverage improvements that were originally expected to be complete by the Enterprise Mobile Platform solution in 2015 and which are currently underway in 2016. The improvements include reorganization of the inconsistent approaches field workers were using to input Field Dispatch, run an asset inspection application, and run a vehicle inspection solution. Having multiple methods to input data was difficult from the end-user perspective and has resulted in operational inefficiencies. To address this issue, PG&E is completing an Enterprise Mobile Platform to optimize IT resources and create a consistent end-user experience.[24]

b. Electric Distribution Capital Spending

Overview

In response to Energy Division discovery, PG&E identified 20 safety-related capital expenditure programs in the Electric Distribution Line of Business. Overall, actual capital spending in 2014 and 2015 was 98% and 122%, respectively, of authorized.

In 2014, PG&E underspent its authorized allowance by $19.0 million, or 2% below authorized. This was due to rescheduling of Rule 20A (undergrounding) projects, delays in projects requested by third parties or governmental agencies, three Bay Area switchgear replacements deferred to 2015, and lower than planned asset replacements. In contrast, there was higher than expected spending on pole replacement projects, substation Supervisory Control and Data Acquisition (SCADA), and routine emergency recovery.[25]

In 2015, Electric Distribution overspent its 2015 capital budget by $191.6 million, or 22%. The higher than expected spending was mainly due to major emergencies, substation capacity projects, and substation emergency equipment replacement. This high spending was slightly offset by third-party delays and re-scoping of Rule 20A projects, underground asset and

[24] GRC-2017-Phl_DR_ED_Oral010-Q04
[25] GRC-2017-PhI_DR_ED_002-Q01Atch03

base reliability replacement projects that were rescheduled to 2016, and lower than expected spending on substation switchgear projects.[26]

For Electric Distribution capital costs, Major Work Categories that were significantly under- or overspent compared to GRC-authorized levels were chosen for further investigation. Categories were chosen based on the actual dollar amount of under- or overspending instead of the percent change from authorized. Although most of the focus in this section is on underspending, the Major Emergency category was chosen for further investigation because it was overspent by 304% in 2015.

As reflected in Table 3-6**Error! Reference source not found.** and Table 3-7 below, the Underground Asset Management Program underspent its authorized budget in 2014 by $19.6 million, or 19%. In 2015, this program was overspent by $3.9 million, or 5%. Distribution Transformer Replacement underspent its 2014 budget by $33.6 million or 52%; in 2015, it underspent by $9.1 million, or 26%. Major Emergency overspent its 2015 budget by $86.4 million or 204%. In contrast, in 2014 this category was underspent by $0.2 million.

Of note is the category Electric Distribution Operation Activities. As can be seen in Tables 3-6 and 3-7, in 2014 and 2015 the forecast and authorized amounts for this category are negative. This is an artifact of the way PG&E allocated costs to certain categories in the 2014 GRC. At the time of the filing, the company anticipated avoiding, through efficiency efforts, about $41 million in capital expenditures in the electric distribution line of business but had not yet fleshed out the details on how those savings would be achieved. The introduction of the negative $41 million in this category, instead of reducing capital forecasts across all expense and capital major work categories, was made in order to avoid claims of false precision.[27]

[26] GRC-2017-PhI_DR_ED_002-Q01Atch03.
[27] Conversation with Minci Han of PG&E, and email from October 7, 2016.

Table 3-6: 2014 Electric Distribution Capital Spending ($000s)

Major Work Category	2014 Forecast	(a) 2014 Authorized	(b) 2014 Actual	(b-a) Difference	(b-a)/(a) Percent Change
Electric Distribution Operation Activities	-$45,982	-$40,641	$6,709	$47,351	-117%
Distribution Line and Equipment Capacity	$107,913	$107,349	$94,291	-$13,059	-12%
Pole Replacement	$69,578	$69,215	$111,797	$42,582	62%
Distribution Line Equipment Overhauls	$68,186	$61,603	$42,682	-$18,921	-31%
Distribution Automation	$73,421	$56,863	$45,620	-$11,244	-20%
Emergency Response	$119,522	$118,898	$135,705	$16,807	14%
Implement Real Estate Strategy	$0	$0	$2,670	$2,670	
Distribution Substation Capacity	$74,892	$74,501	$67,051	-$7,451	-10%
Replace Substation Equipment	$66,021	$65,676	$32,220	-$33,456	-51%
Distribution Transformer Replacements	$64,854	$64,515	$30,920	-$33,596	-52%
Underground Asset Management Program	$140,077	$100,780	$81,219	-$19,561	-19%
Distribution Substation Safety	$3,126	$3,110	$1,230	-$1,880	-60%
Distribution Substation Emergency Equipment Replacement	$41,011	$40,797	$35,526	-$5,270	-13%
Distribution Control Center Project/Facility Improvements	$33,849	$33,672	$43,155	$9,483	28%
Manage Buildings	$3,923	$3,902	$0	-$3,902	-1
Major Emergency	$49,420	$49,040	$48,838	-$202	0%
Overhead Preventive Maintenance and Equipment Repair	$127,240	$101,171	$95,421	-$5,750	-6%
Underground Preventive Maintenance and Equipment Repair	$48,416	$35,411	$55,744	$20,334	57%
Network Preventive Maintenance and Equipment Repair	$19,613	$19,510	$15,699	-$3,812	-20%
Technology	$71,580	$56,059	$55,949	-$110	0%
Total	**$1,136,660**	**$1,021,431**	**$1,002,446**	**-$18,985**	**-2%**

Table 3-7: 2015 Electric Distribution Capital Spending ($000s)

Major Work Category	2015 Forecast	(a) 2015 Authorized	(b) 2015 Actual	(b-a) Difference	(b-a)/(a) Percent Change
Electric Distribution Operation Activities	-$44,920	-$35,081	$4,617	$39,698	-113%
Distribution Line and Equipment Capacity	$98,705	$92,662	$95,722	$3,060	3%
Pole Replacement	$67,912	$59,745	$103,053	$43,308	72%
Distribution Line Equipment Overhauls	$69,740	$53,174	$29,661	-$23,513	-44%
Distribution Automation	$74,685	$49,084	$44,281	-$4,802	-10%
Emergency Response	$119,387	$102,631	$145,786	$43,155	42%
Implement Real Estate Strategy	$0	$0	$2,175	$2,175	
Distribution Substation Capacity	$97,142	$64,308	$68,301	$3,993	6%
Replace Substation Equipment	$74,622	$56,691	$49,184	-$7,506	-13%
Distribution Transformer Replacements	$60,191	$55,689	$46,571	-$9,118	-16%
Underground Asset Management Program	$157,715	$86,992	$90,905	$3,913	4%
Distribution Substation Safety	$3,120	$2,685	$3,222	$537	20%
Distribution Substation Emergency Equipment Replacement	$40,940	$35,215	$34,092	-$1,123	-3%
Distribution Control Center Project/Facility Improvements	$0	$29,065	$20,591	-$8,475	-29%
Manage Buildings	$3,967	$3,368	$0	-$3,368	-100%
Major Emergency	$54,165	$42,331	$128,686	$86,355	204%
Overhead Preventive Maintenance and Equipment Repair	$116,266	$87,329	$109,976	$22,647	26%
Underground Preventive Maintenance and Equipment Repair	$48,343	$30,566	$43,506	$12,940	42%
Network Preventive Maintenance and Equipment Repair	$17,525	$16,841	$19,694	$2,853	17%
Technology	$72,068	$48,389	$33,303	-$15,086	-31%
Total	**$1,131,573**	**$881,683**	**$1,073,325**	**$191,642**	**22%**

Expenditures for 2014 and 2015 capital programs are illustrated in Figure 3-2 and Figure 3-3**Error! Reference source not found.** below, which compare the amounts requested, authorized, and spent across all capital programs.

Figure 3-2: 2014 Electric Distribution Capital Spending: Comparison of Forecast, Authorized, and Actual Spending by Major Work Category

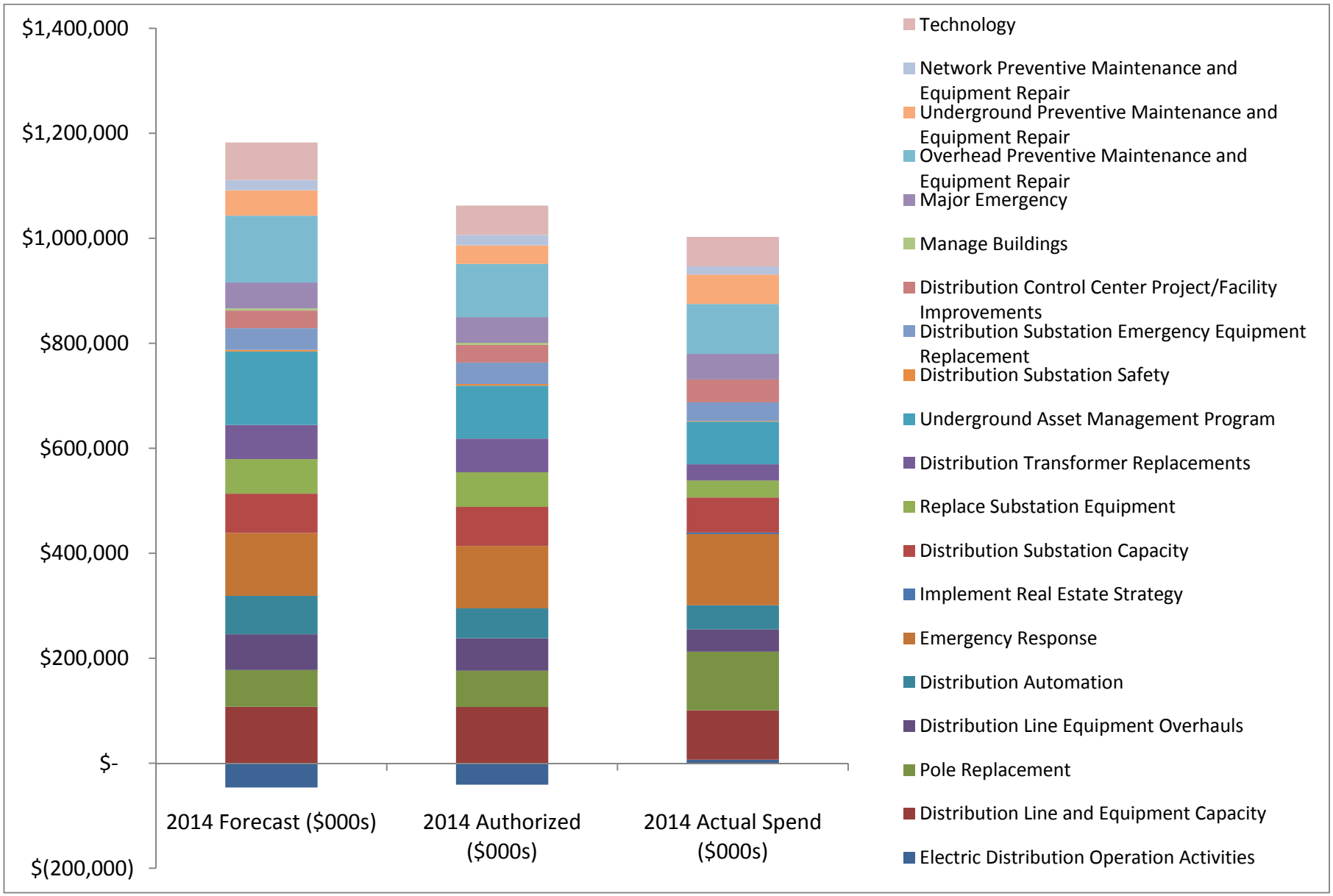
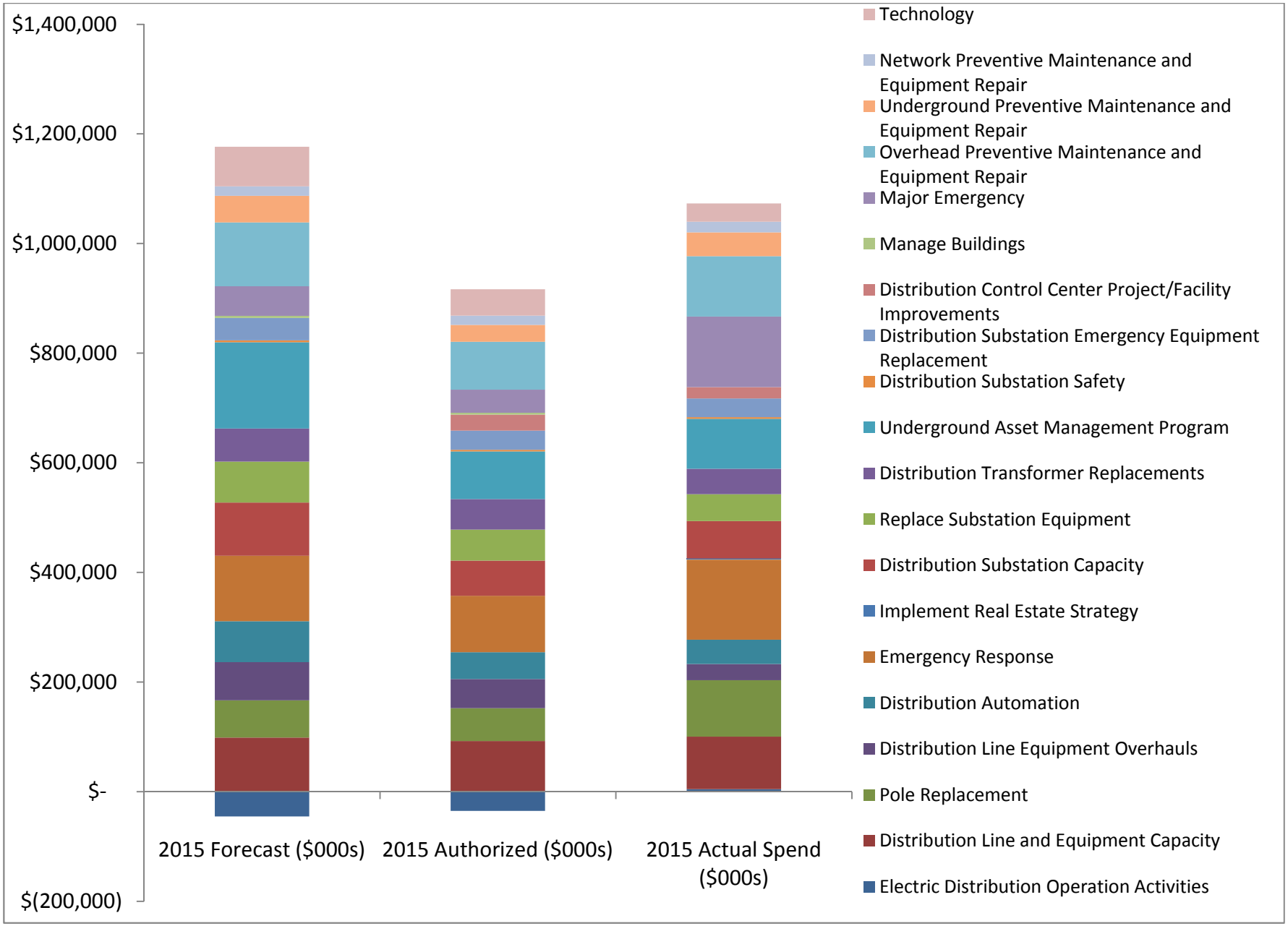


Figure 3-3: 2015 Electric Distribution Capital Spending: Comparison of Forecast, Authorized, and Actual Spending by Major Work Category



i. Underground Asset Management Program (MWC 2B)

Electric Distribution Underground Asset Management includes non-emergency replacement of primary distribution cable such as tie-cables, preliminary and secondary network cables, transfer ground rocker arm main/transfer ground rocker arm line switches, load break oil rotary switches, and failed primary distribution cables. This program also includes performing cable rejuvenation and testing.[28]

Spending for this program was approximately $19.6 million, or 19%, below authorized in 2014 and $3.9 million, or 4%, above authorized in 2015 due to re-scheduling of several underground asset replacement projects to fund higher priority work. Some projects were delayed due to permitting, existing conduit failures, and working in highly congested areas of Oakland. PG&E notes that the 2014 recorded amounts for this program do not include $2 million in underground oil switch replacements that were requested in Major Work Category 2B.[29]

ii. Distribution Transformer Replacements (MWC 54)

Electric Distribution substation transformer replacements include maintaining or improving substation reliability by replacing transformers that have the highest risk of failure. This work category also includes maintaining an adequate supply of emergency transformer stock, mobile transformers, and breakers for emergency response.[30]

In 2014 and 2015, spending was approximately $33.6 million, or 52%, and $9.1 million, or 16%, below authorized levels respectively. In 2014 the underspending was due to more current assessments of project information, including construction schedule changes to

[28] March 31, 2016 Budget Report in Compliance with CPUC 14-08-032 (page B3-12)
[29] GRC-2017-PhI_DR_ED_002-Q08
[30] March 31, 2016 Budget Report in Compliance with CPUC 14-08-032 (page B3-11)

coordinate projects with the other work at the stations. Funds were reallocated to support substation emergency replacements and higher priority work in other programs.[31]

In 2015, capital expenditures were less than authorized primarily due to a lower volume of circuit breaker projects undertaken and the reprioritization of the Berkeley T Substation Bank 1 and Bank 2 replacement project.[32]

iii. Major Emergency (MWC 95)

Electric Distribution Major Emergency includes response work to outages when a division Operations Emergency Center (OEC) has been activated with PG&E's Major Emergency Balancing Account Criteria Guidance Document. Beginning in 2014, these costs are included in the two-way Major Emergency balancing account authorized by D. 14-08-032.[33]

In 2014, PG&E spent 100% of the Major Emergency authorized budget.

In 2015, capital expenditures were approximately $86.4 million, or 204%, above authorized levels due to the severe weather events and wildfires that occurred in 2015. The 2015 recorded amount of $128.7 million includes costs that are eligible for recovery through the Catastrophic Events Memorandum Account (CEMA). The total amounts of these eligible costs are being finalized and will be included in a future CEMA application.

[31] GRC-2017-PhI_DR_ED_002-Q06
[32] GRC-2017-PhI_DR_ED_002-Q06
[33] March 31, 2016 Budget Report in Compliance with CPUC 14-08-032 (page B3-12)

IV. Electric Generation

In response to a data request from Energy Division, PG&E identified a total of 26 electric generation safety programs in 2014 and 2015. Fifteen of these programs are expense and 11 are capital programs.

PG&E had forecasted a total of $1.062 billion in safety spending for Electric Generation activities in test year 2014. Of that total, $546 million were expensed and $517 million were for capital programs, as reflected in Table 4-1. In 2014, the Commission approved a total of $1.013 billion in expense and capital programs, approximately 95% of PG&E's forecast. Actual spending (expense plus capital) in 2014 was $905 million, about 89% of authorized spending.

For 2015, PG&E had forecasted $579 million in capital expenditures, as reflected in Table 4-2. The Commission approved $425 million in capital expenditures, or 73% of PG&E's forecast. PG&E did not provide a forecast of 2015 expense in the 2014 GRC as it would be subject to attrition adjustment adopted by the Commission. PG&E's total safety program spending in 2015 amounted to $947 million, about 98% of the $961 million authorized, as reflected in Table 4-2. Total safety program expenditures were $947 million in 2015, about 5% more than the roughly $905 million spent in 2014.

Table 4-1: 2014 Safety-Related Electric Generation Spending ($000s)

	2014 Forecast	(a) **2014 Authorized**	(b) **2014 Actual**	(b-a)/(a) **Percent Change**
Expense Safety Program	$545,901	$521,569	$491,755	-6%
Capital Safety Program	$516,745	$491,819	$413,245	-16%
Total	**$1,062,646**	**$1,013,388**	**$905,000**	**-11%**

Table 4-2: 2015 Safety-Related Electric Generation Spending ($000s)

	2015 Forecast	(a) **2015 Authorized**	(b) **2015 Actual**	(b-a)/(a) **Percent Change**
Expense Safety Program	-	$536,674	$510,285	-5%
Capital Safety Program	$578,546	$424,530	$436,818	3%
Total	**-**	**$961,204**	**$947,103**	**-1%**

PG&E did not forecast 2015 expense in the 2014 GRC.

a. Electric Generation Expense

Overview

Four expense programs were chosen to discuss in detail in this section. They were chosen based on the substantial difference between 2014 actual and authorized amounts. As reflected in Table 4-3 below, the amount of underspending was substantial for three programs: Maintain Hydro Reservoirs, Dams, and Waterways ($12 million or about 33% lower), Maintain Diablo Canyon Power Plant (DCPP) Assets ($17.6 million or about 10% lower) and Maintain Fossil Generating Equipment programs ($11.4 million or about 36% lower). However, the Operate Diablo Canyon Power Plant account had an overspending of $6.6 million, or about 7%.

Table 4-3 reflects safety-related electric generation expense forecast, authorized, and actual costs across all 15 identified programs for 2014. It also reflects the differences between actual and authorized spending in percentage and dollar amounts.

Table 4-3: 2014 Electric Generation Expense Spending ($000s)

Major Work Category	2014 Forecast	(a) 2014 Authorized	(b) 2014 Actual	(b)-(a) Difference	(b-a)/ (a) Percent Change
Maintain Hydro Reservoirs, Dams, and Waterways	$36,813	$36,032	$23,989	-$12,043	-33%
Maintain Hydro Buildings	-	-	$262	$262	-
Operate Hydro Generation	$51,507	$50,868	$50,574	-$294	-1%
Maintain Hydro Generating Equipment	$30,037	$29,396	$32,703	$3,307	11%
Maintain Hydro Structure, Roadways & Infrastructure	$14,625	$12,845	$10,859	-$1,986	-15%
Operate Diablo Canyon Power Plant	$107,340	$98,107	$104,713	$6,606	7%
Maintain Diablo Canyon Power Plant Assets	$184,178	$182,946	$165,387	-$17,559	-10%
Maintain Diablo Canyon Power Plant Configuration	$70,238	$61,116	$55,634	-$5,482	-9%
Operate Fossil Generation	$14,591	$14,543	$15,033	$490	3%
Maintain Fossil Generating Equipment	$31,942	$31,198	$19,839	-$11,359	-36%
Maintain Fossil Buildings, Grounds & Infrastructure	$3,048	$2,962	$2,580	-$382	-13%
Operate Alternative Generation	$364	$354	$290	-$64	-18%
Maintain Alternative Generation Generating Equipment	$1,109	$1,096	$1,219	$123	11%
Maintain Alternative Generation Buildings, Grounds, and Infrastructure	$108	$105	$50	-$55	-52%
Manage Various Balancing Account Processes	-	-	$8,625	$8,625	-
Total	**$545,901**	**$521,569**	**$491,755**	**-$29,814**	**-6%**

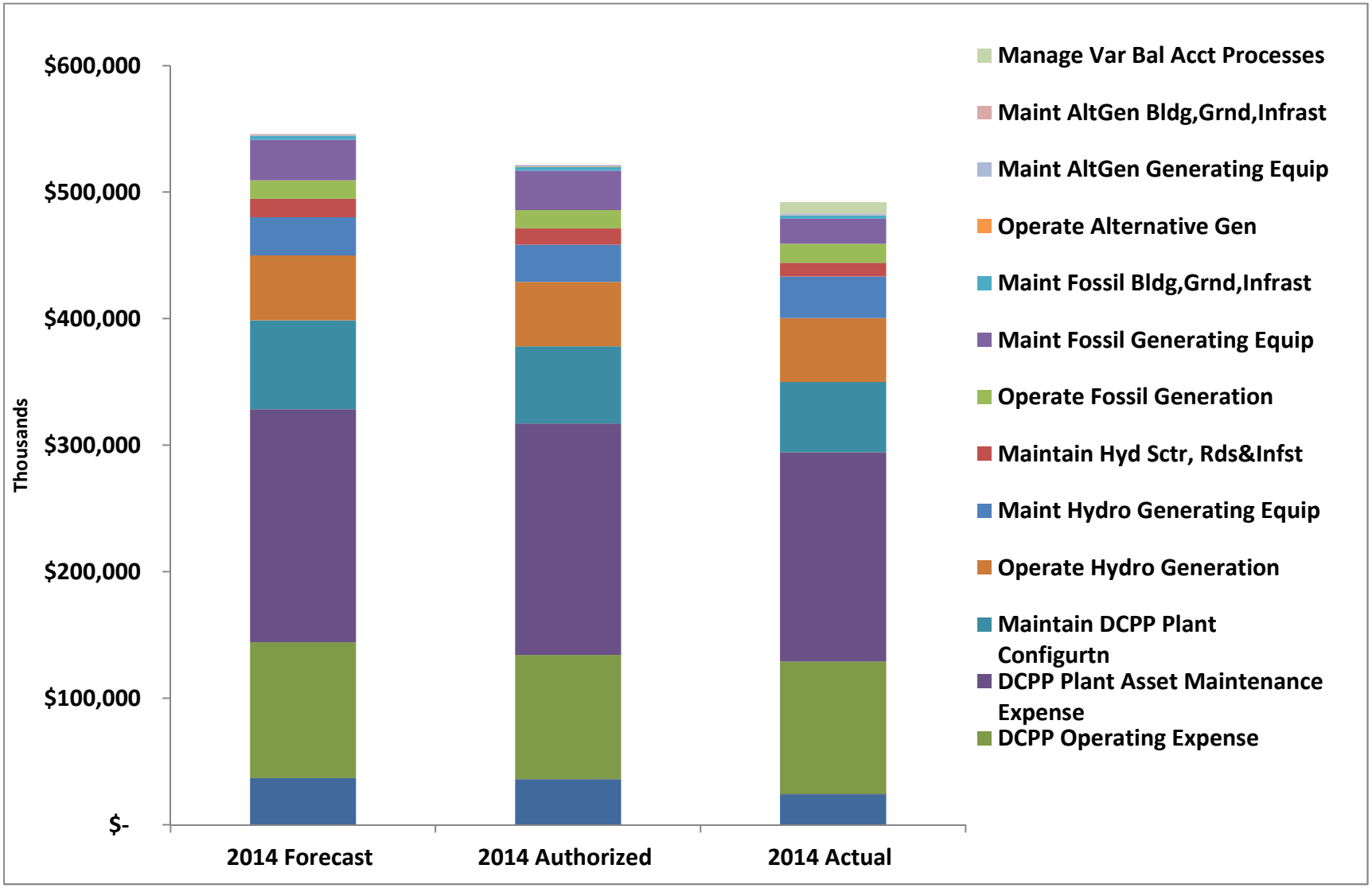
Maintain Hydro Buildings and Manage Various Balancing Account Processes were not explicitly forecasted or authorized.

To identify the main drivers for under- and overspending, the focus here is placed on the differences in dollar amount. The alternative, of placing the emphasis on the differences in percentage terms, can provide an incomplete picture. For example, the percent change between authorized and actual expenditure is highest for Maintain Alternative Generation Buildings, Grounds, and Infrastructure (about 53%), but in dollars the difference ($55,000) is small.

In 2014, total expense safety expenditures were $492 billion, which is $30 million (about 6%) lower than the total authorized budget of $522 million. This decline was partially offset by Operate Diablo Canyon Power Plant spending, which was $6.6 million (or about 7% higher than authorized) and by the establishment of two new programs: Maintain Hydro Buildings and Manage Various Balancing Account Processes. Excluding spending on the two new programs (about $9 million), which were either not explicitly authorized or were accounted for in a manner that differs from what was authorized in D. 14-08-032, results in total expense underspending of $39 million, or 7.4% in 2014.

Figure 4-1, below, contrasts forecast, authorized and actual expense across different programs in 2014.

Figure 4-1: 2014 Electric Generation Expense Spending: Comparison of Forecast, Authorized, and Actual Spending by Major Work Category



As reflected in Table 4-4 below, PG&E underspent in 2015 as well but not by as much as in 2014. The Maintain Hydro Reservoirs, Dams, and Waterways underspent about 28.8% in 2015 compared to an underspending of about 33% in 2014. Maintain Diablo Canyon Power Plant Assets, on the other hand, showed an increase in underspending compared to 2014 (21% underspending in 2015 compared to 10% in 2014). In contrast, Maintain Fossil Generating Equipment reversed course and reflected 35% overspending in 2015, compared to about 36% underspending in 2014.

In 2015, underspending continued to be highest for Maintain Diablo Canyon Power Plant Assets, which was underspent by $38.8 million or 21%. In 2014, underspending for this category was $17.6 million or about 10%. The only program that exhibited overspending in 2014, Operate Diablo Canyon Power Plant, changed course and reflected underspending in 2015 (2% underspending in 2015 compared to 7% overspending in 2014).

Table 4-4: 2015 Electric Generation Expense ($000s)

Major Work Category	(a) 2015 Authorized	(b) 2015 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Maintain Hydro Reservoirs, Dams, and Waterways	$36,994	$26,344	-$10,650	-29%
Maintain Hydro Buildings	-	$453	$453	-
Operate Hydro Generation	$52,371	$52,693	$322	1%
Maintain Hydro Generating Equipment	$30,180	$31,348	$1,168	4%
Maintain Hydro Structure, Roadways & Infrastructure	$13,155	$14,248	$1,093	8%
Operate Diablo Canyon Power Plant	$101,203	$99,064	-$2,139	-2%
Maintain Diablo Canyon Power Plant Assets	$188,306	$149,514	-$38,792	-21%
Maintain Diablo Canyon Power Plant Configuration	$62,944	$58,149	-$4,795	-8%
Operate Fossil Generation	$14,971	$15,488	$517	3%
Maintain Fossil Generating Equipment	$31,927	$43,225	$11,298	35%
Maintain Fossil Buildings, Grounds & Infrastructure	$3,027	$2,434	-$593	-20%
Operate Alternative Generation	$362	$289	-$73	-20%
Maintain Alternative Generation Generating Equipment	$1,126	$429	-$697	-62%
Maintain Alternative Generation Buildings, Grounds, and Infrastructure	$108	$67	-$41	-38%
Manage Various Balancing Account Processes	-	$16,542	$16,542	-
Total	**$536,674**	**$510,285**	**-$26,389**	**-5%**

Maintain Hydro Buildings and Manage Various Balancing Account processes were not explicitly authorized.

Figure 4-2: 2015 Electric Generation Expense Spending: Comparison of Authorized and Actual Spending by Major Work Category

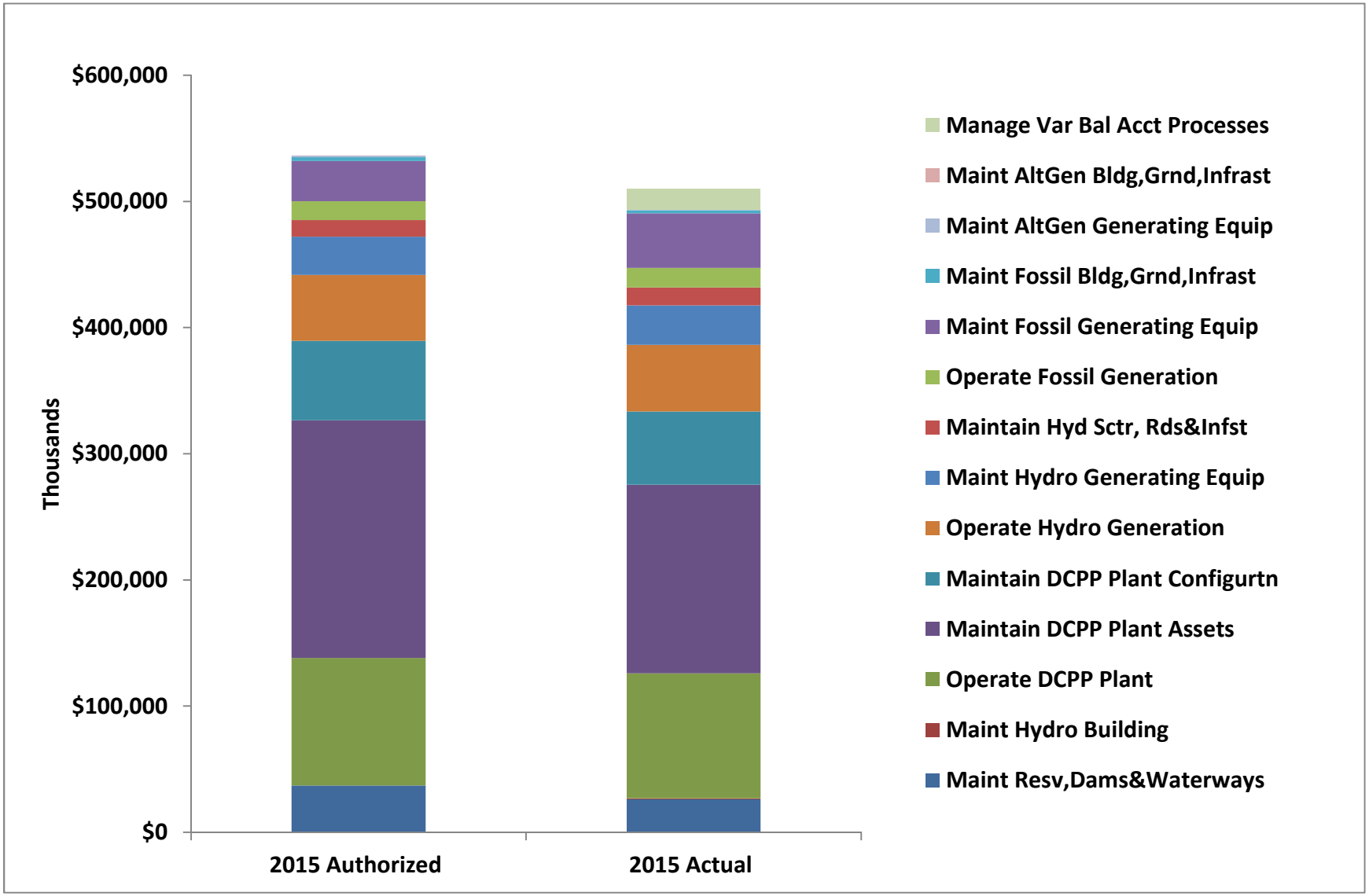


Figure 4-2 (above) contrasts forecast, authorized, and actual expense spending across different programs in 2015.

The following section provides individual program analysis for the expense programs, which showed substantial discrepancies from the authorized levels.

i. Maintain Hydro Reservoirs, Dams, and Waterways (MWC AX)

Work in the Maintain Hydro Reservoirs, Dams, and Waterways Program (MWC AX) includes dam safety and facility risk management as well as maintenance of dams, canals, flumes, and penstocks. According to PG&E's 2014 GRC Decision 14-08-032 "[t]hese water storage and conveyance facilities pose a significant hazard to the public if they are not adequately maintained."

Actual spending on MWC AX was $24.0 million in 2014 and $26.3 million in 2015. These spending levels were approximately $12.0 million and $10.7 million, or 33% and 29%, respectively, below the authorized levels.

In response to an Energy Division enquiry, PG&E explained that expense spending on this project was lower than forecasted primarily due to three factors. First, PG&E's 2014 GRC forecast assumed that there would be significant costs to make repairs and/or modifications to dams and water conveyance systems. PG&E noted that while spending did increase in this area "some of that work that was performed turned out to be capital work rather than expense once the work was better defined/scoped." Second, according to PG&E, "some of the work was rescheduled due to scoping, access, and/or permitting issues." Finally, "various dredging projects that had been identified have been reprioritized and rescheduled."[34]

[34] GRC-2017-PhI_DR_ED_003.

ii. Maintain Diablo Canyon Power Plant Assets (MWC BS)

PG&E forecasted $184.2 million for 2014 expenses in Maintain Diablo Canyon Power Plant Assets (MWC BS). This category covers the Maintenance Department, which plans and performs preventive and corrective maintenance and surveillance testing of DCPP's mechanical and electrical equipment, instrumentation, and controls. Actual spending on this category in 2014 and 2015 was $165.4 million and $149.5 million respectively. This spending was approximately $17.6 million and $38.8 million (10% and 21%) below the authorized level of $182.9 million and $188.3 million respectively. In 2015, actual spending on this category was 10% lower than in 2014.

According to PG&E, the discrepancy between authorized and actual program spending on Maintain DCPP Assets is primarily due to the fact that certain costs included in the authorized amount were recorded, or had offsets, in other Major Work Categories. More specifically, the 2014 GRC authorized amount included $14.6 million for various expense balancing account orders. Subsequent to the issuance of the GRC decision, PG&E established a new work category, Manage Various Balancing Account Processes (MWC IG), in order to track costs associated with the balancing account orders.

The Manage Various Balancing Account Processes category includes Fukushima and Emergency Planning and Cybersecurity costs. The actual spending on Manage Various Balancing Account Processes was approximately $8.6 million. PG&E further explained that the principal reason for underspending when compared to the $14.6 million authorized for this work, "was due to a lack of clarity on the final Fukushima expense scope at the time of the 2014 GRC filing. Fukushima costs were forecasted in the GRC at $11.5 million, but actual costs were only $1.8 million."[35] However, PG&E notes the decline in spending was partially offset by higher than forecasted expenditures on Emergency Planning and Cybersecurity.

[35] GRC-2017-PhI_DR_ED_003.

PG&E noted that this reclassification reduced the authorized amount for Maintain DCPP Assets to $168.3 million, which results in much smaller underspending: $2.9 million for 2014 or about 1.7%.

The authorized amount for Maintain DCPP Assets includes costs for the second refueling outage and outage costs generally. PG&E noted that the authorized amount for the second refueling outage in 2014 was $37.7 million. There was only one refueling outage in 2015. Therefore there was no actual cost for second refueling outage in 2015. As authorized by the GRC decision, the costs of the second refueling outage were levelized over the 2014-2016 period. PG&E further notes the offset (second refueling outage amortization) to the amount included in MWC BS is in the work category Business/Miscellaneous Expense (MWC AB).

According to PG&E, after these adjustments, the amount spent on Maintain DCPP Assets is approximately $12 million higher than an adjusted GRC-authorized amount for 2015. The overspending "is attributable to longer outage duration than originally planned, higher headcount than originally planned, and emergent expense project work."[36]

iii. Maintain Fossil Generating Equipment (MWC KL)

PG&E's forecast for Maintain Fossil Generating Equipment (MWC KL) of $31.9 million was for maintenance at Gateway, Colusa, and Humboldt. The forecast includes labor to maintain the facilities, the Long-Term Service Agreements (LTSA) at Colusa and Gateway, materials and contracts for the facilities, and other maintenance and engineering services. Actual spending on this category was $19.8 million in 2014 and $43.2 million in 2015. While spending was approximately $11.4 million or 36% below the $31.2 million authorized in 2014, it was $11.3 million or 35% more than authorized in 2015. Actual spending on this category was 118% higher in 2015 than in 2014.

[36] GRC-2017-PhI_DR_ED_003.

In response to an Energy Division enquiry regarding the discrepancy between 2014 authorized and actual program spending, PG&E explained that the primary reason is due to the fact that the GRC-authorized amount included costs associated with major LTSA outages at PG&E's Gateway and Colusa generating stations. The expected costs of the LTSA outages were levelized over the 2014-2016 period. PG&E noted that since LTSA costs generally incur when there are major outages at the fossil plants, they are "lumpy." There were no major Fossil LTSA outages in 2014.

In 2015, there was an LTSA outage. However, since the 2015 authorized amount included only a levelized portion of the LTSA costs that resulted in overspending in 2015. According to PG&E the discrepancy is due to a timing difference between when costs are collected in revenues and when they are incurred.

iv. Operate Diablo Canyon Power Plant (MWC BR)

PG&E's forecast of $107.3 million for the Operate Diablo Canyon Power Plant program (MWC BR) included: Operations Services, the Chemistry Department, and Radiation Protection.

Actual 2014 spending on this program was $104.7 million, or approximately $6.6 million (7%) higher than the authorized level of $98.1 million. In 2015, actual spending on the program was $99.0 million, or approximately $2.1 million (2%) lower than the authorized amount of $101 million. In 2015 actual spending on Operate DCPP was about 5% lower than in 2014.

In response to an Energy Division enquiry regarding the discrepancy between the authorized and actual program spending on Operate DCPP, PG&E explained that the final 2014 GRC decision made certain adjustments to PG&E's forecast of $107.3 million. The primary adjustment was the removal of the incremental cost associated with hiring ahead of attrition for Diablo Canyon. According to PG&E, the adjustment should have been made to multiple Major Work Categories, but all of the adjustment was applied to Operate DCPP, effectively understating the authorized amount for this category. PG&E noted that for 2014 if only "the $3.0 million of the adjustments directly applicable to MWC BR had been removed from MWC BR, the actual MWC BR expense costs of $104.7 [million] would have been very close to the authorized amount for this MWC BR."

Furthermore the authorized amount for MWC BR includes costs of the second refueling outage. PG&E noted that the authorized amount for the second refueling outage in 2014 was

$7.6 million. There was no actual cost for the second refueling outage in 2015. As authorized by the GRC decision, the costs of the second refueling outage were levelized over the 2014-2016 period. PG&E further notes that, similar to Maintain DCPP Assets, the offset (second refueling outage amortization) to this amount is in Business/Miscellaneous Expense (MWC AB).

For 2015, PG&E noted that after incorporating these adjustments, the spending on MWC BR is $0.6 million lower than the adjusted GRC-authorized amount.

b. Electric Generation Capital

Overview

Seven capital programs were chosen to discuss in detail in this section. They were chosen based on the substantial difference between 2014 actual and authorized amounts. (Capital expenditure deviations in 2015 were less, as discussed below.) Table 4-5 below shows that 2014 spending was far below authorized level for six programs: Diablo Canyon Power Plant Capital ($66.4 million or 28%); Install/Replace for Hydro Electric Safety and Regulatory Requirement ($8.2 million or 17%); Install/Replace Hydro Generating Equipment ($19.4 million or 17%); Install/Replace Reservoirs, Dams, and Waterways ($30.0 million or 38%); Install/Replace Hydro Buildings, Grounds, and Infrastructure ($6.8 million or 45%); Install/Replace Fossil Buildings, Grounds, and Infrastructure ($0.6 million or 92%). On the other hand, spending was substantially above authorized level for Install/Replace Fossil Generating Equipment ($7.8 million or 917%).

In 2014, PG&E's total capital program spending on this Line of Business was $413 million, which was $79 million (16%) lower than the total authorized budget of $492 million. However three programs — Install/Replace Fossil Safety and Regulatory Requirements, Install/Replace Alternative Generation Equipment, and Nuclear Safety and Security Programs — were either not explicitly authorized or were accounted for in a manner that differs from what was authorized in D. 14-08-032. Excluding these programs results in actual total capital underspending of $124 million (25%) and $31 million (7%) in 2014 and 2015 respectively.

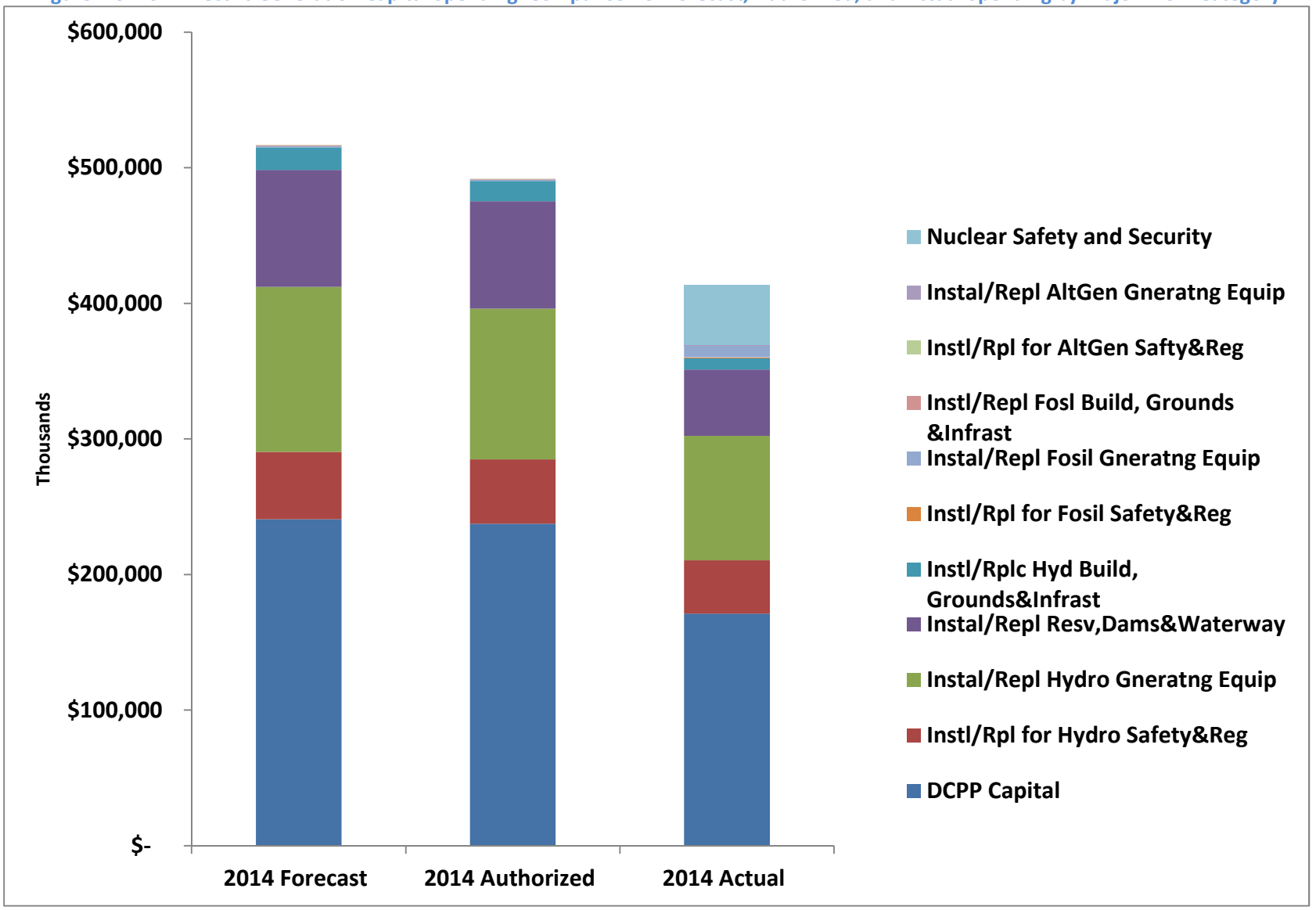
Table 4-5: 2014 Electric Generation Capital Spending ($000s)

Major Work Category	2014 Forecast	(a) 2014 Authorized	(b) 2014 Actual	(b)-(a) Difference	(b-a)/ (a) Percent Change
Diablo Canyon Power Plant Capital	$240,848	$237,507	$171,131	-$66,376	-28%
Install/Replace for Hydro Safety and Regulatory Requirements	$49,614	$47,475	$39,312	-$8,163	-17%
Install/Replace Hydro Generating Equipment	$121,702	$111,168	$91,780	-$19,388	-17%
Install/Replace Reservoir, Dams, and Waterways	$86,244	$79,079	$49,063	-$30,016	-38%
Install/Replace Hydro Buildings, Grounds, and Infrastructure	$16,652	$15,068	$8,238	-$6,830	-45%
Install/Replace Fossil Safety and Regulatory Requirements	-	-	$657	$657	-
Install/Replace Fossil Generating Equipment	$948	$855	$8,701	$7,846	918%
Install/Replace Fossil Building Grounds & Infrastructure	$694	$626	$49	-$577	-92%
Install/Replace Alternative Generation Safety and Regulation	$41	$40	$28	-$12	-30%
Install/Replace Alternative Generation Equipment	-	-	$187	$187	-
Nuclear Safety and Security	-	-	$44,099	$44,099	-
Total	**$516,743**	**$491,819**	**$413,245**	**-$78,574**	**-16%**

Install/Replace Fossil Safety and Regulatory Requirements, Install/Replace Alternative Generation Equipment, and Nuclear Safety and Security Programs were not explicitly forecasted or authorized.

Figure 4-3 contrasts forecast, authorized and actual capital spending across different Major Work Categories in 2014.

Figure 4-3: 2014 Electric Generation Capital Spending: Comparison of Forecast, Authorized, and Actual Spending by Major Work Category



As reflected in Table 4-6 below, underspending continued in 2015 but, for three of the five programs that exhibited underspending in 2014, the amount of underspending in 2015 was lower. More specifically, DCPP Capital was underspent by 13% in 2015 compared to 28% in 2014; Install/Replace Reservoirs, Dams, and Waterways was underspent by about 24% in 2015 compared to about 38% in 2014; and Install/Replace Hydro Buildings, Grounds, and Infrastructure was underspent by 10% in 2015 compared to 45% in 2014. On the other hand, Install/Replace Hydro Generating Equipment and Install/Replace Fossil Buildings, Grounds, and Infrastructure, which exhibited underspending in 2014 of about 17% and 92%, respectively, changed course and reflected overspending of about 15% and 316%, respectively, in 2015. Overspending on Install/Replace Fossil Generating Equipment continued in 2015 (699%), but was less than in 2014 (917%).

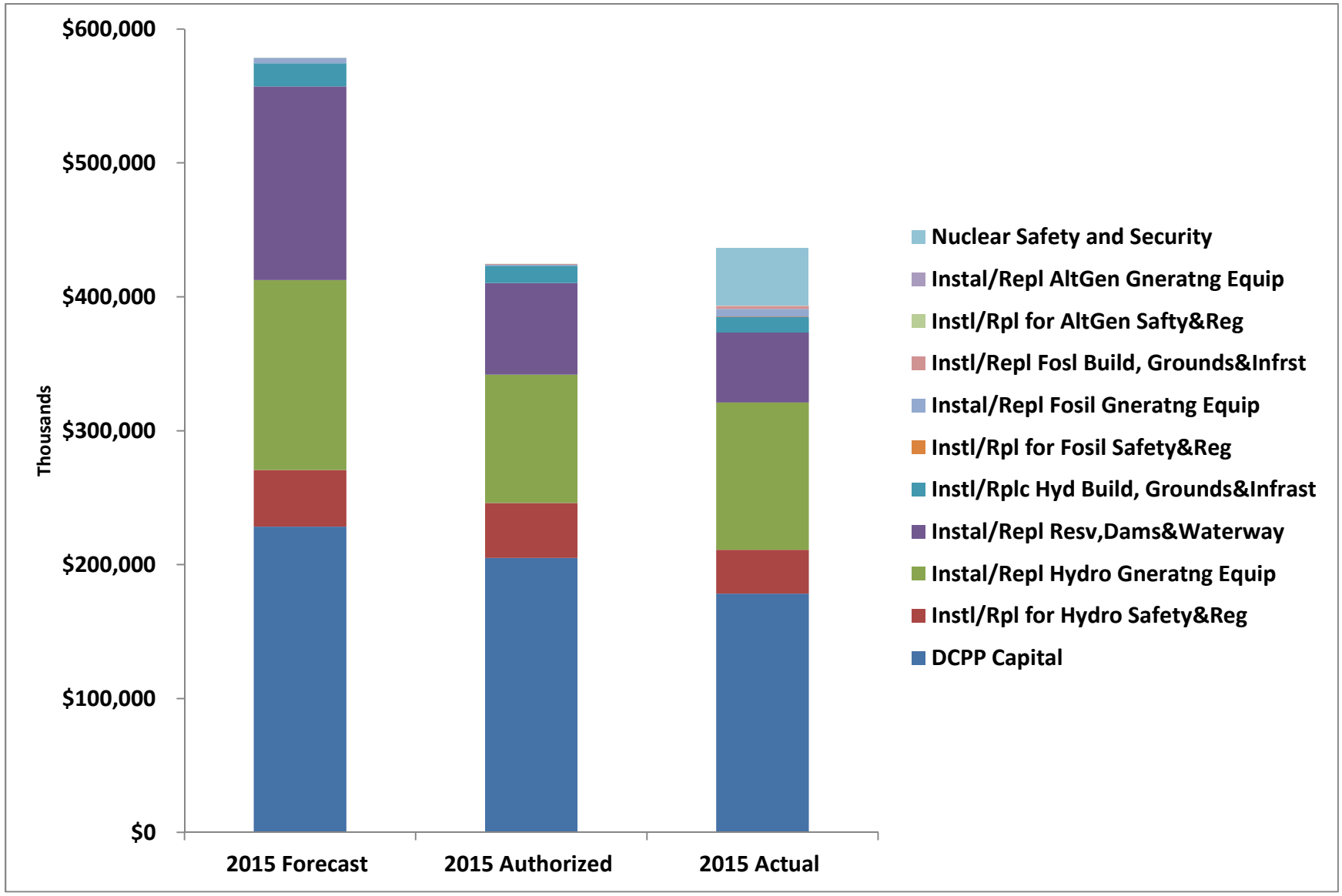
Table 4-6: 2015 Electric Generation Capital Spending ($000s)

Major Work Category	(a) 2015 Forecast	(a) 2015 Authorized	(b) 2015 Actual	(b)-(a) Difference	(b-a)/ (a) Percent Change
Diablo Canyon Power Plant Capital	$228,347	$205,012	$178,389	-$26,623	-13%
Install/Replace for Hydro Safety and Regulatory Requirements	$42,284	$40,980	$32,712	-$8,268	-20%
Install/Replace Hydro Generating Equipment	$141,854	$95,958	$109,933	$13,975	15%
Install/Replace Reservoir, Dams, and Waterways	$144,554	$68,260	$52,214	-$16,046	-24%
Install/Replace Hydro Building, Grounds , and Infrastructure	$17,420	$13,007	$11,727	-$1,280	-10%
Install/Replace Fossil Safety and Regulation	-	-	$122	$122	-
Install/Replace Fossil Generating Equipment	$4,043	$738	$5,897	$5,159	699%
Install/Replace Fossil Building, Grounds, and Infrastructure	-	$541	$2,249	$1,708	316%
Install/Replace Alternative Generation Safety and Regulation	$43	$35	$0	-$35	-100%
Install/Replace Alternative Generation Equipment	-	-	$289	$289	-
Nuclear Safety and Security	-	-	$43,286	$43,286	-
Total	**$578,546**	**$424,530**	**$436,818**	**$12,288**	**3%**

Install/Replace Fossil Safety and Regulatory Requirements, Install/Replace Alternative Generation Equipment, and Nuclear Safety and Security Programs were not explicitly forecasted or authorized.

Figure 4-4, below, contrasts forecast, authorized, and actual capital spending across different programs in 2015.

Figure 4-4: 2015 Electric Generation Capital: Comparison of Forecast, Authorized, and Actual Spending by Major Work Category



The following section consists of individual program analysis for the capital programs which showed substantial variance from authorized.

i. Diablo Canyon Power Plant Capital (MWC 20)

PG&E's Diablo Canyon Power Plant Capital (MWC 20) forecast of $240.8 million reflects: (1) the Transformer Super-Cooler Replacement Project and (2) the DCPP Access Road Repairs project. Actual spending on DCPP Capital in 2014 was $171.1 million, which was approximately $66.4 million, or 28%, less than the $237.5 million authorized. In 2015, actual spending was $178.4 million, which was $26.6 million, or 13%, below the $205.0 million authorized.

In response to an Energy Division enquiry regarding the discrepancy, PG&E noted that the 2014 GRC-authorized amount of $237.5 million for DCPP Capital included $58.9 million for various capital balancing account orders. Subsequent to the issuance of the GRC decision, PG&E established the Nuclear Safety and Security Major Work Category (MWC 3I) in order to track capital expenditures that are eligible for the new Nuclear Regulatory balancing account that was approved in the 2014 GRC. The costs included in this category are for capital projects associated with implementing new or amended Nuclear Regulatory Commission (NRC) rules related to Fukushima, Emergency Planning, the National Fire Protection Association 805 Rulemaking, and Cyber Security. The actual costs for this new program totaled $44.1 million out of the $58.9 million that was originally allotted to this purpose in the DCPP Capital category.

PG&E further explains that "the principal reason for underspending the new MWC 3I authorized amount by $14.8 million was due to delays in implementing the Reactor Cooling Pumps (RCP) Thermal Seal projects and the Fire Detection modifications — both NFPA 805 [National Fire Protection Association 805 Rulemaking] modifications. Both of these projects require a refueling outage window for implementation, and they were delayed by one refueling

cycle (or about 18 months) due to issues related to vendor acceptance testing and design complexity."[37]

The adjusted DCPP Capital authorized amount for 2014 is $178.6 million. According to PG&E "[t]he principal reason for underspending the adjusted MWC 20 authorized amount by $7.5 million was cancellation of the Main Bank Transformer Fire Barriers project. Alternative solutions have been developed to manage the risk of transformer fires."

Similarly, the 2015 GRC-authorized amount for DCPP Capital, $205.0 million, included $60.9 million for various capital balancing account orders that are being tracked in the Nuclear Safety and Security category. The actual costs for this new category totaled $43.3 million in 2015. PG&E explained that "the principal reason for underspending the new MWC 3I authorized amount by $17.6 million was due to delays in implementing the Fire Detection and Hot Shut Down modifications (both NFPA 805 modifications) and an overestimate of the needs for the Fukushima capital program in 2015. Both of the NFPA 805 projects were delayed by one refueling cycle, or about 18 months due to design complexity and resource availability issues."[38]

The adjusted DCPP Capital authorized spending for 2015, $144.1 million, is lower than the actual costs of $178.4 million.

PG&E further explained that, in general, the 2015 authorized capital amounts for each Major Work Category are based on a seven-year average of historical expenditures in that MWC and are not tied to specifically identified projects forecasted in the 2014 GRC. Therefore a comparison of actual to authorized amount for 2015 is not necessarily valid at the project level due to the difference in methodology. Nonetheless, according to PG&E, the principal reason for

[37] GRC-2017-PhI_DR_ED_003.
[38] Ibid.

higher spending in DCPP Capital in 2015 "was due to the identification of new scope on various security projects."[39]

ii. Install/Replace Hydro Electric Safety and Regulatory Requirement (MWC 2L)

PG&E had forecasted capital expenditures of $49.6 million and $42.3 million for Install/Replace Hydro Electric Safety and Regulatory Requirement (MWC 2L) in 2014 and 2015, respectively, for facility safety work plus other work required by various regulatory bodies. In 2014, actual spending was $39.3 million, which was approximately $8.2 million, or 17%, below the $47.5 million authorized. In 2015, actual spending was $32.7 million, which was $8.3 million, or 20%, less than the $41.0 million authorized.

Regarding the discrepancy between 2014 authorized and actual program spending on this category, PG&E noted that the primary reasons are "due to reduced contractor costs achieved by restaging work on several projects, lower priority projects cancelled, and other project work rescheduled from 2014 due to changes in planned outage schedules."

For 2015, as was mentioned before, PG&E noted that the 2015 authorized capital amounts for the Major Work Category are based on a seven-year average of historical expenditures for each MWC and are not tied to specific projects. Therefore a comparison of 2015 actual to authorized spending is not necessarily valid at the project level due to the difference in methodology. Nonetheless, PG&E noted that "the lower than authorized spending in MWC 2L was primarily due to delays in permitting on various projects pushing work to 2016 and higher realized capital efficiencies."[40]

iii. Install/Replace Hydro Generating Equipment (MWC 2M)

PG&E had forecasted $121.7 million in Install/Replace Hydro Generating Equipment (MWC 2M) for the installation or replacement of unreliable, obsolete, and degraded hydro

[39] GRC-2017-PhI_DR_ED_003.
[40] GRC-2017-PhI_DR_ED_003.

generating equipment. This forecast included $60.3 million for Generator Systems, $49.1 million for Turbine Systems, and $12.2 million for Protection, Controls, and Ancillary Electrical Equipment. The Turbine System projects were forecasted to improve operating efficiency. PG&E forecasted $141.9 million for this category in 2015.

In 2014, actual spending on Install/Replace Hydro Generating Equipment was $91.8 million. This spending was approximately $19.4 million, or 17%, below the authorized level of $111.2 million. In 2015, actual spending on this category was $110.0 million, which was $14.0 million, or 15%, above the authorized level of $96.0 million. PG&E noted that the primary reasons for the discrepancy between authorized and actual spending included the cancellation of the Kern Canyon runner replacement project and the receipt of two renewable energy grants.

PG&E further noted that, while a comparison of 2015 actual to authorized spending is not necessarily valid at the project level due to the difference in methodology, the primary reason spending on "MWC 2M was higher in 2015 was due to the Helms rotor replacement projects."[41]

iv. Install/Replace Reservoirs, Dams, and Waterways (MWC 2N)

PG&E had forecasted $86.2 million for Install/Replace Reservoirs, Dams, and Waterways (MWC 2N). These costs were to modify and replace hydro dams and appurtenant facilities, including $39.2 million for canals, $24.8 million for penstock systems, $17.6 million for dams, and $4.5 million for flumes. During the 2014 GRC proceeding, PG&E claimed that the increased funding was required to enhance public safety, improve water conveyance reliability, and improve the condition of dams, reservoirs, and waterways. PG&E argued that the ongoing Asset Management and Enterprise Risk Management processes would cause spending in this category to increase because additional facility assessments could identify weaknesses in PG&E water storage and conveyance facilities.

[41] GRC-2017-PhI_DR_ED_003.

In 2014, actual spending in this category was $49.1 million, which was $30.0 million, or 38%, lower than the $79.1 million authorized. In 2015, actual spending was $52.2 million, which was $16 million, or 24%, below the authorized level of $68.3 million.

PG&E noted that the discrepancy between authorized and actual spending was primarily "due to rescheduling of work at the Potter Valley penstock due to materials availability, cancellation of the Centerville penstock replacement, reduced costs of canal repairs due to asset management efficiency programs such as implementing new standardized designs, bundling contracts, and prioritizing the portfolio of water conveyance projects."

PG&E also noted that while a comparison of 2015 actual to authorized spending is not necessarily valid at the project level due to the difference in methodology explained above, the primary reason for underspending is that the historical data used to estimate the authorized amount included a very large dam project, which inflated the historical average.

v. Install/Replace Hydro Buildings, Grounds, and Infrastructure (MWC 2P)

PG&E had forecasted $16.7 million for 2014 in Install/Replace Hydro Buildings, Grounds, and Infrastructure (MWC 2P) for 32 different infrastructure projects and programs. Major elements of the forecast included starting construction on the Auburn hydro service center replacement (forecast to cost $6.0 million) and rebuilding the deteriorated Bucks Creek portal road and the Caribou access road (forecast to cost $3.0 million and $1.5 million respectively). Other infrastructure projects included road, bridge, valve house, roof, and telecommunication improvements, plus the removal of abandoned buildings. PG&E forecasted $17.4 million for 2015 in this category.

Actual 2014 spending on Install/Replace Hydro Buildings, Grounds, and Infrastructure was $8.2 million, which was approximately $6.8 million, or 45%, less than the $15.1 million

authorized. In 2015, actual spending was $11.7 million, which was $1.3 million, or 10%, below the authorized level of $13.0 million.

PG&E noted that the discrepancy between 2014 authorized and actual costs "was due to the timing of expenditures on the Hydro Service Center project, rescheduling of a Helms pump installation project to align with the planned outage schedule, and rescheduling of several road replacement projects."[42]

For 2015, PG&E noted that the authorized amount for each Major Work Category is not tied to specific projects, therefore a comparison of 2015 actual to authorized spending is not possible due to the difference in methodology.

vi. Install/Replace Fossil Buildings, Grounds, and Infrastructure (MWC 2T)

PG&E's forecast of $694,000 in Install/Replace Fossil Buildings, Grounds, and Infrastructure (MWC 2T) for 2014 included capital costs to install or replace buildings, grounds, and infrastructure on the plant site to support fossil generation activities.

Actual 2014 spending on this category was $49,000, which was approximately $577,000, or 92%, below the authorized level of $626,000. In 2015, actual spending was $2.2 million, which was approximately $1.7 million, or 316%, above the authorized level of $541,000.

PG&E stated that the primary reason for the discrepancy between 2014 authorized and actual spending "was due to the cancellation of the Humboldt Bay Generating Station Warehouse and Workshop project."

For 2015, PG&E noted that while a comparison of 2015 actual to authorized spending is not possible due to the difference in methodology, the primary reason for overspending is that the historical spending used to estimate the authorized amount in this category is very low. In

[42] GRC-2017-PhI_DR_ED_003.

2015, specific projects were needed "including the replacement of the Canal Bridge at Colusa Generating Station."[43]

vii. Install/Replace Fossil Generating Equipment (2S)

PG&E forecast $948,000 for 2014 in Install/Replace Fossil Generating Equipment (MWC 2S). This category includes capital costs to install new, or to replace existing, generating equipment or components to support fossil generation activities. More specifically, the majority of the forecast included the following projects: Gateway Generating Station (GGS) GE Mark V Controls; GGS and Colusa Generating Station (CGS) Spare Step-up Transformer; GGS and CGS Auxiliary Boiler; GGS Combustion Turbine Compressor Upgrades; Humboldt Bay Generating Station (HBGS) Heat Recovery Generators; HBGS GHG Reduction Equipment; HBGS Capital Emergency Spare Generator; and HBGS and CGS Capital Emergency Spare Parts. PG&E had forecasted $4 million for MWC 2S in 2015.

Actual 2014 spending on this category was $8.7 million, which was approximately $7.8 million, or 918%, more than the $855,000 authorized. In 2015, actual spending was $5.9 million, which was $5.2 million, or 699%, above the authorized level of $738,000.

In response to an Energy Division enquiry regarding the discrepancy between authorized and actual spending, PG&E explained that the primary reason "was due to an emergent project for major work on the Colusa Generating Station steam turbine generator."[44] For 2015, PG&E noted that the authorized amount for each Major Work Category is not tied to specific projects, therefore a comparison of 2015 actual to authorized amount is not necessarily valid due to the difference in methodology.

[43] GRC-2017-PhI_DR_ED_003.
[44] GRC-2017-PhI_DR_ED_003

V. Gas Distribution

In response to Energy Division discovery, PG&E identified 14 safety-related gas distribution expense programs and eight safety-related gas distribution capital expenditure programs.

PG&E forecast a total of $413.1 million in safety program expense for test year 2014. Of that total, the Commission ultimately approved $358.5 million, or 87% of PG&E's forecast. Actual expense spending for 2014 was $366.1 million, or 2% more than authorized. For 2015, PG&E was authorized about $365.6 million, while actual spending was $378.2 million, or 3% more than authorized.

Table 5-1: 2014 Gas Distribution Expense and Capital Spending ($000s)

	2014 Forecast	(a) **2014 Authorized**	(b) **2014 Actual**	(b-a)/(a) **Percent Change**
Expense	$413,107	$358,487	$366,120	2%
Capital	$603,480	$539,302	$403,278	-25%
Total	$1,016,587	$897,789	$769,398	-14%

For the year 2014, PG&E forecast a total of $603.5 million in capital expenditures, of which the Commission ultimately approved $539.3 million, or 89%. PG&E's actual safety program capital expenditures for 2014 amounted to $403.3 million, or 25% less than authorized.

Table 5-2: 2015 Gas Distribution Capital and Expense Spending ($000s)

	2015 Forecast	(a) **2015 Authorized**	(b) **2015 Actual**	(b-a)/(a) **Percent Change**
Expense*		$365,641	$378,204	3%
Capital	$613,473	$465,517	$484,447	4%
Total		$831,158	$862,651	4%

*PG&E does not create attrition year forecasts for expense spending in the GRC.

For the year 2015, PG&E forecast a total of $ 613.5 million in capital expenditures, of which the Commission ultimately approved $465.5 million, or 76%. PG&E's actual safety program related capital expenditures for 2015 amounted to $484.4 million, or 4% more than authorized.

a. Gas Distribution Expense Spending

Overview

Total 2014 expense spending for all 14 identified safety-related gas distribution expense programs is summarized in Table 5-3. Total 2015 expense spending is summarized in Table 5-4.

Table 5-3: 2014 Gas Distribution Expense Spending ($000s)

Major Work Category	2014 Forecast	(a) 2014 Authorized	(b) 2014 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Provide Field Service	$105,956	$98,665	$104,564	$5,899	6%
Gas Distribution Leak Survey	$33,840	$25,222	$25,220	-$3	0%
Gas and Electric Transmission and Distribution Locate and Mark	$39,049	$39,264	$37,687	-$1,577	-4%
Gas Distribution Cathodic Protection	$12,610	$12,583	$10,495	-$2,088	-17%
Gas Distribution Meter Protection	$917	$918	$2,679	$1,761	192%
Gas Distribution Operate System	$12,988	$12,985	$12,286	-$699	-5%
Gas Distribution Preventive Maintenance	$28,266	$28,210	$18,043	-$10,168	-36%
Gas Distribution Corrective Maintenance	$102,141	$73,394	$73,404	$10	0%
Gas Distribution Mapping	$16,199	$14,800	$6,396	-$8,404	-57%
Gas Distribution Planning and Operations Engineer	$6,133	$6,172	$8,957	$2,784	45%
Change/Maintain Used Gas Meters	$7,756	$5,713	$5,211	-$501	-9%
Gas Distribution Integrity Management	$47,253	$40,560	$32,769	-$7,791	-19%
Gas Distribution Leak Survey & Repair	-	-	$28,409	$28,409	-
Total	**$413,107**	**$358,487**	**$366,120**	**$7,633**	**2%**
Total (Excluding Leak Survey/Repair)[45]			**$337,711**		**-6%**

Source: GRC-2017-PhI_DR_ED_001-Q01Atch01

[45] This total excludes spending in MWC JU Leak Survey and Repair, as this spending was above the balancing account caps authorized in D. 14-08-032, as discussed below.

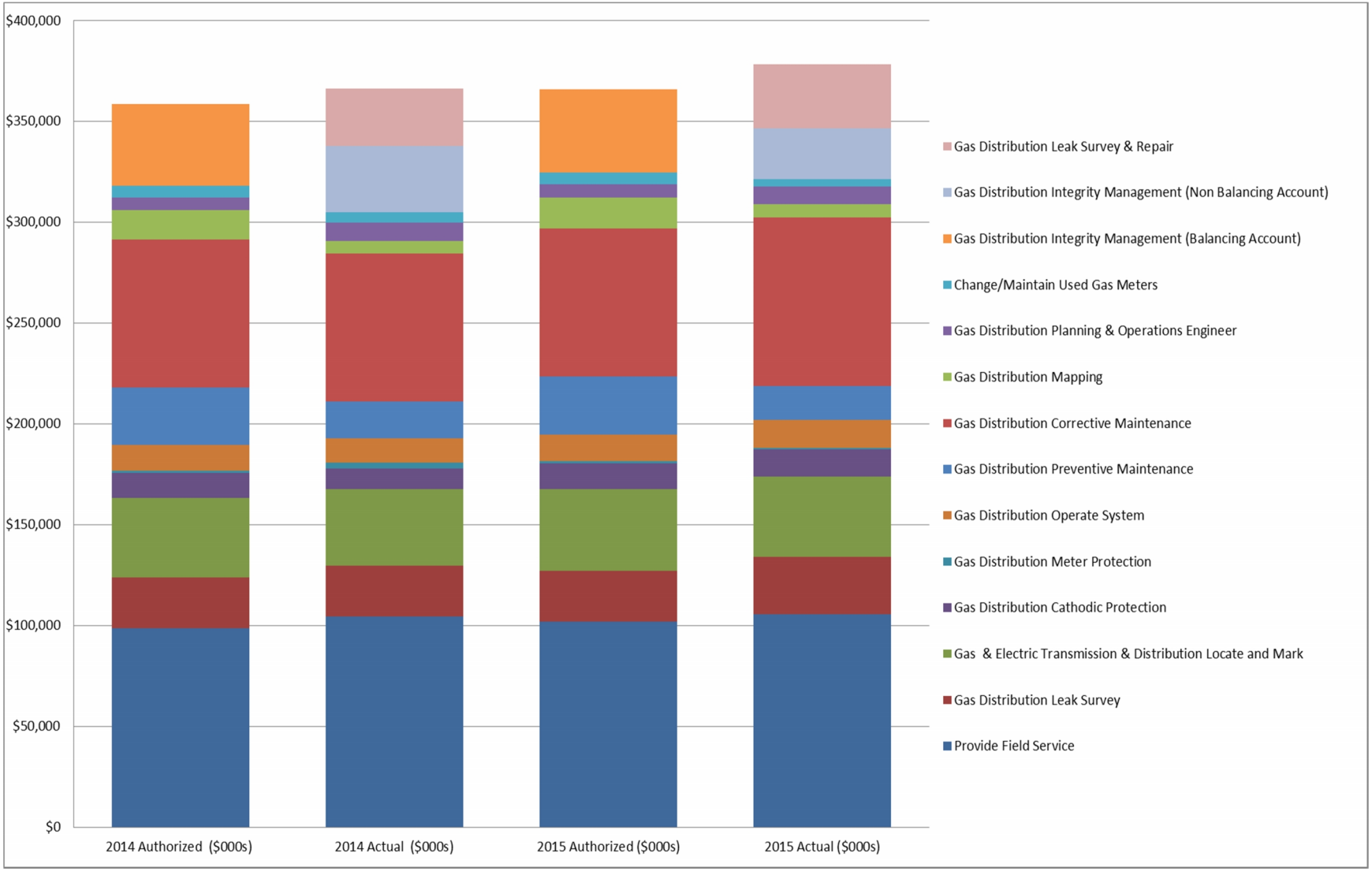
Table 5-4: 2015 Gas Distribution Expense Spending ($000s)

Major Work Category	(a) 2015 Authorized	(b) 2015 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Provide Field Service	$101,753	$105,653	$3,900	4%
Gas Distribution Leak Survey	$25,222	$28,270	$3,047	12%
Gas and Electric Transmission and Distribution Locate and Mark	$40,467	$39,770	-$697	-2%
Gas Distribution Cathodic Protection	$12,937	$13,710	$773	6%
Gas Distribution Meter Protection	$946	$503	-$443	-47%
Gas Distribution Operate System	$13,362	$14,099	$737	6%
Gas Distribution Preventive Maintenance	$28,891	$16,691	-$12,200	-42%
Gas Distribution Corrective Maintenance	$73,394	$83,520	$10,127	14%
Gas Distribution Mapping	$15,278	$6,566	-$8,712	-57%
Gas Distribution Planning and Operations Engineer	$6,368	$8,645	$2,277	36%
Change/Maintain Used Gas Meters	$5,742	$3,726	-$2,016	-35%
Gas Distribution Integrity Management	$41,280	$25,437	-$15,843	-38%
Gas Distribution Leak Survey and Repair	-	$31,613	$31,613	-
Total	**$365,641**	**$378,204**	**$12,563**	**3%**
Total (Excluding Leak Survey/Repair)		**$321,154**		**-5%**

Source: GRC-2017-PhI_DR_ED_001-Q01Atch01

Including all expense program spending, PG&E spent 2% more than authorized in 2014 and 3% more than authorized in 2015. The tables above also include a total excluding Leak Survey and Repair spending in MWC JU, which was above balancing account caps authorized in D. 14-08-032 and thus not authorized to be recovered from ratepayers. Excluding this program from actual spending, PG&E spent less than what was authorized. Excluding this program results in total expense spending that was 15% less than what was authorized for 2014 and 12% below what was authorized for 2015.

Figure 5-1: 2014-2015 Gas Distribution Expense: Comparison of Authorized and Actual Spending by Major Work Category



Source: GRC-2017-PhI_DR_ED_001-Q01Atch01

Figure 5-1, above, illustrates PG&E's gas distribution safety program expense spending for 2014 and 2015. As shown in Figure 5-1, PG&E's 2014 and 2105 expense safety program spending varies from authorized, in some cases substantially. Both Gas Distribution Mapping and Gas Distribution Preventative Maintenance program spending was, in percentage terms, far below authorized. Leak Survey and Repair also saw substantial spending that was not explicitly authorized, as discussed below. The following section consists of individual program analysis for the expense programs that showed substantial variance from the authorized amount.

i. Gas Distribution Integrity Management (MWC JS & JQ)

According to PG&E's 2014 GRC filing, this program contains PG&E's efforts to comply with federal pipeline safety requirements and includes diverse activities such as locating and mitigating cross-bored sewer pipes and replacing older vintage plastic pipe, which has proved susceptible to brittle cracking. PG&E reported spending $32.8 million on Gas Distribution Integrity Management (DIMP) in 2014 and $25.4 million in 2015.

Prior to 2014, DIMP spending was categorized under MWC JS and was recovered through a one-way balancing account. The Commission ordered PG&E to close this balancing account in 2014, stating that:

> The DIMP has now become more established, and its costs can reasonably be estimated without the extraordinary requirement for balancing account treatment. PG&E shall remain responsible for managing DIMP costs without the protections of—or constraints of—a balancing account.[46]

[46] D 14-08-032, at pp. 56.

Table 5-5: Gas Distribution Integrity Management Spending ($000s)

	2014	2015
Authorized (a)	$40,560	$41,280
Actual (b)	$32,769	$25,437
Percent Change (b)-(a)/(a)	-19%	-38%

Source: GRC-2017-PhI_DR_ED_001-Q01Atch01

Table 5-5 shows actual spending as a percentage of authorized spending. Actual program spending was 19% less than authorized for 2014, and was 38% less than authorized in 2015. Actual spending was considerably less than was forecast and authorized. In the 2014 GRC, ORA proposed an authorization of $25.6 million for DIMP work. PG&E opposed this proposal, and stated that given this level of funding, PG&E "would have to scale back its program to a level below 2012 recorded costs."[47] PG&E's actual spending for DIMP in 2015 was $25.4 million.

ii. Leak Survey and Repair (MWC JU)

Leak Survey and Repair is represented by several individual safety programs, which are separated by funding stream. In D. 14-08-032, the Commission adopted two main funding sources for leak survey and repair. As a minimum, the Commission adopted a set revenue requirement for MWC DE of $25.2 million in 2014. In 2014 and 2015, PG&E spent $25.2 million and $28.3 million, respectively.

Due to the uncertainty surrounding new leak detection technologies, the Commission also adopted a method for PG&E to recover prudently incurred expenses above that revenue requirement through a two-way balancing account. In authorizing balancing account treatment for recovery of costs above the minimum revenue requirements, the Commission included cost caps to protect ratepayers. The Commission stated that: "Costs recoverable through the balancing account will be based on actual units of work, but limited to the adopted per-unit

[47] Ibid. at pp. 55.

labor and overhead rates for the applicable work activity and capped at PG&E's forecast amounts."[48] In this case, PG&E had forecast $33.8 million.

In 2017 testimony, PG&E described the treatment as follows:

> The Commission therefore adopted a hybrid one-way/two-way balancing account that set the initial revenue requirement at the level recommended by The Utility Reform Network, which was lower than PG&E's 2014 forecast, but allowed PG&E to recover additional costs, up to a maximum cap set at PG&E's 2014 forecast, with no escalation in the attrition years. The Commission then left it to PG&E to determine the best use of resources within these funding limits.[49]

MWC JU represents the expenses incurred over and above the limits of that balancing account. PG&E reported spending $28.4 million in 2014 and $31.6 million in 2015 above the limits adopted in D. 14-08-032. In response to an Energy Division data request, PG&E reported that this expense above the balancing account limits was funded by shareholders.[50]

Leak detection and repair is a core safety function for any gas utility. Starting in 2014, PG&E adopted new leak detection technologies that were, at the time, expected to increase leak detection. PG&E requested a substantial increase in leak detection funding and received the majority of that request. The company gave two major justifications for its forecast: an increase in leak detection due to the introduction of the Picarro leak surveyor and the move from a five- to a three-year leak survey cycle.[51] Although the Commission authorized the majority of the funding the company had requested in 2014, the move away from a five-year

[48] Ibid. at pp. 80.
[49] PG&E 2017 Ex. 3 at pp. 6C-13
[50] ED DR 2, Q17.
[51] 2014 Exhibit PG&E-3, Ch. 5, pp. 5-19.

leak survey cycle has yet to occur. In its 2017 GRC, PG&E has proposed moving from a five-year to a four-year leak survey cycle.[52]

PG&E spent much more in 2014 and 2015 on leak survey and repair than was authorized and by its own admission did not meet one of its key goals for the past rate cycle. The overspending relative to the authorized maximum spending came at shareholder expense rather than from ratepayers.

iii. Preventative Maintenance (MWC FH)

PG&E spent much less than was authorized on Gas Distribution Preventative Maintenance in the 2014-2015 period. PG&E was authorized $28.2 million in expense spending in 2014 and $28.9 million in 2015. Actual program spending was $18.0 million in 2014, which was 36% less than authorized. Actual program spending for 2015 was $16.7 million or 32% less than authorized.

In 2014 testimony, PG&E described the program as follows:

> MWC FH captures the preventative maintenance activities for the Company's gas distribution system. These activities include proactive maintenance intended to increase the useful life of an asset and reduce the likelihood of the asset becoming inoperative, breaking or failing.[53]

PG&E identified two main factors driving the increase in forecast costs. PG&E stated:

> The main drivers impacting the increase in forecast are the $3.1 million…for the dedicated above ground paint crew and the $4.0 million… for low vent elevation

[52] 2017 Exhibit PG&E-3, Ch. 6c, pp. 6c-18.
[53] GRC 2014 Exhibit PG&E-3, Ch. 5, pp. 5-18.

reconstruction to mitigate the risk of an over-pressurization of the gas distribution system caused by flooding.[54]

In 2017 testimony, PG&E explained the shortfalls in spending relative to authorized levels by stating that one of the key programs for 2014 — a dedicated above-ground paint crew — had not been achieved. In response to an Energy Division data request on the matter, PG&E stated that "the painting work was included in MWC FH in the 2014 GRC, but it was rescheduled in order to first collect the manual field inspection records and prioritize the work."[55] In response to an ORA data request on the matter, PG&E elaborated that the company "anticipates ramping up the AC mitigation work in 2016 and forming the crews in 2017."[56]

The other key 2014 program — raising the height of vault vents — was also deferred to the 2017 GRC. Both key programs used by PG&E to justify the increase in forecast expenses in Gas Distribution Preventative Maintenance were deferred to 2017 or later. In fact, PG&E's expense spending in the program area for 2014-2015 was in-line with actual spending in 2011-2013, as provided in PG&E's 2017 GRC testimony. While PG&E requested and received additional funding in the 2014 GRC, the company continued to spend at prior levels and did not complete the key projects for which the company requested additional dollars.

iv. Mapping (MWC GF)

In D 14-08-032, the Commission approved the bulk of PG&E's forecast[57] for gas distribution mapping. In doing so the Commission stated that "inaccurate location information is

[54] Ibid.
[55] GRC-2017-PhI_DR_ED_001-Q01Atch01.
[56] GRC-2017-PhI_DR_ORA_050-Q09.
[57] The Commission approved PG&E's forecast with the exception of $1.3 million in contingency, and a reduction from 85 to 80 in-house mappers. D 14-08-032, at pp. 41-3.

a significant contributing factor to excavation damage, which is the largest contributor to PG&E's distribution system risk."[58]

Although the Commission identified gas distribution mapping as a priority safety activity, and though nearly all of PG&E's 2014 request was approved, PG&E's actual spending in the area was only 43% of authorized in 2014, and 44% in 2015. PG&E's 2017 forecast for gas distribution mapping is in line with actual spending in 2014-2015, at $6.2 million in 2016 and $6.4 million in 2017.

In calling for the increase in 2014 testimony, PG&E indicated that the extra funding was necessary for a project to collect and digitize as-built records. However, in 2017 testimony PG&E indicated that the program has not yet begun. PG&E explained that "due to postponement of the final decision of the 2014 GRC and requirement interdependencies with the Pathfinder Project, the kickoff of this effort was delayed until 2015 and a new completion date is planned for 2017."[59] Separately in the 2017 GRC, PG&E has requested $15 million for the as-built records project in 2017, over and above what was already collected in 2014.

b. Gas Distribution Capital Spending

In response to Energy Division discovery, PG&E's identified 14 safety-related capital expenditure programs. Total capital expenditure for all programs in 2014 is summarized in Table 5-6. Total capital expenditure for all programs in 2015 is summarized in Table 5-7.

[58] D 14-08-032, at pp. 41.
[59] GRC 2017 Exhibit PG&E-3, Ch. 5, pp 9-22

Table 5-6: 2014 Gas Distribution Capital Expenditure Spending ($000s)

Major Work Category	2014 Forecast	(a) 2014 Authorized	(b) 2014 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Gas Distribution Pipeline Replacement Program	$331,190	$303,973	$188,224	-$115,748	-38%
Gas Meter Protection: Capital	$246	$245	$1,877	$1,632	667%
Gas Distribution Capacity	$15,138	$15,045	$25,907	$10,863	72%
Gas Distribution Reliability General	$128,055	$111,404	$124,168	$12,763	11%
Gas Distribution Leak Replacement/Emergency	$614	$610	$8,007	$7,397	1213%
Install New Gas Meters	$14,879	$4,021	$4,849	$828	21%
Gas Distribution Replace/Convert Customer High Pressure Regulator	$51,150	$50,835	$24,688	-$26,146	-51%
Gas Distribution Central Operations Assets	$62,209	$53,170	$25,557	-$27,613	-52%
Total	**$603,480**	**$539,302**	**$403,278**	**-$136,024**	**-25%**

Source: GRC-2017-PhI_DR_ED_001-Q01Atch01

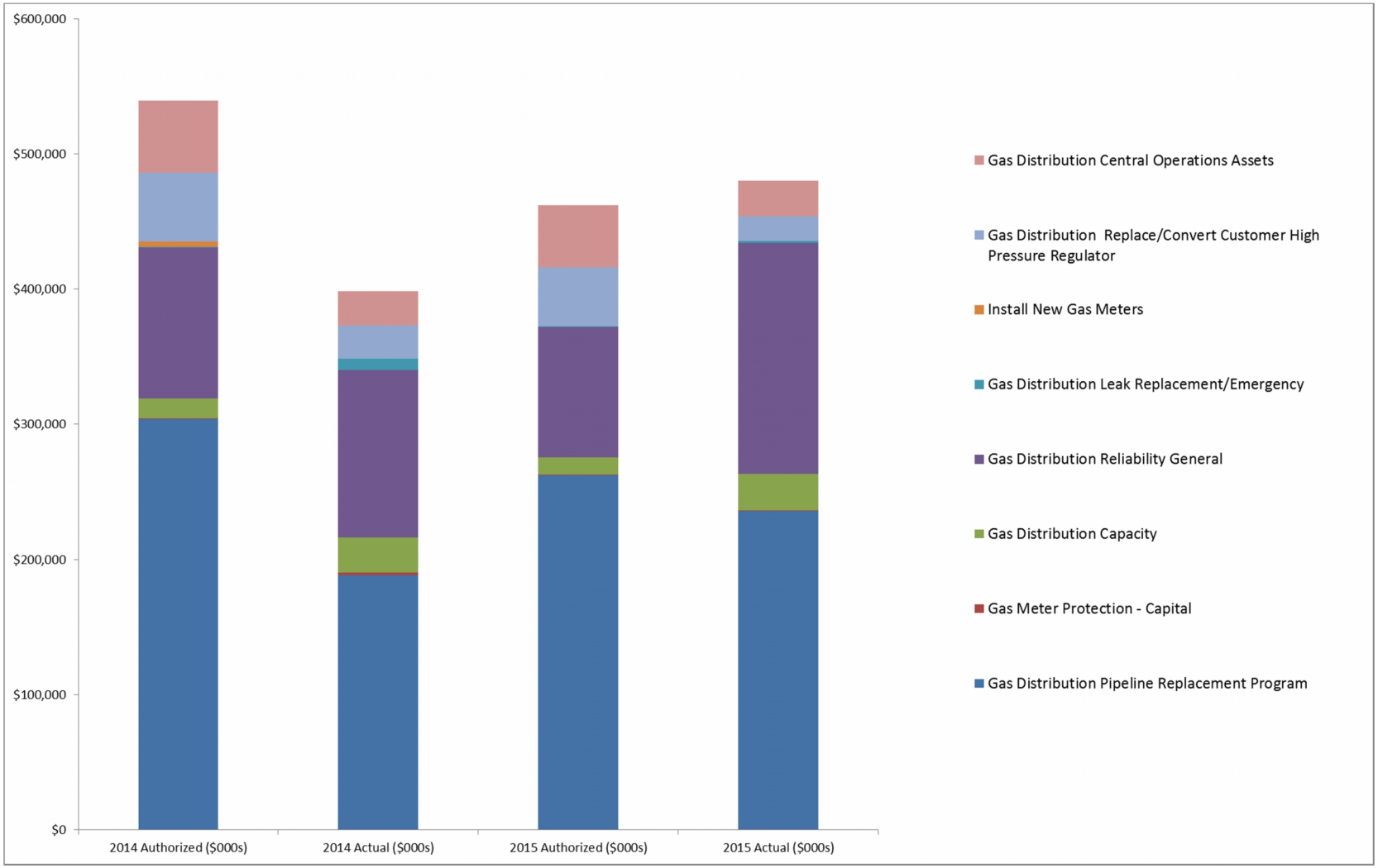
Table 5-7: 2015 Capital Expenditure Spending ($000s)

Major Work Category	2015 Forecast	(a) 2015 Authorized	(b) 2015 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Gas Distribution Pipeline Replacement Program	$336,625	$262,385	$235,633	-$26,752	-10%
Gas Meter Protection: Capital	$252	$211	$639	$428	203%
Gas Distribution Capacity	$15,615	$12,986	$26,960	$13,974	108%
Gas Distribution Reliability General	$129,914	$96,163	$171,002	$74,840	78%
Gas Distribution Leak Replacement/Emergency	$625	$527	$1,439	$913	173%
Install New Gas Meters	$15,363	$3,471	$4,311	$841	24%
Gas Distribution Replace/Convert Customer High Pressure Regulator	$52,071	$43,880	$17,786	-$26,093	-59%
Gas Distribution Central Operations Assets	$63,008	$45,896	$26,676	-$19,220	-42%
Total	**$613,473**	**$465,517**	**$484,447**	**$18,930**	**4%**

Source: GRC-2017-PhI_DR_ED_001-Q01Atch01

As shown Tables 5-6 and 5-7, total safety-related capital expenditures were 25% less than authorized in 2014 and 4% more than authorized in 2015. Capital expenditures for the 14 safety-related programs are illustrated in Figure 5-2, which shows actual spending in relation to authorized levels for the years 2014 and 2015.

Figure 5-2: 2014-2015 Gas Distribution Capital Spending: Comparison of Authorized and Actual Spending by Major Work Category



Source: GRC-2017-PhI_DR_ED_001-Q01Atch01

As shown in the figure above, there was significant variance between authorized capital expenditures and PG&E's actual spending. Three programs stand out as having the most significant differences and are described in detail below.

i. Pipeline Replacement Program (MWC 14)

PG&E spent substantially less than was authorized for the Gas Distribution Pipeline Replacement program in 2014 and 2015. In testimony for the 2014 GRC, PG&E had forecast $331.2 million in 2014 and $336.6 in 2015. The Commission authorized $304 million in 2014 and $262.4 million in 2015. PG&E's actual spending for those years was $188.2 and $235.6 million, or 62% and 90% of authorized.

PG&E states in 2014 testimony that the Gas Pipeline Replacement Program, established in 1985, was originally intended to replace cast iron and pre-1931 steel mains. The scope of the program has since been modified to target other gas mains and service lines which could pose an increased risk of failure. In 2014, the Commission authorized replacement of 27 miles of pre-1940 steel pipe, and 139 miles of pre-1973 Aldyl-A plastic pipe on an annual basis. In 2014, PG&E actually replaced 26.6 miles of pre-1940 steel and cast iron, 32 miles of Aldyl-A plastic and seven miles of reliability main. This was far lower than the company had estimated in the 2014 GRC.

In response to Energy Division data requests regarding the relative underspending on gas main replacement, PG&E indicated that the company had reprioritized approximately $100 million in 2014 funding from main replacement to service line replacement. PG&E indicated that the adjustments were considered in terms of risk and that it was determined that the pipeline replacement program was a lower priority within the Gas Operations portfolio.

PG&E indicated that it had spent almost $90 million more than was authorized for gas service replacement (MWC 50) in 2014 and 2015, and that this was a primary driver of lower spending on the gas pipeline replacement program (MWC 14). PG&E explained that there was a 2014 shift in policy towards replacing rather repairing leaking steel, copper, Aldyl-A and pre-1985 plastic gas services, and that funding authorized for the gas pipeline replacement program was reprioritized to facilitate these service line replacements.

ii. Replace/Convert Customer High Pressure Regulator (MWC 2K)

High Pressure Regulators (HPR), commonly referred to as "Farm Taps," are small diameter regulator sets served directly from a transmission pipeline.[60] In testimony for the 2014 GRC, PG&E had forecast $51.1 million in 2014 and $52.1 in 2015 for the HPR replacement program. The Commission authorized $50.8 million and $43.9 million respectively. PG&E's actual spending was $24.7 and $17.8 million or 49% and 41% of authorized.

PG&E's 2014 GRC forecast reflected a plan to address about 1,000 HPRs per year through 2015. The Commission ultimately adopted PG&E's proposed plan. However, during the 2014-2105 period PG&E determined that that the relative risk of failure for an HPR was less than system components in other program areas, and thus the utility prioritized spending away from the HPR replacement program.[61]

iii. Central Operations Assets (MWC 4A)

This program consists of Supervisory Control and Data Acquisition (SCADA) devices that monitor pressure at key points on the gas distribution system. PG&E states that the capital projects within this program consist of "these devices, and the software and communication systems that support them."[62] In testimony for the 2014 GRC, PG&E had forecast $62.2 million in 2014 and $63 million in 2015. The Commission authorized $53.1 million and $45.9 million respectively. PG&E's actual spending was $25.6 and $26.7 million, or 48% and 58% of authorized.

To explain this variance, PG&E cites unacceptably high unit costs. In response to higher than forecast unit costs, PG&E slowed deployment and initiated a study of the causes of the higher than expected costs. PG&E states that in the 2014 Risk-Informed Budget Allocation

[60] 2014 Exhibit PG&E-3, Ch. 8, pp. 8-23.
[61] 2017 Exhibit PG&E-3, Ch. 5, pp. 5-16 states that "The 2013 risk assessment results indicated HPRs posed a lower risk relative to other PG&E gas distribution assets."
[62] 2017 Exhibit PG&E-3, Ch. 7, pp. 7-18.

process, funding was reprioritized away from the program.[63] The result was actual spending levels at approximately 50% of authorized.

[63] 2017 Exhibit PG&E-3, Ch. 7, pp. 7-21.

VI. Other Safety-Related Programs

In response to Energy Division discovery, PG&E identified 10 other safety-related expense programs and three other safety-related capital expenditure programs. These programs fall under the Shared Services, Information Technology, and Administrative and General GRC categories.

Shared Services includes the Safety Department, Transportation Services, Supply Chain management, Real Estate, and the Environmental Program.[64] Information Technology includes costs for companywide IT projects and systems, including cybersecurity. Administrative and General (A&G) is made up of the Corporate Services organizations that provide support to all PG&E's Lines of Business. Among the departments that fall into this category are: Law, Financial, Risk and Audit, Regulatory Relations, and Human Resources.[65]

Corporate Services costs are represented differently in the GRC than those from other Lines of Business. Since A&G costs are general and not directly attributable any specific utility function, most are not given Major Work Category codes. Rather, most data is presented at the department level. However, some specific Corporate Services projects, such as IT projects, do have MWC codes.

Since all the divisions in the "other" cost category have functions that cut across the business, most of the Major Work Categories examined below serve as catch-alls for a variety of different kinds of projects. For example, all IT projects performed for Corporate Services are placed in the same category despite the fact that some of these projects are safety related, and some are not. When looking at the data in this section of the report, it is important to remember that not all of the costs presented in the tables below are for safety-related spending.

[64] PG&E GRC Rate Case Prepared Testimony, Exhibit 7, pp. 1-1–1-2.
[65] PG&E GRC Rate Case Prepared Testimony, Exhibit 9, pp. 1-1–1-2.

For the test year 2014, PG&E forecast a total of $366.9 million in other safety-related program expense spending. Of that total, the Commission ultimately approved a total of $353.6 million for 2014, or 96% of the forecast. Actual 2014 expense spending was $305.3 million, or 14% less than authorized. For 2014 capital expenditures, PG&E forecast $317.4 million, of which the Commission ultimately approved $294.4 million, or about 93% of the amount forecasted. Actual capital spending was $246.4 million in 2014, or 16% less than authorized.

Table 6-1: 2014 Other Safety-Related Expense and Capital Spending ($000s)

	2014 Forecast	(a) **2014 Authorized**	(b) **2014 Actual**	(b-a)/(a) **Percent Change**
Expense	$366,902	$353,606	$305,335	-14%
Capital	$317,358	$294,447	$246,423	-16%
Total	$684,259	$648,054	$551,758	-15%

In 2015, the Commission approved $364.5 million for other safety-related expenses. Actual expense spending in 2015 was $329.9 million, about 9% less than authorized. For capital expenditures, PG&E forecast that it would require $296.9 million in 2015. The Commission authorized $254.2 million or 86% of the utility's request. Actual capital spending was $278.6 million or 10% more than authorized.

Table 6-2: 2015 Other Safety-Related Expense and Capital Spending ($000s)

	2015 Forecast	(c) **2015 Authorized**	(d) **2015 Actual**	(d-c)/(c) **Percent Change**
Expense*		$364,456	$329,933	-9%
Capital	$296,943	$254,162	$278,577	10%
Total		$618,618	$608,510	-2%

*PG&E does not create attrition year forecasts for expense spending in the GRC.

When the years 2014-2015 are taken together, PG&E spent less than was authorized for both expense and capital: 12% less than authorized for expense and 4% less than authorized for capital.

a. Other Expense

Overview

The 2014 and 2015 expense spending for the 10 other safety-related gas programs is summarized in Tables 6-3 and 6-4, below. Five expense programs were chosen to be discussed in detail in this section. These programs were chosen by looking at both the dollar difference between authorized and actual spending and the percent change.

The category Maintain IT Applications and Infrastructure was chosen because it is so large that the dollar value of underspending was very high even though underspending was within 10% in percentage terms. The categories Maintain Buildings, Information Technology Costs, and PG&E Academy Department were also chosen due to significant underspending. Safety Engineering and Occupational Safety and Health Administration (OSHA) Compliance was selected due to overspending.

Table 6-3: 2014 Other Safety-Related Expense Spending ($000s)

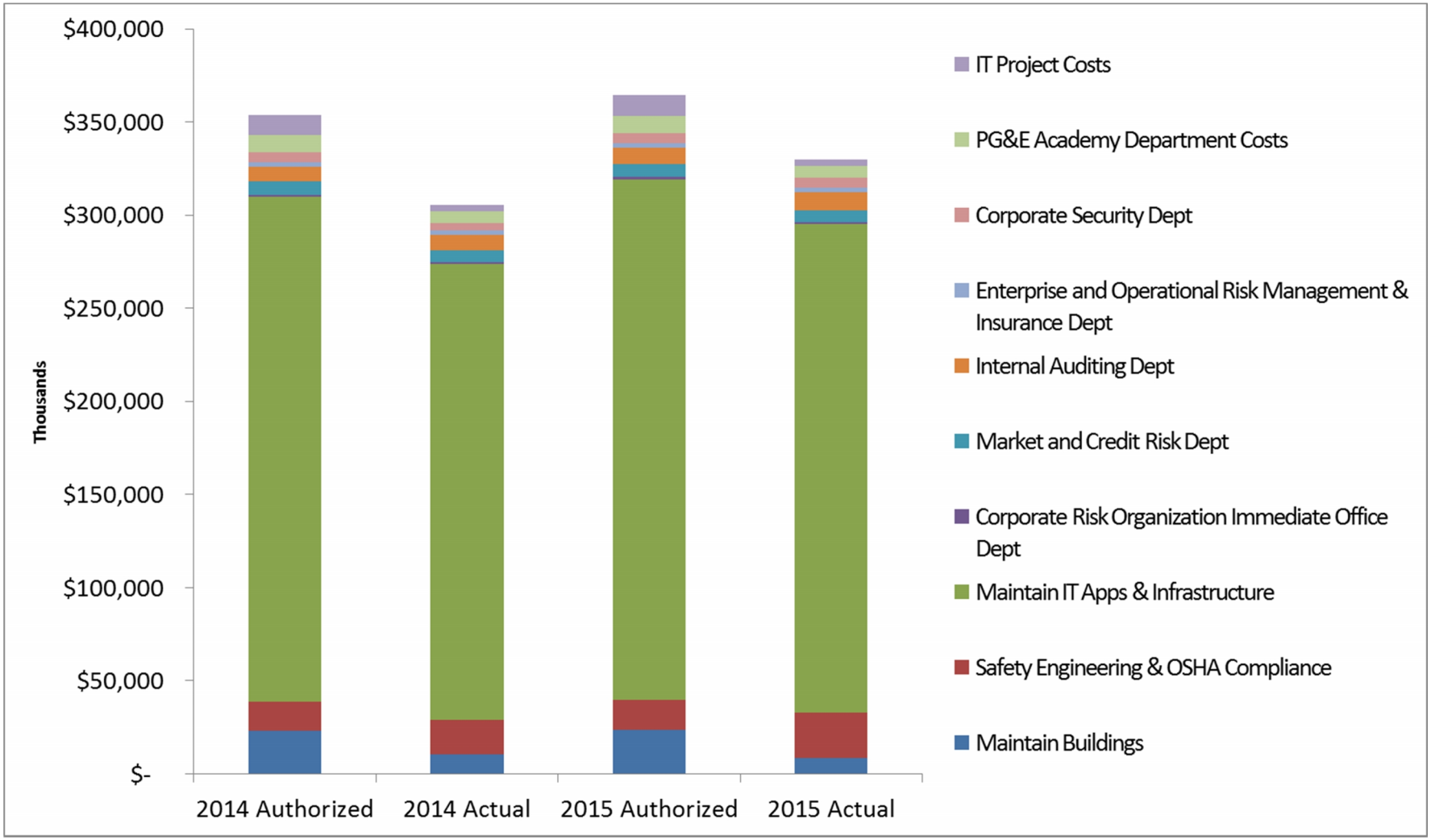
Major Work Category/Organization	2014 Forecast	(a) 2014 Authorized	(b) 2014 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Maintain Buildings	$25,114	$23,126	$10,487	-$12,638	-55%
Safety Engineering and OSHA Compliance	$15,587	$15,651	$18,491	$2,841	18%
Maintain IT Applications and Infrastructure	$275,188	$271,151	$244,866	-$26,285	-10%
Corporate Risk Organization Immediate Office Dept.	$1,124	$1,098	$976	-$123	-11%
Market and Credit Risk Dept.	$7,183	$6,955	$6,319	-$637	-9%
Internal Auditing Dept.	$8,283	$8,174	$8,366	$192	2%
Enterprise and Operational Risk Management and Insurance Dept.	$2,531	$2,450	$2,306	-$144	-6%
Corporate Security Dept.	$5,705	$5,382	$4,116	-$1,266	-24%
PG&E Academy Dept.	$13,831	$8,850	$6,250	-$2,600	-29%
IT Project Costs	$12,357	$10,769	$3,158	-$7,611	-71%
Total	**$366,902**	**$353,606**	**$305,335**	**-$48,271**	**-14%**

Table 6-4: 2015 Other Safety-Related Expense Spending ($000s)

Major Work Category/Organization	(a) 2015 Authorized	(b) 2015 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Maintain Buildings	$23,575	$8,467	-$15,108	-64%
Safety Engineering and OSHA Compliance	$16,173	$24,382	$8,209	51%
Maintain IT Applications and Infrastructure	$279,622	$262,308	-$17,314	-6%
Corporate Risk Organization Immediate Office Dept.	$1,132	$1,244	$112	10%
Market and Credit Risk Dept.	$7,187	$6,270	-$917	-13%
Internal Auditing Dept.	$8,445	$9,770	$1,325	16%
Enterprise and Operational Risk Management and Insurance Dept.	$2,531	$2,257	-$274	-11%
Corporate Security Dept.	$5,556	$5,634	$78	1%
PG&E Academy Dept.	$9,127	$6,315	-$2,812	-31%
IT Project Costs	$11,108	$3,286	-$7,822	-70%
Total	**$364,456**	**$329,933**	**-$34,523**	**-9%**

Figure 6-1 below provides a graphical view of PG&E's other expense spending in 2014-2015.

Figure 6-1: 2014-15 Other Expense: Comparison of Authorized and Actual Spending by Major Work Category/Organization



The following sections consist of individual program analysis for the expense programs which showed substantial variance from what was authorized.

i. Maintain IT Applications and Infrastructure (MWC JV)

As its name suggests, the purpose of the Maintain IT Applications and Infrastructure program is to maintain, operate, and repair the company's information technology applications, systems, and infrastructure. In 2014, PG&E spent $244.9 million out of $271.2 million authorized or 10% less than authorized. In 2015, PG&E spent $262.3 million out of $279.6 million authorized or 6% less than authorized. This category encompasses four sub-programs:

1) The Baseline sub-program: ongoing operations and maintenance of existing applications, systems, and infrastructure.

2) The Lifecycle sub-program: the physical asset and software replacement needed to maintain IT's current operational and reliability performance standards.

3) The Continuous Improvement sub-program: improving efficiency or streamlining the delivery of IT functions or services.

4) The Technology Reliability Project sub-program: in-house projects that address: (1) enabling new technology deployments across PG&E's lines of business; (2) managing reliability, or addressing security concerns with obsolete technology; or (3) fulfilling capacity needs arising from growth in PG&E's new technology environment.[66]

PG&E explains that it spent less than authorized amounts in 2014 and 2015 in order to support higher priority work in other parts of the company (e.g. gas, electric, and nuclear). In addition, the company benefited from vendor support that was obtained at lower than expected cost.

[66] Email from PG&E regulatory affairs representative Minci Han on October 7, 2016.

ii. Maintain Buildings (MWC BI)

The Maintain Buildings program was significantly underspent in both 2014 and 2015. In 2014, PG&E spent $10.5 million out of $23.1 million authorized or 55% less than authorized. In 2015, PG&E spent $8.5 million out of $23.6 million authorized or 64% less than authorized.

Maintain Buildings, which is in Major Work Category BI, falls mainly under the Real Estate division of Shared Services. A very small part of MWC BI costs are attributed to the Supply Chain: Materials Logistics and Planning section. The category includes: "costs to repair and maintain base building to extend the life of building components, correct building component deficiencies, improve equipment operating efficiencies, and increase the operating reliability of buildings and yards."[67]

The safety component of this category is seismic safety work. However, seismic upgrades make up a relatively small proportion of total Maintain Buildings spending, and not all seismic expenses listed in the GRC are safety related. The seismic category includes both Life Safety and Immediate Occupancy spending. Only Life Safety spending is considered to be safety related because it is for projects intended to prevent injuries and fatalities in the event of an earthquake. In contrast, Immediate Occupancy projects are designed to ensure that a building can be used in the immediate aftermath of an earthquake. Since Immediate Occupancy projects are not intended to protect life and health, they are not considered to be safety related.[68]

In the GRC, seismic work represented $4.2 million out of the $25.1 million forecast for the Maintain Buildings category in 2014.[69] Of that $4.2 million, PG&E states that only $3.3 million is safety related.[70] As can be seen in Table 6-5 below, PG&E spent less than forecast on safety-related seismic work.

[67] Pacific Gas and Electric Company's March 30, 2015 Budget Report in Compliance with California Public Utilities Commission Decision 14-08-032, p. 7-2.
[68] Phone conversation with PG&E, 9/20/2016.
[69] PG&E 2014 GRC Testimony, Exhibit 7 pp. 6-105.
[70] Response to verbal data request: ED_004_Detail.

Table 6-5: 2014-2015 Safety-Related Seismic Expense Forecast and Actuals ($000s)[71]

Location	2014 Forecast	2014 Actual	2015 Forecast	2015 Actual	2014-15 Forecast	2014-15 Actual
Fortuna Service Center	$800	$0.1	$0	$0	$800	$0.1
San Carlos Service Center	$2,528	$1,143	$653	$966	$3,181	$2,109
Auburn Office	$0	$0	$1,200	$0	$1,200	$0
Total	$3,328	$1,143.1	$1,853	$966	$5,181	$2,109.1

Three buildings were scheduled to be retrofitted during the years 2014-2015: the Fortuna Service Center, the San Carlos Service Center, and the Auburn Office.[72] The Fortuna seismic upgrades were finished under budget and ahead of schedule. The work was originally scheduled to begin in 2013 and to conclude in 2014. However, work began in 2012 and was mostly completed in 2013. The only costs incurred in 2014 were close-out costs of $100. The Fortuna retrofits were also completed for $710,000 less than forecast, as can be seen in Table 6-6 below.

Table 6-6: Fortuna Service Center Expense Forecast and Actual Spending ($000s)

Fortuna Service Center	2012	2013	2014	Total
2014 GRC Forecast	$0	$1,217	$800	$2,017
Actual	$76	$1,231	$0.1	$1,307.1

Work on the San Carlos Service Center was completed in 2015 for $1.1 million less than forecast. PG&E decided to defer retrofits on the Auburn Office due to the potential closure of the building. For these reasons, PG&E spent $3.1 million (59%) less on safety-related seismic work than was forecast in the GRC.

In addition to seismic work, the larger Maintain Buildings category includes Americans with Disabilities Act (ADA) compliance work and other building maintenance. The most

[71] Despite being categorized as expense, the 2014 GRC forecast included forecasts for these projects in the attrition years. See PG&E 2014 GRC Testimony, Exhibit 7, pp. 6-48 – 6-49.
[72] PG&E 2014 GRC Testimony, Exhibit 7 pp. 6-48 – 6-51.

significant reason for the difference between authorized and actual spending in the Maintain Buildings category as a whole is that PG&E allocated less money to it in the company's internal budgeting process than was authorized in the GRC. In 2014, $10.8 million was budgeted internally compared to the $23.1 million authorized by the Commission. In 2015, $6.7 million was budgeted compared to $23.6 million authorized.[73]

PG&E cited its discretion to establish budgets and reprioritize projects as justification for these changes in spending.[74]

Actual expenditures are relatively closely aligned with internal budgets: $10.5 million actual vs. $10.8 million budgeted in 2014 and $8.5 million actual vs. $6.7 million budgeted in 2015. PG&E states that 2015 actual expenses were higher than the internally budgeted amount due to higher than anticipated costs for base building work, which is not safety related. Funds from the Real Estate Strategy and Transactions category were used to cover the increased costs.

iii. PG&E Academy Department Costs

In 2014 and 2015, the category PG&E Academy Department was underspent by $2.6 million and $2.8 million respectively. Actual spending was 29% less than authorized in 2014 and 31% less in 2015.

The PG&E Academy is the utility's centralized training organization, providing safety and productivity training across the company.[75] It is part of the Human Resources Department within Corporate Services, and it is not assigned to a Major Work Category. Previously, the Academy included a Professional Development team, and costs for this team were included in the 2014 GRC. In 2014, this function and its associated costs were moved to the Talent Management organization. Actual costs for Professional Development were $2.3 million in 2014 and $2.8 million in 2015. As can be seen in Table 6-7 below, when taken together, the actual costs for Professional Development and the PG&E Academy Department are consistent with the amount

[73] Ibid.
[74] Response to data request GRC-2017-PhI_DR_ED_002-Q01Atch03.
[75] PG&E 2014 GRC Testimony, Exhibit 9 pp. 4-26, 4-29.

authorized by the Commission: $8.55 million (97% of authorized) in 2014 and $9.14 million (just over 100% of authorized) in 2015.[76]

Table 6-7: PG&E Academy and Professional Development Authorized and Actual Spending ($000s)

	2014 Authorized	2014 Actual	2015 Authorized	2015 Actual
PG&E Academy Dept.	$8,850	$6,250	$9,127	$6,315
Professional Development	$0	$2,301	$0	$2,823
Total	$8,850	$8,551	$9,127	$9,138

iv. IT Project Costs (MWC JV & KZ)

In 2014 and 2015, the category IT Project Costs, or MWC JV, was considerably underspent. Actual spending was $7.6 million (71%) less than authorized in 2014 and $7.6 million (70%) less in 2015.

This category includes "ongoing maintenance, operations and repair" [77] for IT projects used by Corporate Services as a whole. However, only six IT projects in this category are safety related. The GRC forecast included one safety-related project for Human Resources and five such projects for the Corporate Security Department, which is part of the Risk and Audit division of Corporate Services.[78] Together, safety-related projects made up $2.8 million of the $12.4 million forecasted for the work category as whole in 2014 or 23% of the total forecast.

Comparing authorized to actual spending for safety-related projects is difficult in this case for two central reasons. First, the GRC decision authorizes funding at the Major Work Category level, not at the project level. Therefore, we can see that PG&E forecast that it would

[76] Response to data request GRC-2017-PhI_DR_ED_004_Q07.
[77] PG&E's March 30, 2015, Budget Report in Compliance with California Public Utilities Commission Decision 14-08-032, p. 7-2.
[78] Response to data request GRC-2017-PhI_DR_ED_004_Q08.

need $12.4 million in 2014 and that the Commission authorized $10.8 million, or 87% of what was forecast, but there is no record showing how that reduction in spending should impact individual projects. Second, we can see that the Commission indirectly authorized $11.1 million in spending for this MWC in 2015 through the imputation methodology. However, there is no consistent record of how PG&E intended to spend those funds because the GRC application does not typically include a forecast for expense spending in the attrition years.[79]

Further complicating matters is the fact that, beginning in 2015, actual costs for Corporate Security work that had been forecasted as MWC JV were split between two categories: MWC JV and a new category, Provision for Risk and Security Services, or MWC KZ. This category includes IT support for Corporate Security, which provides "guard services, investigations and investigators, executive protection, access control, physical security testing, video monitoring our security facilities, and fixing broken security equipment."[80]

PG&E states that the new category was added because, as the utility began to execute the projects, there were components that were more related to physical security than technology. It was these physical security costs that were recorded in MWC KZ.[81] Since the expenses that were recorded in MWC KZ were originally forecasted to be part of projects in the MWC JV category, it seems reasonable to include them in comparisons to the original forecast.

Table 6-8, below, shows the six safety-related projects in these categories and compares the 2014 forecast to actual spending. A column that combines 2015 MWC JV and KZ spending is also included to show the impact of the new cost category. Authorized amounts are not shown

[79] In this case, PG&E did include a rough forecast for the Human Resources project known as Qualifications Tracking Enhancements. On p. 4-45 of 2014 GRC Exhibit 9, PG&E states, "The project is forecasted to cost $840,000 expense in 2014-2016."
[80] PG&E's March 31, 2016 Budget Report in Compliance with California Public Utilities Commission D. 14-08-032, p. B3-6.
[81] Email from Geri Callejas of PG&E, September 30, 2016.

in this table because the GRC decision approves spending at the Major Work Category level, not at the project level.

Table 6-8: Safety-Related Project Spending Included in the MWC JV Forecast ($000s)

	2014 Forecast	2014 Actual	2015 MWC JV	2015 MWC KZ	2015 Combined Actual
Corporate Security Department					
Security Management System Implementation and Enhancements	$1,000	$0	$0	$0	$0
Corporate Security Asset Management	$470	$117	$404	$100	$504
Physical Security Incident Management	$200	$0	$0	$367	$367
Business Continuity and Emergency Management Program	$375	$0	$0	$0	$0
System and Software Upgrades	$500	$0	$0	$0	$0
Subtotal	*$2,545*	*$117*	*$404*	*$467*	*$871*
Human Resources					
Qualifications Tracking Enhancements	$300	$265	$243	-	$243
Total	**$2,845**	**$382**	**$647**	**$467**	**$1,114**

As can be seen in Table 6-8, above, 2014 spending on safety-related projects in MWC JV was $382,000, which was $2.5 million, or 87%, less than the forecast $2.8 million. The pace of spending increased in 2015. If MWCs JV and KZ are combined, in 2015, PG&E spent $1.1 million on the six safety-related projects originally forecast as MWC JV. Taking the years 2014 and 2015 together, total safety-related spending on these projects was $1.5 million, which was still $1.3 million less than was forecast for 2014. If the Major Work Categories JV and KZ are combined, two safety-related projects met or exceeded the 2014 forecast budget by 2015: Corporate Security Asset Management and Physical Security Incident Management. Total spending on Corporate Security Asset Management was $621,000, which was $151,000, or 32%, more than

forecast for 2014. Actual spending on Physical Security Incident Management was $367,000, which was $167,000 or 84%, more than the 2014 forecast.

There was also significant spending on the Human Resources project Qualifications Tracking Enhancements. In its GRC forecast, PG&E stated that it planned to spend $840,000 on this project between 2014 and 2016.[82] Actual 2014-2015 spending totaled $507,000 or 60% of the forecasted total.

In contrast, the following safety-related projects were not funded at all in 2014-2015: Security Management System Implementation and Enhancements, the Business Continuity and Emergency Management Program, and System and Software Upgrades. Together, these projects were originally forecast to cost $1.9 million.

As was mentioned above, safety-related projects made up 23% of the 2014 forecast budget for this category. For actual spending, safety-related spending in 2014 was $382,000, or 12%, of total MWC JV spending of $3.2 million; for 2015, safety-related spending was $647,000, or 20%, of total MWC JV category spending of $3.3 million.

PG&E states that the IT Project Costs Category as a whole was underspent in 2014 primarily due to a resequencing of projects. The company's risk organization determined that the first priority should be to develop a physical security strategy and complete annual Human Resources projects. Relatively minor improvements to Finance and Regulatory systems were re-sequenced.

In 2015, several factors contributed to underspending in the overall IT Project Costs expense category. Projects continued to be re-sequenced to prioritize the physical security

[82] PG&E 2014 GRC Exhibit 9, p. 4-45.

strategy. The Regulatory Rate Model, which had originally been budgeted as expense, was also executed as a capital project.[83]

v. Safety, Engineering, and OSHA Compliance (MWC FL)

The Safety, Engineering, and OSHA Compliance category was significantly overspent: by 18% in 2014 and by 51% in 2015. In 2014, PG&E spent $2.8 million more than the $15.7 million authorized; in 2015, PG&E spent $8.2 million more than the $16.2 million authorized.

Safety, Engineering, and OSHA Compliance, or Major Work Category FL, represents expenses for the Safety Department, located within Shared Services This category "includes costs for the development and integration of safety and health solutions supporting the goal of eliminating employee injuries."[84]

In its yearly internal planning process, PG&E budgeted more to this category than was authorized by the Commission in order to bolster the implementation of its Safety Culture and contractor safety programs. This change was due to a provision of D.15-07-014, which required PG&E to implement a companywide contractor safety program.[85] Additional staff was hired in 2015-16 to implement this program. Most of the additional money for this project came from PG&E's reserve fund. However, shareholders also contributed $1 million to offset the program's costs.

b. Other Capital

Overview

PG&E identified three other safety-related capital expenditure programs, all of which exhibited spending that varied significantly from what was authorized in the GRC. Maintain

[83] Email from Geri Callejas of PG&E, September 30, 2016.
[84] PG&E's March 30, 2015, Budget Report in Compliance with California Public Utilities Commission Decision 14-08-032, p. 9-4.
[85] Response to data request GRC-2017-PhI_DR_ED_004_Q06.

Buildings was overspent in both 2014 and 2015. The two other programs were underspent. Confusingly, these two programs have both the same name (Build IT Applications and Infrastructure) and the same Major Work Category code (2F). Despite their similarities, these categories represent different technology projects performed for different Lines of Business. The first includes technology costs for Shared Services and Information Technology. The second represents IT projects for Corporate Services, which includes safety-related spending for the Risk and Audit and Human Resources organizations.

Total capital expenditures for the three other safety-related capital expenditure programs are summarized in Table 6-9 and 6-10, below.

Table 6-9: 2014 Other Capital Spending ($000s)

Major Work Category/Organization	2014 Forecast	(a) 2014 Authorized	(b) 2014 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Maintain Buildings	$48,410	$43,406	$45,317	$1,911	4%
Build IT Applications & Infrastructure (Shared Services)	$231,873	$218,178	$182,039	-$36,139	-17%
Build IT Applications & Infrastructure (Corporate Services)	$37,075	$32,864	$19,067	-$13,797	-42%
Total	**$317,358**	**$294,447**	**$246,423**	**-$48,024**	**-16%**

Table 6-10: 2015 Other Capital Spending ($000s)

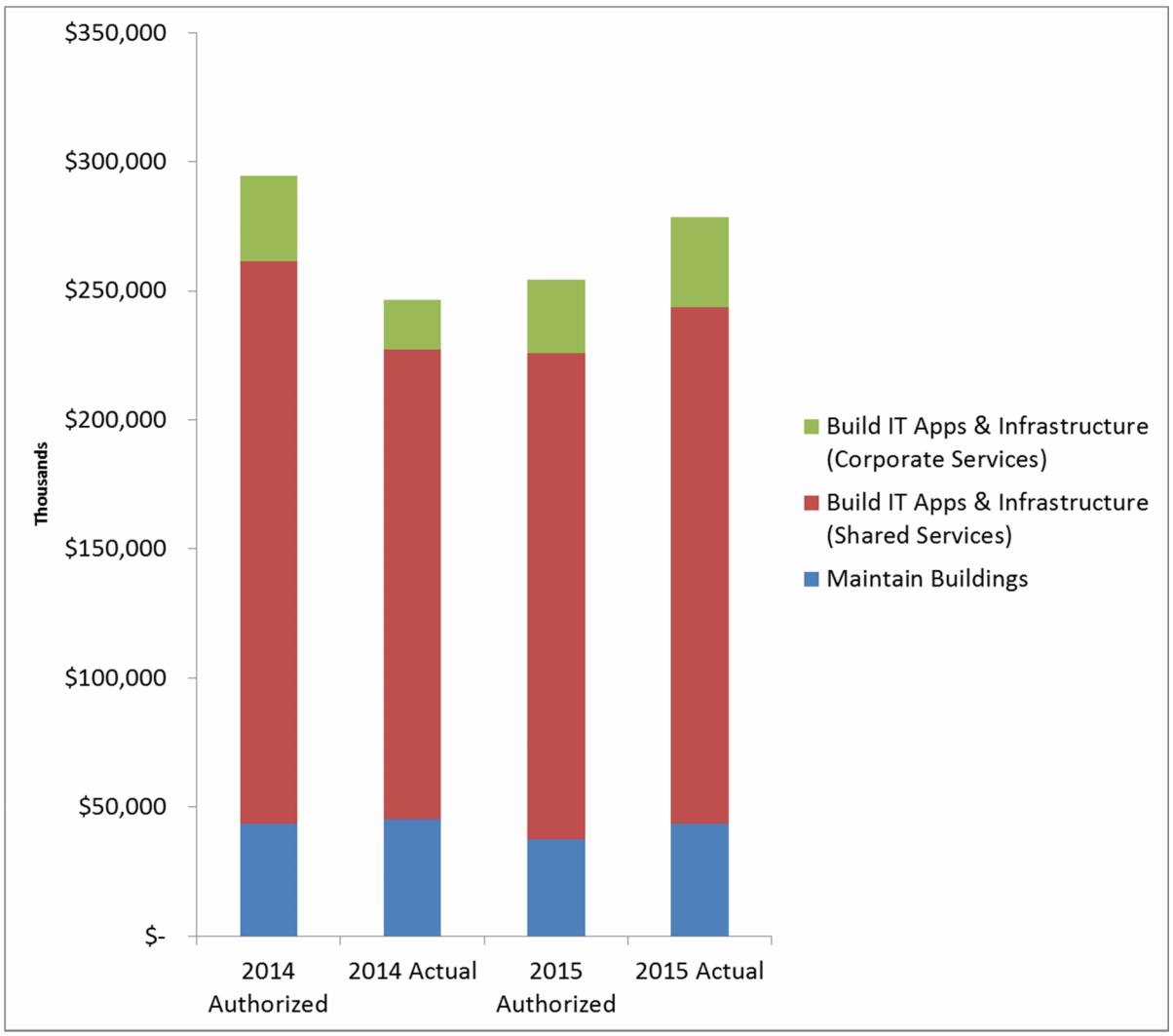
Major Work Category/Organization	2015 Forecast	(a) 2015 Authorized	(b) 2015 Actual	(b)-(a) Difference	(b-a)/(a) Percent Change
Maintain Buildings	$47,234	$37,467	$43,701	$6,234	17%
Build IT Applications & Infrastructure (Shared Services)	$223,129	$188,328	$199,885	$11,558	6%
Build IT Applications & Infrastructure (Corporate Services)	$26,580	$28,368	$34,991	$6,623	23%
Total	**$296,943**	**$254,162**	**$278,577**	**$24,415**	**10%**

As can be seen in the tables above, the category Maintain Buildings was overspent by 4% in 2014 and 17% in 2015. Taking the two years together, the category was overspent by 10%. In contrast, the first Built IT Applications category was underspent by 17% in 2014 and

overspent by 6% in 2015. The combined spending for the two years was 6%, or $24.6 million, less than authorized. The second Build IT Applications category was also underspent in the first year and overspent in the second; it was underspent by 42% in 2014 and by overspent by 23% in 2015. Combined 2014-15 spending was 12%, or $7.2 million, less than authorized.

Figure 6-2 (below) illustrates PG&E's other safety program expense spending for 2014 and 2015.

Figure 6-2: 2014-2015 Other Capital: Comparison of Authorized and Actual Spending by Major Work Category



The following section consists of individual program analysis for the other capital programs.

i. Maintain Buildings (MWC 22)

In 2014 and 2015, the category Maintain Buildings was overspent by $1.9 million and $6.2 million, respectively. While capital spending was only 4% over authorized in 2014, it was 17% more than authorized in 2015.

This capital spending category falls under Major Work Category 22 and includes "the costs to replace and construct base buildings, to extend the life of building components, correct building component deficiencies, improve equipment operating efficiencies, replace failed or functionally obsolete building components, and increase the operating reliability of buildings and yards. This includes furniture, office equipment, and IT Infrastructure for buildings."[86] Maintain Buildings work was done for the Real Estate Department within Shared Services.

Similarly to the Maintain Buildings expense category, seismic upgrades are the only safety-related work in this category. Typically, most seismic work is classified as an expense because it consists of adding additional support — such as beams, joists, and rafters — to existing structures. Seismic upgrades may include capital expenditures if they require more significant work, such a replacing a roof or rebuilding shear walls.[87]

The only seismic capital expenditures forecast in the 2014 GRC were for the San Carlos Service Center: $1.549 million in 2014 and $0.401 million in 2015.[88] However, no actual capital expenditures were recorded for these years. PG&E states that, while capital costs were predicted for the San Carlos Service Center, it is difficult to know with certainty whether they will be needed until engineers are on-site working on the project. So, despite the fact that Maintain Buildings as a whole is overspent, the safety-related portion of the category is underspent because the forecasted work was determined to be unnecessary.

As a whole, this category was allocated more than the Commission-authorized amount during the integrated planning process. In 2014, $56.2 million was allocated to Maintain

[86] 2015 PG&E Budget Compliance Report, p. 9-7.
[87] Phone call with PG&E, 9/20/2016.
[88] Response to verbal data request: ED_004_Detail.

Buildings compared to $43.4 million authorized. In 2015, $43.2 million was budgeted internally compared to $37.5 million authorized. While 2014 actual costs were higher than authorized, they were $10.9 million below the internally budgeted amount. The underspent funds were reprioritized for vehicle purchases. In 2015, actual and internally budgeted costs were very similar: $43.7 million and $43.2 million respectively.

ii. Build IT Applications and Infrastructure: Shared Services (MWC 2F)

The Build IT Applications and Infrastructure: Shared Services and Information Technology category was underspent by $36.1 million, or 17%, in 2014 and overspent by $11.6 million, or 6%, in 2015. Taking the two years together, the category was underspent by $24.6 million or 6%.

As mentioned above, Build IT Applications and Infrastructure is part of Major Work Category 2F, which "includes the costs to design, develop and enhance applications, systems and infrastructure technology solutions."[89] The work in this category was done for Shared Services and Information Technology. Safety-related projects make up a subset of this category and were planned for the Safety Department, Transportation Services, and Information Technology. In 2014, safety-related IT costs were forecasted to be $84.4 million out of the $231.9 million forecasted for the category as a whole. In 2015, safety-related costs were forecasted to be $85.1 million out of $223.1 million forecasted for the category. Table 6-11, below, compares the forecasted and actual expenses for safety projects in this category. Authorized amounts are not shown in this view because the GRC decision approves spending at the Major Work Category level, not at the project level.

[89] 2015 PG&E Budget Compliance Report, p. 7-4.

Table 6-11: Safety-Related Work in Build IT Applications and Infrastructure: Shared Services ($000s)

	2014 Forecast	2014 Actual	2015 Forecast	2015 Actual
Safety Department				
Improve Safety Work Management	$15	$0	$150	$0
Improve Safety Customer Communications	$90	$0	$0	$0
Safety Migration to Enterprise Content Management	$40	$0	$40	$0
Subtotal	*$145*	*$0*	*$190*	*$0*
Transportation Services				
Vehicle Safety and Operational Monitoring System	$1,000	$0	$1,000	$542
Information Technology				
Disaster Recovery	$33,900	$21,353	$44,000	$33,642
Telecommunications Network Enhancements	$39,400	$26,038	$30,900	$20,359
Identity and Access Management	$10,000	$7,094	$9,000	$9,673
Subtotal	*$83,300*	*$54,485*	*$83,900*	*$63,674*
Total	**$84,445**	**$54,485**	**$85,090**	**$64,216**

As can be seen in Table 6-11 above, the three IT projects planned for the Safety Department were all deferred. The $255,000 forecast for Improve Safety Work Management and Improve Safety Customer Communications was used to fund higher priority projects. The project Safety Migration to Enterprise Content Management "was not prioritized individually due to a larger company-wide approach to Enterprise Content Management."[90] A new completion date has not been set for these projects.[91]

[90] Response to data request GRC-2017-PhI_DR_ED_005-Q01Atch01.
[91] Response to data request DR_Q04Atch01_Misc.

Planned spending in the Transportation Services Department was delayed. However, the Vehicle Safety and Operation Monitoring System — an electronic tracking system, which allows the utility to monitor driver behavior — was completed in 2016.

Spending on the three safety-related projects in Information Technology was also lower than forecasted: 35% less in 2014 and 25% less in 2015. The Disaster Recovery project, which is intended to ensure the availability of "mission critical processes such as emergency field support and monitoring, operations, and control of the gas and electric systems,"[92] was underspent by $12.6 million in 2014 and $10.4 million in 2015. PG&E states that this project has increased in scope and will continue into 2017.[93] Telecommunications Network Enhancements was underspent by $13.4 million in 2014 and $10.5 million in 2015.[94] Underspending on this project was caused by rescheduling due to "vendor constraints."[95] It will also be continued into 2017.[96] Identity and Access Management was underspent by $2.9 million in 2014 and overspent $673,000 in 2015. This project is intended to reduce the risk of unauthorized access to the PG&E system. PG&E asserts that the primary scope of this project has been completed; additional functionality will be added in 2017.[97]

Taken together, PG&E spent $30.0 million, or 35%, less than forecast on safety-related MWC 2F spending in 2014. In 2015, the utility spent $20.9 million, or 25%, less than forecast on such projects. PG&E cited its discretion to establish budgets and reprioritize projects as justification for these changes in spending.

iii. Build IT Applications and Infrastructure: Corporate Services (MWC 2F)

The Build IT Applications and Infrastructure: Corporate Services category was underspent by $13.8 million, or 42%, in 2014. In 2015, the category was overspent by $6.6

[92] PG&E 2014 GRC Testimony, Exhibit 7 p. 8-6.
[93] Response to data request DR_Q04Atch01_Misc.
[94] Response to data request GRC-2017-PhI_DR_ED_005-Q01Atch01.
[95] GRC-2017-PhI_DR_ED_004-Q10.
[96] Response to data request DR_Q04Atch01_Misc.
[97] Ibid.

million or 23%. Combining 2014-15 spending, this category was underspent by $7.2 million, or 12%.

This category includes the costs to design and implement various new technological projects for Corporate Services. Safety-related IT work includes projects for Risk and Audit and Human Resources.[98] Safety projects represented 45% of all capital costs forecast for this category in 2014 and 12% of all forecasted costs in 2015.

Table 6-12, below, compares forecast to actual spending for the safety-related projects. Authorized amounts are not shown in this view because the GRC decision approves spending at the Major Work Category level, not at the project level.

Table 6-12: Safety-Related Work in Build IT Applications and Infrastructure: Corporate Services ($000s)

	2014 Forecast	2014 Actual	2015 Forecast	2015 Actual
Risk and Audit				
Alternate Emergency Operations Center	$6,900	$0	$0	$0
Corporate Security Department				
Security Management System Implementation and Enhancements	$500	$0	$650	$0
Corporate Security Asset Management	$1,720	$1,119	$1,920	$4,066
Physical Security Incident Management	$500	$0	$500	$0
Business Continuity and Emergency Management Program	$150	$0	$0	$0
Subtotal	*$9,770*	*$1,119*	*$3,070*	*$4,081*
Human Resources				
Qualifications Tracking Enhancements	$0	$473	$0	$3,671
Total	**$16,670**	**$1,592**	**$3,070**	**$7,767**

[98] Response to data request DR_Q04Atch01_Misc.

In 2014, PG&E spent $15.1 million, or 90%, less than forecast on safety-related projects. Of that underspending, $6.9 million was due to the utility's decision to move the Alternative Emergency Operations Center out of this category and into Electric Distribution. Three other projects were not funded: Security Management System Implementation and Enhancements, Physical Security Incident Management, and the Business Continuity and Emergency Management Program. Two safety-related capital projects were funded in 2014: Corporate Security Asset Management and Qualifications Tracking Enhancements. The former was underspent by 35%, and the latter was not included in the original forecast. In explanation, PG&E states that Qualifications Tracking Enhancements was originally forecasted as all expense but was executed as both capital and expense.[99]

In 2015, safety-related projects were overspent compared to the forecast by $4.7 million or 152%. Despite the increase in spending, the three projects deferred in 2014 were not executed in 2015. Corporate Security Asset Management and Qualifications Tracking Enhancements were the only two projects to receive funds. The former was overspent by $2.1 million or 112%. PG&E spent $3.7 million on the latter, despite it not being included in the forecast. The combined capital cost for Qualifications Tracking Enhancements was $4.1 million, which is considerably more than the $840,000 in expense costs that were originally forecast for this project for the years 2014-2016.

[99] Response to GRC-2017-PhI_DR_ED_006-Q01Atch01.

Appendix A: Major Work Category Codes discussed in this report

MWC Code	Major Work Category Name	Major Work Category Description
Electric Distribution		
BF	Patrol and Inspections	Includes patrols and inspections of overhead (OH) and underground (UG) electric distribution facilities per General Order 165; patrols and inspection of OH facilities in wildfire areas; infrared inspections; testing and inspection of OH and UG line equipment; special patrols and inspections; and other work associated with electric distribution system maintenance such as the cost of implementing mobile technology.
BH	Corrective Maintenance/Routine Emergency	Includes response to OH or UG outages that occur during normal conditions including routine emergency response work as well as work issued using PG&E's Field Automation System (FAS) for either emergency response or system reliability.
GE	Electric Mapping and Records Management	Includes creating new maps, recording updates and maintaining the electric distribution system maps, and mapping and record management initiatives
JV	Maintain IT Applications and Infrastructure	Includes costs for ongoing maintenance, operations and repair for PG&E's IT applications, systems and infrastructure.
2B	Underground Asset Management Program/ Electric Distribution Preventive Maintenance, Underground	Includes replacing deteriorated UG facilities on a planned basis where it is not cost effective to repair those facilities. This work is similar to the work performed in MWC KB, but includes replacing equipment, rather than repair and maintenance. Typical equipment replacements include corroded transformers, inoperative switches, damaged UG enclosures and other UG distribution facilities. Equipment is replaced in-kind in most cases; however, upgrades are required where the equipment must meet current operating conditions, technology, and safety standards.
54	Substation Transformer Replacements	Includes maintaining or improving substation reliability by replacing transformers that have the highest risk of failure. This MWC also includes maintaining an adequate supply of emergency transformer stock, mobile transformers, and breakers for emergency response.
95	Major Emergency	Includes response work to OH or UG outages when a division Operations Emergency Center (OEC) has been activated and consistent with PG&E's Major Emergency Balancing Account Criteria Guidance Document. Beginning in 2014, these costs are included in the two way Major Emergency balancing account authorized by Decision 14-08-032.
Electric Generation		
AX	Maintain Hydro Reservoirs, Dams, and Waterways	Includes costs associated with maintenance of hydroelectric reservoirs, dams, and water conveyance systems. These maintenance activities also ensure safety through routine and preventive maintenance.
BR	Operate Diablo Canyon Power Plant	Includes all activities to operate the plant, radiation control, monitoring of plant chemistry, managing radioactive waste and hazardous waste generation, nuclear fuel movement, and reactor physics testing.
BS	Maintain Diablo Canyon Power Plant Assets	Includes all preventative and corrective maintenance activities for systems, structures, and components at the plant.
KL	Maintain Fossil Generating Equipment	Includes costs to maintain fossil power generating station equipment.
2L	Install/Replace for Hydro Electric Safety and Regulatory Requirement	Includes capital costs primarily related to employee or public safety and regulatory requirements that are not connected with relicensing for hydroelectric generation.

MWC Code	Major Work Category Name	Major Work Category Description
2M	Install/Replace Hydro Generating Equipment	Includes capital costs to install/replace generating equipment or components to support hydroelectric generation activities.
2N	Install/Replace Reservoirs, Dams, and Waterways	Includes capital costs to support the operation of reservoirs, dams and waterways.
2P	Install/Replace Hydro Buildings, Grounds, and Infrastructure	Includes capital costs to install/replace buildings, grounds and infrastructure to support hydroelectric generation activities, including roads and bridges.
2S	Install/Replace Fossil Generating Equipment	Includes capital costs to install new or replace existing generating equipment or components to support fossil generation activities.
2T	Install/Replace Fossil Buildings, Grounds, and Infrastructure	Includes capital costs to install or replace new buildings, grounds and infrastructure on the plant site to support fossil generation activities.
20	Diablo Canyon Power Plant Capital	Includes replacement of capital structures, systems and components that no longer can be maintained to safely and reliably operate and protect the plant. There are three major drivers to these replacements: (1) reliability has degraded to cause replacement to be needed; (2) obsolete replacement material, not allowing proper maintenance to continue; and (3) regulatory driven (NRC) requirements.
Gas Distribution		
FH	Gas Distribution Preventative Maintenance	A key system safety and integrity activity that includes work to comply with pipeline safety regulations that require PG&E to conduct periodic or routine maintenance on its gas distribution system. Preventive maintenance work includes regulator station maintenance, maintenance on mains and services, distribution valve replacement, service valve replacement, and overall preventive gas maintenance support.
GF	Gas Distribution Mapping	Encompasses tracking the size, material type, location, configuration, and other essential information needed to monitor and identify over 42,000 miles of underground gas main and nearly 3.3 million gas services. Gas Mapping updates and maintains the gas distribution system maps and records.
JC	Gas Distribution Integrity Management: Balancing Account	A key program to improve public safety and the integrity of the gas distribution system. DIMP includes development of an overall plan that evaluates risks and implements projects to reduce risks.
JQ/JS	Gas Distribution Integrity Management Program: JQ=Non-Balancing Account JS=Balancing Account	A key program to improve public safety and the integrity of the gas distribution system. DIMP includes development of an overall plan that evaluates risks and implements projects to reduce risks. MWC JQ includes developments and improvements in the following areas: the DIMP program, preventative maintenance, leak surveys, operator qualifications, training, and programs such as cross-bored sewer, marker ball installation, and Aldyl-A. Per Decision 14-08-032, the DIMP balancing account (MWC JS) was closed beginning in 2014.
JU	Gas Distribution Leak Survey and Repair	Used to record costs incurred above the Balancing Account cost cap (spend and units) for Gas Leak Survey, Gas Leak Repair, Meter Set Gas Leak Repair, Gas Tee-Cap Repair, and Gas Atmospheric Corrosion Inspection.
2K	Gas Distribution Replacement /Convert Customer High Pressure Regulator	A key safety and integrity program that includes the replacement of gas customer High Pressure Regulators (HPR) or the reconstruction of gas distribution systems to eliminate the need for HPRs

MWC Code	Major Work Category Name	Major Work Category Description
4A	Gas Distribution Central Operations Assets	Includes costs associated with the installation of Supervisory Control and Data Acquisition devices, electronic recorders, and similar instrumentation assets and related tools. MWC 4A captures costs associated with the development of software tools to support the collection, retention, and presentation of data related to the Control Center. Capital outlays support telecommunication radio system assets to monitor and control the gas distribution network.
14	Gas Distribution Pipeline Replacement Program	A key safety and integrity program that primarily encompasses three gas distribution asset replacement programs, the GPRP, Copper Service Replacement Program (CSRP) and Aldyl-A-Plastic Replacement Program. The GPRP targets cast iron and pre-1940 steel gas mains. PG&E uses age, materials, seismic factors, and gas leaks to identify and prioritize gas mains for replacement. In addition to gas main replacement, the program includes related service replacement and meter relocation work. CSRP was added to MWC 14 in 2006 because copper services were determined to have a similar relative risk to GPRP pipe. Subsequently, plastic was added into MWC 14 in 2012 because of increase in the relative risk of vintage plastic material such as Aldyl-A.
Other Safety-Related Programs		
BI	Maintain Buildings (Expense)	Includes costs to repair and maintain base building to extend the life of building components, correct building component deficiencies, improve equipment operating efficiencies, and increase the operating reliability of buildings and yards.
FL	Safety, Engineering, and OSHA Compliance	Includes costs of the Safety Engineering & Health Services department which provides overall direction and implementation of the Company's occupational safety and health programs. MWC FL also includes costs for the development and integration of safety and health solutions supporting the goal of eliminating employee injuries.
JV	Information Technology Project Costs	Includes costs for ongoing maintenance, operations and repair for PG&E's IT applications, systems and infrastructure.
KZ	Provision for Risk and Security Services	Includes support for corporate security, risk management, internal audit, and insurance functions. Work is primarily Corporate Security expense costs. Corporate Security includes guard services, investigations and investigators, executive protection, access control, physical security testing, video monitoring our security facilities, and fixing broken security equipment.
2F	Build Information Technology Applications and Infrastructure	Includes the costs to replace and construct base buildings, to extend the life of building components, correct building component deficiencies, improve equipment operating efficiencies, replace failed or functionally obsolete building components, and increase the operating reliability of buildings and yards. This includes furniture, office equipment, and IT Infrastructure for buildings.
22	Maintain Buildings (Capital)	Includes the costs to design, develop and enhance applications, systems and infrastructure technology solutions.