San Diego Gas & Electric Company
2020 Wildfire Mitigation Plan
Compliance Report

March 31, 2021

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I. Introduction

Wildfire safety, prevention, mitigation, and recovery are central priorities for SDG&E. On February 6, 2019, in accordance with the January 17, 2019 Ruling of Administrative Law Judge Thomas[1] and California Senate Bill 901,[2] San Diego Gas & Electric Company (SDG&E) filed its first Wildfire Mitigation Plan (WMP or Plan). Consistent with state law and objectives, SDG&E's WMP was founded upon the goal of minimizing the probability that various components of SDG&E's electric system might become the original or contributing source of ignition for a wildfire. On February 7, 2020, SDG&E submitted its 2020 Wildfire Mitigation Plan, in accordance with updated guidance from the California Public Utilities Commission (CPUC) and the Wildfire Safety Division (WSD).[3] The programs, initiatives, and plans described in SDG&E's 2020 WMP highlight many of the efforts SDG&E has made and will continue to make to mitigate the risk of catastrophic wildfire and the customer impacts of Public Safety Power Shutoff (PSPS) events.

In 2020, SDG&E implemented and tracked progress of 81 different mitigations outlined in its 2020 WMP. Progress on these mitigations is reported through 43 quantitative and 51 qualitative metrics. SDG&E's mitigations involve a wide-array of topic areas such as inspection and maintenance programs, infrastructure replacement programs, and vegetation management programs, all aimed at mitigating the risk of ignitions due to a fault on the electric system. Additional topic areas include situational awareness, which informs SDG&E's risk models and helps prioritize infrastructure replacement, and strategies and tools for real time decision making during emergency response or PSPS events. SDG&E also has mitigations that reduce the impact of a wildfire once an ignition has occurred, including high-definition cameras, ground and aerial fire suppression resources, and a fuels management program. In addition, SDG&E has implemented mitigations to the customer impacts associated with PSPS events, including the installation of sectionalizing devices to limit the customer impact, additional weather stations, generator grant programs, microgrids, Community Resource Centers (CRC) during PSPS events, and SDG&E's customer outreach programs.

Pursuant to Public Utilities Code Section 8386.3(c)(1), SDG&E submits this report addressing its WMP compliance for 2020. This report provides a breakdown of each 2020 mitigation with a quantitative or qualitative metric to show risk reduction. As discussed in SDG&E's 2021 WMP Update, the risk reduction calculations performed for the WMP programs rely on the quantitative targets to calculate the overall risk reduction for the program. This report also provides a description of operational changes and their potential impact on risk reduction, planned and actual spend with variance

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[1] *Administrative Law Judge's ruling on Wildfire Mitigation Plan template, and adding additional parties as respondents*, dated January 17, 2019.

[2] California Senate Bill 901 (SB 901), enacted in 2018, adopted new provisions of Public Utilities Code Section 8386 requiring all California electric utilities to prepare, submit and implement annual wildfire mitigation plans that describe the utilities' plans to construct, operate and maintain their electrical lines and equipment in a manner that will help minimize the risk of catastrophic wildfires caused by those electrical lines and equipment

[3] WSD-002, *See also* Rulemaking (R.) 18-10-007, Administrative Law Judge's Ruling on Wildfire Mitigation Plan Templates and Related Material and Allowing Comment, Attachment 1 – WMP Guidelines (December 16, 2019), as clarified by the Wildfire Safety Division (WSD) on January 15, 2020 and January 27, 2020.

explanations for costs +/-10% of planned costs, and a description of the PSPS customer impact reduction provided by the mitigation. It is important to note that many of the program-level variances reported are due to differences in WMP reporting requirements between the 2020 WMP filing and the 2021 WMP Update.

The following are some activities that are summarized this report:

- SDG&E has fire hardened 236 miles of its electric system and replaced over 2,517 structures within the high fire threat district from January 1, 2020 through December 31, 2020.
- The appropriate operational measures were taken for the Elevated, Extreme, and Red Flag Warning days.
- Annual routine and high fire threat district (HFTD) focused distribution, substation, and transmission inspections were completed including timely remediation per general order requirements.
- Vegetation management annual inspections and trimming were completed in accordance with SDG&E's 2020 WMP, including the trim or removal of over 17,000 targeted species trees in HFTD to enhanced clearances levels.
- Situational awareness capabilities were enhanced by adding 30 weather stations and updating additional weather stations to provide 30 second reads.

Overall, SDG&E met 24 and exceeded 11 quantitative targets of the 2020 WMP. SDG&E did not meet 8 the stated targets of its 2020 WMP for various reasons detailed in this report. Generally, however, of those 8 targets, four will be completed in 2021, three had a modified scope, and one target was impacted by external factors outside of SDG&E's control. Additionally, despite a 2020 wildfire season during which SDG&E experienced its largest PSPS event, SDG&E's PSPS mitigation programs were able to reduce PSPS impacts to approximately 9,000 customers during a PSPS event in early December. By meeting or exceeding 35 of 43 quantitative targets and reducing PSPS impacts to 9,000 customers, SDG&E has met its risk reduction intent as set forth in the 2020 WMP.

II. Risk Assessment and Mapping (2020 WMP Section 5.3.1)

SDG&E remains committed to the ongoing development and implementation of its Wildfire Risk Reduction Model (WRRM) and continues to refine a primarily automated risk assessment and mapping methodology. SDG&E's engineers and emergency operations personnel continue to analytically evaluate and prioritize proposed grid hardening projects and emergency actions from the standpoint of minimizing fire risk potential from overhead electric facilities.

SDG&E stands at the forefront of the development of this important risk related model and leads the industry in the creation of such a model. SDG&E continues to work with Technosylva and others to implement innovative approaches to enhance and leverage this modeling and these efforts are being duplicated across the state. WRRM represents SDG&E's continued commitment to the ongoing development and further refinement of risk related models for the evaluation of hardening projects and the safe operation of the SDG&E system. SDG&E subject matter experts, including fire coordinators and fire scientists analyze the model's performance for all wildfires on the landscape, identifying deviations from the risk and propagation modeling. These findings help drive the future development of the model. and The ongoing refinements should result in improved and more specific quantifiable outcomes allowing for better decision making in the overall hardening effort.

Below is a financial summary for the programs within the Risk Assessment and Mapping category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 1,400	$ 1,191	$ (209)
O&M	$ -	$ -	$ -

A. Summarized Risk Map: Operational Wildfire Risk Reduction Model (2020 WMP Section 5.3.1.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to use WRRM to simulate virtual wildfires to assess, quantify and prioritize risk mitigation efforts. Additionally, SDG&E plans to use the WRRM-OPS model to evaluate wildfire risk within SDG&E's service territory and provide significant enhancements for WRRM Ops.	In 2020, SDG&E subject matter experts used the operational WRRM (WRRM-Ops) to assess and quantify the potential risk of all ignitions in the service territory that had the potential to grow into wildfires. In addition to the simulation of ignitions in real-time as they occurred, SDG&E simulated millions of virtual ignitions daily to evaluate, anticipate and prepare for wildfire risk.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 1,400	$ 1,191	$ (209)
O&M	$ -	$ -	$ -

The spend is slightly below what was expected in 2020 and is related to the software vendor that builds and maintains WRRM-Ops. This variance is related to a difficulty with exact projections for these costs year over year.

PSPS Impact Reduction: N/A

B. Climate-driven Risk Map and Modelling (2020 WMP Section 5.3.1.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to provide the 10-hour fuel moisture levels that are incorporated into all its risk calculations for 2020 PSPS events to quantify the risk associated with different weather conditions.	The state of the 10-hour fuel moisture level is an important measure when determining the wildfire risk across the southern California Chaparral Ecosystem. SDG&E generated 10-hour fuel projections from its modeling system twice daily and shared this information directly with the USFS, the National Weather Service, and academia.

Operational Changes: N/A

Spend: The costs for this program are embedded within Summarized Risk Map: Operational Wildfire Risk Reduction Model program.

PSPS Impact Reduction: See Summarized Risk Map: Operational Wildfire Risk Reduction Model.

C. Ignition Probability Mapping (2020 WMP Section 5.3.1.3)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to use SDG&E's WRRM-Ops Model showing the probability of ignition along SDG&E's electric lines and equipment to determine the wildfire risk throughout the year.	In 2020, SDG&E subject matter experts used the operational WRRM-Ops to assess and quantify the potential risk of all ignitions in the service territory that had the potential to grow into wildfires. In addition to the simulation of ignitions in real-time as they occurred, SDG&E simulated millions of virtual ignitions daily to evaluate, anticipate and prepare for wildfire risk.

Operational Changes: N/A

Spend: The costs for this program are embedded within Summarized Risk Map: Operational Wildfire Risk Reduction Model program.

PSPS Impact Reduction: See Summarized Risk Map: Operational Wildfire Risk Reduction Model.

D. Initiative Mapping and Estimation of Wildfire and PSPS Risk-reduction Impact (2020 WMP Section 5.3.1.4)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E's plans to use the WRRM Model to provide initiative mapping and estimation of wildfire and PSPS risk-reduction impact.	In 2020, the WRRM-Ops model was leveraged to provide and integrate consequence modeling into the Wildfire Next Generation Model (WiNGS). WiNGS provides initiative mapping to help drive wildfire hardening efforts.

Operational Changes: In 2020, SDG&E began the development of WiNGS to help drive wildfire mitigation efforts moving forward. These efforts will continue through 2021.

Spend: The costs for this program are embedded within Summarized Risk Map: Operational Wildfire Risk Reduction Model program.

PSPS Impact Reduction: See Summarized Risk Map: Operational Wildfire Risk Reduction Model.

E. Match Drop Simulations (2020 WMP Section 5.3.1.5)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to use the WRRM Model depicting a match drop simulation showing the potential wildfire consequence of ignitions that occur along the electric lines.	SDG&E subject matter experts used the operational WRRM (WRRM-Ops) to assess and quantify the potential risk of all ignitions in the service territory that had the potential to grow into wildfires. In addition to the simulation of ignitions in real-time as they occurred, SDG&E simulated millions of virtual ignitions daily to evaluate, anticipate and prepare for wildfire risk.

Operational Changes: N/A

Spend: The costs for this program are embedded within Summarized Risk Map: Operational Wildfire Risk Reduction Model program.

PSPS Impact Reduction: See Summarized Risk Map: Operational Wildfire Risk Reduction Model.

F. Weather-driven Risk Map and Modelling (2020 WMP Section 5.3.1.6)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to use the WRRM Model to provide weather-driven risk map and modelling based on various relevant weather scenarios to bring situational awareness to areas that have an increased potential of being impacted by strong winds. This information can then be incorporated into SDG&E's risk modeling during an event.	SDG&E has installed software which automatically downloads output from weather models that are run by National Oceanic and Atmospheric Administration (NOAA). This data is then used in an automated process to run detailed weather forecasts and automatically send fire weather conditions to our fire behavior modeling system (WRRM-Ops).

Operational Changes: As planned, SDG&E has begun automatically downloading NOAA data to run detailed weather forecasts and send fire weather conditions to WRRM-Ops.

Spend: The costs for this program are embedded within Summarized Risk Map: Operational Wildfire Risk Reduction Model program.

PSPS Impact Reduction: See Summarized Risk Map: Operational Wildfire Risk Reduction Model.

G. High Performance Computing Infrastructure (2020 WMP Section 5.3.1.7)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to utilize three high-performance computing clusters to generate high quality weather data that is incorporated directly into operations. Additionally, SDG&E plans to use its computing clusters to integrate the new methodologies in order to maintain forecast reliability and situational awareness.	In 2020, SDG&E successfully leveraged three high-performance computing clusters to generate high quality weather data that is incorporated directly into operations in an automated process.

Operational Changes: N/A

Spend: The costs for this program are embedded within Summarized Risk Map: Operational Wildfire Risk Reduction Model program.

PSPS Impact Reduction: See Summarized Risk Map: Operational Wildfire Risk Reduction Model.

III. Situational Awareness and Forecasting (2020 WMP Section 5.3.2)

Weather continues to have a significant impact on utility operations. SDG&E is an industry leader in the development and implementation of utility-specific meteorological technology to anticipate, prepare for, respond to, and recover from severe weather and wildfire events. Utilization of situational awareness tools such as weather stations, cameras, wireless fault indicators, and the Fire Potential Index have proven successful historically and continue to be beneficial to system planning, emergency operations, and the safe implementation of PSPS. Based on these successes, SDG&E situational awareness networks will be expanded into areas where they can be used to minimize the impacts of PSPS and make communities safer.

Below is a financial summary for the programs within the Situational Awareness and Forecasting category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 8,530	$ 2,527	$ (6,003)
O&M	$ 2,815	$ 3,363	$ 548

A. Camera Networks and Advanced Weather Station Integration (2020 WMP Section 5.3.2.1)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
20	30	150%	Weather stations
4	4	100%	Cameras

SDG&E determined that extra weather stations were required to fill in data gaps, especially in the Rancho Santa Fe and Valley Center areas of the service territory. These specific areas required additional data to assist with PSPS decision making.

Operational Changes: As stated above, additional weather stations were targeted in specific areas to fill in data gaps.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 775	$ 1,083	$ 308
O&M	$ -	$ -	$ -

The additional spend in 2020 was related to the additional weather stations completed.

PSPS Impact Reduction: During the Red Flag Warning events in early December 2020, SDG&E estimates that 30-second reads from weather stations reduced the number of customers impacted by PSPS by 2,593 customers.

B. Wireless Fault Indicators (2020 WMP Section 5.3.2.3)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
500	502	100%	Wireless fault indicators

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 630	$ 835	$ 205
O&M	$ -	$ -	$ -

Additional costs were driven by higher rates associated with the installation costs from contractors performing the work.

PSPS Impact Reduction: N/A

C. Fire Science and Climate Adaptation Department (2020 WMP Section 5.3.2.4.1)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
1	1	100%	Fire Science & Innovation Lab

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 4,500	$ 608	$ (3,892)
O&M	$ 2,500	$ 3,363	$ 863

The variance in forecasted capital spend in 2020 is primarily due to unforeseen delays in the planned Emergency Operation Center re-build caused by the COVID-19 pandemic. Costs associated with the rebuild are shared with the Emergency Management Operations program. The additional O&M costs associated with Fire Science and Climate Adaptation were due to a change in how the costs are allocated. Costs from the PSPS Situational Awareness Dashboard are reflected in this line item.

PSPS Impact Reduction: N/A

D. Fire Potential Index (2020 WMP Section 5.3.2.4.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans on generating the daily FPI and prioritizing the integration of the FPI into its operational decision making to mitigate wildfire potential.	SDG&E generated the FPI daily and leveraged this information to operate with a high level of wildfire situational awareness. In addition to being a factor when considering PSPS, this information was used by field personnel and operation centers daily to minimize the potential for wildfire ignitions.

Operational Changes: N/A

Spend: The costs for this program are embedded within Fire Science and Climate Adaptation.

PSPS Impact Reduction: N/A

E. Santa Ana Wildfire Threat Index (2020 WMP Section 5.3.2.4.3)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E's meteorology team plans to conduct verification of the SAWTI by tracking daily SAWTI values and the occurrence of large wildfire activity, and then share the information daily with the fire agencies for public dissemination.	In 2020, the SDG&E meteorology team conducted a SAWTI training with the new fire potential forecasting team with the United States Forecasting System. Additionally, the SDG&E Meteorology team archived the SAWTI data daily and validated the SAWTI by comparing the output to large wildfire activity.

Operational Changes: N/A

Spend: The costs for this program are embedded within Fire Science and Climate Adaptation.

PSPS Impact Reduction: N/A

F. PSPS Situational Awareness Dashboard (2020 WMP Section 5.3.2.4.4)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to enhance and expand its current operational awareness by building visual dashboards that integrate the vegetation risk index (VRI), historical wind conditions, 95th and 99th percentile wind gusts, and the ability to identify areas that contain vulnerable electric infrastructure.	As planned, SDG&E enhanced and expanded the capabilities of the PSPS situational awareness dashboard by updating the VRI, historical wind conditions, 95th and 99th percentile wind gusts. Additionally, SDG&E worked with human-interface engineering specialists to help optimize the dashboard design.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 2,100	$ -	$ (2,100)
O&M	$ 315	$ -	$ (315)

The O&M costs associated with the PSPS Situational Awareness Dashboard are in Fire Science and Climate Adaptation.

PSPS Impact Reduction: While this program cannot be directly tied to a decrease in PSPS impacts, it does improve the situational awareness within the EOC during PSPS events.

G. Operating Conditions (2020 WMP Section 5.3.2.5)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue the use of the established Operating Conditions (i.e., Normal, Elevated, Extreme, and Red Flag Warning) to monitor wildfire potential throughout its service territory and, among other things, inform decisions regarding recloser settings, sensitive relay settings, testing procedures, and work restrictions throughout the year.	SDG&E published daily operating conditions and operated in accordance with the restrictions set by those conditions.

Operational Changes: N/A

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

H. Network Management Situational Awareness Upgrades (2020 WMP Section 5.3.2.7)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E continues to plan building key weather integrations into the NMS system to enable more accurate and real-time operational decision-making to implement reclosing policies, sensitive relay settings policies, and work cancellation decisions during extreme weather events.	NMS provided enhanced visibility for work being done or planned in HFTD areas. Additional job attributes were added to support job cancellation decisions during weather events. Additionally, groundwork started for the future FPI integration through the development of detailed requirements.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 525	$ -	$ (525)
O&M	$ -	$ -	$ -

The NMS Situational Awareness Upgrades costs were completed as part of base business costs.

PSPS Impact Reduction: N/A

IV. Grid Design and System Hardening (2020 WMP Section 5.3.3)

SDG&E's grid hardening programs are a set of controls and mitigations that directly address the goals of the wildfire mitigations plans, in the form of reducing wildfires caused by utility equipment and minimizing the societal impacts to customers from mitigations such as PSPS. SDG&E has a number of controls and mitigations including overhead hardening and strategic undergrounding that have demonstrated a measured reduction in risk events on utility equipment, reducing the opportunities for ignitions. Some of SDG&E's protection and equipment programs include advanced protection, expulsion fuse replacement program, and the lightning arrestor program. While these programs do not prevent the risk event from occurring, they reduce the chance that a risk event results in an ignition by utilizing protection settings and/or equipment that addresses a specific failure mode known to lead to potential ignition. These result in measured reductions in ignition percentage from risk events. And finally, SDG&E has a number of programs intended to reduce PSPS impacts to customers, including the PSPS sectionalizing program, microgrid and generator programs, as well as strategic undergrounding. The impacts of these programs are measured in the number of customers who will no longer be impacted by a future PSPS event assuming weather conditions similar to previous events.

Below is a financial summary for the programs within the Grid Design and System Hardening category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 243,944	$ 329,740*	$ 85,796
O&M	$ 11,460	$ 15,999	$ 4,539

*This report only includes programs with quantitative and qualitative metrics, however, there are two programs with costs that did not have metrics within the 2020 WMP which are included in the grid design and system hardening capital summary costs.

A. SCADA Capacitors (2020 WMP Section 5.3.3.1)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
30	30	100%	SCADA capacitors

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 1,575	$ 992	$ (583)

The underspend for SCADA Capacitors is related to timing of the work in 2020. There were some material ordering delays that pushed the installations late into 2020 and delayed some of the associated QC and commissioning costs into 2021.

PSPS Impact Reduction: N/A

B. Advanced Protection (2020 WMP Section 5.3.3.2)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
8	6	75%	Circuits
6	8	133%	Substations

Substation deployments at two locations involved were accelerated from 2021 into 2020. Two circuits were under construction, but not completed in 2020 due to red flag events, weather, and resource availability. These circuits will be completed next year in 2021, and the program's risk reduction benefits are still on target to complete all Tier 3 circuits by 2026.

Operational Changes: Several substation hardening projects were integrated into Advanced Protection to combine future planned advanced protection work into the existing projects. This will accelerate the deployment in Tier 3 of the HFTD. Advanced Protection also began trials with some emerging technologies such as Rapid Earth Fault Current Limiting (REFCL) and Early Fault Detection (EFD) to study feasibility and benefits.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 5,300	$ 9,119	$ 3,819

The additional spend in 2020 is attributed to the integration of five substation hardening projects into the Advanced Protection scope..

PSPS Impact Reduction: N/A

C. Distribution Overhead System Hardening (2020 WMP Section 5.3.3.3)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
1	1.9	190%	Miles covered conductor
102	99.5	98%	Miles bare wire

Operational Changes: The change in miles of covered conductor actual completed compared to SDG&E's target was due to the fact one project completed construction in November of 2020 that was nearly two miles in total length. The change in miles of bare wire was approximately 2% less (~2.5miles) than planned for 2020. The difference was due to the fact that not all projects that went into construction in 2020 were able to fully complete construction. SDG&E had over 35 miles of projects in construction but not complete at the end of 2020.

Spend:

Covered conductor	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 1,071	$ 1,798	$ 727

The variance in covered conductor actual cost compared to the target was due to the fact the program is a new initiative and SDG&E is still refining our estimates for the costs to design and construct covered conductor and the associated hardware. SDG&E also increased the targets for covered conductor installation in 2021 and 2022 in the 2021 WMP filing as compared with our 2020 WMP filing. The mile target increased by 10 miles in 2021 and 50 miles in 2022. By increasing the target miles of hardening in 2021 and 2022 SDG&E began the engineering and design process on more projects in 2020 so they could be ready for construction in 2021 and 2022.

Bare wire	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 87,000	$ 138,378	$ 51,378
O&M	$ -	$ 3,446	$ 3,446

The variance in actual compared to target Capital costs are most attributable to the increase in SDG&E's mile target for 2021 in our 2021 WMP filing as compared with our 2020 WMP filing. The mile target increased by 86 miles in 2021. By increasing the target miles of hardening in 2021 the engineering and design process was accelerated on additional projects in 2020 so they could be ready for construction in 2021. The variance in actual compared to target O&M costs is most attributed to an oversight. SDG&E has historically seen approximately 2-3% O&M associated with our Capital work, which should have been included in the original estimate.

PSPS Impact Reduction: While this program cannot be tied to a direct decrease in PSPS impacts, when an entire circuit segment is hardened it can increase the threshold for which the line would experience a PSPS.

D. Expulsion Fuse Replacement (2020 WMP Section 5.3.3.7)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
3000	3179	106%	Fuses

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 3,737	$ 6,521	$ 2,784

The cost per fuse replacement increased due to the amount of work that was completed using overtime labor rates and an increase in locations that required traffic control.

PSPS Impact Reduction: N/A

E. PSPS Sectionalizing Enhancements (2020 WMP Section 5.3.3.8.1)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
7	23	329%	Switches

In order to minimize the impacts to customers involved in PSPS events, SDG&E maximized the number of switches that could be installed prior to the 2020 fire season. These switch locations were strategically evaluated to consider access requirements, weather station coverage, and minimization of customers impacted by PSPS events.

Operational Changes: As stated above, this program was accelerated to minimize the impacts to customers involved in PSPS events.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 550	$ 5,111	$ 4,561

The extra spend associated with this program is attributed to the extra switches that were prioritized for 2020, and the additional costs per switch that increased due to two switch installation jobs that required undergrounding of 0.34 miles of cable, and SCADA base station installations in Cleveland National Forest to provide new SCADA coverage.

PSPS Impact Reduction: PSPS sectionalizing enhancements enables SDG&E the ability to divide the distribution system into smaller segments. This allows for more targeted application of PSPS to the areas of greatest risk and minimizes the impacts to adjacent customers. During the 2020 Red Flag Warning event from December 2nd to December 4th, SDG&E estimates that PSPS sectionalizing enhancements reduced the number of customers impacted by PSPS by 5,773 customers.

F. Microgrids (2020 WMP Section 5.3.3.8.2)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
3	4	133%	Microgrids

Operational Changes: SDG&E's original plan for microgrids included two locations (Butterfield and Shelter Valley) as a single microgrid. Upon further evaluation, SDG&E determined that it would be more beneficial to separate the two communities into separate microgrid locations.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 11,340	$ 3,542	$ (7,798)
O&M	$ -	$ 371	$ 371

COVID-19 led to delays in obtaining the required permits and delays in obtaining energy storage equipment to get to the final renewable solution. Anticipated 2020 spend was delayed into 2021.

PSPS Impact Reduction: By the end of 2020, SDG&E had five microgrids to keep communities energized during PSPS events. This included sites at Ramona Air-Attack Base, Cameron Corners, Butterfield Ranch, Shelter Valley, and Julian Town Center. During the 2020 Red Flag Warning event from December 2nd to December 4th, SDG&E estimates that microgrids reduced the number of customers impacted by PSPS by 569 customers.

G. Hotline Clamps (2020 WMP Section 5.3.3.10)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
1650	2061	125%	Hotline clamps

Operational Changes: Although the scope of the project did not change, the number of hot line clamps per structure was higher than anticipated. This was the primary driver for the 25% increase from actual to plan.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 3,000	$ 3,299	$ 299

PSPS Impact Reduction: N/A

H. Customer Resiliency Programs (2020 WMP Section 5.3.3.11.1)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
1250	1334	107%	Generators
8	8	100%	CRC's
4	4	100%	Generators Leased

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 3,340	$ 6,370	$ 3,030

The cost variance included in this initiative is due to the way SDG&E categorized and implemented the three customer programs: Customer Resiliency Programs, Expanded Generator Grant Program, and Whole House Generator Program. When combining these three programs, the 2020 Target spend was $8,460k and 2020 Actual spending was $8,885k or a difference of five percent.

PSPS Impact Reduction: In 2020, the Customer Resiliency Program provided portable battery-powered generators to 1,334 medical baseline customers.

I. Expanded Generator Grant Program (2020 WMP Section 5.3.3.11.2)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
130	1274	980%	Generators

Operational Changes: In the 2020 WMP, SDG&E planned to introduce an Expanded Generator Grant program, targeting 130 customers in addition to the 1,250 participants in the Generator Grant program (GGP). These 130 customers would have received the same generator as the medical baseline and access and functional needs customers who participated in the GGP.

Based on customer feedback, it was determined a more cost-effective approach to expand the market focus beyond vulnerable customers and broaden SDG&E's program reach was to shift focus to a point-of-sale rebate program, which became the Generator Assistance Program.

With the new point of sale rebate program, SDG&E created an internal goal of having 1,000 generators purchased by customers using the instant rebate coupon. This goal was exceeded by roughly 300. The overshoot of the target can be explained by a dramatic increase in interest in the program following a large PSPS event that occurred from December 2 through December 5, 2020.

The shift to a more cost-effective approach enabled SDG&E to provide more generators to customers within the HFTD that were previously impacted by PSPS than the initial program target thereby exceeding the previous risk reduction.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 4,870	$ 761	$ (4,109)

The cost variance included in this initiative is due to the way SDG&E categorized and implemented the three customer programs: Customer Resiliency Programs, Expanded Generator Grant Program, and Whole House Generator Program. When combining these three programs, the 2020 Target spend was $8,460k and 2020 Actual spending was $8,885k or a difference of five percent.

PSPS Impact Reduction: In 2020, the Expanded Generator Grant Program provided 2,284 generator purchase rebates to customers within the HFTD. This resulted in 1,274 customers purchasing a generator.

J. Whole House Generator Program (2020 WMP Section 5.3.3.11.3)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
300	75	25%	Generators

Program delays resulted in reaching one quarter of year-end goal. SDG&E has established a streamlined process and plans to maintain and improve it going forward. Specifically, SDG&E has collaborated with the County of San Diego (and the third-party contracting company involved with these programs) to streamline residential permitting—a process that used to take anywhere from four to eight weeks, reducing it down to a two- to three-week process. Also, in discovering the extended permitting and installation processes involved with specific commercial/community buildings (like schools and mobile home parks), SDG&E intends to start these projects earlier in the year in preparation for timelier site assessments, permitting, and installations. SDG&E will continue to explore enhancements to this category of customer initiatives through evaluation of customer feedback and lessons learned.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 250	$ 1,754	$ 1,504

The cost variance included in this initiative is due to the way SDG&E categorized and implemented the three customer programs: Customer Resiliency Programs, Expanded Generator Grant Program, and Whole House Generator Program. When combining these three programs, the 2020 Target spend was $8,460k and 2020 Actual spending was $8,885k or a difference of five percent.

PSPS Impact Reduction: In 2020, the Whole House Generator Program provided whole home generators to 75 customers. During the 2020 Red Flag Warning events in early December 2020, SDG&E estimates that whole house generators reduced the number of customers impacted by PSPS by 32 customers per event.

K. Strategic Undergrounding (2020 WMP Section 5.3.3.16)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
10	15.6	156%	Miles

The additional miles performed in 2020 were due to modifications required to the design after job walks were performed. Additional jobs were scoped and completed in 2020 that were not in the original plan.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 31,000	$ 38,850	$ 7,850

The additional spend in 2020 is directly tied to the additional mileage of undergrounding performed.

PSPS Impact Reduction: During the 2020 Red Flag Warning events in early December 2020, SDG&E estimates that strategic undergrounding reduced the number of customers impacted by PSPS by 119 customers.

L. Overhead Transmission Fire Hardening (2020 WMP Section 5.3.3.17.1)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
21.5	19.7	92%	Miles transmission OH
0	0	100%	Miles transmission UG
10	9.4	94%	Miles distribution underbuilt

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 5,871	$ 5,030	$ (841)

The cost underrun is tied to the reduction in miles hardened in 2020.

PSPS Impact Reduction: While this program cannot be tied to a direct decrease in PSPS impacts, when an entire circuit segment is hardened it can increase the threshold for which the line would experience a PSPS.

M. Cleveland National Forest Fire Hardening (2020 WMP Section 5.3.3.17.2)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
29	29.1	100%	Miles transmission OH
50	46.8	94%	Miles distribution OH
14	14.4	103%	Miles distribution UG

Operational Changes: N/A

Spend:

Distribution OH	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 35,000	$ 46,271	$ 11,271

The increased costs are due to invoice timing and construction scheduling. There was work performed in 2020 that was initially scheduled in 2019, and the contractor invoice timing for the work fell into 2020.

Distribution UG	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 30,000	$ 37,973	$ 7,973

The increased costs are due to invoice timing and construction scheduling. There was work performed in 2020 that was initially scheduled in 2019, and the contractor invoice timing for the work fell into 2020.

PSPS Impact Reduction: While this program cannot be tied to a direct decrease in PSPS impacts, when an entire circuit segment is hardened it can increase the threshold for which the line would experience a PSPS.

N. Distribution Communications Reliability Improvements (2020 WMP Section 5.3.3.18.1)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
25	15	60%	Stations

The DCRI program purchased a spectrum license and installed 15 base stations in 2020. The active development of distribution standards and the associated integrated LTE/Distribution build process has delayed the installation of additional base stations last year. The integrated LTE/Distribution build process is a new unique process that integrates numerous departments and various safety and regulatory requirements into new distribution standards that drive design. Site specific designs must be fully completed prior to initiating procurement of the engineered steel poles used in the designs. The procurement process for an engineered steel pole is estimated at one year, delaying mass deployment. Once the process has been standardized, the program will be able to generate a predictable build-out schedule to meet forecasted goals. In addition, the number of total base stations required is expected to be reduced with the purchase of an additional spectrum in 2021.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 31,500	$ 35,473	$ 3,973

The DCRI program purchased a spectrum license and installed 15 base stations in 2020. The additional costs are related to the spectrum license purchase and the design and procurement costs associated with the engineered steel poles.

PSPS Impact Reduction: N/A

V. Asset Management and Inspections (2020 WMP Section 5.3.4)

The purpose of SDG&E's asset management and inspection programs are to promote safety for the general public, SDG&E personnel, and contractors by providing a safe operating and construction environment, while maintaining system reliability. SDG&E's established inspection and maintenance programs enable SDG&E to identify and repair conditions and components to reduce potentially defective equipment on SDG&E's electric system to minimize hazards and maintain system reliability. To accomplish this, SDG&E meets or exceeds the requirements of the inspections mandated by Public Resource Code Sections 4292 and 4293 as well as GO 95, GO 128, GO 165, and GO 174.

SDG&E is continually working to find ways to improve the safety of its system through its asset management and inspection programs. This includes development of new programs such as the distribution and transmission drone programs with a continued focus on existing programs such as the routine and detailed inspections performed for substation, distribution, and transmission assets.

Below is a financial summary for the programs within the Asset Management and Inspections category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 14,168	$ 27,706	$ 13,538
O&M	$ 53,190	$ 53,885	$ 695

A. Pole Replacement and Reinforcement (2020 WMP Section 5.3.3.6)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
670	598	89%	Poles

SDG&E only replaces and reinforces poles that are identified through our inspections. Poles identified to be replaced in 2020 decreased from both compliance maintenance program inspections and wood pole intrusive inspections.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 10,568	$ 10,925	$ 357

PSPS Impact Reduction: N/A

B. Detailed Corrective Maintenance Program Inspections (2020 WMP Section 5.3.4.1)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
17500	17977	103%	Inspections

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 1,257	$ 1,062	$ (195)

There was an upward pressure of internal and external non-routine inspection requests. A portion of our routine inspections were moved into 2021 to accommodate the unplanned increased workload.

PSPS Impact Reduction: N/A

C. Transmission System Inspections (2020 WMP Section 5.3.4.2)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
117	114	97%	Inspections (Visual)
113	110	97%	Inspections (Infrared)
41	41	100%	Inspections (Detailed)
27*	21	78%	Inspections (Aerial 69kV)

* This target was overstated in the 2020 WMP as 27 tie lines which included five 230kV or 500kV tie lines, and one additional 69kV tie line (TL626) that was removed from service in 2020.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ -	$ 838	$ 838

In 2020, SDG&E replaced a total of 72 Transmission Poles in the HFTD of which 34 of them had distribution underbuilt. SDG&E also completed the design of seven more transmission poles with distribution underbuilt that have not yet been constructed.

PSPS Impact Reduction: N/A

D. Infrared Inspections of Distribution Infrastructure (2020 WMP Section 5.3.4.4)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
8500	13077	154%	Inspections

Operational Changes: As the wildfire season developed, SDG&E saw windspeeds exceeding 99th percentile speeds throughout the HFTD. SDG&E performed infrared inspections between red flag warning events to further analyze the impacts of the events on Tier 3 circuits and further analyze timing as part of development of the pilot program. Between August and October, approximately 5,600 patrols were performed to verify structures between events. In addition, when conditions were identified via infrared on a circuit, larger segments of that circuit were inspected to assess whether similar conditions were present on the same circuit. These two items were what prompted SDG&E to perform additional infrared inspection on Tier 3 HFTD distribution lines.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 245	$ 175	$ (70)

For the 2020 WMP, SDG&E provided a conservative range for distribution infrared inspections with the center of the target range at 8,500 structures and the higher target at 10,000 inspections. This target range was conservatively set due to the projected start date but with efficiencies achieved throughout the development of the pilot, SDG&E was able to perform approximately 7,000 distribution infrared inspections prior to the start of August in anticipation of wildfire season.

PSPS Impact Reduction: N/A

E. Intrusive Pole Inspections - Distribution (2020 WMP Section 5.3.4.6)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
18000	14450	80%	Inspections

There was an upward pressure of internal and external non-routine inspection requests. A portion of our routine inspections were moved into 2021 to accommodate the unplanned increased workload.

Operational Changes: N/A

Spend: Costs for this program are tracked within the Pole Replacement and Reinforcement program.

PSPS Impact Reduction: N/A

F. HFTD Tier 3 Inspections (2020 WMP Section 5.3.4.9.1)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
11500	11864	103%	Inspections

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 368	$ 400	$ 32

PSPS Impact Reduction: N/A

G. Drone Assessments of Distribution Infrastructure (2020 WMP Section 5.3.4.9.2)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
33000	37310	113%	Inspections

When SDG&E set targets for this pilot program in early 2020, the number of facilities in the Tier 3 HFTD SDG&E would be able to assess was estimated in light of potential agency restrictions, access, etc. SDG&E was able to complete flights for the majority of facilities in the Tier 3 HFTD.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 3,600	$ 15,901	$ 12,301
O&M	$ 50,500	$ 51,953	$ 1,453

The issue rate for findings on distribution facilities was much higher than anticipated, resulting in more repairs. The variance in costs for capital and O&M was related to costs for implementing repairs of issues found during flights and inspections.

PSPS Impact Reduction: N/A

H. Circuit Ownership (2020 WMP Section 5.3.4.9.3)

Risk Reduction:

2020 Plan	2020 Actual
The Circuit Ownership program provides the opportunity for SDG&E's field employees and management of field employees to submit circuit vulnerabilities via a Mobile Data Terminal (MDT) program or mobile application (both iOS and Android). Since it is a new program, SDG&E will continue to evaluate this program for improvements, encourage participation, and seek feedback from both front-end and back-end users.	In Q4 2020, SDG&E completed a renewed roadshow on the Circuit Ownership business process to all business groups, receiving buy-in on how the process works and how submissions are handled. However, SDG&E did not receive any new submissions in Q4 2020 that were applicable to the program. There were two submissions, but both were deemed "de-scoped" and not applicable.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ -	$ 41	$ 41
O&M	$ 525	$ -	$ (525)

There were far fewer submissions from this program in 2020 than SDG&E anticipated. We completed a roadshow to garner more interest in the program and will continue to monitor and report progress specific to this initiative.

PSPS Impact Reduction: N/A

I. Drone Assessments of Transmission Infrastructure (2020 WMP Section 5.3.4.10)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E will continue to develop the program to enhance its existing inspection efforts of transmission structures in HFTD areas starting in 2020. SDG&E plans to focus on inspecting all its transmission structures in Tier 3 areas in 2020, along with four select circuits in the Tier 2 HFTD.	SDG&E inspected ~85% of its transmission structures in Tier 3 and selected circuits in Tier 2 HFTD.

Operational Changes: N/A

Spend: Transmission inspection costs are subject to FERC jurisdiction and are not included within the WMP.

PSPS Impact Reduction: N/A

J. Patrol Inspections of Distribution Poles - CMP (2020 WMP Section 5.3.4.11)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
86000	86075	100%	Inspections

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 295	$ 295	$ -

PSPS Impact Reduction: N/A

K. Monitoring and Auditing of Inspections (2020 WMP Section 5.3.4.14)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E continues to utilize various reports to monitor its CMP progress, for both inspections and repairs. Additionally, SDG&E plans to select 1.5% of the combined inspections and assess their conditions to see if the appropriate improvements have been properly carried out.	SDG&E completed all of the audits of our GO165 overhead detailed inspections for 2020. Overall result was positive, with very few additional findings discovered. Out of 981 structures audited, only 35 additional findings were found.

Operational Changes: N/A

Spend: The costs for monitoring and auditing inspections are embedded within operational costs and are not split by HFTD and Non-HFTD.

PSPS Impact Reduction: N/A

L. Substation System Inspections (2020 WMP Section 5.3.4.15)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
330	405	123%	Inspections

The WMP (and SDG&E's maintenance practice) has a minimum acceptable frequency as well as a planned frequency. For example, the minimum acceptable frequency is 5 inspections every 12 months for priority 2 substations. In general, SDG&E exceeded the minimum acceptable frequency of inspections. Additionally, due to the COVID-19 pandemic, SDG&E scheduled extra inspections on substations that feed COVID critical facilities (Hospitals, vaccine centers, etc), which resulted in additional inspections.

Operational Changes: N/A

Spend: Substation inspection costs are tracked as FERC dollars and are not included within the WMP.

PSPS Impact Reduction: N/A

VI. Vegetation Management Inspections (2020 WMP Section 5.3.5)

As part of its efforts to make its electric system more resistant to wildfires, and to comply with relevant Commission rules and state law, SDG&E's vegetation management program was designed with the goal of keeping trees and brush clear of electric infrastructure. SDG&E's vegetation management program involves several components including but not limited to: tracking and maintaining a database of inventory trees and poles, routine and enhanced patrolling, pruning and removing hazardous trees, replacing unsafe trees with more situationally compatible species, pole brushing, and training first responders in electrical and fire awareness.

SDG&E's strategy for conducting its vegetation management program focuses on annual routine and enhanced inspections. Routine operations are driven by regulatory requirements by following an annual, master schedule that includes pre-inspection activities, trimming, auditing, and pole brushing. During routine and off-cycle inspections in the HFTD, SDG&E pursues enhanced clearances on its targeted species. The off-cycle inspections provide a second assessment of all trees within the HFTD during the annual cycle. The criteria for determining target species include factors such as growth rate and characteristics, failure potential, outage frequency history, and other environmental factors. Targeted species include eucalyptus, palm, oak, pine, and sycamore. Species alone does not necessarily trigger the need for enhanced trimming; SDG&E also considers the risk based on multiple site-specific conditions. Many of these trees, such as eucalyptus and sycamore, are fast-growing and have the propensity to shed branches during wind conditions.

Below is a financial summary for the programs within the Vegetation Management Inspections category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ -	$ -	$ -
O&M	$ 62,322	$ 79,264	$ 16,942

A. Vegetation Management - Community Engagement (2020 WMP Section 5.3.5.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to participate in several community town hall meetings centered in communities in its service territory that are subject to enhanced vegetation management operations. Additionally, SDG&E will continue to create content for its public education campaign, outreach activities and broadcast and social media outreach.	In 2020 Vegetation Management participated in three Wildfire Preparation Webinars and four Wildfire Safety Fairs. These venues afforded the opportunity to engage with the public regarding Vegetation Management activities, fire safety practices, and tree giveaways. COVID-19 restrictions precluded many of the scheduled activities. SDG&E has developed door hanger messaging catered to specific activities to inform customers of routine and enhanced tree operations. SDG&E is also working on targeted messaging including Vegetation Management operations to residential customers in the HFTD via surveys. These surveys will help identify customers' resiliency while helping them plan for PSPS events.

Operational Changes: N/A

Spend: The costs for this program are embedded within routine operations as well as Community Outreach/Engagement programs due to Vegetation Management's involvement in the 2020 SDG&E Wildfire Safety Fairs.

PSPS Impact Reduction: N/A

B. Detailed Inspections of Vegetation Around Distribution Infrastructure – Inventory Tree Inspections (2020 WMP Section 5.3.5.2)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
455,000	451,207	99%	Inspections

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 27,776	$ 57,791	$ 30,015

SDG&E tracked higher than forecasted O&M costs primarily due to the increased contract rate as a result of Senate Bill 247 and a higher volume of work than in previous years. The 2020 forecasted spend for tree inspection included the fuels management and enhanced trim programs. For the purposes of this report, SDG&E has split the 2020 actual costs out by program.

PSPS Impact Reduction: N/A

C. Fuels Management (2020 WMP Section 5.3.5.5)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
500	324*	123%	500

*Fuels management 2020 progress was under reported in the 2021 WMP Update. Table 5-2 should have read 614 poles completed in 2020. The actual numbers include 314 poles that were re-cleared as maintenance in 2020, and an additional 300 new poles that were cleared in 2020. The Fuels Management program is unique in that SDG&E does not have land rights for many of the work areas, meaning SDG&E is subject to individual landowner approval(s) for every work area. If SDG&E does not receive approval, it is unable to complete the planned work. The targeted 500 work areas included in the 2020 WMP were SDG&E's best estimate prior to receiving landowner approvals.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 5,000	$ 5,805	$ 805

SDG&E conducted a fire retardant test in October 2020 which exceeded initial cost forecasts.

PSPS Impact Reduction: N/A

D. LiDAR Inspections of Vegetation Around Distribution Infrastructure and Vegetation Management Technology (2020 WMP Section 5.3.5.7)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to utilize LiDAR as a tool in its vegetation management operations. This technology augments and enhances the inspection activity by determining the empirical spatial relationship between trees and power lines. In addition, SDG&E plans to research future use of LiDAR to identify change detection on trees, to serve as an audit tool, and to identify pole movement and equipment condition.	Vegetation Management continued its LiDAR pilot on a priority risk circuit that includes a mix of tree density and species for a use case to determine the data accuracy and potential integration of the technology into routine inspection activities. Because of the relative long turnaround time between flight and data delivery, LiDAR's incremental value is still being assessed as an augmentation to ground inspection activities.

Operational Changes: N/A

Spend: The costs for this program are generally embedded within the Distribution Overhead System Hardening program; some specific vegetation management clearance analysis was tracked in SDG&E's Tree Trim Balancing Account (TTBA). The majority of LiDAR costs are tracked within the Overhead System Hardening program to support engineering as-builts. The costs for the recent pilot on circuit 214 around Palomar Mountain were tracked to the TTBA because the data was captured specifically for vegetation management clearance analysis.

PSPS Impact Reduction: N/A

E. Other Discretionary Inspections of Vegetation Around Distribution Infrastructure – Enhanced Inspections, Patrols, and Trims (2020 WMP Section 5.3.5.9)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
17,000	17,075	100%	Trim/Remove

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 23,603	$ 10,235	$ (13,368)

The 2020 forecasted spend for routine operations included the Fuels Management and Enhanced Trim programs. For the purposes of this report, we have split the 2020 actual costs out by program.

PSPS Impact Reduction: N/A

F. Quality Assurance/Quality Control of Inspections (2020 WMP Section 5.3.5.13)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to utilize a third-party contractor to perform quality assurance audits of all its vegetation management activities. Additionally, SDG&E's audit contractor plans to hire additional personnel to perform an anticipated increase in audit scope and activities. Furthermore, SDG&E anticipates completion of 100% audit on all its enhanced HFTD trim and removal activities.	Vegetation Management increased the number of contracted auditors performing QA/QC activities in 2020 to support Level 2 hazard tree inspection activities within the HFTD. One audit lead and five audit personnel were added to the QA/QC workforce. A QA/QC audit was performed on a 12-15% representative sample of all completed vegetation management activities in 2020. The scope of the post-trim QA/QC activity was increased to include 100% audit on all completed reliability (hazard) trimming and removals in HFTD.

Operational Changes: N/A

Spend: The costs for this program are embedded within the Tree Trim Balancing Account (TTBA).

PSPS Impact Reduction: N/A

G. Recruiting and Training of Vegetation Management Personnel (2020 WMP Section 5.3.5.14)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E Vegetation Management contractors are responsible for developing and conducting training of its personnel. SDG&E continues to require all its contractors to perform annual training to include hazard tree assessments, customer engagement, fire preparedness and environmental regulations.	Vegetation Management contractors performed all targeted, annual training. Contractors were challenged to perform training in a virtual environment or smaller venues to meet CDC requirements. SDG&E participated in the statewide initiative to develop college-level curriculum for new qualified line-clearance tree trimmers. This program will produce highly trained personnel versed in safety and utility tree operations.

Operational Changes: N/A

Spend: The costs for this program are embedded within the Tree Trim Balancing Account (TTBA).

PSPS Impact Reduction: N/A

H. Removal and Remediation of Trees with Strike Potential to Electric Infrastructure - Hazard Tree Removal and Right Tree-Right Place (2020 WMP Section 5.3.5.16)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue the effort of hazard tree evaluation throughout the year, as is a critical component of SDG&E's vegetation management program operations to reduce tree-related outages and fire ignitions.	As part of its routine and off-cycle activities, SDG&E continued its targeted Level-2 hazard tree inspections in the HFTD using ISA-Certified Arborists. The scope of the off-cycle hazard tree patrols was increased to occur throughout the entire HFTD following the annual vegetation management master schedule of activities. All vegetation management contractors receive annual hazard tree evaluation training.

Operational Changes: N/A

Spend: The costs for this program are embedded within the Tree Trim Balancing Account (TTBA).

PSPS Impact Reduction: N/A

I. Vegetation Inventory System - Tree Database (2020 WMP Section 5.3.5.19)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue with their inventory database and work management systems that are collectively referred to as PowerWorkz. However, SDG&E plans to work with a vendor on the next generation of its electronic work management system to provide greater efficiency and functionality.	SDG&E made significant progress in the development of its new work management system (EPOCH) which is the mobile, mapping and work order application to manage the VM tree database. The majority of the design and build out of the new system was completed in 2020. Training and go-live activities are beginning in Q1 2021. Improvements with the new system will include better mapping navigability, GPS tree-locating, record attachment functionality, enhanced software performance.

Operational Changes: N/A

Spend: The costs for this program are embedded within the Tree Trim Balancing Account (TTBA).

PSPS Impact Reduction: N/A

J. Vegetation Management to Achieve Clearances Around Electric Infrastructure – Pole Brushing (2020 WMP Section 5.3.5.20)

Risk Reduction:

2020 Plan	2020 Actual	% of Target	Units
35500	35563	100%	Poles brushed

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 5,943	$ 5,433	$ (510)

PSPS Impact Reduction: N/A

VII. Grid Operations and Protocols (2020 WMP Section 5.3.6)

SDG&E's grid operations and protocols consist of mitigations that reduce risk through changing the way SDG&E operates during periods of elevated and extreme wildfire risk. This includes the disabling of reclosing in the HFTD, the enabling of fast recloser settings, restricting work in the HFTD during extreme fire potential and Red Flag Warnings, and sending contract fire resources with crews during elevated days in the HFTD. These operational decisions have led to reduced ignitions on the electric system, and just as importantly reduced ignitions during operational periods where an ignition is more likely to lead to a catastrophic fire.

Below is a financial summary for the programs within the Grid Operations and Protocols category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 10,200	$ 11,566	$ 1,366
O&M	$ 9,967	$ 8,060	$ (1,906)

A. Recloser Protocols (2020 WMP Section 5.3.6.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue the use of overhead distribution reclosers to allow SDG&E to operate its system in a variety of configurations depending on input from its meteorologists, known localized conditions, and its declared Operating Condition.	SDG&E continues to leave reclosing disabled in the HFTD. During extreme operating conditions, SDG&E disabled reclosing in the Wildland Urban Interface.

Operational Changes: N/A

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

B. Wildfire Infrastructure Protection Teams - Contract Fire Resources (2020 WMP Section 5.3.6.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to contract for wildfire prevention and ignition mitigation services, Contract Fire Resources, which are paired with SDG&E personnel during times of elevated wildfire potential. SDG&E is prepared to expand the program to support the increased need to ensure the wildfire mitigation efforts taking place are being done to the highest wildfire safety standards to prevent potential ignitions.	SDG&E continued to pair Contract Fire Resources with field personnel during times of elevated wildfire potential in 2020. SDG&E was able to increase the number of resources to meet the needs during periods of extreme conditions.

Operational Changes: SDG&E increased the number of resources to meet the needs during periods of extreme conditions.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 1,668	$ 1,294	$ (374)

During Red Flag Warnings, the costs for the wildfire protection teams is tracked separately as part of the emergency response. Due to the high number of Red Flag Warnings in 2020, increased costs were tracked separately leading to the variance.

PSPS Impact Reduction: N/A

C. Other Special Work Procedures (2020 WMP Section 5.3.6.3)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to use the operating conditions (Normal, Elevated, Extreme) to dictate the types of work that we perform under normal, elevated, extreme or RFW conditions today. Additionally, SDG&E will continue to review the procedures that govern these operations.	Leveraging the daily Fire Potential Index issued by Meteorology in 2020, daily work was adjusted according to the wildfire risk. Additionally, SDG&E reviewed and updated the procedural document that governs this work.

Operational Changes: N/A

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

D. Protocols for PSPS Re-energization (2020 WMP Section 5.3.6.4)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to follow the protocols for PSPS Re-energization, which takes place after the SDG&E weather network shows that wind speeds have decreased, and SDG&E weather forecasts indicate that winds will not re-accelerate at or above dangerous levels.	In the 4th quarter of 2020, SDG&E executed multiple PSPS events where these protocols were successfully implemented. Once local winds have died down and are forecasted to stay down at safe levels, the officer in charge provides the okay to patrol. Once a full patrol of a segment is complete, if no damage to the circuit is found, the segment is re-energized.

Operational Changes: N/A

Spend: The costs for this program are embedded within Emergency Management Operations.

PSPS Impact Reduction: This program does enable a reduction of the duration of a PSPS event.

E. PSPS Protocols (2020 WMP Section 5.3.6.5.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to regularly evaluate its PSPS protocols before, during, and after wildfire season to identify areas for improvement and incorporate lessons learned.	SDG&E implemented PSPS as a last resort mitigation due to extreme conditions and high winds across the service territory as described in SDG&E's WMP.

Operational Changes: There were no operational changes made to the PSPS Protocols as SDG&E continues to closely align with the decisions in the De-energization OIR.

Spend: The costs for this program are embedded within Emergency Management Operations.

PSPS Impact Reduction: N/A

F. Mitigating the Public Safety Impact of PSPS Protocols (2020 WMP Section 5.3.6.5.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to manage and mitigate the impacts of a PSPS event through collaboration with key stakeholders in the wildfire response community. SDG&E plans to continue and strengthen the relationship with the partners over the course of the year to address a range of fire prevention and emergency activities.	In 2020, SDG&E customers experienced five PSPS de-energization events. Following all required notification requirements, public safety partners were informed up to 72-hours prior to any de-energization and given access to a GIS information portal. Similarly, impacted customers were notified 24 to 48 hours prior. All stakeholders continue to receive notifications throughout the PSPS event. SDG&E continues to actively engage with the CAISO and other IOUs within California to identify and mitigate the impact of transmission PSPS. SDG&E also engages with fire agencies during fire emergencies in real time to deenergize or otherwise make safe transmission facilities to enable firefighting efforts to continue in a safe manner.

Operational Changes: N/A

Spend: The costs for this program are embedded within Cooperation and Best practice Sharing with Outside Agencies.

PSPS Impact Reduction: N/A

G. PSPS Communication Practices (2020 WMP Section 5.3.6.5.3)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to utilize its wildfire communications framework, which consists of a multi-pronged approach and is divided into three phases – prior to, during, and following the extreme weather event. The purpose of the communications program is to educate and help the public prepare for, respond to, and recover from a PSPS or wildfire event. Additionally, SDG&E plans to adjust and refine communications tactics in real time based on customer and stakeholder feedback to ensure ongoing relevancy and effectiveness.	SDG&E augmented and utilized diverse communication tools to meet customer communications needs through a year-round wildfire/PSPS safety education and communication campaign which consisted of customer communication prior to, during and following wildfire/PSPS season. The campaign promoted signing up for notifications, preparedness messaging, and customer updates during events. More than twenty communication platforms were leveraged including communications through regional community and emergency partners and community based organizations, outbound dialer system for customer notifications during events, a new PSPS mobile app, dedicated and enhanced PSPS website, community events and online webinars, extensive social media toolkits for community partners and social media on multiple platforms, including community, zip code specific platforms, broadcast media including TV, radio and local publications, digital in- community signage providing event real time updates and safety messaging, and AFN/Medical Baseline outreach and tribal outreach.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 3,000	$ 4,474	$ 1,474

PSPS Impact Reduction: N/A

H. Aviation Firefighting Program (2020 WMP Section 5.3.6.6.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E has developed and implemented an effective, year-round aerial firefighting program to support the fire agencies in its service territory. SDG&E will continue to assess the effectiveness of its Aviation Firefighting program and will work with CAL FIRE on any changes for improved firefighting effectiveness.	With the establishment of an Aviation firefighting program, SDG&E has an MOU with San Diego County and Orange County Fire Authority to have two aerial firefighting assets available seven days a week, 365 days per year. Availability is measured in days and any days that an asset is not available for immediate dispatch degrades the availability. Additionally, the number of dispatches is equal to a response to need. For 2020, SDG&E provided the following availability and dispatches: • Air Crane - zero days unavailable • Blackhawk - zero days unavailable • 35 dispatches, 19 with fire attack

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 7,200	$ 7,092	$ (108)
O&M	$ 7,961	$ 6,766	$ (1,194)

SDG&E was able to gain efficiencies in the contract costs related to the Air Crane helicopter. Monthly costs were lower than forecast.

PSPS Impact Reduction: N/A

I. Industrial Fire Brigade (2020 WMP Section 5.3.6.6.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue the contract with Industrial Fire Brigade (IFB), which is available 24 hours a day, 365 days a year. The IFP is trained to fight fires involving electrical equipment as well as flammable liquids and are focused on site specific fire prevention and ignition mitigation.	In 2020, the Industrial Fire Brigade (IFB) remained available 24 hours a day, 365 days a year to train and fight fires involving electrical equipment.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 338	$ -	$ (338)

The costs for the Industrial Fire Brigade are primarily Electric Transmission (FERC) related and not tracked within the WMPMA.

PSPS Impact Reduction: N/A

VIII. Data Governance (2020 WMP Section 5.3.7)

In 2020, SDG&E began centralizing its WMP-related measures and metrics in a central repository to gain insights and assess progress on WMP programs and initiatives.

During the establishment of the centralized measures and metrics reporting process, SDG&E inventoried required data metrics and identified data owners and data sources. Through subsequent interviews of data owners, SDG&E determined that each specific data metric would need to be clearly defined and a repeatable and verifiable processes established to accumulate and track the data to ensure its integrity and auditability.

Initially, SDG&E almost exclusively collected data metrics and measures manually. In addition, data definitions were inconsistent, some data was untimely, and preliminary and final data metrics could vary. To enhance data quality and improve the efficiency of the data gathering process, SDG&E began developing a WMP Data Governance Framework (DGF) and an automated Central Data Repository (CDR) for wildfire-related data, which can be used by multiple internal and external stakeholders in the future. These changes will improve data collection by moving away from manual collection to a more uniform, electronic format that will provide data metrics in a searchable format, similar to a GIS data structure.

The DGF will define a set of repeatable standards, policies, processes and controls for wildfire- related data. Similar to the WSD's GIS Data Standards, the vision of SDG&E's DGF is to make its wildfire-related data actionable, accessible, aligned, and auditable.

In response to the WSD GIS Data Standards and other related regulatory initiatives, SDG&E is making significant enhancements to the CDR that will make it scalable and sustainable to accommodate future regulatory requirements. SDG&E will pursue technology solutions to automate these data requests where possible.

To date, SDG&E has completed approximately 25% of the effort needed to implement the DGF and CDR and anticipates the completion of data related to the all the metrics tables contained in the WMP by the end of 2021. SDG&E expects that the repository along with the supporting documentation will be completed near the end of 2022.

Below is a financial summary for the programs within the Data Governance category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ -	$ 7,480	$ 7,480
O&M	$ 315	$ -	$ (315)

A. Centralized Repository for Data (2020 WMP Section 5.3.7.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E continues to develop an Enterprise Asset Management Platform (EAMP), which is a centralized repository for asset data. This will provide means to optimize its risk, performance, and investments, while meeting or exceeding safety and regulatory objectives.	For 2020, SDG&E implemented consolidated data views pulling asset attributes of different categories including nameplate data, inspection and maintenance data, outage history, and weather data for distribution poles, cables, tees, and wires. Additionally, asset health and risk indices were completed for distribution wood poles, cables, wires, and tees utilizing machine learning, AI, and statistical analysis. The EAMP can perform granular analysis to understand the quality of asset data in scope.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ -	$ 5,272	$ 5,272

The additional capital expenditure in 2020 was related to implementation and software license costs for the EAMP project related to WMP. The variance is attributable to funds re-allocated to Data Governance programs from Asset Management as a result of difference in reporting structure between the 2020 WMP and the 2021 WMP Update.

PSPS Impact Reduction: N/A

B. Geographic Information System Data (2020 WMP Section 5.3.7.1.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to use the automated sharing of PSPS event data with many different entities utilizing ESRI's ArcGIS Online (AGOL) application to provide Cal OES and other public safety partners to consume the requested data in a timely and secure fashion. In addition, SDG&E will continue to manually send the data to other Public Safety Partners that can't access the data in an automated fashion.	In 2020, SDG&E continued to share PSPS and/or potential PSPS data via the automated process with Cal OES and public safety partners for all activations. Once meteorology publishes the data for a particular event the data is sent to a cloud-based platform (ArcGIS Online or AGOL) for Cal OES and public safety partners to consume. Additionally, SDG&E manually sends the PSPS data via the SDGE Electronic Data Transfer (EDT) site to the partners who do not have access to the cloud-based app AGOL. Data was shared via the automated process or manually to ~ 70 agencies.

Operational Changes: N/A

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

C. Collaborative Research on Utility Ignition and/or Wildfire - Innovation Lab and Other Collaboration (2020 WMP Section 5.3.7.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to establish a Fire Science and Innovation Lab in 2020. The lab will bring together leading thinkers and problem solvers in academia, government, and the community to create forward-looking solutions to help prevent ignitions, mitigate the impacts of fires, and ultimately help build a more resilient region.	SDG&E has established the Fire Science and Innovation Lab in 2020, though initial implementation was completely on a remote basis due to the COVID-19 pandemic. As part of the establishment of the lab, new partnerships were established with San Jose State University, Scripps Institution of Oceanography, and the San Diego Supercomputer Center.

Operational Changes: N/A

Spend: The costs for this program were embedded within the Fire Science and Climate Adaptation Department.

PSPS Impact Reduction: N/A

D. Wildfire-related Data and Algorithms (2020 WMP Section 5.3.7.3)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue the partnership with academia, government, and other professionals to undertake unprecedented initiatives over the last decade to innovate, implement, and share advanced technologies to improve wildfire safety in the region.	SDG&E has continued its partnerships with academia, government, and other professionals through 2020. To help facilitate these partnerships, SDG&E worked with the San Diego Supercomputing Center to make all weather model information generated by SDG&E available publicly.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ -	$ 2,208	$ 2,208

The variance is attributable to funds re-allocated to Data Governance programs from Asset Management as a result of difference in reporting structure between the 2020 WMP and the 2021 WMP Update.

PSPS Impact Reduction: N/A

E. Ignition Management Program (2020 WMP Section 5.3.7.4.1)

Risk Reduction:

2020 Plan	2020 Actual
In 2019, SDG&E established a pilot Ignition Management Program (IMP). SDG&E intends to continue to develop the IMP in 2020. This work is closely aligned with priorities in the 2020 WMP and is intended to enhance SDG&E's ignition data and analytics.	Throughout 2020, SDG&E continued the development of the Ignition Management Program (IMP) with the goal of creating a "No ignition ignored" culture, heightening awareness using technology to identify areas of improvement to reduce the risk and occurrence of ignitions.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 315	$ -	$ (315)

The costs for this program were embedded within the Fire Science and Climate Adaptation Department.

PSPS Impact Reduction: N/A

F. Reliability Database (2020 WMP Section 5.3.7.4.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E continues to track and maintain customer outage impact data for CPUC annual reporting, other internal and external reporting, and to analyze causes of electric system outages in order to use that information to optimize electric system reliability investments.	The Reliability database continued to successfully track and maintain customer outage impact data for CPUC annual reporting, other internal and external reporting, and to analyze causes of electric system outages in order to use that information to optimize electric system reliability investments.

Operational Changes: N/A

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

IX. Resource Allocation Methodology (2020 WMP Section 5.3.8)

SDG&E's enterprise risk management process includes a step focused on risk-informed investment decision-making. As addressed in SDG&E's 2019 RAMP, the capital planning process is the Company's current annual process for prioritizing funding based on risk-informed priorities and input from operations. The capital allocation planning sessions begin with input from functional capital committees that comprise subject matter experts who perform high level assessments of the capital requirements based on achieving the highest risk mitigation at the lowest attainable costs. These requirements are presented to a cross-functional team representing each functional area with capital requests.

This committee reviews the resource requirement submissions from all functional areas, and projects are evaluated against priority by assessing a variety of metrics including safety, cost effectiveness, reliability, security, environmental, strategic, and customer experience. Recommendations for capital spending are then presented to an executive committee for approval. Once the capital allocations are approved, each individual operating organization is chartered to manage their respective capital needs within the capital allotted by the plan. This includes re-prioritizations as necessary to address imminent safety concerns as they arise. As with the Company's risk evaluation processes, the capital planning process is continuing to evolve as the Company endeavors to achieve the goal of more quantitatively determining the risk reduction per dollar invested, also referred to as risk spend efficiency or RSE.

Below is a financial summary for the programs within the Resource Allocation Methodology category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 9,697	$ 1,623	$ (8,074)
O&M	$ 2,288	$ 3,719	$ 1,431

A. Asset Management (2020 WMP Section 5.3.8.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continues to develop and build a comprehensive asset management system, which includes process improvements, data analytics and system solutions, will provide the access to and integration of data throughout the asset life cycle to develop analysis and a health index for critical assets.	With the SDG&E asset management system being built in phases by asset class or business unit groups, Asset management system phase 1 with electric transmission and distribution operating group is currently in-progress with milestone accomplishments. An Operating Model, which is a process flow designed for electric system projects that outlines the different capabilities to lead and facilitate development of the strategic documents that define the program governance, overarching policy and strategy for a sustainable asset management system and integrated asset management plan implementation in alignment with ISO 55000 standards, has been developed and being refined. • A set of system solutions around data consolidation for decision support of capital and O&M maintenance and replacement strategies, including health scores, criticality, probability of failure, risk, and visualization, and risk-informed investment prioritization for evaluating the risk reduction benefits of projects while optimizing cost are currently in-progress for implementation. • In addition, a Data Analytics and Quantification team has been formed to perform asset and risk analytical capabilities to develop predictive machine learning models and asset health and risk scores.

Operational Changes:

SDG&E's Asset Management team, in 2020, began critical work on the creation of a centralized data foundation and repository for wildfire work and metrics. The centralized data foundation is intended to aid in the reporting process.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 9,697	$ 1,623	$ (8,074)
O&M	$ 450	$ 329	$ (121)

The variance seen above is attributable to funds re-allocated to Data Governance related to costs for a centralized data repository and data foundation for reporting.

PSPS Impact Reduction: N/A

B. Risk Spend Efficiency Analysis (2020 WMP Section 5.3.8.3)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to review and refine RSEs (Risk Spend Efficiency) and plans to further expand the activities for which an RSE is calculated in future WMP and RAMP filings.	SDG&E expanded the activities for which an RSE is calculated as shown in the 2021 WMP update. Additionally, more updates were made to the Risk Quantification Framework (RQF) in 2020 that were reflected in the 2021 WMP update.

Operational Changes: SDG&E recognized the need to disaggregate some of its initiatives that were previously grouped together for purposes of calculating RSEs, and in 2021 evolved the categorization of initiatives to allow for more RSEs to be represented where appropriate and to distinguish between activities that directly mitigate risk and ones that do not. Additionally, SDG&E developed a preliminary framework to allow for more granular RSEs to inform project prioritization efforts at a sub-circuit level using its new WiNGS model.

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

C. Wildfire Mitigation Personnel (2020 WMP Section 5.3.8.4.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E established the Wildfire Mitigation and Vegetation Management department with existing management personnel already deeply familiar with the WMP. In 2020, this team plans to continue to collaborate, gather information and the ability to inform, plan, act and improve with a compressed timeline, when needed through periodic meetings internally, with other SDG&E business units and externally.	In 2020 the Wildfire Mitigation and Vegetation Management department was able to track and report on all current wildfire mitigation operational targets. This reporting came in the form of internal dashboards as well as the various quarterly reports and data requests submitted to the Wildfire Safety Division. The team also continues to leverage the data from across the company to measure the effectiveness of mitigations and refine SDG&E's risk models that inform future mitigations.

Operational Changes: Wildfire Mitigation increased workforce in 2020, through the onboarding of additional full-time employees and contractors to help meet the growing operational, reporting and data analytic demands of the department.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 1,838	$ 3,389	$ 1,551

Increased spend for the Wildfire Mitigation Personnel is primarily attributable to costs associated with the PSPS Mitigation Engineering Team. Also contributing to the increased spend are incremental FTEs and strategic consulting.

PSPS Impact Reduction: N/A

D. PSPS Mitigation Engineering Team (2020 WMP Section 5.3.8.4.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E formed a dedicated team of experts bringing in a diverse set of skillsets from engineering to meteorology and risk management to look at the Company's infrastructure in the areas of highest wildfire risk with the objective of identifying short and long-term strategies to not only minimize wildfire risk, but also to reduce or minimize the customer impacts of PSPS. The team's effort will include a segment-by-segment analysis of circuits prone to PSPS to identify highest risk areas within the circuit to target various mitigation efforts that can either eliminate the need for shutoffs or reduce impacts of the shutoffs.	SDG&E's PSPS mitigation engineering team was able to identify short-term mitigations that were implemented ahead of the 2020 Wildfire season to reduce PSPS impacts. Furthermore, the team worked on developing the WiNGS tool which is being utilized to scope long-term mitigations to further reduce the impacts of PSPS in the future.

Operational Changes: The formation of this team provided detailed analysis necessary for SDG&E to make educated decisions regarding certain wildfire mitigation initiatives. Using RSE values and performing a circuit-by-circuit analysis, the PSPS Mitigation Engineering Team identified ways to lower PSPS risk in many areas, thus reducing overall risk.

Spend: Costs for this team were tracked within the Wildfire Mitigation Personnel program.

PSPS Impact Reduction: The efforts of this specialized team helped identify new solutions and prioritized programs to reduce the scope and duration of PSPS events. By taking a comprehensive and holistic look at regularly de-energized circuits, strategic undergrounding points were identified, as well as cost-effective candidates for the whole-home generator program. These decisions, along with identifying new sectionalizing device locations, were made with consideration to the respective RSEs.

X. Emergency Planning and Preparedness (2020 WMP Section 5.3.9)

The mission of the SDG&E's Emergency Management department is to coordinate safe and effective emergency preparedness for the Company, SDG&E's customers, and emergency response personnel. That mission extends to safely and efficiently preparing for, responding to, and recovering from all threats and hazards through strategic planning, training, and exercising, and a sustained Quality Assurance and Improvement process.

Below is a financial summary for the programs within the Emergency Planning and Preparedness category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 4,500	$ 2,140	$ (2,360)
O&M	$ 4,821	$ 12,214	$ 7,393

A. Overview of Emergency Preparedness Plan (2020 WMP Section 5.3.9.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E continues to refine the emergency preparedness plan that is developed in collaboration with key internal and external stakeholders and lessons learned from past incidents, trainings, and exercises are incorporated as appropriate. Additionally, SDG&E Emergency Management and Regional Government Liaisons plan to meet with local city, and county public safety partners to ensure effective communications between SDG&E and the partners.	Emergency planning activities are contained with the Company Emergency Response Plan (CERP) and corresponding hazard specific annexes. All trainings and exercises are developed in accordance with the plans and are in coordination with local public safety partners.

Operational Changes: N/A

Spend: Costs for this program are tracked within Emergency Management Operations.

PSPS Impact Reduction: N/A

B. Overview of Customer Support in Emergencies (2020 WMP Section 5.3.9.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to provide emergency residential and non-residential customer protections and availability communications for wildfire victims, consistent with CPUC direction provided in R.18-03-011.	In 2020, SDG&E focused on outreach to its most vulnerable customers. This included outreach to Medical Baseline customers, such as efforts to update contact records for wildfire event communications. Additionally, SDG&E finalized agreements with 2-1-1 San Diego and 2-1-1 Orange County to provide support for AFN customers impacted by PSPS events.

Operational Changes: N/A

Spend: Costs for this program are tracked within Emergency Management Operations.

PSPS Impact Reduction: This mitigation does not have a measurable impact on reducing PSPS impacts, but does help customers access information to assist them during PSPS events.

C. Coordination with Public Safety Partners (2020 WMP Section 5.3.9.3)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to work and strengthen its relationships with its Public Safety Partners, including local jurisdictions, to ensure coordination exists during Public Safety Power Shutoff events. SDG&E plans to accomplish this coordination via the following activities: conducting tours of its Emergency Operations Center for its Public Safety Partners in advance of events; and providing 24/7 contacts to its Public Safety Partners based on Public Safety Partner customer segment (e.g., a dedicated contact for emergency services, jurisdictional and utility partners and fire services).	SDG&E continues to work and strengthen the relationships with its Public Safety Partners, including local jurisdictions, to ensure coordination exists during Public Safety Power Shutoff events. SDG&E provides 24/7 contacts to its Public Safety Partners based on Public Safety Partner customer segment (e.g., a dedicated contact for emergency services, jurisdictional and utility partners and fire services). Additionally, SDG&E presents at, and regularly attends, the Regional Fire Chiefs Association, Regional Emergency Managers, Regional AFN Workgroup, and Unified Disaster Council meetings to expand our partnership.

Operational Changes: N/A

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

D. Adequate and Trained Workforce for Service Restoration (2020 WMP Section 5.3.9.4.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to strengthen its Incident Command System (ICS) framework, which uses a three-pronged approach with respect to its trained workforce for service restoration.	SDG&E strengthened its ICS framework and completed workforce training. The EPOCH field patrol tool and training was provided to our workforce in early 2020. Due to the timing of training however the tool wasn't used in actual events. SDG&E's Skills Training will be partnering with that team to provide better support in 2021. Skills Training also delivered PSPS pre- and post-patrol and ICS principles training to all of our contractors (QEW) in partnership with the Design and Construction Management department in 2020. PSPS pre- and post-patrol and ICS principles training was provided to district personnel. SDG&E's workforce was provided ESP 113.1 annual training, and Wildfire mitigation practices, PSPS processes, and ICS principles are being integrated into New Hire Lineman, Line Assistant and First Responder classes for 2021. Conducted PSPS tabletop exercise with ERO. ARCOS Crew Manager training was conducted in 2020 to support the management of resources in support of PSPS and ICS-Resource Coordination.

Operational Changes: SDG&E provided new trainees information on PSPS process and ICS to better prepare for real-world situations.

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

E. Company Emergency Response Plan Overview (2020 WMP Section 5.3.9.4.4.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E's Emergency Response Plan (CERP) and its risk specific response plans provide a framework by which it can effectively coordinate its pre-incident and response and recovery activities to a given threat or hazard. In addition to the CERP, SDG&E works collaboratively with the local jurisdictions to ensure integration into regional plans. SDG&E representatives are members of the Southern California Catastrophic Earthquake planning committee, Co-chair of the Southern California Lifelines training and exercise committee and are part of a three-year Department of Homeland Security Regional Resiliency Assessment Program sponsored by Cal OES.	SDG&E is in the process of updating the Company Emergency Response Plan (CERP) and several of the hazard specific annexes. All planning efforts are conducted in coordination with our public safety partners and presented annually to satisfy the AB1650 requirement of sharing emergency plans with local jurisdictions.

Operational Changes: N/A

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

F. Preparedness and Planning for Service Restoration - Mutual Assistance and Contractors (2020 WMP Section 5.3.9.4.5)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E is a member of multiple emergency associations to facilitate mutual assistance and maintains active mutual assistance agreements with the following organizations: California Utilities Emergency Association (CUEA); Western Regional Mutual Assistance Group; Western Energy Institute; Edison Electric Institute; and the American Gas Association.	SDG&E continues to be a member of multiple emergency associations to facilitate mutual assistance and maintains active mutual assistance agreements with the following organizations: California Utilities Emergency Association (CUEA); Western Regional Mutual Assistance Group; Western Energy Institute; Edison Electric Institute; and the American Gas Association. In 2020 the Mutual Assistance Plan was expanded to include COVID-19 protocols for both inbound and outbound assistance to ensure the safety of our crews.

Operational Changes: N/A

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: Mutual assistance potentially helps to reduce the potential for prolonged PSPS events.

G. Protocols in Place to Learn from Wildfire Events - After Action Reports (2020 WMP Section 5.3.9.4.6)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E reviews all significant incidents and activations to identify potential improvements and establish a comprehensive and measurable After Action Report.	In 2020, SDG&E documented After Action Reports for six PSPS events and two exercises, one with external stakeholders.

Operational Changes: N/A

Spend: Costs for this program are embedded within normal operations.

PSPS Impact Reduction: N/A

H. Other - Emergency Management Operations (2020 WMP Section 5.3.9.4.7)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to manage emergencies in alignment with the state Standardized Emergency Management System (SEMS) and federal National Incident Management System (NIMS), to coordinate across all levels of utility, government, and agency activity.	SDG&E is enhancing the Training & Exercise program by creating a division within the Emergency Management Department to oversee the expanding training requirements. Additionally, the new division will focus on expanding the ICS implementation to promote efficient and effective responses that coordinate and collaborate with first responders on scene.

Operational Changes: Creating a new division to oversee training requirements will increase general ICS awareness and efficiencies, thus creating smoother operations within the EOC during PSPS events. Another reason to create the new division is due to increased CalOES requirements, oversight, and reporting around PSPS training and exercises.

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ 4,500	$ 2,140	$ (2,360)
O&M	$ 4,821	$ 12,214	$ 7,393

The variance in forecasted capital spend in 2020 is primarily due to unforeseen delays in the planned Emergency Operation Center re-build caused by the COVID-19 pandemic. As noted previously, these costs are shared with the Fire Science and Climate adaptation program The O&M budget includes Emergency Management operations, Disaster and Emergency Preparedness plan, and customer support in emergencies. The overspend is primarily attributable to higher than forecasted PSPS-related spend.

PSPS Impact Reduction: Emergency Management operations do not directly impact PSPS thresholds, or reduce the scope, scale, or duration of PSPS events. Instead, the department contributes to efficient operations during PSPS events.

XI. Stakeholder Cooperation and Community Engagement (2020 WMP Section 5.3.10)

A first-class level of engagement and cooperation amongst all wildfire stakeholders is extremely important to SDG&E, as it endeavors to fulfill its commitment to mitigate the risk of wildfires and adverse impacts of PSPS events. SDG&E remains dedicated to partnering with utility customers, elected officials, nonprofit support organizations, first responders and all other public safety and community partners, understanding they all play a unique and important role in achieving wildfire prevention and mitigation in SDG&E's service territory. SDG&E provides an essential service, and it takes its role within the communities it serves very seriously. This is especially true during PSPS events, when communities – neighborhoods in which SDG&E's employees, families and friends live – depend on complete, accurate, and timely information for their well-being.

SDG&E will continue to strive to provide all stakeholders up-front awareness and information, using available channels to educate the public on wildfire preparedness and PSPS events. It is SDG&E's goal to equip those it serves with the information and resources to navigate the adversity of an emergency, wildfire, or PSPS event. Through thoughtful education campaigns and strategic partnerships, SDG&E has implemented a robust, external communication strategy, which is continuously analyzed to identify areas of improvement. SDG&E also leverages its broadened and increased relationships with CBOs and stakeholders to amplify and disseminate critical, sometimes life-saving information.

One of the pillars of SDG&E's wildfire and PSPS awareness lies within its Energy Solutions Partner network, which consists of nearly 200 CBOs. In addition, key to SDG&E's stakeholder engagement are its relationships with emergency response agencies, both locally and at the state-level. SDG&E is widely recognized as a world-class innovator with its Fire Science and Climate Adaptation department. This team is routinely asked – and happily provides – best practices to other national utilities, as well as internationally. This cooperation, in addition to communication practices lays the foundation for SDG&E's success in stakeholder cooperation and community engagement.

SDG&E remains committed to fostering productive collaboration and engaging the communities it serves.

Below is a financial summary for the programs within the Stakeholder Cooperation and Community Engagement category of SDG&E's 2020 Wildfire Mitigation Plan:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
Capital	$ -	$ -	$ -
O&M	$ 4,928	$ 8,761	$ 3,833

A. Community Engagement - Community Outreach and Public Awareness (2020 WMP Section 5.3.10.1)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to utilize its multi-pronged approach to community education, outreach and engagement related to public awareness of fire risk, fire prevention, and emergency preparedness.	• SDG&E delivered more than 1.3 million customer notifications to channels preferred by customers/stakeholders - cell phone, email, land line and text messages. • Approximately 22,000 public safety partner notifications were delivered, more than 12,000 SDG&E PSPS app downloads occurred and over 31 in-community locations were leveraged for event roadside signage in the HFTD. • Partnered with more than 400 community-based organizations, hosted virtual wildfire/PSPS safety webinars and drive thru safety fairs and collaborated with local school districts for outreach and provided communication tools for local school districts. • Communicated in the 21 prevalent languages in the service territory, provided year-round enhanced public safety partner outreach and coordination and expanded the AFN/vulnerable community outreach campaign. • Achieved nearly 275 million touchpoints with more than 148,000 engaged users related to wildfire and PSPS safety. • Customer surveys indicate more than 50% highly favorable towards SDG&E overall and 80% of HFTD and non-HFTD customers having updated their contact information to receive PSPS/wildfire notifications.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ -	$ 448	$ 448

The variance in unplanned spend for Community Outreach and Public Awareness is due to the inclusion of SDG&E's Customer Programs Outreach team and includes newly added Customer Resiliency Program resources.

PSPS Impact Reduction: N/A

B. Cooperation and Best Practice Sharing with Agencies Outside California (2020 WMP Section 5.3.10.2)

Risk Reduction:

2020 Plan	2020 Actual
SDG&E plans to continue to prioritize cooperation and sharing of best practices as an important component of our fire mitigation activities. Sharing best practices has been effective and a contributor to SDG&E's success in wildfire mitigation activities over the last decade.	In 2020, SDG&E continued to prioritize cooperation and sharing of best practices as an important component of our fire mitigation activities through participation in the International Wildfire Risk Mitigation Consortium. This consortium consists of utilities from across the world and was established to share best practices.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ 4,928	$ 8,227	$ 3,300

This O&M budget consisted to funds allocated for PSPS and wildfire communication practices. After filing the 2020 WMP, the budget was increased due to higher than planned costs. Budget consists of funds allocated for Mitigating the Public Safety Impact of PSPS Protocols and PSPS Communication Practices.

PSPS Impact Reduction: N/A

C. Cooperation with Suppression Agencies (2020 WMP Section 5.3.10.3)

Risk Reduction:

2020 Plan	2020 Actual
The Fire Coordinators plan to continue to stay active in professional forums, seminars, and training throughout the service territory to ensure state-of-the-art fire practices are incorporated into SDG&E operations and practices. Additionally, they will continue to share information with the firefighting agencies within the SDG&E service territory and on a rotating basis, provide those agencies with electrical and gas safety training.	SDG&E's Fire Science & Coordination team remained active in professional forums and trained over 2000 fire professionals across the region.

Operational Changes: N/A

Spend:

	2020 Target ($000)	2020 Actual ($000)	$ Change ($000)
O&M	$ -	$ 86	$ 86

The O&M 2020 Target for this line item is embedded within the Fire Science & Climate Adaptation (FSCA) program.

PSPS Impact Reduction: N/A