

Company: San Diego Gas & Electric Company
Application No.: A.22-10-____
Proceeding: Catastrophic Expense Memorandum Account (CEMA)
Exhibit No.: _____
Witness: Peter M. Pavao

**PREPARED DIRECT TESTIMONY OF
PETER M. PAVAO
ON BEHALF OF
SAN DIEGO GAS & ELECTRIC COMPANY**

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



October 31, 2022

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6
I. OVERVIEW AND PURPOSE

7 The purpose of this testimony is to present San Diego Gas & Electric Company's
8 (SDG&E) electric-related response to the following seven catastrophic events as stated in
9 SDG&E's Application for Catastrophic Event Memorandum Account (CEMA). The costs
10 associated therein can be found in the prepared direct testimony of Mr. R. Craig Gentes:

- 11 • 2014 Emergency Drought
- 12 • January 2017 Storms
- 13 • 2017 Lilac Fire
- 14 • 2018 West Fire
- 15 • 2019 Winter Storms
- 16 • August 2020 Extreme Heat Event
- 17 • September 2020 Extreme Heat and Valley Fire Event

18 Specifically, this testimony will describe SDG&E's response to these CEMA events,
19 which include: (1) restore service to customers and (2) repair, replace, or restore damaged
20 facilities. Details of the costs associated with these CEMA events can be found in the prepared
21 direct testimony of R. Craig Gentes.

22
II. 2014 EMERGENCY DROUGHT

23
A. Background

24 Southern California, along with the rest of the state suffered through a severe five-year
25 drought from 2012-2016, the result of which was significantly below average precipitation in

1 SDG&E’s service territory. Due to the severity of the drought, Governor Brown proclaimed a
2 state of emergency on January 17, 2014.

3 One of the effects of such a severe drought is an increase in severe fire weather, as both
4 live and dead fuels in wildland areas reached critically low moisture levels. Notably, in May
5 2014, San Diego County suffered a firestorm that impacted several north county areas. The May
6 2014 San Diego County Wildfires began at approximately 1100 Pacific Daylight Time on
7 Tuesday, May 13, 2014, southwest of the Rancho Bernardo community in the City of San Diego.
8 Over the event period, there were fourteen separate fires burning in San Diego County, including
9 the Bernardo, Cocos, and Poinsettia fires, which are the primary focus for this report due to their
10 size and impact. The fires, in total, consumed approximately 26,000 acres. Additionally, the
11 fires destroyed an estimated 65 structures, including 46 single-family homes, in the City of
12 Carlsbad, City of San Marcos and unincorporated areas of the county.

13 This firestorm was especially notable for how early in the season it occurred, primarily
14 driven by the lack of rainfall in the 2013-14 winter season, leading to critical conditions during a
15 time of year that typically sees moist, foggy conditions. One of the key findings identified in the
16 After Action Report¹ as an area of improvement to “increase our ability to stage contract aircraft
17 locally during extended Red Flag conditions.” SDG&E has long been a leading utility in
18 wildfire prevention, implementing measures such as placing fire prevention crews alongside
19 utility crews in the field, and contracting with aviation firefighting resources so that those
20 resources are available locally to respond to vegetation fires.

¹ San Diego Fire Regional Fire Foundation, May 2014 San Diego County Wildfires After Action Report at 5, available at <http://www.sdfirefoundation.org/commandpost/San-Diego-County-Wildfires-May-2014.pdf>.

1 **B. SDG&E Response to the Drought Emergency**

2 After the May 2014 firestorm, SDG&E proactively contracted for an Erickson helitanker
3 and a Type II helicopter that increased the readiness and availability of firefighting resources to
4 reduce the impact of wildfires in SDG&E’s service territory. These aviation resources were also
5 made available for dispatch by local fire agencies for wildfire suppression activities. As part of
6 SDG&E’s contracting efforts, a Memorandum of Understanding (MOU) between SDG&E and
7 the County of San Diego established an operating budget for 2014 fire season, with SDG&E
8 covering the cost to operate the helicopters during the first two hours of flight of any new fire
9 and the County of San Diego covering the second two hours of flight from the County's Aerial
10 Fire Protection Fund. Local fire officials noted the drought as a key risk factor in requesting
11 more air resources for the San Diego area to respond to and suppress fires early in their
12 development.²

13 As noted previously, Contract Fire Resources in the field play a key role in mitigating
14 wildfire risk due to construction and maintenance activities. These crews are able to identify fire
15 risks, take action to mitigate those risks, and respond immediately if an ignition were to occur.
16 Contract Fire Resources (CFR) supported SDG&E personnel daily during periods of the year
17 with elevated fire risk. Additional CFRs accompanied crews performed at risk activities
18 essential to maintaining a reliable utility network in areas where fuels had been affected by
19 drought conditions. While all SDG&E field personnel receive a basic level of fire prevention

² PRNewswire, SDG&E Air Assets Arrive For High-Risk Fire Season (September 2, 2014), states, (“With California well into the third drought year it is critical that the region is steadfast in its commitment to fire preparedness and prevention,’ said Chief Javier Mainar of San Diego Fire-Rescue Department. ‘It is vital to have sufficient air support in the region so that we can quickly respond and suppress fires early in their development.’”), available at <https://www.prnewswire.com/news-releases/sdge-air-assets-arrive-for-high-risk-fire-season-273608591.html>.

1 training, the addition of these Contract Fire Resources enhances their fire safety and enables
2 SDG&E to not only mitigate the consequence of a fire but in many cases also prevent an ignition
3 from at risk work activities.

4 **III. JANUARY 2017 STORMS**

5 **A. Event Background**

6 In 2017, several winter storms moved through SDG&E territory between January 2 and
7 January 24, 2017, resulting in 96 severe weather-related outages to SDG&E customers and
8 damage to SDG&E facilities. During the first half of the month, storm activity was generally
9 weak with seven days of measurable precipitation and minimal significant wind conditions.
10 More impactful conditions arose towards the end of the month, though, when SDG&E was
11 subject to a series of three storms from January 19-24, 2017. The first brought widespread
12 moderate to heavy rainfall on January 19, with rainfall totals of 0.5-1" across the coastal
13 communities, 1-2" across the mountains, and up to 0.3" in the deserts. The following day, the
14 most significant of the three storms brought widespread heavy rainfall and strong winds (*see*
15 wind gust summary table below) that combined with completely saturated soils to result in many
16 downed trees across the region. While conditions gradually cleared during the day on January
17 21, the final storm of the series approached the next afternoon, bringing additional heavy rainfall,
18 breezy conditions, and periods of rain, mountain snow, and isolated lightning strikes.

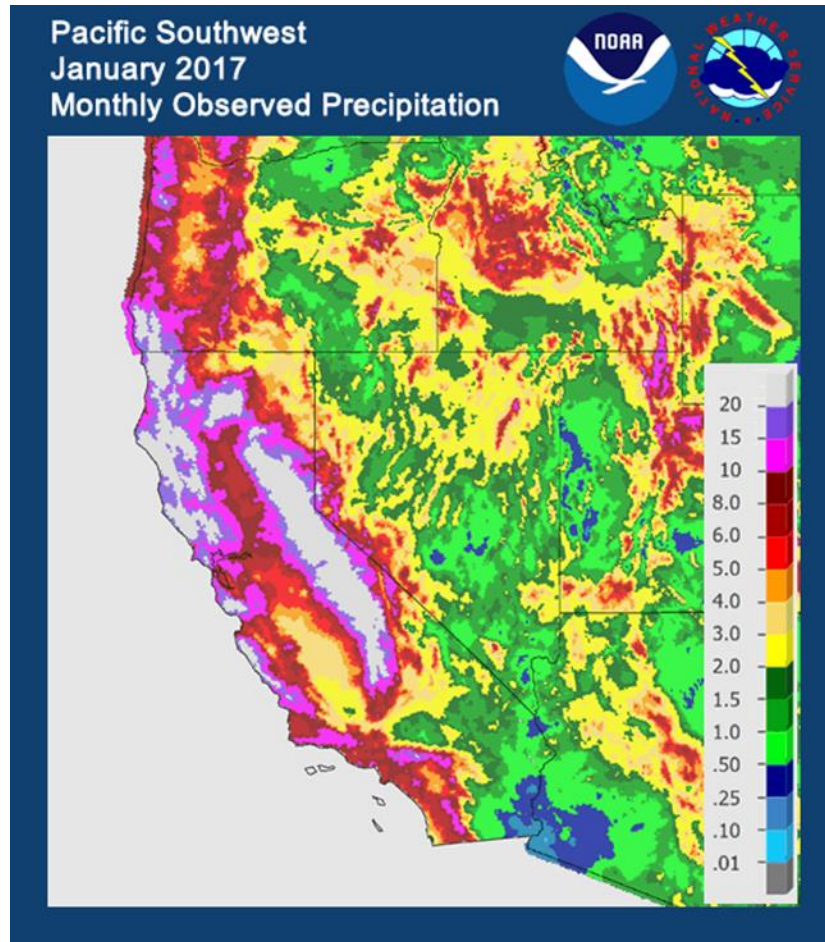
19 **Peak Wind Gusts During the January 20 Storm**
20 **Compared to the Normal Peak Gusts:**

District	Weather Station	Peak Wind Gust	Normal Peak Gust
Mountain Empire	Campo	76 mph	23 mph
Ramona	Volcan Mountain	71 mph	36 mph
Orange County	Mateo Ridge	70 mph	21 mph
Eastern	Lawson Creek	68 mph	18 mph
Metro	Border Field	64 mph	19 mph

District	Weather Station	Peak Wind Gust	Normal Peak Gust
Northeast	Olivenhain	58 mph	21 mph
North Coast	Oceanside Airport	47 mph	17 mph
Beach Cities	Tecolote Canyon	46 mph	14 mph

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January 2017 Observed Precipitation



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Rainfall totals for the month amounted to around 3-4" along the coastline (roughly 1" above average), up to 7-8" across our foothills (roughly 4" above average), and as much as 14-15" across the mountains (roughly 8-9" above average), nearly two-thirds of which fell during the January 19-24, 2017 timeframe.

1 **Storm Flooding on January 20, 2017 in**
2 **Sorrento Valley Area of San Diego³**



3
4 On January 23, 2017, Governor Edmund Brown proclaimed a State of Emergency due to
5 the rainstorms that started on January 3, 2017 in the County of San Diego. Because of the need
6 for immediate repairs and emergency services, SDG&E incurred extraordinary and substantial
7 costs for materials and supplies and for payroll.

8 **B. SDG&E Response to Winter Storms**

9 **1. Damage Assessment and Initial Restoration**

10 As noted above, the first priority in such an event is to get customers' service restored as
11 safely and expeditiously as possible. In response, SDG&E mobilized crews in advance of the
12 storm, staging crews at district yards so that they are available to immediately assess and repair
13 damage after the storm has passed. In 2017, due to the widespread damage reported by field

³ CBS8.com, Photos: San Diego Storm Damage (January 24, 2017), available at <https://www.cbs8.com/article/weather/photos-san-diego-storm-damage/509-c2ed8ab7-a45d-412c-8d82-f91527ab4f4c>.

1 crews, SDG&E also activated its EOC in support of field efforts to aid in restoration and repair
2 efforts.

3 The 2017 Storm Response utilized the shared District Storm desk operation model as
4 described in the 2019 Winter Storms section above; however, the severity of the storm caused
5 SDG&E to open the Emergency Operating Center (EOC). The EOC remained activated over the
6 course of four days from January 20, 2017 to January 23, 2017.

7 Typically, the EOC is activated if any of the following criteria are met:

- 8 • If there is a Red Flag Warning or Fire Potential Index (FPI) rating of 14 or higher
9 along with forecasted strong Santa Ana winds from the National Weather Service
10 (NWS).
- 11 • Multiple business units are required to respond, and the EOC activation can assist
12 in the response coordination.
- 13 • A State-of-Emergency exists, either as proclaimed by the Governor of California
14 or County Proclamation.
- 15 • Any wildfire that may impact SDG&E's critical infrastructure, levels one, two or
16 three.
- 17 • In response to any condition that requires SDG&E to perform PSPS within its
18 service territory.

19 **2. Repairing and Replacing Damaged Infrastructure**

20 During the most severe storms from January 20, 2017 to January 23, 2017, there were 94
21 unique primary outages that resulted in 52,296 electricity customers impacted. This totaled
22 66,289 minutes of sustained outages with an average of 705 minutes per outage. The total
23 system average interruption duration index (SAIDI) impact was 11.66 SAIDI Minutes, which is

1 far in excess of the 5-year average SAIDI Minutes impact during normal operating conditions
2 which is typically 0.19 per day, which totals 0.76 over a 4-day period. The severity of the SAIDI
3 Minutes metric due to the 2017 storms is over 15 times as impactful as that seen in normal
4 operations. In response to these outages, primary assessors were sent out, and the damage was
5 assessed. Crews were allocated to make repairs safely and expeditiously based on the damages
6 found by assessment. Examples of these damages were downed wires, broken poles, broken
7 cross-arms and detached hardware. During the repair phase, 39 line crews responded to the 94
8 primary outages, and 96 line crews responded to the 180 secondary outages caused by the storm.
9 In addition to repair crews, 21 vegetation crews were needed to assess damages and remove
10 newly created hazards to the electric system.

11 **C. Summary of Justification**

12 While SDG&E strives continuously to provide reliable service throughout all weather
13 conditions, the storms in January 2017 were extreme in nature, requiring a response above and
14 beyond the normal operation of the electric system. This level of response was indicated clearly
15 by Governor Brown's emergency proclamation for San Diego County due to the severity of the
16 storms. SDG&E's response to this event was swift and effective, resulting in extraordinary costs
17 to assess, repair, and restore service to our customers.

18 **IV. 2017 LILAC FIRE**

19 **A. Background**

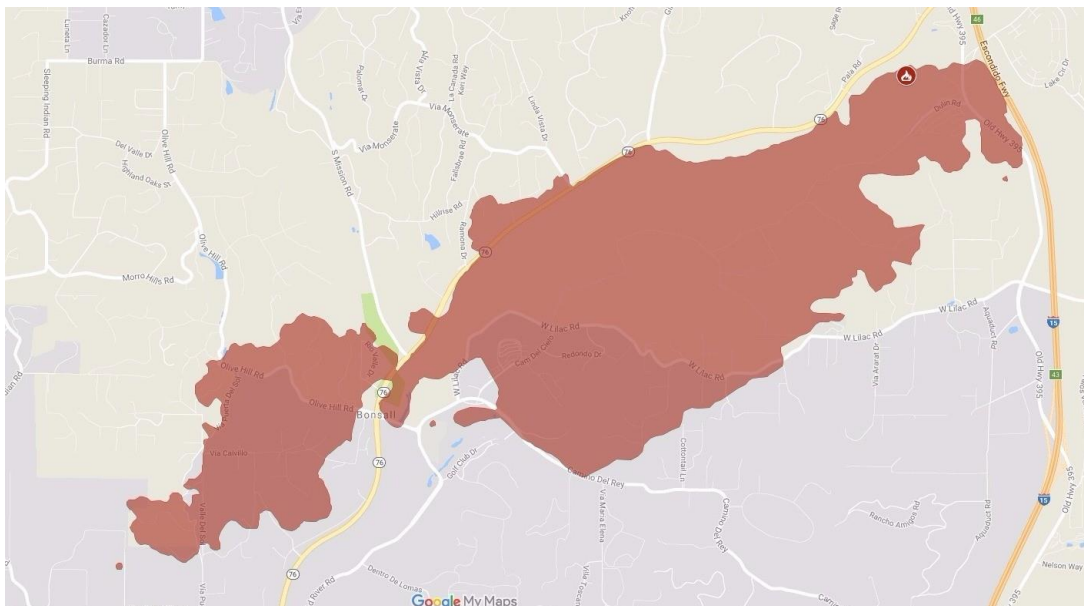
20 The 2017 Lilac Fire started on December 7, 2017 near Bonsall in San Diego County. In
21 total, the fire consumed 4,100 acres and destroyed 157 structures before it was contained on
22 December 16, 2017. The fire damaged SDG&E equipment and resulted in outages to 3,220
23 electricity customers during the course of the fire. The fire started during a period of extreme
24 fire weather due to Santa Ana winds. At the time of ignition, the closest weather stations

1 reported the relative humidity of between 4% and 6% with winds gusting to 28 mph. The table
 2 below shows the weather conditions throughout the county at the time the Lilac Fire ignited.

3 **Weather Conditions Throughout San Diego County**
 4 **on December 7, 2017**

Station	Temperature	Relative Humidity	Sustained Wind	Wind Gust
Circle R	75°F	4%	14 mph	29 mph
Sill Hill	55°F	7%	48 mph	77 mph
Rancho Heights	65°F	5%	39 mph	59 mph
Sherilton Valley	56°F	7%	33 mph	53 mph
Hoskings Ranch	55°F	9%	33 mph	50 mph
Round Potrero	60°F	5%	28 mph	42 mph
Anderson Valley	62°F	6%	25 mph	42 mph
Otay Mountain	59°F	3%	26 mph	42 mph
Mission Trails	72°F	6%	31 mph	41 mph
Sweetwater River	56°F	7%	24 mph	40 mph

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 6 **2017 Lilac Fire Footprint**



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 9 These conditions coupled with dry fuels and the topographical alignment of winds with
 10 the surrounding area led to rapid fire growth. As a result of the 2017 Lilac Fire and other
 11 southern California wildfires, Governor Brown proclaimed a state of emergency for San Diego

1 County on December 7, 2017, and President Donald Trump declared a state of emergency for
2 California on December 8, 2017.

3 **B. SDG&E's Response to the Lilac Fire**

4 From the initial minutes of the incident through full containment, repopulation, and
5 restoration, SDG&E had a company liaison embedded with first responders on a 24/7 basis to
6 support the objectives of the incident. To coordinate response to the fire, SDG&E dispatched an
7 SDG&E Fire Coordinator and activated its EOC, which supported the coordination of field
8 crews, aviation resources, and contract fire resources. The EOC provided meals to SDG&E
9 EOC and district personnel during the CEMA Event so that personnel were able to perform their
10 duties without interruption for the duration of the event.

11 While the fire was burning, SDG&E continued to utilize contract fire resources to support
12 at risk work and ensure that its activities in the rest of the service territory did not cause
13 additional ignitions while safe and reliable energy was supplied to our customers.

14 Once the fire was contained, SDG&E resources were dispatched to repair facilities that
15 were damaged by the fire. Crews were allocated to make repairs safely and expeditiously based
16 on the damages found by assessment. Examples of these damages were downed wires, burned
17 poles, broken cross-arms and detached hardware. Helicopter assets were dispatched to assess the
18 damage from the fire, and vegetation management crews were dispatched to assess vegetation
19 damage, remove debris, and prune at risk trees.

20 **V. 2018 WEST FIRE**

21 **A. Background**

22 The 2018 West Fire started on July 6, 2018, near Alpine in San Diego County. In total,
23 the fire consumed 504 acres and destroyed 48 structures before it was contained on July 11,
24 2018. The 2018 West Fire also damaged SDG&E distribution equipment and resulted in outages

to roughly 2,000 customers. At the time of ignition (CALFIRE 11:39),⁴ the closest weather station had a reading of 101°F, 11% relative humidity, and winds gusting to 32mph. The table below shows the weather conditions throughout the county at the time the West Fire ignited.

Weather Conditions Throughout San Diego County on July 6, 2018

Weather Station	Temperature	Relative Humidity	Sustained Wind	Wind Gust
East Willows Rd	101°F	11%	20 mph	32 mph
Viejas Grade	98°F	12%	20 mph	39 mph
Round Potrero	100°F	9%	24 mph	35 mph
Hoskings Ranch	96°F	11%	20 mph	34 mph
Witch Creek	100°F	7%	24 mph	33 mph
Sill Hill	95°F	10%	22 mph	31 mph
Dye Mountain	100°F	9%	18 mph	31 mph
La Posta	94°F	9%	18 mph	27 mph
Hellhole Canyon	106°F	9%	10 mph	27 mph
Archie Moore	113°F	6%	14 mph	22 mph

West Fire – Area Burned



⁴ CA.gov, CAL Fire, West Fire Incident, available at <https://www.fire.ca.gov/incidents/2018/7/6/west-fire/>.

1 **B. SDG&E’s Response to the 2018 West Fire**

2 Prior to the ignition of the fire, SDG&E had activated its EOC in response to the extreme
3 fire weather. SDG&E assessed quickly that the location of the ignition coupled with the extreme
4 conditions had the potential to have significant impact. To coordinate response to the fire,
5 SDG&E dispatched two SDG&E Fire Coordinators⁵ which supported the coordination of field
6 crews, aviation resources, and contract fire resources.

7 While the fire was burning, SDG&E continued to utilize contract fire resources to support
8 at risk work in the fire area and ensure that its activities in the rest of the service territory did not
9 cause additional ignitions while safe and reliable energy was supplied to our customers.

10 While the fire was still actively burning, SDG&E resources were dispatched to repair
11 facilities that were damaged by the fire. At the time of the CEMA declaration, there were three
12 circuits with confirmed damage with at least 26 poles requiring change out, three transformer
13 replacements, and numerous poles that experienced physical or secondary damage. While
14 SDG&E utilized ground crews some of the poles required helicopter support to set a new pole
15 and all work activities were coordinated with the Incident Management Team running the fire.
16 With the permission of first responders, repair and restoration crews worked within damaged
17 areas to restore service as safely and efficiently as possible. Through this close coordination,
18 SDG&E was able to support the objectives of the incident for the safe repopulation of the fire
19 area.

⁵ SDG&E Fire Coordinators are former firefighters who work for SDG&E and train with first responders year-round to ensure safe and efficient response to emergency incidents.

1 **VI. 2019 WINTER STORMS**

2 **A. Event Background**

3 In 2019, several winter storms moved through the SDG&E territory between January 5,
4 2019 and February 28, 2019, resulting in 325 outages to 155,537 SDG&E electricity customers.
5 Early 2019 was characterized as a wet and cold period, with frequent storm activity in both
6 January and February, and records broken for the coldest February on record for several of the
7 valley, foothill, and mountain communities. A Pacific storm system entered the region on
8 January 14, 2019, bringing moderate to locally heavy rainfall and breezy conditions through
9 January 18. During this time, rainfall accumulations reached approximately 1" for our coastal
10 communities, 2" for our inland valleys and foothills, and 3-6.5" across our mountains. Winds
11 peaked in strength during the afternoon and evening on January 14, with gusts as high as 41 mph
12 reported along the coastline and up to 63 mph along mountain ridges. Lightning, snow/ice, and
13 flooding were not considerable factors during this time.

14 The most notable storms during this period occurred on February 2, when a strong cold
15 front passed through the region, and February 13-14, when an atmospheric river crossed through
16 the state. The cold front produced widespread rainfall of 1-2" from the coast to the mountains,
17 though the larger impact was winds with gusts of 45-55 mph along the coastline and up to 60+
18 mph in the mountains. The atmospheric river event mid-month produced widespread significant
19 rainfall that resulted in street closures due to flooding of both urban areas and local rivers and
20 streams. Rainfall totals for the two-day event reached up to 2" along the coast, as high as 6.5-7"
21 across the mountains, and over 1.5" in the deserts. This was combined with a brief period of
22 winds when gusts reached 40-50 mph along the coast and as high as 70 mph in the mountains.
23 By the end of February, the percentage of average rainfall for the water year (October 1, 2018-
24 February 28, 2019) ranged from 150% of normal along the coast to nearly 400% of normal

1 across portions of the San Diego County mountains. On February 21, 2019, Governor Gavin
2 Newsom proclaimed a State of Emergency due to the severe winter storms that caused flooding,
3 mudslides, erosion, power outages and damage to critical infrastructure beginning on January 5,
4 2019, in the County of San Diego. Due to the magnitude and acute nature of these events,
5 SDG&E incurred substantial costs, relative to year-to-date expenditures of recent years, for
6 emergency internal/contracted labor, materials, and other operating costs.

7 **February 2019 Winter Thunderstorm Radar**



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10 **B. SDG&E Response to the 2019 Winter Storms**

11 **1. Damage Assessment and Initial Restoration**

12 SDG&E prioritizes personnel/public safety and expeditious restoration of service. To
13 achieve these objectives, SDG&E mobilizes crews in advance of the storm, staging first
14 responders, internal/contract line crews, support crews such as traffic control, hydro-excavation,
15 hazardous materials, and heavy equipment, emergency management staff, etc., at district yards
16 and strategic field locations so that they are available to immediately assess and repair damage
17 when safe to do so. Various other operational and management support staff are also mobilized

1 at SDG&E office locations as needed to monitor event progress and provide real-time updates to
2 inquiring customers, media, and public agencies.

3 When the storm causes a significant number of outages, at least one (1) SDG&E regional
4 operating district is activated to facilitate emergency Storm Desk operating protocols. Activating
5 a district often entails the adoption of a formal Incident Command organizational structure in
6 which participating employees' roles and responsibilities may be repurposed or reoriented to
7 provide a more effective incident response effort given the substantially more consequential
8 event. These efforts aim to improve process cycle times, communication, and operational
9 flexibility to properly assess all damage, ensure safety, make repairs, and expeditiously restore
10 service. Depending on the designated roles of the employee, staffing is coordinated on a 24/7
11 plan to ensure all operational needs are effectively managed. SDG&E maintains various levels
12 of workforce activation beginning with local field resources, then growing modularly as the
13 event expands to include office staff, interdepartmental staff (*e.g.*, as drivers for a driver-and-
14 qualified assessor pair), inter-district support, as well as mutual aid for catastrophic events. This
15 increased level of staffing and enhanced response result in additional costs beyond those
16 necessary to respond to typical electric system events.

17 Under Storm protocols, information pertaining to suspected primary distribution
18 (generally 4.16/12.47 kV) outages is initially received by Distribution System Operators within
19 the Electric Distribution Operations department. Orders requesting resources are generated and
20 dispatched by the Service Dispatch organization to first responders such as troubleshooters,
21 underground fault van personnel, or designated primary assessors (other qualified electrical
22 workers) as appropriate. In performing their damage assessments, these personnel patrol the
23 outage area to identify problems on the primary distribution system, document damage and

1 repair requirements, and communicate these findings to a Primary Assessor Coordinator. Orders
2 are continually reviewed by Incident Command staff for prioritization. The Primary Assessor
3 Coordinators work with the respective District Construction Supervisors to determine resource
4 requirements for follow-up construction. This information is shared with the Crew Dispatcher
5 who dispatches the personnel to the Primary outage. Crews are dispatched to the damage, and
6 repairs are made.

7 While assessing and repairing primary distribution outages is vital to full restoration of
8 the wide area, winter storm conditions often cause an influx of secondary distribution or service
9 wire damages (120-480 V). During major storms, the Activated District, under delegated
10 assignment from the Service Dispatch department, utilizes Asea Brown Boveri's Service Order
11 Resource Tracking Dispatch Application (SORT-DA), which houses all damage orders received
12 via outage notifications, customer calls, or other reports. District Engineers assess these orders
13 within the office and prioritize them per SDG&E's enterprise risk measures, generally:

- 14 • Public safety risks – fire, electrical injury, bodily injury
- 15 • Major customer criticality – public entities, medical baseline
- 16 • Reliability impacts – high customer count, damages
- 17 • Other business impacts – damage claims, compliance, partial power

18 Once a priority list has been created, the orders are given to a Secondary Assessment
19 Coordinator (SAC). The SAC distributes the orders to Secondary Assessors who go out to field
20 and assess the severity of the damage. All orders are documented, and the results are given back
21 to the SAC. The SAC delivers the damage assessments to the SORT Operators who input the
22 data to the order it correlates with into SORT so that all information is documented in one
23 system of record. Any damage triggers the SORT Operator to fill out a Damage Assessment

1 form. Depending on severity of damage, a Construction Supervisor reviews and shares how
2 many personnel and what material is needed to remediate the damage. This information is
3 shared with the crew dispatcher who dispatches the personnel to the job and gives them the
4 damage order. From there, the working foreman in the field receives the order and goes to the
5 damaged facility. This process continues throughout the duration of the active storm. When the
6 volume and frequency of secondary orders returns to normal operating conditions, the respective
7 District may deactivate the storm desk and return secondary dispatching operations to the service
8 dispatch department.

9 **2. Repairing and Replacing Damaged Infrastructure**

10 SDG&E's response to this event included assessing damage, repairing downed wires,
11 replacing damaged poles, cross-arms, insulators, and reattaching hardware where necessary. To
12 achieve this, specialty crews are relied on heavily during storm events, as the sheer volume of
13 outages and damaged infrastructure would make timely restoration infeasible for typical SDG&E
14 first responders. For example, due to the large volume of tree-trimming requests during storm
15 events, there is a Tree Trim Coordinator who works with the proper Vegetation Management
16 personnel to clear any vegetation that interferes with SDG&E Infrastructure. In total, 41
17 Vegetation Management crews were deployed to assist in emergency restoration operations
18 during that time period.

19 Additionally, Make Safe Crews are assembled to respond to hazards reported by
20 Assessors affecting public safety and to eliminate the hazard to make the situation safe. Make
21 Safe Crews clear hazards to the public, such as down wires. Their job is to clear public hazards
22 which will free up Assessors to move to their next job.

1 Throughout the 55-day period of the 2019 storms, SDG&E incurred 325 unique primary
2 outages which affected 155,537 customers. In total, these outages resulted in an increase of
3 10.16 minutes to SDG&E’s SAIDI.

4 During eight days of this period, SDG&E recorded “severe weather” as the primary cause
5 of various outages, causing major disruptions to normal operations. In preparation and response
6 to these outages, SDG&E implemented Storm protocols, activating the affected operating
7 districts’ workforce as previously described. As a result, SDG&E incurred substantial costs to
8 provide expeditious outage restorations and deferred other normal business as appropriate.

9 During an additional unique seventeen days of this period, SDG&E recorded other
10 weather conditions (*e.g.*, rain, ice, snow, wind, lightning) as notable drivers or significant factors
11 involved with assessing damage or restoring power during forced outages. SDG&E’s operating
12 districts staged resources as appropriate to combat the storms, and as a result, SDG&E was able
13 to provide swift response to outage events, avoiding the need to perform purely responsive
14 callout procedures, as per normal business, which would have likely otherwise caused
15 unnecessary delays to restore power.

16 **3. Summary of Justification**

17 With deep integrations of weather forecasts advised by SDG&E’s Meteorology
18 Department into storm management operational business processes, the Electric Regional
19 Operations Department and its supporting workgroups worked diligently and efficiently to align
20 specialized workflows and resources with anticipatory weather impacts on system reliability.
21 These actions are believed to have prevented substantial delays in restoring power to customers
22 impacted by inclement weather during this wet and cold period. In addition to electric reliability
23 benefits, SDG&E’s vegetation management efforts yielded various other contributions toward

1 mitigating community public safety risks associated with trees falling into areas of public and
2 private thoroughfare.

3 **VII. AUGUST 2020 EXTREME HEAT EVENT**

4 **A. Event Background**

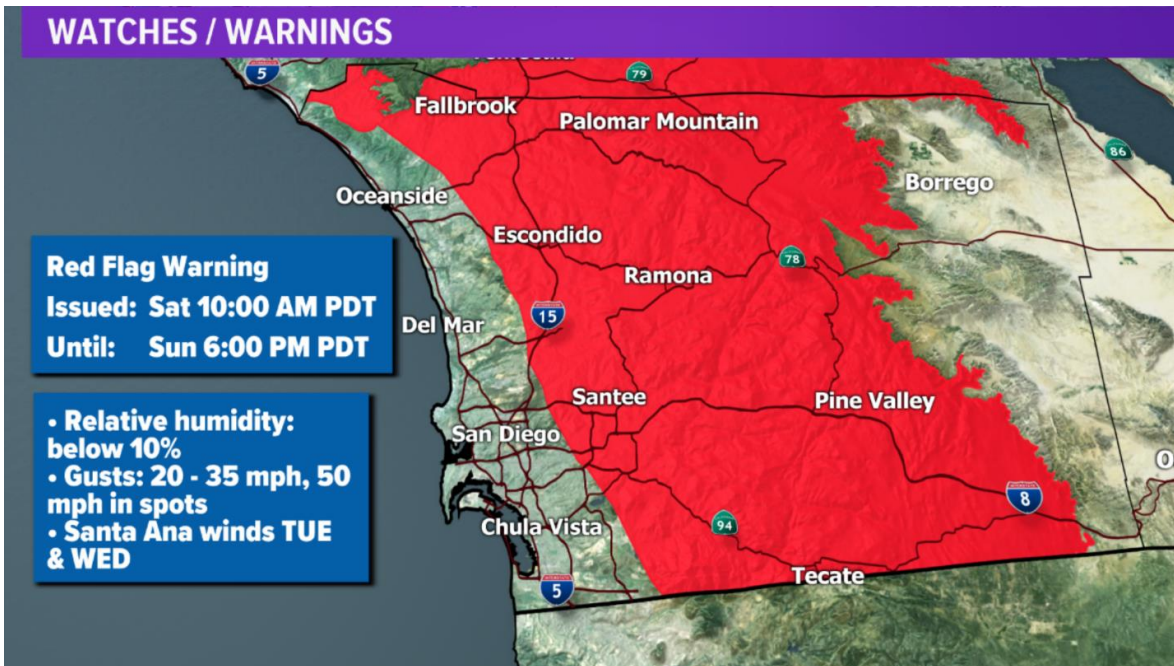
5 In 2020, California experienced two extreme heat events that resulted in California
6 Independent System Operator (CAISO) system demand which strained the ability of the
7 balancing authority to meet that demand. The August 2020 Extreme Heat Event began on
8 August 14, 2020 and ended on August 21, 2020. Governor Gavin Newsom issued a
9 Proclamation of a State of Emergency due to the extreme heat event on August 16, 2020. The
10 prolonged heat wave and high demand for electricity resulted in CAISO ordering rotating
11 outages among all California utilities, including SDG&E. On August 14, 2020, approximately
12 58,700 SDG&E electricity customers were impacted by rotating outages. All impacted
13 customers had their power restored approximately an hour and 20 minutes after the rotating
14 outages began. On August 15, 2020, approximately 17,200 electricity customers were impacted
15 by rotating outages. All impacted customers had their power restored approximately 20 minutes
16 after the rotating outages began. For the remainder of the event, from August 16, 2020 through
17 August 21, 2020, SDG&E notified customers daily of the potential for rotating outages due to
18 CAISO orders but did not need to implement the rotating outages due to significant energy
19 conservation efforts across the entire state.

20 SDG&E's response to the heat event included EOC activation, employee field response,
21 and contract fire crews' response to support field utility crews.

**Observed Maximum Temperature During 2020 Heat Event #1
(August 14-20, 2020)**

	08/14	08/15	08/16	08/17	08/18	08/19	08/20
Coast	88	86	88	84	88	84	84
Valley	104	102	99	102	108	100	100
Foothills	101	102	97	101	107	101	100
Mountains	98	102	94	102	102	98	99
Deserts	117	113	115	113	113	115	109

August 2020 Red Flag Warning Information



B. SDG&E Response to the August 2020 Extreme Heat Event

1. EOC Activation

The EOC was activated from August 14, 2020 through August 21, 2020 to provide support to the operations groups and to coordinate customer notifications. SDG&E personnel at district offices responded to the event. Contract Firefighting Resources

Throughout the heat event, SDG&E utilized 20-40 Contract Fire Resources per day serving in the role of dedicated fire patrol with a focus on fire prevention, while crews performed assessment, make-safe, and restorative activities in areas with Extreme Fire Potential.

1 **2. Employee Response**

2 Field employees worked overtime hours responding to the High Heat event from August
3 14, 2020, through August 21, 2020. The field employees included standby ETS who were
4 responsible for switching activities, patrols responsible for patrolling lines after forced outages,
5 and trouble crews responding to transformers or heat-related failures of the system.

6 **VIII. SEPTEMBER 2020 EXTREME HEAT AND VALLEY FIRE EVENT**

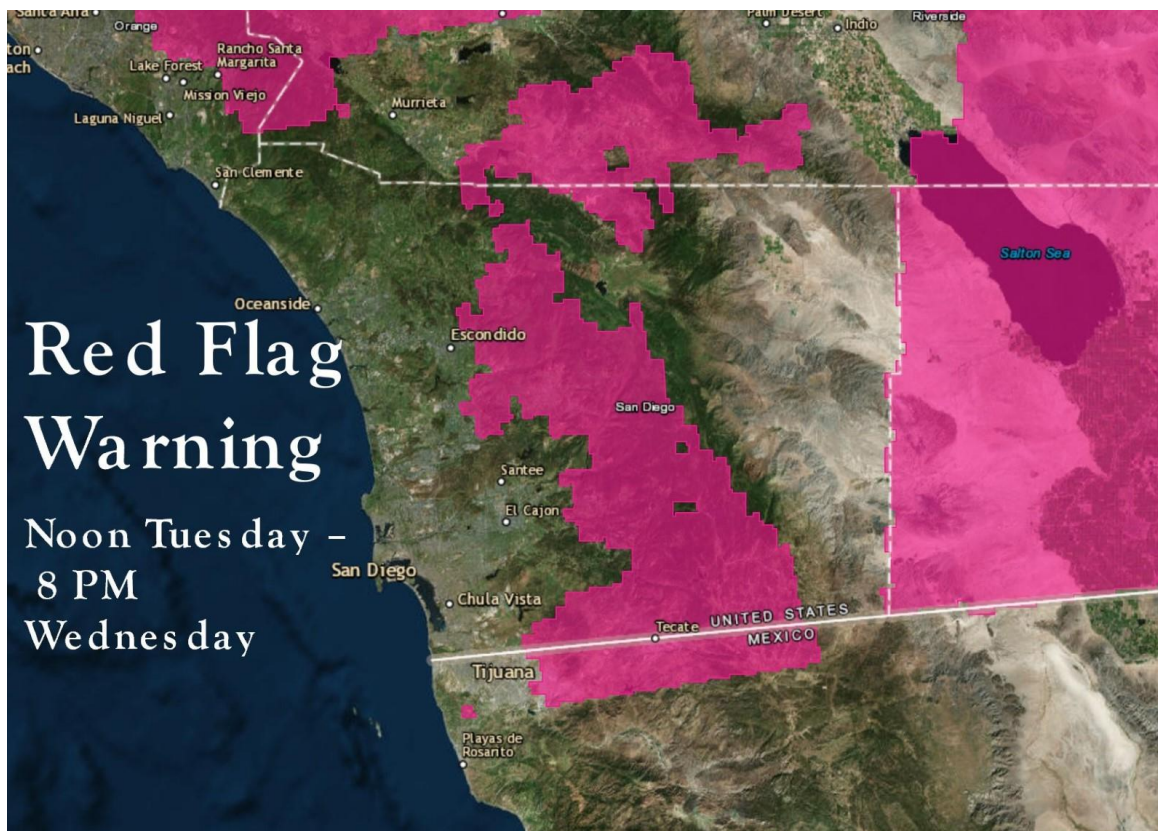
7 **A. Event Background**

8 The second heat event of 2020 began over Labor Day weekend on Saturday,
9 September 5, 2020 and once again saw the CAISO short on energy with load curtailments
10 predicted. Governor Gavin Newsom proclaimed a state of emergency on September 3, 2020,
11 due to the heat event. SDG&E activated its EOC in response of this heat event as well, and
12 staffed contract fire resources in support of field activities. During this heat event, on
13 September 5, 2020, the Valley Fire ignited near Spirit Trail in the Alpine area of San Diego
14 County, rapidly growing to a large fire, and eventually burning 16,390 acres. Governor Newsom
15 proclaimed a State of Emergency in San Diego County on September 6, 2020, due to the Valley
16 Fire. As a result of the fire, a 69 kV transmission line was damaged, and a 500 kV transmission
17 line was forced out of service due to the fire burning underneath it. In addition, five 12 kV
18 circuits were damaged by the fire. SDG&E carried out repairs and restoration to its facilities in
19 close coordination with first responders throughout the incident and had resources on scene to
20 support first responder objectives within minutes of the initial reports of the fire. In total, there
21 were 344 distribution poles, 26 transmission poles, and 20 transmission towers within the
22 perimeter of the fire. In support of the fire prevention effort during the heat event and the
23 restoration work during the Valley Fire, SDG&E utilized 20-40 Contract Fire Resources per day
24 and were successful in preventing additional fire-related incidents in the service territory.

**Observed Maximum Temperature During September 2020
Heat Event (September 2-7, 2020)**

	09/02	09/03	09/04	09/05	09/06	09/07
Coast	76	79	81	91	102	81
Valley	87	93	99	116	114	95
Foothills	89	94	100	111	111	98
Mountains	91	93	97	104	105	94
Deserts	106	108	113	118	117	109

September 2020 Red Flag Warning Information



B. SDG&E’s Response to the September 2020 Extreme Heat Event

1. Employee Response

SDG&E field personnel including standby electric troubleshooters (ETS) and patrols responded to the heat event. The standby ETS were prepared to implement required switching activities to de-energize or re-energize lines as needed. The patrols responded to forced outages

1 on distribution lines. Standby Qualified Electrical Workers (QEWs) were also posted as
2 observers to report on emergency situations.

3 **2. Contract Fire Resources**

4 Throughout the heat event, SDG&E utilized 20-40 Contract Fire Resources per day
5 serving in the role of dedicated fire patrol with a focus on fire prevention while crews perform
6 assessment, make safe, and restorative activities in areas with Extreme Fire Potential. While the
7 August 2020 Heat Event and September 2020 Heat Event are similar in many ways, the added
8 complexity of the Valley Fire, coupled with the conditions already present after the August 2020
9 Heat Event, lead to the increase in the use of prevention crews.

10 **3. SDG&E Response to the Valley Fire**

11 **a. EOC Activation**

12 On Saturday, September 5, 2020, SDG&E's EOC was fully activated in response to the
13 convergence of several weather events and the threats posed by the Valley Fire in eastern San
14 Diego County. The EOC operated in a monitoring mode starting September 3, 2020, due to
15 extreme heat in the region, increased wildfire potential, and the possibility for CAISO-directed
16 load curtailments. The EOC quickly transitioned to a Level-3 activation due to changing
17 conditions and the potential for Public Safety Power Shutoffs (PSPS). The CEMA-related EOC
18 activities covered here include emergency advertising to customers, backup generation,
19 equipment rentals, meals, and janitorial services.

20 SDG&E conducted an advertising campaign to alert customers to the potential outages
21 they might experience due to the Valley Fire, and to the resources that would be available to
22 impacted communities to mitigate the impacts, such as community resource centers. The
23 advertising campaign involved customer notifications, website updates, News Center posts, and
24 Social Media updates.

1 SDG&E also worked with San Diego County Office of Emergency Services (OES) to
2 fulfill a request from the office of Senator Jones to coordinate provision of generator fuel and
3 water to a raptor farm that was not able to evacuate due to the Valley Fire. Additionally,
4 SDG&E Outreach and Customer Assistance staff were present at the American Red Cross shelter
5 and County OES Local Assistance Center to provide information and services to those affected
6 by the Valley Fire.

7 The EOC provided meal catering for SDG&E EOC employees and district personnel to
8 ensure that personnel were able to perform their duties without interruption for the duration of
9 the event. SDG&E hired catering staff to deliver the food items to in-field responders
10 throughout the course of the event. SDG&E also contracted janitorial resources throughout the
11 event to maintain the facilities that EOC personnel utilized 24 hours per day to respond to the
12 Valley Fire.

13 **b. Materials and Labor**

14 In response to the Valley Fire, SDG&E field crews worked overtime hours after the
15 fire to assess and repair damaged assets to support restoration efforts. Standby ETS
16 personnel were utilized to isolate and de-energize damaged areas as needed. In addition,
17 eight contract crews worked over the course of two days to repair and maintain assets in areas
18 impacted by the Valley Fire. Damages from the Valley Fire impacted poles and equipment
19 on one transmission line and five distribution circuits. The repairs required materials and
20 tools, such as poles, conductors, crossarms, guy anchors, and fuses. Crews hand-dug holes
21 for the installation of new weathering steel poles to replace existing poles damaged by fire.
22 Damaged crossarms were replaced with fiberglass crossarms.

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c. Vegetation Management

In response to the Valley Fire, SDG&E Vegetation Management conducted post-fire hazard tree inspection and tree-trimming activities to mitigate the threat to the overhead facilities within the fire-impacted zone. The hazard tree inspection activity consisted of two patrollers for a total period of approximately 40 hours. This inspection activity identified fifteen fire-damaged trees that required trimming or removal. This work was issued to the tree trim contractor to perform. In total, thirteen trees were trimmed, and two trees were removed for a total duration of approximately 109 crew hours.

d. Helicopter Utilization

Helicopters were utilized to clean soot and ash from conductors and insulators in fire-impacted areas. This is an important activity that helps prevent a flashover from occurring on the lines due to the buildup of soot and ash particles. SDG&E will typically wash transmission lines impacted by soot and ash before reenergization to avoid flashovers which could damage the line. The cleaning of the insulators also helps to reveal any damage that may have occurred when the fire passed beneath the transmission line. In the case of the Valley fire, three helicopters dropped water on fire-impacted lines during the post-fire washing activities.

C. Summary of Justification

Based on the discussion of resources summarized above, SDG&E utilized necessary resources to respond to the two 2020 Heat Events, including the Valley Fire. SDG&E’s response was necessary during these emergency situations to repair and maintain electric infrastructure and support the communities that SDG&E serves.

1 **IX. SUMMARY**

2 The activities described in this testimony were unplanned emergencies that far surpassed
3 normal utility operations.

4 This concludes my prepared direct testimony.

1 **X. QUALIFICATIONS**

2 My name is Peter M. Pavao. My business address is 8330 Century Park Court, San
3 Diego, California 92123. I am employed by SDG&E as the Manager – Construction and
4 Operations in the Electric Regional Operations organization.

5 In 2020, I assumed my current role as Manager – Construction and Operations for the
6 Construction Metro Construction and Operations center. I am responsible for the maintenance,
7 construction, operations and repair of the Distribution Electric System within the Metro region.

8 I have worked for SDG&E for 22 years and have worked in several Construction and
9 Operations centers, and managed several engineering and operational departments within
10 SDG&E.

11 I received a Bachelor of Science degree in Electrical Engineering from San Diego State
12 University in 2000.

13 I am a licensed Professional Electrical Engineer in the State of California.

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