Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2024 General Rate Case – Track 3
Application No.: A.22-05-016
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SUPPLEMENTAL REBUTTAL TESTIMONY OF JENNIFER KAMINSKY ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY (TRACK 3 – ASSET MANAGEMENT AND INSPECTIONS)

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

May 2026

SUPPLEMENTAL REBUTTAL TESTIMONY OF JENNIFER KAMINSKY ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

I. INTRODUCTION

Q. What is the purpose of your testimony?

A: The purpose of this rebuttal testimony is to respond to and correct factual inaccuracies, analytical errors, and scope mischaracterizations in Mr. Powers' Track 3 testimony, and to demonstrate that his critiques do not provide a reasonable or lawful basis to disallow SDG&E's recorded Track 3 Wildfire Mitigation Plan Memorandum Account costs, particularly with respect to SDG&E's drone inspection programs and associated repairs.

Q. Please provide a summary of your response to the testimony offered by Mr. Powers?

A: Mr. Powers' testimony mischaracterizes the purpose, scope, and cost drivers of SDG&E's drone-enabled inspections and the associated repairs identified as necessary following those inspections. Through these misstatements, Mr. Powers reaches conclusions that are not supported by the record, unreasonable, and not based in fact. Most importantly, Mr. Powers testimony fails to reflect two vitally important facts:

- SDG&E was required to perform a certain number of drone inspections each year, consistent with its approved and ratified Wildfire Mitigation Plan (WMP). Failure to perform these inspections would have resulted in potential fines for WMP non-compliance and risked SDG&E receiving its safety certificate due to failure to implement its WMP.
- Upon finding assets that posed imminent risk to reliability or public safety, or failed to comply with General Orders and other regulatory requirements, SDG&E was obligated to perform repairs of those assets to promote safety, reliability, and regulatory

compliance. Failure to perform repairs of the at-risk assets identified by inspections could be deemed imprudent and, more importantly, could have placed our customers and communities at risk of wildfire.

Thus, Mr. Powers' ultimate conclusion that *all* costs associated with drone inspections and subsequent repairs from those inspections runs afoul of SDG&E's legal and regulatory obligations under Public Utilities Code (Pub. Util. Code) Section (§) 8386, *et. seq*., applicable Commission General Orders, and SDG&E's legal obligations to provide safe and reliable service, and should be wholly rejected.

Further, Mr. Powers' testimony is focused almost exclusively on criticizing SDG&E's drone inspection methodologies and provides no substantive analysis or assessment of whether the repair work identified and completed—and which represent 70% of the total costs at issue—were unreasonable or unnecessary. Nor does he dispute whether SDG&E should have repaired assets posing the risk of wildfire, or offer alternatives to performing those repairs. To the extent Mr. Powers offers no evidence contesting the reasonableness of SDG&E's costs to repair conditions identified through drone inspections, the Commission should authorize those costs—as further described in my Supplemental Workpapers—in full.

The testimony relies heavily on presenting unfounded alternative cost comparisons and hypothetical substitutes for inspection programs (e.g., helicopters, training all Qualified Electric Workers (QEWs) as pilots, elimination of machine learning, or reliance on legacy inspection approaches), which fail to offer the same level cost-effective risk reduction as SDG&E's drone inspection programs and would have left infrastructure less safe and reliable. As further discussed herein, many of the alternatives offered by Mr. Powers—such as helicopters—have been rejected by SDG&E's peer utilities as less effective at identifying conditions, and his

comparisons to utilities without recognition of scale or regulatory compliance requirements lack merit.

SDG&E's Drone Investigation Assessment and Repairs (DIAR) and Risk-Informed Drone Inspection (RIDI) Programs were implemented as targeted, supplemental tools to enhance visibility and situational awareness of overhead distribution assets in the highest wildfire-risk areas, accelerate identification of conditions needing corrective action, and improve prioritization and timeliness of repairs and replacements. Both the costs of performing drone inspections as well as the repairs identified as necessary through those inspections are reasonable in light of the complexity and innovation required to start a program involving new and emerging technologies during the time period at issue (2019-2023), as well as the added capabilities provided by development of higher-resolution aerial imagery and machine learning model intelligence. Accordingly, Mr. Powers' critiques do not provide a sound basis for disallowance of SDG&E's recorded costs.

Q. Do you agree with Mr. Powers' conclusions and recommendations regarding SDG&E's request for recovery of costs associated with drone inspection programs and associated repairs?

A: No. First, Mr. Powers concedes that "drones are a useful tool"[1] and does not dispute that the use of drones helps to identify non-obvious hazards that traditional methods cannot reliably

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[1] Exhibit (Ex.) PCF-59, *Prepared Direct Track 3 Testimony of Bill Powers, P.E. on Behalf of The Protect Out Communities Foundation* (April 6, 2026) (Ex. PCF-59),at 2-3 *"…as supplemental field tools used by field inspection personnel to enhance inspection efficiency…*" (emphasis added) and "*Drones used in this manner can and do enhance the comprehensiveness and cost-efficiency of conventional 'boots on the ground' (or bucket truck) pole inspections.*" (emphasis added). *See also* at 14 "Drones are a useful tool."

detect. He in fact cites drone programs operated by other utilities (albeit in different circumstances and scopes) so it is clear that he has no objection to the use of drones as a utility inspection tool. Next, while Mr. Powers' testimony criticizes SDG&E's inspection methodology and costs, he neither addresses nor provides any facts to dispute the reasonableness of the costs necessary to make repairs to address conditions identified on SDG&E's electric infrastructure through those inspections, which comprise the majority of Track 3 expenditures. Nor does he demonstrate that the identified defects should not have been repaired and does not connect inspection critiques to the disallowance of corrective work. Overall, the testimony does not meaningfully assess the prudence or reasonableness of the Track 3 costs under review.

II. DETAILED RESPONSE TO PCF'S ASSERTIONS

Q. Can you please remind the Commission of the scope and proportion of the SDG&E's Drone Inspection and Repair Programs?

A: Yes. SDG&E's DIAR and RIDI Programs were a supplemental inspection strategy for overhead electric distribution facilities used to increase inspection quality and coverage and accelerate corrective actions in the highest wildfire-risk areas. The DIAR and RIDI programs scope as presented in SDG&E's WMPs, as well in this proceeding for cost recovery, included both the initial inspection by drone pilot and associated images, as well as the repair of any conditions identified. The scope of DIAR inspections performed from 2019-2022 included the entirety of Tier 2 and Tier 3 of SDG&E's territory in the High Fire Threat District (HFTD) and select portions of the Wildland Urban Interface (WUI).

After gaining situational awareness of the conditions of all assets within the highest risk areas of SDG&E's service territory, SDG&E refined the program scope to a risk-informed approach in developing the RIDI program. The scope of RIDI inspections performed in 2023

included inspection of approximately 15% of the highest risk distribution poles in the HFTD and WUI.

The costs presented also include those related to development of Machine Learning and Artificial Intelligence models, which improved efficiency of inspections and have proven a highly useful tool for situational awareness, Public Safety Power Shutoff (PSPS) preparedness, and other operations. These are discussed further in my Supplemental Direct Testimony.

Drone inspections represent a portion of SDG&E's comprehensive suite of inspection programs and were deployed to support SDG&E's broader Asset Management & Inspections (AM&I) and Wildfire Mitigation Plan (WMP) inspection and repair work resulting in improved situational awareness and asset health. While costs are tracked separately, repairing conditions identified during drone inspections is not different from management and implementation of repairs of conditions identified during any other inspection program. These repairs were necessary to maintain asset health and reduce the risk of equipment failure and associated ignitions. Improved asset health is correlated with reduced safety events, ignitions, and unplanned outages.[2]

Q. Was the intent of SDG&E's Drone Inspection and Repair Programs to replace inspections performed by Qualified Electrical Workers?

A: No. SDG&E did not design or implement the DIAR or RIDI Programs to replace inspections performed by QEWs. All inspections under DIAR and RIDI were performed by

[2] See Decision (D.) 20-05-051, at 21–22 (finding that wildfire mitigation strategies focused on inspection, condition assessment, and corrective maintenance reduce ignition risk); D.21-06-014, at 45–47 (approving utility programs premised on the principle that improving the condition of electric distribution assets reduces the probability of equipment-related ignitions); D.22-12-027, at 30–32 (recognizing that asset hardening and replacement are key mitigations for safety and reliability risks).

QEWs either in the field or via desktop review of images collected by drone pilots. Further, there is no intention to eliminate QEWs from the performance of hands-on field assessments, repair work, or verification that completed work was performed in compliance with CPUC and SDG&E's standards and safety requirements.

Qualified inspectors are essential because condition assessment is not a simple checklist exercise; it requires trained judgment to interpret observations in context (e.g., loading, environment, equipment configuration, and known failure modes) and determine whether a condition is actionable. That experience-based screening ensures corrective work is prioritized for conditions that present a credible risk to safety, reliability, or compliance, while distinguishing cosmetic or non-material anomalies that are unlikely to result in equipment failure. It is for these reasons that drone-enabled inspections were intended to supplement conventional AM&I patrol and detailed inspections by providing an additional method to observe asset conditions and to help prioritize where QEW follow-up, repairs, or replacements were most urgently needed. As described in my direct testimony, drones offer an unrivaled means of observing equipment status, including the ability to view images in a sustained fashion from vantage points unavailable from the ground, bucket trucks, or ladders. This is particularly true for infrastructure in hard to reach areas, as much of SDG&E's backcountry poles are not accessible by road.

Additionally, SDG&E's development of machine learning models for asset identification and damage detection was not intended to supplant the need for QEWs, but rather as a "Human + Machine" partnership. Just as those employees that work on computers all day have the support of software tools or programs that identify data discrepancies in system records, the machine learning models developed during DIAR and RIDI were intended to support QEWs and improve

the quality of their inspections. The asset identification models were also developed to help reduce repetitive work and the time it would take a QEW to verify asset data, such as pole, crossarm and equipment types and material at each location. Finally, the models will enable a future where images collected from other sources (outside of inspections) could be assessed by a machine and limit the number of images that would then require review by a QEW for potential follow-up action that would also be performed by a QEW. This saves time and money and offers long-term Operations and Maintenance (O&M) savings that can be passed on to customers as future ratepayer savings. This type of opportunistic inspection and repair program would not be possible without such technological aids. However, as stated above, the critical component in the process is understanding what is actionable will be the qualified human resource.

Q. How is Mr. Power's incorrect in his assertion on Page 3 that this was SDG&E's intent?

A: Mr. Powers' assertion that "the intent of this drone/AI/Machine Learning program over the long-term appears to be to replace the QEW in the field with a high cost, automated drone/AI/Machine Learning alternative that is capital expenditure (CAPEX) intensive" is incorrect in two ways. First, as stated above, SDG&E's development of machine learning models (a form of Artificial Intelligence) is not intended to eliminate or supplant QEW inspections. Second, as stated in my Supplemental Direct Testimony (at 88-89) the "development costs are upfront, while benefits recur and grow as models are reused and improved." Meaning that the development costs are not ongoing. In fact, although not within the scope of this proceeding, the costs related to machine learning development in 2024 and 2025 continued to decrease. In 2024, capital costs were less than 50% of what was spent in 2023 and, in 2025, capital costs were less than 1% of the total costs spent to date.

Thus, contrary to Mr. Powers' assertion, SDG&E intended the development of Machine Learning and Artificial Intelligence Models to provide long-term support for QEWs performing inspection work in the field with a low cost, automated drone/AI/Machine Learning supplement.

Q. Is Mr. Powers' correct that conventional AM&I inspections have proven successful and adequate over time to reduce fires and ignition events? Can you please explain how inspections and repairs facilitated by SDG&E's drone programs supplemented wildfire risk reduction?

A: Conventional AM&I patrol and detailed inspections have been and remain a core component of SDG&E's asset management program and have supported the safe operation of our electric distribution system for decades. As noted in my Supplemental Direct Testimony, many of these programs remain in place consistent with regulatory requirements. However, climate change is increasing wildfire risk and contributing to more extreme wildfire seasons through increased heat, extended drought, and a "thirsty atmosphere," which can dry fuels and intensify fire weather conditions.[3] It is necessary and prudent to adapt utility operations to meet the challenges of climate change and reduce the risk of catastrophic events.

Traditional inspections are like using paper maps, which have gotten people where they need to go for decades, and they still work. But as conditions change, technologies improve, and the stakes increase, we don't refuse use of GPS and digital maps simply because paper maps used to be sufficient. Instead, we keep the fundamentals, and supplement with better tools that improve visibility, speed, and decision-making. The same principle applies here, conventional inspections remain essential, but increased wildfire risk warrants embracing innovations like

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[3] National Oceanic and Atmospheric Administration, *Wildfire climate connection*, *available at*: https://www.noaa.gov/noaa-wildfire/wildfire-climate-connection.

drones that can enhance situational and grid awareness and accelerate risk-informed inspection and repair. Utilities need to continually strengthen and modernize their inspection and mitigation toolsets, including embracing new technologies like drones that were not as readily available or mature a decade ago, to improve visibility, speed, and targeting of corrective work in the highest-risk areas.

SDG&E's wildfire safety regulator, the Office of Energy Infrastructure Safety (Energy Safety) has continually challenged the utilities in the development of data and situational awareness using new technologies. For instance, on a 2025 Podcast discussion with Commissioner Houck, the then Director of Energy Safety discussed the "game changing" opportunities offered by development of Artificial Intelligence and Machine Learning Models:[4]

> But the biggest one that I think that there is still massive opportunity with is artificial intelligence, right? So, and I'll just give one example of the way that it's currently being utilized in the California utilities that I think is game changing to the industry, which is learning one of the key elements of being able to address their risk is to understand where their stuff is, right? So asset registries and knowing what components, ultimately down to literally like the connector level, the bolt level right now, they're not even close to that, but ultimately getting to that kind of level.
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> So understanding their inventory of their infrastructure and using AI to be able to augment the everyday health oversight of that infrastructure, whether that's imagery processing and identifying what components are on there so they can have an accurate registry to identifying potential defects on those components in a way that is going to be much more comprehensive than individual human ground inspections ever will be.

During this same conversation, Commissioner Houck also agreed regarding the "huge potential" of Artificial Intelligence and how it would serve as a "critical tool" going forward. These sentiments run directly afoul of PCF's position that utilities should stay in the dark ages of

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[4] Tech Talk for Regulators, *California Wildfire Mitigation Regulatory Agencies*, (May 15, 2025), *available at*: https://podcasts.apple.com/ca/podcast/california-wildfire-mitigation-regulatory-agencies/id1809159659?i=1000708647381.

inspections, relying on inferior tools and systems rather than embracing new technologies that offer significant improvements in risk reduction and situational awareness.

SDG&E's drone programs supplemented wildfire risk reduction by enabling more frequent and higher-resolution observation of overhead assets in the highest-risk areas, identifying conditions that may be difficult or impossible to detect from the ground, and accelerating prioritization and completion of repairs and replacements. Based on the damages detected and repairs completed during the drone program, I truly believe that without SDG&E's drone program, our service territory would have experienced a catastrophic wildfire in our service territory in the last five years. Thus, when considering the costs of developing and implementing drone inspections, and performing the necessary repairs associated with conditions found during those inspections, the Commission should consider the material and significant avoided costs of a catastrophic wildfire, which could have ranged in the billions or tens of billions, not to mention the threat to lives and property and the avoided GHG emissions .

Q. Is there any merit to Mr. Powers' concerns regarding hacking and alteration of images gathered through drone inspections?

A: No. SDG&E takes data integrity and cybersecurity seriously for all inspection methods, including drone-enabled inspections. There is no evidence of any hacking or alteration of images, and Mr. Powers' concerns lack merit.

Images and related inspection data are collected, transmitted, stored, and accessed using controlled systems and established cybersecurity practices (e.g., access controls, auditability, and secure storage), and they are subject to quality assurance/quality control before being relied upon for work planning. Moreover, SDG&E's corrective actions are not based solely on the results of machine learning models, which were used for QA/QC of human identified damage conditions.

Additionally, conditions identified through drone imagery and machine learning models are corroborated through additional review and field verification prior to repair or replacement. For these reasons, Mr. Powers' generalized concern offered without any support or additional evidence does not provide a basis to discount the reliability of the drone inspection program outputs.

Q. Does SDG&E intend at any point to solely rely on drones as a method of inspections?

A: No. SDG&E does not intend to solely rely on drones as its method of inspection. Drones are one of several complementary inspection tools within SDG&E's broader AM&I program, which includes patrol and detailed inspections performed by qualified personnel and follow-up field assessments as needed. SDG&E will continue to use the appropriate inspection method(s) based on risk, asset type, accessibility, and the nature of the condition being evaluated, with QEWs and other qualified inspection personnel performing the work that requires hands-on assessment or corrective action.

Q. Does the history of utility-related wildfires in California support Mr. Powers' assertion that conventional inspections are sufficient to reduce wildfire risk?

A: No. California's experience with catastrophic utility-related wildfires demonstrates that wildfire risk is not static and that relying on any single mitigation measure, including time-based conventional inspections alone, is not sufficient. Even with inspection programs in place, ignitions can occur due to a combination of extreme weather, changing fuel conditions, and evolving asset risk profiles. Detailed inspections and comprehensive system knowledge aid in prioritizing repairs and reducing risk. For instance, supplementing traditional patrols and time-based detailed inspections with drone imagery of assets could have reduced the risk of the

ignition that resulted in the Camp Fire, which was caused by a failed C-hook not obviously visible from the ground or via helicopter patrols. As directed by General Order (GO) 95 Rule 31.2, "[l]ines shall be inspected frequently and thoroughly for the purpose that they are in good condition so as to conform to these rules."[5] Thorough inspection programs, supplemented by drones that offer the means of detailed up-close and sustained imagery of infrastructure, are consistent with these requirements, effective at reducing ignitions, and should be deemed reasonable.[6]

Consistent with the increased risk, our awareness of wildfire science, and new technological developments, SDG&E's approach is therefore layered: conventional inspections and repairs remain foundational, and supplemental tools like drone-enabled inspections, early fault detection sensors, facility hardening programs, and other programs are used to enhance detection and reduce risk. This layered approach is consistent with prudent utility practice for wildfire risk reduction, as evidenced by SDG&E's nearly 20-year history without a catastrophic wildfire associated with its infrastructure.

Q. To your knowledge, does Mr. Powers have any experience in utility asset management?

A: I have not reviewed Mr. Powers' full professional background beyond what is stated in his testimony and materials submitted in this proceeding. To the extent Mr. Powers has not

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[5] GO 95, Rule 31.2.

[6] *See* Commission's Safety and Enforcement Division (SED) Camp Fire Investigation Report (Redacted) (November 8, 2019), concluding, among other things, that PG&E lacked adequate investigation and maintenance programs, and "routine patrols and [] ground and aerial inspections have been ineffective in finding cold-end hardwire defects…." While admittedly the Camp Fire was the result of equipment on a transmission line, the same can be said for the inadequacies of alternative inspection methods in identifying issues with small hardware on distribution lines.

presented specific utility asset management qualifications, training, or operational responsibility supporting his conclusions, the Commission should weigh his opinions accordingly.

Q. Was SDG&E required to perform drone inspections as part of its approved WMP?

A: Yes. SDG&E's Wildfire Mitigation Plan established inspection and mitigation objectives reasonably necessary to mitigate wildfire risk in its service territory. SDG&E is required to comply with approved WMP targets pursuant to Pub. Util. Code §8386.3 and safety certificate requirements pursuant to Pub. Util. Code § 8389. Failing to implement approved WMP targets would not only put SDG&E's communities at increased risk of wildfire, it would also lead to potentially significant fines for WMP non-compliance[7] and loss of the safety certificate—which would be devastating for SDG&E's financial health and ability to operate in a safe and reliable manner. There can be no question that once a WMP target is approved, the Commission expected utilities to substantially comply with that target[8]—in this case by achieving the total number of planned inspections or substantially close thereto.

Consistent with that framework, SDG&E implemented DIAR and RIDI to help achieve its WMP goals of enhancing inspections and prioritizing repair work in the highest wildfire risk areas. In fact, Mr. Powers' testimony is supportive of other utilities' drone use stating that when used in that supplemental way, drones "can and do enhance the comprehensiveness and

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[7] For instance, on June 3, 2025, SED issued a proposed Administrative Enforcement Order to PacifiCorp directing the company to pay a penalty of $27,284,000 for eleven alleged WMP compliance violations, including failure to substantially comply with various WMP targets, including Covered Conductor Installation, Pole Replacements, Weather Station Installation, Detailed Vegetation Inspections, Distribution Patrol Inspections, and Vegetation Clearances. *See* CPUC-21-AEO, In the matter of: PacifiCorp's 2020 WMP Compliance, [Proposed] Administrative Enforcement Order.

[8] Senate Bill (SB) 254 revised this provision to remove the concept of substantial compliance, implying an even heightened approach to enforcement for failure to implement a WMP.

cost-efficiency of conventional 'boots on the ground' (or bucket truck) pole inspections."[9] SDG&E's leadership in developing a drone inspection program and supporting Machine Learning and Artificial Intelligence Models to support situational awareness, prioritize and accelerate repairs, and reduce risk has been cited as a strength of its WMP.[10]

Q. Is the RIDI Program 13.5 times more expensive than other inspection and repair programs, as PCF asserts?

A: No. RIDI inspections are not 13.5 times more expensive than other inspection and repair programs. Mr. Powers performs an inappropriate and uninformed apples to oranges comparison to reach this assertion. First, Mr. Powers omits that SDG&E consolidated HFTD Tier 3 inspections into the RIDI program, and fails to include the costs of those inspections ($34 per pole) in his analysis, even though they would have remained a component of SDG&E's inspection programs without RIDI. Thus, the failure to include these costs is in error and Mr. Power's calculations fail.[11]

Second, Mr. Powers fails to account for the differences in scope, operating requirements, and the additional value of the data collected through drone inspections, which do not yield to a like-for-like comparison. RIDI is a risk-targeted program focused on the highest-risk distribution assets in HFTD and WUI areas and includes the costs necessary to perform those inspections safely and effectively. For instance, specialized costs associated with RIDI include the risk-

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[9] Ex. PCF-59 at 2.

[10] SDG&E, 2023-2025 WMP (October 13, 2023) at 44, *available at*: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=55859&shareable=true&_gl=1*2x7zga*_ga*MjAwNDMyMzMzNS4xNzQxNjMzOTk2*_ga_69TD0KNT0F*czE3Nzc5MzQ1NTAkbzM4JGcwJHQxNzc3OTM0NTUwJGo2MCRsMCRoMA..*_ga_340RFMFNWY*czE3Nzc5MzQ1NTAkbzE0JGcwJHQxNzc3OTM0NTUwJGo2MCRsMCRoMA..*_ga_DCP197HRSL*czE3Nzc5MzQ1NTAkbzI0JGcwJHQxNzc3OTM0NTUwJGo2MCRsMCRoMA...

[11] Ex. PCF-59, at 7, footnote 23.

modeling required to inform and properly target the program scope, flight planning, permitting, environmental and safety requirements, data collection, and quality control costs. Overall, comparing a risk-targeted, inspection program to lower-cost, time-based inspection activities on an average-cost basis overstates the cost differences without accounting for the increased benefits.

And failing to account for the benefits—as PCF continually tries to do—fundamentally results in an improper comparison of unit costs that the Commission should disregard. Fundamentally, even a corrected unit-cost comparison (e.g., "5 times" instead of "13.5 times") is not the sole basis for comparing costs during a reasonableness review because it treats wildfire risk mitigation as though it should be measured only on a "lowest first-dollar cost" basis, rather than on effectiveness, value to customers, and the long-term benefits offered. Rather than selecting wildfire mitigation efforts solely based on the lowest cost per inspection, *the relevant comparison is whether the cost of performing drone inspections is justified by the additional risk reduction that those inspections offer*—such as the ability to obtain otherwise unavailable views of infrastructure, improved ability to identify non-obvious defects and monitor potential defects over time to reduce uncertainty, and accelerate repairs on the highest-risk assets in the highest-risk areas. Consideration of these additional benefits and risk reduction, which are not offered by any other inspection method, establishes the cost-effectiveness of SDG&E's drone inspection programs.

Applying Mr. Powers' logic would lead to rejection of many prudent safety and reliability investments that materially reduce the probability or severity of catastrophic outcomes simply because they present relatively higher upfront costs. In critical safety matters where margins for error must be low, people and companies are willing to pay more for options that

deliver better performance and lower risk. Mr. Powers' approach would, for instance, lead to all cars being developed without back-up cameras, because back-up cameras pose additional upfront costs. But the added safety and risk reduction of back-up cameras has made them an industry standard in most cars, despite their additional costs. And, while during their initial deployment as a safety option, cameras were more expensive as a vehicle option, as they have become standard in vehicles, their costs have also decreased. The same is true for drone inspections: they meaningfully and measurably reduce the risk of ignition and keep the electrical system running more safely; the upfront costs associated with starting up drone inspections was higher than maintaining the status quo; and as the program has evolved as an industry standard, those costs have stabilized—maintaining the meaningful safety benefits at lower costs. Given the increasing risk of catastrophic wildfires and the availability of new technologies, it would be unreasonable to adopt Mr. Powers' suggestions that utilities remain in the age of paper maps and rearview mirrors simply to keep up front costs low.

SDG&E's obligation is to reasonably deploy tools that most effectively mitigate wildfire risk based on how a reasonable manager would have acted at the time, not merely to perform only the cheapest inspection method on a per-pole basis. The Commission should reject any arguments that support leaving California utility customers at higher risk when meaningful risk reduction can be achieved at a reasonable cost. SDG&E's drone inspection programs offered that precise risk reduction and meaningful safety enhancements at reasonable costs in compliance with legal and regulatory requirements, and should be approved.

Q. Please describe in more detail the benefits of the drone program and how those justify the additional costs versus traditional inspection methods.

A: As discussed in my Supplemental Direct Testimony, SDG&E's drone inspection programs offered a myriad of benefits that have been recognized by the company's regulators. For instance, the Independent Evaluator (IE) for SDG&E's 2021 WMP compliance found that drone imagery aided significantly in the volume of initiatives that could be verified, including grid hardening, weather stations, and fuels management.[12] The IE also noted the robustness of SDG&E's program and the breadth of possible uses for the technology.[13] SDG&E has leveraged drone imagery across its wildfire mitigation program to reduce and mitigate PSPS impacts, target PSPS to the highest-risk areas of its service territory based on known infrastructure conditions, and improve operations.

But the largest benefit of the drone program is that it meaningfully reduced the chance of a catastrophic wildfire in SDG&E's service territory because it facilitated awareness and timely repair of conditions that could lead to equipment failure. For instance, drone inspections of infrastructure might have identified the types of equipment that failed and led to the Camp Fire, which was caused by a C-hook that failed in high winds, resulting in ignition. That fire caused 85 fatalities, destroyed 18,000 structures, and resulted in an estimated $16.5 billion in damage. Years later, less than half the pre-fire population has returned to Paradise, demonstrating the long-term damage to communities and economies that go unmeasured after a fire.

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[12] Final Independent Evaluator Report on Compliance for SDG&E's 2022 WMP (June 30, 2022), available at https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52688&shareable=true

[13] *Id.*

Other past fires demonstrate the necessity of performing informed and timely repairs. The 2018 Woolsey Fire was caused by a loose transmission guy wire, vegetation overgrowth, and proximity of electric infrastructure to communications infrastructure—ultimately leading to arcing and ignition. The Commission's Safety and Enforcement Division (SED) found Southern California Edison violated a number of rules and General Orders related to the Woolsey ignition, including failure to perform timely and prioritized repairs on infrastructure, and failure to *thoroughly* inspect their lines.[14] The Woolsey Fire killed three people, destroyed 1,643 structures, and is estimated to have caused approximately $6 billion in damages.

A holistic view of the cost effectiveness of SDG&E's drone inspection programs and the comprehensive repairs that followed cannot be done without consideration of the costs avoided—both financial and in lives and livelihoods—through SDG&E's successful wildfire mitigation program having not caused a wildfire in almost 20 years. It would be error for the Commission to compare SDG&E to other utilities without consideration of the fact that SDG&E's customers have avoided absorbing the costs of a catastrophic wildfire and its communities have benefited from the company's ongoing wildfire safety record. These costs could easily have ranged in the tens of billions, showing that the relative costs of the drone programs were reasonable and necessary to achieve risk reduction and achieve regulatory compliance.

[14] CPUC Safety Enforcement Division, *Investigation Report of the Woolsey Fire* at 34-35, available at: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/safety-and-enforcement-division/investigations-wildfires/sed-investigation-report---woolsey-fire---redacted.pdf

Q. How does SDG&E measure the risk reduction from inspections and repairs performed through the drone programs?

A: SDG&E generally measures risk reduction from inspections and repairs by tying (1) what was found during inspections and (2) what was corrected through repairs/replacements to SDG&E's wildfire risk models and risk framework, and then expressing the resulting benefit as a modeled reduction in ignition risk and other risk dimensions (with supporting operational/asset-health indicators). The core elements are:

- **Risk framework / quantification approach**: For AM&I and drone inspection programs, SDG&E applies the Risk-Spend Efficiency (RSE) framework built on the Multi-Attribute Value Function (MAVF) methodology to quantify how inspections (and the resulting corrective actions) reduce wildfire, PSPS, and operational risk. MAVF evaluates multiple impact categories—commonly described as safety, reliability, financial impacts, and ignition-risk reduction—to generate a normalized risk-reduction score, which is then compared against program costs to produce an RSE value (i.e., risk mitigation per dollar invested). (See SDG&E-T3-WMPMA-07-E discussion of "Risk Identification and Mitigation" across inspection programs.)
- **Inspection-to-repair risk reduction:** Inspections alone do not reduce risk. Rather, inspections raise awareness of potential system issues requiring remediation and reduce uncertainty; risk reduction is realized when repairs/replacements are completed. SDG&E describes this as a risk-based effectiveness approach for inspection programs—often framed as Risk-Based Mitigation Effectiveness (RBME)—which measures risk reduction achieved through the chain of activities (inspection → finding → remediation), not inspection in isolation.

- **Program performance and asset condition indicators**: To the extent possible, SDG&E also tracks operational indicators that corroborate and contextualize modeled risk reduction, such as inspection finding rates, corrective maintenance completion (including GO compliance timeframes), asset health metrics, and outcomes like reductions in safety events, ignitions, and unplanned outages for the inspected population over time.

Q. How have these risk reduction estimates evolved over time?

A: SDG&E's risk reduction estimates have evolved as inspection data volume has increased, analytical methods have matured, and SDG&E has incorporated lessons learned regarding condition classification, repair effectiveness, and risk targeting. Over time, SDG&E has refined how it maps observed conditions to risk drivers, how it treats uncertainty, and how it accounts for differences in geography and asset type. As a result, newer estimates reflect improved data quality, quantity, and modeling inputs compared to earlier iterations, while maintaining a consistent objective of quantifying the incremental wildfire risk reduction attributable to identifying and mitigating conditions on assets.

Q. Are the risk reduction estimates offered in your direct testimony the most up to date and accurate measurements for drone inspection and repair programs?

A: Yes. The risk reduction estimates presented in my Supplemental Direct Testimony (Errata) reflect SDG&E's most current available information and methodologies for the DIAR and RIDI Programs. SDG&E continues to refine its risk modeling and incorporate additional inspection and repair data as it becomes available, but those ongoing refinements do not undermine the risk reduction estimates provided in my testimony, which clearly support the reasonableness of SDG&E's drone inspection programs and the associated repairs.

Q. Are SDG&E's drone inspection costs per pole reasonable? If so, why?

A: Yes. SDG&E's drone inspection costs on a per-pole basis are reasonable when considered in context of SDG&E's initiation of a novel distribution drone inspection program, the initiation costs, the program scope and the operating environment from 2019-2023. As shown in table JK-2 of my Supplemental Direct Testimony, excerpted below, drone inspection costs continued to decrease overtime as the program matured.

Table JK- 1: 2019-2023 Per Pole Inspection Costs Breakdown by Program

Inspection Type	2019	2020	2021	2022	2023	Average (Based on 2019-2023 totals)
Drone	$1,281	$652	$678	$510	$486	**$662**
Detailed	N/A	$10	$16	$19	$32	**$18**
HFTD Tier 3	$37	$34	$30	$33	$0	**$34**
Intrusive	$64	$61	$92	$41	$104	**$69**
Infrared	N/A	$13	$9	$13	$28	**$17**
Patrol	N/A	$3	$3	$3	$4	**$3**

Costs were higher in the beginning as SDG&E was (1) standing up a new, large-scale, risk-targeted inspection capability in high-fire-risk terrain (2) establishing new protocols and procedures and technological capabilities and (3) costs went beyond capturing images, such as utilization of external QEW resources, aviation planning, permitting, environmental, safety data transfer/storage, and management. As demonstrated in my testimony and associated workpapers, the scope of the activities were authorized in the WMP and the work performed was necessary to meet through WMP obligations and targets. Plus, the appropriate procurement, oversight and QA/QC was implemented. The decisions made were reasonable given the available technology

and information known at the time, and any hindsight bias illustrated in Mr. Powers' testimony should be disregarded.

Q. Why is it reasonable for inspections performed under the drone program to have a higher average cost per pole?

A: As mentioned in my response to the prior question, the inspection costs on an average per pole basis were expected to be higher than alternative inspection methods for several reasons:

1. SDG&E led the state in developing a drone-based inspection program for distribution infrastructure in high-fire-risk areas. This required start-up costs to retain qualified contractors that met Federal Aviation Administration requirements to perform drone inspections safely around electrical infrastructure and with minimal customer and landowner disruption.
2. Start up costs also included additional safety costs, including customer outreach to address concerns and minimize the potential for danger to drone operators and other field partners.
3. Drone operations as an industry matured rapidly during this time, resulting in lower costs as SDG&E refined the scope and scale of the program.
4. SDG&E is the sole IOU in the state to have assessed the condition of all electrical infrastructure in the highest fire threat areas of its service territory, allowing it a comprehensive knowledge and situational awareness base that has not only aided in SDG&E experiencing nearly 20 years without a catastrophic wildfire, but also in targeting and limiting PSPS impacts. Further, these inspections have allowed for SDG&E to have situational awareness to implement PSPS in areas where there are known risks on the system awaiting repair, likely avoiding a catastrophic ignition risk.

5. As noted in my Supplemental Direct Testimony and elsewhere in this Rebuttal, SDG&E's leadership in developing and refining drone inspection programs has led to its adoption as a best practice in electrical operations around the country and world, leading to scaled adoption and correlated lower costs.

Based on the information available at the time (2019-2023) and pressing and immediate wildfire risk SDG&E faced, it was reasonable to implement drone inspections of infrastructure, even at a higher cost per pole. Mr. Powers conveniently omits the call to action that California presented to the utilities in passing SB 901 and AB 1054 and implementing the Wildfire Mitigation Plans. As then Governor Brown noted in signing SB 901, "[w]ildfires in California aren't going away, and we're going to have to do everything possible to prevent them. This bill is complex and requires investment – but it's absolutely necessary."[15] The message at the time was clear: utilities must do more to reduce risk and understand their system health. That is precisely what SDG&E did in implementing drone inspections, and consistent then Governor Brown's message, the costs associated with that program were worth it in the payout of having no utility-related wildfires since 2019.

Overall, I believe SDG&E acted reasonably to meet its approved WMP obligations—and the call to action by the state—in a period of increasing wildfire risk. This is consistent with all applicable statutes requiring SDG&E to perform safe and reliable service at just and reasonable rates.

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[15] Office of Governor Edmund J. Brown, *Governor Brown Signs Legislation to Strengthen Wildfire Prevention and Recovery* (September 21, 2018), *available at*: https://archive.gov.ca.gov/archive/gov39/2018/09/21/governor-brown-signs-legislation-to-strengthen-wildfire-prevention-and-recovery/index.html.

Q. Did SDG&E coordinate drone inspections with other patrol or detailed inspections? If the inspections were not performed together, why not?

A: First, in 2023, SDG&E did coordinate its drone inspections with detailed inspections, canceling approximately 2,000 detailed inspections that were otherwise satisfied by RIDI. To achieve this efficiency, SDG&E expanded the drone inspection scope to include reviewing for other conditions.

SDG&E could not, and thus did not, consolidate drone inspections with other traditional inspections like patrol and detailed inspections from 2019-2022 for several reasons. The first was that the efficacy of drones as an inspection tool remained under review. The drone inspections from 2019-2022 focused only on potential fire and safety risks and did not meet the requirements of a complete GO 95 CMP inspection, which is focused on identification of both fire risks and other non-safety and fire risk conditions, such as missing or damaged signage. Another complexity was confirming drone inspections within the strict GO 165 interval requirement for other required inspections. This was achievable after the development of the risk-informed drone inspection program, RIDI, with only 2,000 poles to manage. But it would have been impractical or impossible to remain within required inspection timeframes for traditional inspections during the DIAR timeframe, when SDG&E performed drone inspections for all Tier 2 and Tier 3 poles within a short period of time.

Where possible, SDG&E did seek opportunities to find efficiencies and reduce inspection and repair costs. For instance, SDG&E expanded the scope of the RIDI work to require the QEW inspector to perform minor field fixes that are traditionally performed during detailed inspections. Overall however, the result of this coordination with detailed inspections was reduced productivity, with additional time per inspection and a much higher find rate. The total

find rate for 2023 RIDI inspections (that included non-fire and safety hazards) increased from an average of 25% to 64%. This increased the average cost for the detailed inspection and increased the amount of follow-up repair work. Starting in 2024 (which is not the subject of this proceeding), SDG&E refined this process and removed any overlap from its annual RIDI scope to ensure that any poles subject to a detailed inspection were not included in the annual RIDI scope.

Next, patrol inspections are performed annually on all overhead patrols and are intended to identify significant structural defects. At SDG&E, these inspections are performed by electric trouble shooters (ETS) in coordination with their normal work duties responding to trouble calls. Coordinating drone inspections with patrols during would have required significant technology enhancements to try and meet the interval requirements of GO 165 and created practical and logistical challenges with ETS personnel and record-keeping. Finally, I urge the Commission to evaluate SDG&E's decisions during the 2019–2023 timeframe within the context of what was happening at that time versus through hindsight; California was experiencing unprecedented, catastrophic wildfires with widespread loss of life and property, and the State's policy and regulatory framework was rapidly evolving to demand heightened, verifiable wildfire-risk mitigation by electric utilities. SDG&E's actions were not discretionary "nice-to-have" enhancements; they were undertaken to implement approved and mandated Wildfire Mitigation Plan compliance obligations under Public Utilities Code.

Q. One page 11 of Mr. Powers testimony states that SDG&E did not describe how the RIDI poles were selected and alleged that SDG&E inspected the same poles for RIDI that were already identified as needing repairs in the DIAR program. Are these statements accurate?

A: No, the statements are not accurate. My workpapers (see SDG&E-T3-WMPMA-07, at 27 and 30) described how poles were selected for inspection through RIDI in 2023 using a model that incorporated consequence of wildfire risk data, asset data (e.g. age, location, material, height, elevation, number of attachments), environmental considerations, such as higher wind areas and soil types, as well as damage predictions from machine learning models run on imagery from prior years. In addition, the 2023 RIDI scope did not include "poles that had recently been replaced or were scheduled for replacement in the near term through other construction projects." This scope included poles identified as requiring replacement through prior DIAR inspections.

Q. What are the benefits of the machine learning models generated through SDG&E's drone programs?

A: The machine learning models developed through SDG&E's drone programs provide a "Human + Machine" capability that improves the efficiency, consistency, and scalability of inspection workflows without eliminating the need for qualified personnel judgment. In particular, the models support (1) asset identification (e.g., confirming pole, crossarm, and equipment attributes to reduce manual, repetitive verification work) and (2) quality assurance/quality control by providing an additional check on human-identified conditions to improve consistency across large image volumes. Over time, these models have enabled SDG&E

to evaluate larger volumes of imagery from multiple collection sources to improve asset inventory and risk-modeling.

Q. Does Mr. Powers accurately describe the circumstances regarding development of the Machine Learning models on page 10?

A: No. Mr. Powers' description is incomplete, relies on conjecture without supporting evidence, and does not reflect how the models were developed and used as part of an end-to-end inspection workflow with appropriate human review and quality controls. SDG&E's machine learning efforts were designed to support, not replace, qualified judgment. To the extent Mr. Powers baselessly suggests that SDG&E relied on unvalidated or unsupported automated outputs, that characterization is inaccurate; SDG&E applied quality assurance processes and integrated model outputs that included review by supervisory personnel with follow-up as warranted.

Q. Mr. Powers describes drone assisted inspections performed at two other California utilities, Trinity Public Utilities District and Plumas-Sierra Rural Electric Cooperative. Are those comparisons reasonable? Why or why not?

A: No, those comparisons are not reasonable, and the Commission should reject them out of hand. The comparisons do not control for material differences in system characteristics and program scope, nor does Mr. Powers correctly characterize how drones are being used at SDG&E or these small utilities and cooperatives. First, the comparison does not discuss the labor considerations between SDG&E and the smaller utilities, where SDG&E had an average of 154 QEWs performing detailed inspections each year during the 2019-2023 time period, whereas based on my knowledge and belief from conversations with staff at Trinity Public Utilities District, it has a total workforce of ~23 employees with 10-12 inspectors. Additionally,

compared to the scope of SDG&E's inspection efforts, in 2022 Trinity stated it had three staff members trained in the sue of drones.[16] Mr. Powers' testimony does not account for how these utilities were able to equip their inspectors with drones, whether participation by the inspectors was voluntary or required in their job duties as part of the bargaining agreement ,and the time it would have taken SDG&E to reach an agreement with the union for our inspectors to perform drone inspections as part of the regular duties. All of these considerations would have deterred from the end goal of rapidly understanding and reducing electric system risk at a large-scale utility covering millions of customers.

Second, Mr. Powers ignores the fact that SDG&E, as a large electrical corporation, is subject to distinct WMP requirements and guidelines from small regional electric cooperatives and municipal utilities. For instance, Trinity Public Utilities District's 2025 WMP update is 42 pages, inclusive of cover and appendices, and includes zero WMP targets for initiatives. Plumas-Sierra Regional Electric Cooperative's 2023 WMP implies it had one "drone" to patrol assets before restoration of service after a PSPS.[17] It similarly includes no WMP targets and was subject to entirely different regulatory expectations and requirements. It also goes without saying that as municipalized utilities, both entities do not rely on a safety certification to address the financial uncertainty associated with wildfire costs.

Further, in failing to take into account the significant operational differences, Mr. Powers' unfounded comparisons do not account for the costs and time involved in training 154 SDG&E inspectors to operate a drone, which would include ground school, hands-on training

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[16] The Trinity Journal, *TPUD talks outages, drones* (November 16, 2022), *available* at: https://www.trinityjournal.com/news/local/article_dc68bca6-6535-11ed-ac96-e7c248f4617f.html.

[17] Plumas-Sierra Regional Electric Cooperative (PSREC), PSREC WMP 2023 Update at 26, *available at*: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54277&shareable=true.

and test preparation, plus the cost to take the FAA Part 107 test or the currency requirements. Mr. Powers also does not account for the costs of purchasing and maintaining drones for these inspectors, costs that were instead avoided by using external vendors and pilots that provided their own aircraft. Additionally, Mr. Powers does not include the increased costs to perform the inspections if the use of a drone was required for every inspection or the time associated with training and operating drones that would not have been spent on performing capital work, O&M repairs, new customer connections or other critical O&M work by internal QEWs.

Mr. Powers, in seemingly assuming that performing a drone inspection is as easy as going to the local Wal Mart and flying a children's toy, simplifies the many requirements that are inherent in operating an aircraft in a safe, legal, and licensed fashion as follows:

- Checking Airspace restrictions/NOTAMS
- Airspace approvals per FAA for "No Fly Zones"
- Submittal of flight requests 48 hours prior
- Complete UAS System Checklist and Risk Assessment forms with every flight
- Calling into FOB before launching for situational awareness
- Utilizing the TracPlus unit for real time aircraft location awareness
- Using only approved UASs on DOD land, plus review of all photos on DOD land by DOD and coordination with an approved escort
- Uploading images to company inspection systems
- Uploading UASs flight logs
- Additional reporting for aviation safety issues/concerns

Finally, even if drone inspections were performed by internal inspectors during the course of detailed inspections, the same program start-up costs and support costs would have

been necessary to support systems, new processes and procedures to capture imagery and perform inspections, and obtain authorizations to perform aerial inspections.

Mr. Powers' presentation of alternatives do not present a reasonable comparison of program costs and should be disregarded as misinformed and underdeveloped.

Q. Does Mr. Powers' testimony mention the drone inspection programs at PG&E or SCE?

A: To my review, Mr. Powers does not provide a meaningful discussion of the scope, objectives, and cost drivers of comparable drone-enabled inspection programs at the other large California IOUs (PG&E and SCE) sufficient to support a comparison. Where Mr. Powers references other utilities, the testimony does not adequately account for differences in program scope (including whether repairs are included) and timing. It also does not account for the fact that both those utilities had ignitions during that time period, whereas SDG&E had a successful wildfire mitigation program that prevented any ignitions of catastrophic wildfires. As a result, his testimony does not establish that SDG&E's programs are unreasonable relative to peer practices.

Q. Are inspection programs at other large IOUs more reasonable for comparison across program scopes?

A: In general, inspection and repair programs at other large California IOUs provide a more relevant point of comparison because they operate under similar regulatory requirements, face similar wildfire risk conditions, and manage systems of comparable complexity and scale. Even then, any benchmarking must account for many differences, including but not limited to the following:

- Service territory geography and size;
- HFTD/WUI footprint;

- Asset mix;
- Program Scope and Scale, including number of inspections performed annually and total service territory coverage;
- Whether the Program includes the cost of repairs, or is limited to inspections;
- The extent of analytics and quality controls included in reported costs;
- The timing of program start up, including whether the peer IOU utilized lessons learned from SDG&E's drone program development to implement cost savings at start up.

When those factors are appropriately considered, peer IOU practices can offer perspective that might inform an assessment of reasonableness, but it would still be improper to do a strict dollar for dollar simple unit-cost comparisons because of the misalignment between scope, scale, technologies, and timing at the other utilities.

Q. Does SDG&E frequently benchmark inspection and repair practices with the other large IOUs?

A: Yes. SDG&E regularly monitors and benchmarks inspection and repair practices, emerging technologies, and wildfire mitigation approaches across the industry, including the other large California IOUs, through formal and informal channels (e.g., peer utility engagements, industry working groups, vendor engagements, and review of publicly available filings and best practices). This benchmarking helps SDG&E evaluate opportunities to improve inspection quality, safety, efficiency, and risk targeting, and to adopt tools, such as drone-enabled inspections and supporting analytics, where they provide incremental value in SDG&E's service territory.

Q. Are helicopters a reasonable alternative to drones to perform aerial inspections of electric distribution facilities?

A: Where appropriate, SDG&E uses helicopters as a useful aerial tool in certain circumstances (e.g., broad situational awareness, rapid assessment for re-energization, or patrol of long spans), But helicopters are not a direct or reasonable substitute for a drone-enabled inspection approach for distribution assets in high wildfire-risk areas. First, helicopter patrols do not provide the same close-range, standardized, high-resolution imagery that SDG&E's drone programs were designed to collect for distribution-level components. A helicopter cannot get within mere feet of infrastructure for a sustained period of time. Moreover, helicopters inspections cannot work around potential impediments to visual assessments, such as vegetation cover, that would limit inspectors' ability to see assets in the same manner as from the ground.

In practice, helicopter patrols are "eyes-out" missions and photos are rarely taken because vibration and operating conditions limit the usefulness of imagery for detailed condition assessment and documentation. Below are some examples of images taken of an SDG&E transmission tower from a helicopter that had a wide and clear right-of-way, which clearly do not have the granularity to identify the minor unit hardware issues and other types of damage identified by DIAR and RIDI.

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In summary, helicopter patrols, though classified as inspections, do not provide the granular look that drones provide and therefore are not equivalent for identifying and documenting many distribution-level defects that drive corrective work planning.

Second, helicopter operations generally involve higher and more variable operating costs and additional logistics and safety constraints. Helicopter costs are time-based (a rough average is approximately $2,500 per hour, with significant variability), not including common adders such as transit time to the circuit, fuel, and other fixed and variable costs. Helicopter patrols are also subject to aviation operating considerations, including minimum altitude constraints (e.g., approximately 300 feet above ground level over congested areas and higher over sensitive areas) and airspace and availability constraints, which can limit repeatability and the ability to target specific pole populations as efficiently as drones. Accordingly, while helicopters may be used as a complementary method where appropriate, they are not an equivalent alternative to drones for

the risk-targeted, distribution-level inspection, standardized documentation, analytics support, and repair planning performed under DIAR and RIDI.

This conclusion is also supported by PG&E's detailed study of drone inspection effectiveness in its 2023-2025 WMP Update. PG&E compared several inspection methods, including helicopters, versus drone distribution inspections, and ultimately "canceled most helicopter inspections midway through the pilot," as "the photo quality from the helicopter inspections was poor and did not permit a thorough desktop inspection. PG&E assigned drones to capture photos of the structures missed by helicopters."[18] Like SDG&E, PG&E concluded that, "the drone only method is the most promising for aerial inspections in the near term."[19]

Q. Mr. Powers states that SDG&E had the option of training its AM&I field inspectors to be drone pilots to maximize efficiency. Was this a viable option for SDG&E?

A: SDG&E evaluates workforce strategies on an ongoing basis, but training QEWs to pilot drones is not necessarily a more efficient or safer alternative for achieving the objectives of DIAR and RIDI. As discussed above, drone operations require specialized aviation compliance, flight planning, and piloting proficiency, and they may be best performed by dedicated operators so that QEWs can focus on their core responsibilities where their qualifications are uniquely required. QEWs are trained, qualified, and compensated to perform electrical construction, repair, maintenance, and new customer connections and upgrades—work that directly maintains system reliability and safety. Requiring QEWs to divert time from these core responsibilities to

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[18] PG&E 2023-2025 WMP Update at 1088.

[19] *Id.*

operate aircraft would impose additional training, certification, and compliance costs and reduce productive electrical work hours for a workforce already stretched thin.[20]

In addition, the drone program includes not only flight operations but also data processing, quality control, analytics, and work planning integration, which are distinct capabilities from QEW field work. As a result, SDG&E's approach of using specialized resources for drone operations while deploying QEWs for hands-on verification and repairs is a reasonable division of labor.

Q. Does the discrepancy in the "ignitions avoided by the SDG&E drone program" reflect any change in SDG&E's assumptions, failure rates, or drone program methodology?

A: No. There has been no substantive or unexplained change in the estimated number of ignitions avoided by SDG&E's drone program. The identified discrepancy arises from a now identified error in the table included in Track 2, rather than from any change in assumptions, methodology, or from unrealistic calculated failure rates resulting in an asset ignition.

Specifically, the value of 45.9 ignitions avoided shown in the Track 2 table was inadvertently carried over and does not reflect either the current or previously applied

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[20] Federal and industry workforce analyses consistently identify a nationwide shortage of qualified electric lineworkers, driven by retirements, lengthy apprenticeship and training pipelines, and increasing infrastructure and wildfire-mitigation demands. See U.S. Department of Energy, *Workforce Trends in the Electric Utility Industry* (August 2006), *available at*: https://www.energy.gov/oe/articles/workforce-trends-electric-utility-industry; Center for Energy Workforce Development, *A Workforce Development Primer for Energy Leaders* (November 13, 2023), *available at*: https://cewd.org/wp-content/uploads/2023/01/CEWD_Workforce-White-Paper-DIGITAL.pdf; U.S. Bureau of Labor Statistics, *Occupational Outlook Handbook: Electrical Power-Line Installers and Repairers* (2024–25), *available at*: https://www.bls.gov/ooh/installation-maintenance-and-repair/line-installers-and-repairers.htm.

assumptions, nor the ignition reductions attributed to the drone program as presented by SDG&E should have been reported as 6.53.

The failure rate discrepancy is readily apparent when the Track 2 table is reviewed alongside SDG&E's approved and publicly filed WMPs from 2021 to 2024. Those filings consistently reported avoided ignition values for the drone program that are aligned with SDG&E's Track 3 ignition estimates, and do not indicate a difference on the order of a factor of ten.

My supplemental testimony correctly reports the drone program's avoided ignitions as 6.53 for the 2019–2022 period, which is consistent with the underlying WMP assumptions, the applicable equipment failure rates, and the actual scope of the drone inspections. That value aligns closely with Mr. Powers's own recalculation of approximately 4.6 avoided ignitions when using the same failure-rate assumptions from the 2020 WMP.

Accordingly, the Track 2 table entry does not reflect an overstated assumption, a revised failure rate, or a flawed estimation methodology. Rather, it represents a previously unidentified clerical error in a tabular presentation that has no bearing on the reasonableness or reliability of SDG&E's ignition avoided analysis. The underlying analytical framework, assumptions, and failure rates, consistent with SDG&E's approved WMPs, have remained unchanged, internally consistent, and fully transparent throughout the proceeding.

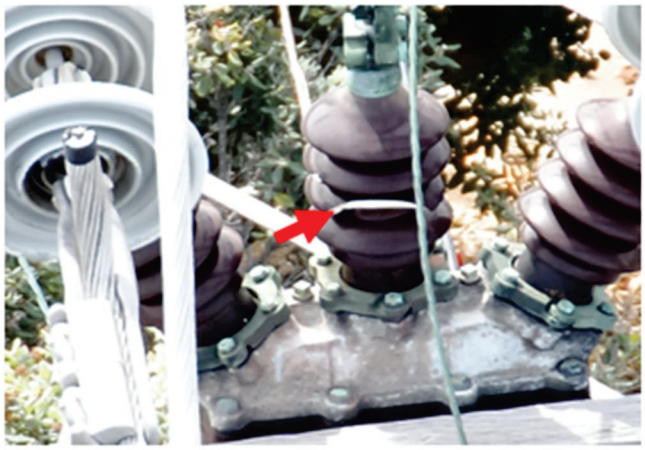
Q. Does Mr. Powers testimony on page 15 appropriately represent the unique capabilities of drones to identify the non-obvious defects that cannot be found by other inspection methods?

A: No. First, Mr. Powers discusses Figure JK-6, JK-8 and JK-9 out of context, as these images were offered to demonstrate the value of enabling a risk-informed inspection strategy

versus time-based, not to establish the unique capabilities of a drone. Mr. Powers also suggested that because the pole shown in JK-2 is next to a road that traditional ground-based inspection methods would have been capable of identifying the damage to the top of the crossarm that was not visible in the side-by-side comparison also shown in Figure JK-2.

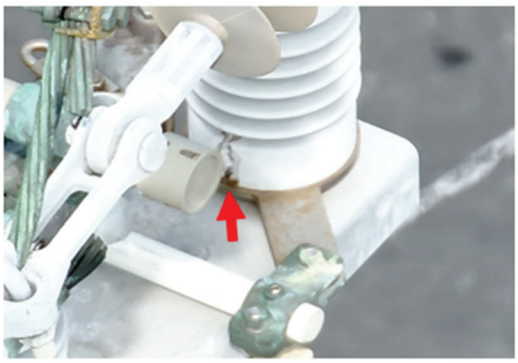
Finally, if additional images are required to support the unique ability of drones to identify non-obvious damage, additional imagery obtained from drone inspections are provided below:

Flashover on insulator

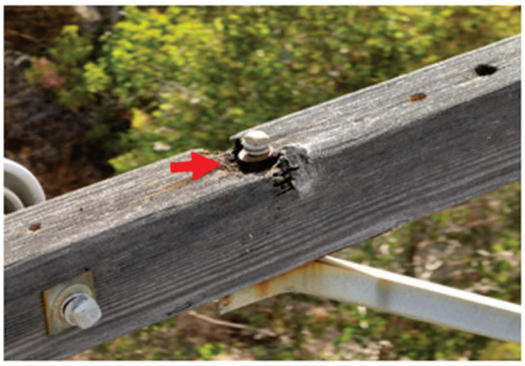


Chipped off insulator

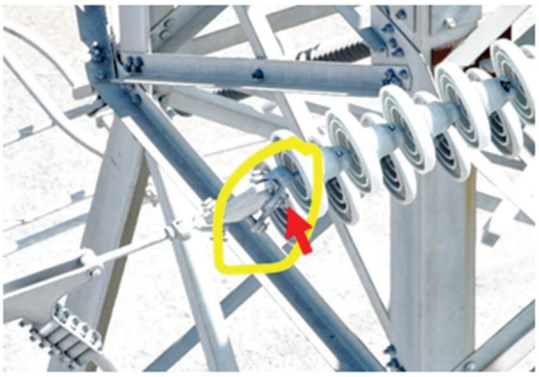
Broken lightning arrestor wire



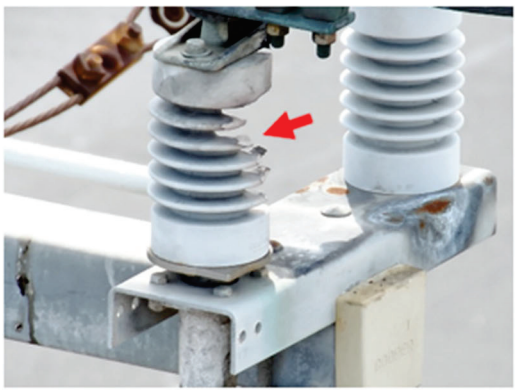
Melted poly-insulator



Crossarm showing severe tracking



Cotter pin backed out



Melted poly-insulator

Flash-over/failed insulator

Q. On page 25, Mr. Powers addresses SDG&E's infrared inspection program. Does SDG&E provide additional information here regarding the infrared inspection program beyond what was provided in SDG&E's Track 2 showing?

A: Yes, SDG&E provided additional information on its Infrared Inspections program as part of my supplemental testimony and workpapers (Ex. SDG&E-T3-WMPMA-06-E and SDG&E-T3-WMPMA-07-E).[21]

[21] See SDG&E-T3-WMPMA-06-E at 22 and SDG&E-T3-WMPMA-07-E at 17.

Q. Should Infrared Inspection costs be disallowed for Track 3 because they were denied in Track 2?

A: No. First, SDG&E believes the Commission erred in denying costs related to Infrared Inspection costs included in the Track 2 decision. The rationale provided by the Commission was that SDG&E did "not provide information regarding whether a greater percentage of abnormalities were found using infrared technology than with other technology." While SDG&E acknowledges that the "find rate" for this program was relatively low in certain years, the appropriate reasonableness inquiry for a required compliance activity is not whether the program produced a high volume of findings in hindsight, but whether SDG&E prudently implemented the approved requirement and incurred reasonable costs to do so. The Commission should allow recovery of those costs because the infrared inspections were a required WMP activity with mandatory annual targets during the period at issue. As reflected in SDG&E's Track 3 AM&I filings, the Distribution Infrared Inspections program was included in SDG&E's WMP requirements as a supplemental inspection tool intended to identify thermal anomalies on energized equipment that may not be observable through routine visual inspections.

Next, the Commission wrongly concluded in Track 2 that "since no costs were sought for capital expenditures" that we did not replace any equipment. My testimony and workpapers explain that repairs, including the replacement of equipment, were completed as a result of the infrared inspections performed from 2019-2022. While the inspections resulted in no findings in 2023, the record demonstrates SDG&E has actively sought to improve or narrow the program consistent with a continuous-improvement approach. For example, SDG&E applied a risk-informed overlay using analytics to better target higher-risk structures and circuit segments, and in December 2023 SDG&E submitted a change request to reduce the target to a smaller, more

risk-focused set of inspections. Energy Safety subsequently rejected that change request on the basis that reducing the number of inspections "did not reduce risk" and SDG&E therefore remained obligated to continue the program at the originally stated targets or face a finding of non-compliance with its approved WMP.[22] Under these circumstances, despite evidence that SDG&E attempted to reduce the program scope, SDG&E was required to perform these inspections by its wildfire safety regulator. Disallowing the associated costs would inappropriately penalize SDG&E for executing a mandated compliance obligation and amount to a regulatory taking.

Further, as part of the Track 2 Decision, the Commission took issue that SDG&E did not "detail the staffing employed, their cost, nor the justification for the additional cost compared with other inspection programs, including their risk spend efficiency." The supplemental testimony and workpapers now include detailed information related to staffing, labor and nonlabor costs, the risk-spend efficiency of the program, and the compliance obligations SDG&E was subject to in implementing the infrared inspections.

Q. Is Mr. Powers' statement on page 25 correct that the infrared inspection program has been "ineffective" at finding pole defects?

A: Although the infrared inspection program yielded a low find rate from 2019-2022 and no thermal abnormalities in 2023, the find rate is not material to the reasonableness inquiry because it was reasonable for SDG&E to explore the risk reduction potential of this method as a

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[22] Energy Safety, *Decision on SDG&E's Change Order Request in relation to its 2023-2025 Base WMP* (May 31, 2024) at 4, *available at*: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56751&shareable=true&_gl=1*1b7925w*_ga*MjAwNDMyMzMzNS4xNzQxNjMzOTk2*_ga_69TD0KNT0F*czE3Nzc5MzQ1NTAkbzM4JGcwJHQxNzc3OTM0NTUwJGo2MCRsMCRoMA..*_ga_340RFMFNWY*czE3Nzc5MzQ1NTAkbzE0JGcwJHQxNzc3OTM0NTUwJGo2MCRsMCRoMA..*_ga_DCP197HRSL*czE3Nzc5MzQ1NTAkbzI0JGcwJHQxNzc3OTM0NTUwJGo2MCRsMCRoMA.

component of its approved WMP. Failure to find issues does not render an inspection program unreasonable, saying such would be akin to claiming that schools should not have a fire drill because they have never experienced a fire.

Further, as discussed above, SDG&E was obligated to complete these inspections to achieve compliance with regulatory requirements. Reasonableness is therefore based on execution of required activities, not on retrospective outcome metrics such as defect counts, particularly for preventive inspection programs designed to confirm asset condition and validate system integrity.

Q. Should the Commission award costs sought as part of Track 3 for AM&I Programs, including Drone Inspections and Repairs performed as part of RIDI and DIAR?

A. Yes. For the reasons discussed in my testimony, the Commission should find SDG&E's recorded Track 3 Wildfire Mitigation Plan Memorandum Account costs for the DIAR and RIDI Programs to be reasonable and should authorize recovery of those recorded amounts. Mr. Powers' critiques are based on mischaracterizations of program intent and scope, hindsight bias, and inappropriate comparisons that do not provide a sound basis for disallowance.

Q. Does This Conclude Your Testimony?

A: Yes.