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SOUTHERN CALIFORNIA EDISON®

(U 338-E)

Woolsey Fire Cost Recovery Application – Rebuttal Prudence of Operations – Design and Construction Testimony

Before the

Public Utilities Commission of the State of California

Rosemead, California
July 15, 2025

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I.

INTRODUCTION

In SCE-03, SCE demonstrated that its design and construction standards—as implemented in part through its Transmission Overhead Construction Standards (TOH) and Distribution Overhead Construction Standards (DOH)—complied with or exceeded regulatory requirements such as GO 95.[1] SCE also showed that highly qualified professionals and experts assessed and updated these standards on a quarterly basis to ensure the safe and secure operation of the grid.[2] These standards informed the design and construction of the facilities on the Big Rock Circuit, including the Subject Pole.[3]

Cal Advocates does not challenge the prudence of SCE's design and construction standards or the fact that they met or exceeded those in GO 95. Instead, Cal Advocates principally criticizes the specific design and construction of the Subject Pole, suggesting that an alternate configuration could have prevented the Woolsey Fire. But Cal Advocates targets purported issues—such as clearance of the subtransmission guy when taut—that not only have no basis, but also have no causal relationship to the Woolsey ignition. The initiating event was caused by a *slack* guy resulting in insufficient clearance and contacting distribution facilities; there was no issue with the clearance achieved by a *taut* guy. Importantly, Cal Advocates does not show that SCE knew, or had any reason to know, that a subtransmission guy wire would become slack at the Subject Pole on or shortly before November 8, 2018. Indeed, from the time the Subject Pole was installed in 2008 until January 2017, there is no evidence of any faults, outages, or relays associated with SCE's facilities there. SCE appropriately responded to the outage that occurred in January 2017, and experienced SCE personnel tightened the subtransmission guy wires to remediate the issue. Nothing put SCE on notice of any larger issue or indicated that a slack guy wire would cause the initiating event of Woolsey Fire, particularly since it is exceedingly rare for a slack guy condition to occur on the same pole on more than one occasion.

This volume also addresses Cal Advocates' critiques regarding SCE's construction QC programs, pole loading calculations for the Subject Pole, and system protection on the Big Rock Circuit, none of which Cal Advocates demonstrates were causal to the ignition of the Woolsey Fire.

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1 SCE-03, pp. 16–20.

2 SCE-03, pp. 16-17.

3 SCE-03, pp. 18–21.

The testimony in this volume rebutting Cal Advocates' prudence-related testimony on design and construction issues is divided into four sections. In Section II, SCE further explains how it prudently designed and constructed the Subject Pole. In Section III, SCE addresses Cal Advocates' concerns regarding construction QC, explaining how SCE designed and constructed its facilities in compliance with rigorous standards. In Section IV, SCE demonstrates why its Pole Loading Program, including its pole loading calculations, is immaterial to any determination of prudence, and in any event, imposed standards that exceeded applicable regulations. Finally, in Section V, SCE explains why its system protection design was prudent and reduced the risk of ignition.

II.

SCE APPROPRIATELY DESIGNED AND CONSTRUCTED ITS ELECTRICAL FACILITIES, INCLUDING AT THE SUBJECT POLE

As described in SCE-03, SCE utilizes robust design and construction standards that meet or exceed the requirements of GO 95. SCE also described how the Subject Pole was installed in 2008 as part of a reconductoring project to support higher loads and improve reliability, with SCE upgrading the Big Rock and Energy Circuits with larger ACSR conductors and replacing older poles with new poles, including the Subject Pole. Cal Advocates does not dispute that SCE's design and construction standards applicable to the Subject Pole, as described in SCE-03, met or exceeded regulatory requirements. Instead, Cal Advocates claims that SCE should have constructed (or re-constructed) the Subject Pole differently given how the Woolsey Fire ignited.

SCE disagrees with Cal Advocates' claims and maintains that its design and construction of the Subject Pole and its down guys was prudent. From the time the Subject Pole was installed in 2008 until January 2017, there is no evidence of any faults, outages, or relays associated with SCE's facilities there. Though the Subject Pole did experience relay operations caused by a slack subtransmission guy in January 2017, SCE appropriately remediated that condition the same day it was discovered when a highly experienced SCE journeyman crew, including two Senior Patrolmen, tightened the guys. SCE had no reason to expect that the subtransmission guy would subsequently slacken after it was appropriately remediated in in January 2017, especially after both an SCE contractor foreman and an SCE Senior Patrolman conducting a post-construction inspection confirmed there was no issue in September 2018. Indeed, SCE data show that such an event—subsequent slackening of the same guy following maintenance—is an exceedingly rare outlier event. SCE's design and construction practices were therefore reasonable based on information known or reasonably available to SCE at the time.

A. SCE Prudently Designed and Constructed the Subject Pole

Cal Advocates critiques SCE's placement of the subtransmission down guy at the Subject Pole, suggesting that it should have been relocated to create more clearance from the distribution jumper. This criticism is misplaced. Cal Advocates does not dispute that a *taut* subtransmission guy wire—as designed and constructed by SCE—achieved at least 12 inches of clearance, or at least 133% of the applicable GO 95 requirement of 9 inches. The clearance of a taut guy wire was therefore entirely prudent. Put differently, Cal Advocates mistakenly conflates concerns about the slack condition (which are addressed below) with unwarranted concerns about clearance as designed and constructed with a taut guy.

In any event, the placement of the subtransmission down guy was prudent. On a pole with a distribution underbuild, such as the Subject Pole, some transmission guys may necessarily cross over distribution facilities in order to appropriately support the load of the transmission facilities. Distribution underbuilds are common across SCE's system and are typically more cost-effective to build and maintain, including because only one pole is required instead of two. Achieving additional clearance while complying with these requirements would require reconfiguration of the pole and/or the subtransmission guy—a costly and unnecessary task. Yet Cal Advocates does not dispute that both the subtransmission guy construction and the placement of the distribution conductors comply with GO 95. For instance, as shown in Figure II-1, the placement of the Subject Pole's subtransmission guys already complied with GO 95 Rule 56.2, industry standards, and applicable SCE policies, all of which require guys to be attached to structures, as nearly as practicable, at the center of the load.[4] Attaching the guy wire at or near the point of conductor or crossarm attachment enables the guy to appropriately counterbalance the load from the conductors that the guy is intended to support. Cal Advocates does not dispute these facts.

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[4] *See* GO 95 Rule 56.2 (providing that "Guys shall be attached to the structures, as nearly as practicable, at the center of the load"); National Electrical Safety Code (NESC) Section 264 (a "guy or brace should be attached to the structure as near as is practical to the center of the conductor load to be sustained"). SCE's applicable Transmission Overhead Construction Standards (TOH) likewise specified that guy wires should be attached approximately one foot below the top phases and one foot below the bottom phases.

Figure II-1
Post-Fire Photograph of Subject Pole and Subtransmission Guy Attachments

Cal Advocates nonetheless suggests that SCE should have known to construct the Subject Pole differently to provide an even greater clearance between the subtransmission guy and the distribution jumper. But Cal Advocates does not explain why, at any point before the Woolsey Fire ignition, prudence would require any changes or point to any industry standard suggesting changes would be appropriate—particularly when the clearance between the subtransmission guy and the distribution jumper already exceeded GO 95 requirements.[5]

[5] Though Cal Advocates points out that other guy wires on the Subject Pole were over four feet away from any energized conductor, the comparison is inapplicable. Two of the other subtransmission guy wires had no distribution underbuild at all on that side of the pole; the third was located *above* the subject subtransmission conductor (thus necessarily achieving greater clearance from the underbuilt distribution lines).

B. SCE Had No Reason to Install Covered Conductor at the Subject Pole After SCE Appropriately Tightened the Subtransmission Guys On January 20, 2017

Aside from critiquing its original construction, Cal Advocates argues that SCE should have replaced bare conductor on the Big Rock Circuit with covered conductor and/or installed a guy rod insulator after a January 20, 2017 relay event, during which the Subject Pole subtransmission guys were observed in a slack condition.[6] But Cal Advocates' testimony rests on the incorrect assumption that the subtransmission guy involved in the Woolsey Fire was likely to become slack again after it was tightened on January 20, 2017. To the contrary, data from SCE's system of record confirms that the likelihood of any particular guy becoming slack a second time is vanishingly low—under 1.4%, and likely well under. Absent any expectation that the subtransmission guy was likely to slacken a second time—which the evidence does not support—Cal Advocates' suggestion that SCE should have taken additional actions following the January 20, 2017 relay event is not reasonable.

1. SCE Had No Reason to Believe the Subtransmission Guy Would Slacken Again After It Was Tightened In January 2017

Cal Advocates describes a January 20, 2017 incident at the Subject Pole where subtransmission guy wires became slack, causing relay operations.[7] As noted in SCE-02, a highly qualified SCE journeyman crew responded that same day and took remedial measures, such as tightening the guys[8] and trimming nearby vegetation. The responding SCE journeymen, including two Senior Patrolmen, collectively possessed over 45 years of relevant electrical work experience among them, including significant experience with identifying and remediating slack guy wires.[9] The work by SCE's journeymen on January 20, 2017 resolved the condition.

There was no basis to expect that the subtransmission guy would become loose again less than two years after SCE fixed the condition, and apart from citing SCE's testimony that slack down guys are "not uncommon" across its system, Cal Advocates points to none. Cal Advocates does not dispute that between January 20, 2017 and the Woolsey Fire, SCE did not receive any notice or indication that the guy

6 CA-05, pp. 14-16.

7 CA-05, p. 14.

8 SCE-02, p. 10.

9 Cal Advocates and EPUC also critique SCE's lack of a formal procedure outlining the manner in which guys should be tightened. Yet SCE is not aware of any industry standard requiring such a procedure, and Intervenors cite none. Instead, SCE relies on the experience of its qualified electrical workers, who receive training on the necessary steps and tools to properly tension a guy wire.

had again become slack or required remediation.[10] Cal Advocates does not explain why SCE should (or even how SCE could) have predicted that the subtransmission guy would slacken again after January 20, 2017.

It is also speculative on the part of Cal Advocates to suggest that the slack condition observed on November 8, 2018 was in fact a "recurrence" of the slack condition observed on January 20, 2017. Cal Advocates conjectures that tree branches "may have" caused the guy to become loose on January 20, 2017, but also concedes that "[i]t is . . . difficult to determine if contact with the oak tree had deflected the down-guy or otherwise contributed to its slackness."[11] SCE concluded that the cause of the January 2017 slack condition is unknown. In any case, Cal Advocates does not dispute that SCE trimmed the tree during the January 20, 2017 remediation to prevent future issues. And as for the slack condition observed in November 2018, Cal Advocates claims that a tree branch was the cause principally based on a single photo and without pointing to any physical evidence. As described in Section II.C below, SCE's expert confirmed that tree branches did not slacken the guy wire.

To the extent that Cal Advocates suggests SCE should have known the problem would recur due to the fact that the cause of the January 20, 2017 loose guy was unknown, I disagree. As I described in SCE-02, a properly constructed guy wire may become slack for any number of reasons.[12] SCE repairs these types of underlying issues where identified. Yet down guys may also become slack, as on January 20, 2017, for reasons that are not immediately (or ever) ascertainable. Slack guy conditions are a routine occurrence across SCE's system, and SCE identified, on average, approximately 3,000 structures with loose guys each year from 2013–2018. It would not be feasible for SCE to try and definitively ascertain the root cause of every one of the thousands of down guys that are identified as slack each year, nor would such analysis likely be fruitful.[13]

Finally, data from SCE's system of record confirm that it is exceedingly rare for a slack guy condition to occur on the same pole more than once. During the period 2013-2018, approximately 20,000 SCE structures were identified as having one or more "Loose" guy notifications. Of those structures, only

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[10] SCE-02, p. 10.

[11] CA-05, p. 14.

[12] SCE-02, pp. 15-16.

[13] Indeed, the amount of time and effort that experts for SCE, Agency investigators, intervenors in this proceeding, and parties in the civil litigation have collectively expended to determine the cause of the slack subtransmission guy on November 8, 2018 with no definitive conclusion ever having been reached demonstrates the likely futility of conducting a deep-dive causal analysis in response to each loose guy wire.

1.4 percent had notifications identifying a guy wire as "Loose" on more than one date, and the number is even smaller (0.5 percent) for such notifications that occur less than 24 months apart. When compared against all SCE overhead structures, not just the structures with "Loose" guy notifications, the percentages are even smaller, as shown below in Table II-1. Overall, only 0.025 percent of SCE structures had notifications created on more than one date identifying a guy wire as "Loose" during the period 2013-2018. For any given structure during this period, the chances of a loose guy being identified twice on the same structure less than 24 months apart, as was the case with the Woolsey Fire, is 0.009 percent. Cal Advocates focuses specifically on recurrence of a guy issue, which likely accounts for only a small subset of this analysis. For instance, many structures have more than one guy wire, and this analysis includes instances where there are notifications related to *distinct* guy wires.[14] And even where the same guy wire is involved, the analysis likewise includes instances involving different causes or issues related to that guy wire. Again, guy wires can become loose for a broad range of reasons. In short, the instances of "Loose" guy wire issues recurring both on the same guy wire *and* from the same cause within two years was likely a very small amount of an already miniscule percentage of SCE's historical guy notifications. Because of the extreme rarity of a guy becoming loose a second time, the January 20, 2017 event was not an indicator of elevated risk at the Subject Pole that should have triggered further action from SCE.

Table II-1
Analysis of "Loose" Guy Notifications, 2013-2018

	Number of Structures	Percent of Structures with Loose Guy Notification(s)*	Percent of All Structures**
Structures with "Loose" guy notifications on different dates	270	1.4%	0.0249%
Structures with "Loose" guy notifications on different dates within 24 months of each other	94	0.5%	0.009%

* There were 19,697 structures with one or more "Loose" guy notifications during the 2013-2018 period.
** There were 1,083,406 total overhead structures during the 2013-2018 period.

[14] A review of structures with multiple guy notifications identified as "Loose" created on two separate dates between 2013-2018 shows that some of these notifications clearly related to different guy wires. For example, some notifications related to primary guy wires and others related to secondary guy wires for a given pole; or the notifications related to span guys and down guys for a given pole.

2. Cal Advocates' Suggestion that SCE Should Have Reconfigured the Subject Pole Earlier Is Unsupported

I disagree with Cal Advocates' claim that SCE should have installed covered conductor and a guy rod insulator[15] at the Subject Pole in response to the January 20, 2017 incident.[16] Deploying covered conductors in an ad-hoc, pole-by-pole manner based on single slack guy wire incidents like the one on January 20, 2017 would not be an efficient or prudent way to deploy system enhancements. As noted above, SCE identifies an average of over 3,000 structures with one or more loose guys each year, and it is exceedingly rare for loose guys to recur after they are remediated. Cal Advocates' testimony does not demonstrate that prudence would have required the extraordinary step of installing covered conductor on every pole where a guy could theoretically contact electrical facilities in the remote scenario that slackness recurs. SCE is not aware of any other utility whose procedures would call for the reconstruction or reconfiguration of a pole as a routine response to each of the thousands of slack down guys like the one identified on January 20, 2017 (for instance, by relocating down guys or adding covered conductor) rather than, for instance, simply tightening the guy or remediating the underlying issue, if known, to prevent the possibility of future similar incidents, as is SCE's practice. Nor would requiring SCE to perform such actions in response to every loose guy be reasonable, much less cost effective from an operations and maintenance standpoint.

Instead of installing covered conductor or other wildfire mitigation equipment in response to each slack guy wire, SCE reasonably deploys such safety and reliability improvements based on a holistic, risk-informed framework. With respect to covered conductor specifically, as described in SCE-03, SCE prioritized the riskiest circuits for replacement under its risk-informed Wildfire Covered Conductor Program beginning in 2018.[17] In 2018, the program used a variety of factors, such as historical ignition frequency, circuit length of vintage small conductor, mitigation effectiveness, and circuit mileage in HFRA and high wind areas, to prioritize circuits for covered conductor installation. In 2018, SCE ranked the Big Rock Circuit as 130th in its risk prioritization methodology for circuits. It generally takes 12 to 24 months to plan, design and construct a covered conductor project. As of November 8, 2018, SCE had deployed 34 miles of

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15 After the Woolsey Fire, a guy rod insulator was installed as part of SCE's covered conductor replacement work under a 2020 standard that called for transitioning to the use of fiberglass guy rod insulators in both HFRA and non-HFRA installations.

16 CA-05 at p. 16.

17 SCE-03, pp. 26–28.

covered conductor in 2018, the first year of the Wildfire Covered Conductor Program. As such, given (1) the length of time it takes to install covered conductor, (2) that 2018 was the first year of the Wildfire Covered Conductor Program, and (3) that more than 100 circuits were prioritized before the Big Rock Circuit based on risk, SCE reasonably planned for and completed the reconductoring work at the Subject Pole early on in the program, in 2021.[18]

Finally, Cal Advocates criticizes SCE for not having guy strain insulators on the Subject Pole.[19] That is incorrect. The lower subtransmission down guy and the three distribution down guys each had a guy strain insulator (also known as a Johnny Ball), even though no sectionalizing was required under GO 95.[20]

C. **<u>There Is No Evidence that Any Contact Between Tree Branches and the Subtransmission Down Guy Created the Slack Condition Observed After the Woolsey Fire</u>**

After the Woolsey Fire, I understand that the subject lower northeast subtransmission guy was found to be in contact with an oak tree branch when the guy was in a slack condition. Cal Advocates claims that movement of the tree could have directly affected the tension in the guy wire, which could have contributed to the guy wire becoming slack.[21] Cal Advocates bases its claim largely on a photograph taken after the fire showing the guy deflected upwards by a small tree branch.[22] Specifically, Cal Advocates claims that

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[18] In addition, as discussed in SCE-11, Section II.A, in 2019 Cal Advocates argued that SCE's covered conductor program should be only a limited term pilot through 2020 and then re-evaluated because the technology had not yet been proven to reduce wildfire ignitions (*See* A.18-09-002, CalAdvocates-01).

[19] CA-05, p. 18.

[20] Cal Advocates also critiques SCE for not maintaining a database that tracks the specific location of guy strain insulators. As noted above, the lower subtransmission guy in fact had a guy strain insulator at the time of the Woolsey Fire, and thus any alleged failure with respect to tracking the location of guy strain insulators was non-causal. Regardless, Cal Advocates' assertion that SCE cannot ensure compliance with GO 95 without individually tracking guy strain insulators in a database is unsupported. Guy strain insulators are considered "B" material. SCE does not track the locations of "B" material in its system of record, such as high voltage signs, regardless of whether there may be an associated GO 95 requirement. SCE instead ensures that guy strain insulators and other "B" material are installed during the rigorous design and construction processes described in SCE-03, and inspects and maintains the conditions of its "B" materials, as applicable, through its inspection programs. Cal Advocates' suggestion that SCE track each piece of "B" material on every structure is not reasonable.

[21] CA-06, p. 9.

[22] *See* CA-06, Figure 2. Cal Advocates and EPUC also cite testimony from an expert retained by the California Governor's Office of Emergency Services, a plaintiff in civil litigation, in which the expert draws conclusions about the possible effect of the tree branches on the guy wire. SCE served rebuttal expert reports in response, which are attached here as Appendix A (October 4, 2024 Report of Robert R. Novembri, President, Novembri Consulting, LLC) and Appendix B (October 4, 2024 Report of Andrew H. Stewart, President, EDM International Inc.).

"[d]eflection of a tension member and natural movement of the tree branches will cause variation in the guy-wire tension" and that the "dynamic changes in tension will necessarily result in either a slack guy wire, elongation of the cable, or movement of one or more of the anchor points, any which [sic] would affect the tension of the cable."[23] Cal Advocates' testimony does not dispute that the guy wire lacked signs of strain or mechanical damage, yet concludes that nonetheless the tree branches must have slackened the guy.

Based on my examination of the guy wire, I do not believe tree interference slackened the subtransmission guy. Even had the oak tree branch been in contact with the subtransmission guy when taut, based on my physical examination and subsequent analysis, I have concluded that vegetation did not elongate or otherwise slacken the lower northeast subtransmission guy wire. My opening testimony described the physical evidence supporting my conclusion that the hardware that attached the subtransmission down guy to its ground anchor—known as a strandvise or "quickie"—did not fail on November 8, 2018.[24] Cal Advocates does not dispute this finding. I also testified that I would expect to see some physical evidence if excessive loading from tree branches had caused slackening of the guy wire, and yet the guy wire exhibited no signs of strain or mechanical damage.[25] Further, I examined the points of attachment between the subtransmission guy and the pole for signs of slippage, mechanical damage, or other indications that may explain why the guy became slack, and did not observe evidence of such slippage or mechanical damage. Cal Advocates does not dispute my findings that there was no physical evidence to support a theory that tree branches or another physical force slackened the guy wire.[26]

Furthermore, the Subject Pole employed 3/8 inch, 7-strand steel guy wires for its subtransmission guys. According to SCE's Specification MS 24-1996, Zinc-Coated Steel Wire Strand, the guy was rated with a minimum breaking strength of 15,400 pounds. Though the guy wire at issue did not break, a steel guy wire will not elongate until it yields, which occurs just before breaking. Objects that can weigh approximately 15,000 pounds include a semi-truck, a small commuter airplane, and an African elephant. In my opinion, it would not be possible for the tree branches depicted in CA-06, Figure 2 to elongate a steel

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[23] CA-06, p. 10.

[24] SCE-02, pp. 12–15.

[25] SCE-02, p. 15.

[26] Cal Advocates states that the anchors could have moved due to tree contact with the guy but does not cite any evidence such as photographs or physical evidence indicating that the anchors were dislodged. I understand that SCE has presented evidence in its opening testimony based on a physical examination which concludes that the ground anchor did not move, dislodge, or otherwise become unsettled in the ground. *See* SCE-02, p. 15.

subtransmission guy with this rating. Moreover, a force sufficient to elongate the guy wire would likely cause the quickie to fail first, which as discussed did not occur here.

In sum, the physical evidence does not support Cal Advocates' claim that the movement of tree branches slackened the guy, or caused it to elongate or otherwise slacken.

D. Both GO 95 and Good Utility Practice Permit Incidental Contact Between Tree Branches and Guys

Cal Advocates speculates that contact between the subtransmission guy and the oak tree "could" have affected the tension in the guy wire, relying on a photograph showing a tree branch contacting the guy wire when it was slack.[27] Cal Advocates then concludes that the decision to route the guy wire through the oak tree "increased the risk of the design."[28] But this photograph cannot support such a conclusion. Indeed, SCE's expert analysis confirms that the guy wire does not show any signs that tree interference slackened the guy. Cal Advocates, again, cites no physical evidence demonstrating that the tree branch materially strained the guy.

Moreover, based on the history of the Subject Pole, and particularly given SCE's robust inspection and maintenance practices as described in SCE-12 Vol. 02, tree interference that produced any significant strain with the guy—even assuming there was any tree contact at all when the guy was taut—would have been identified and addressed prior to the Woolsey Fire. SCE's inspection and maintenance work specifically accounted for vegetation creating such strain on guy wires. With respect to the Subject Pole specifically, as noted in my opening testimony in this proceeding,[29] an SCE journeyman crew responded to relay operations on January 20, 2017, and tightened two subtransmission down guys at the Subject Pole. Although the cause of the slack down guy was undetermined, the SCE crew nonetheless as part of its remediation trimmed tree branches to access the guy anchor and to ensure that vegetation was not impacting the tautness of the guy. I confirmed with the responding crew as part of this Application that they trimmed any tree branches contacting the guy on January 20, 2017, and that no tree branches were in contact with the

[27] CA-01, pp. 13–14; CA-06, pp. 7–10.

[28] CA-06, pp. 7–10.

[29] SCE-02, p. 7.

subject guy after the work was completed.[30] Though Cal Advocates takes issue with SCE's lack of specific documentation showing that the tree was trimmed, Cal Advocates does not appear to dispute that such maintenance occurred.

In any event, even if there was incidental contact between the oak tree branch and the subtransmission guy while taut, it would not be improper under the General Orders and prudent utility practice. GO 95 does not prohibit contact between vegetation and guys. For instance, Rule 35 of GO 95 does not require clearance between trees and guys, nor does it prohibit a guy from being adjacent to or even touching trees. Cal Advocates does not dispute that peer utility practice also does not prohibit incidental contact. For instance, San Diego Gas & Electric Company's data request responses in this proceeding reveal that under their practices, "[v]egetation may come into contact with the guy wire; an infraction occurs when the vegetation contact causes a significant strain, abrasion, or damage to the guy wire," confirming that their policy mirrors SCE's.[31]

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[30] A notification written up three days after the January 20, 2017 incident to memorialize the remediation stated that the guy wire "had a tree branch fall onto it." This notification was coded as a "Loose" guy, not as a "Trim" of "Vegetation/Tree" needed. (*See* SCE-12, Vol. 2 at Section II.B.1 for an explanation of this vegetation code, which identifies guys that have vegetation causing strain or abrasion). Following its investigation as part of this Application, SCE understands that the cause of the slack was undetermined. Regardless, Cal Advocates does not claim that a tree branch falling on the subtransmission guy caused the slack guy conditions identified on January 20, 2017 and/or November 8, 2018.

[31] San Diego Gas & Electric Company's Response to CALPA-SDGE-A2410002-002A, Questions 3 and 5 (similarly noting that "[Inspection] Code 332 refers to vegetation in the guy causing heavy strain or abrasion.").

III.

SCE APPROPRIATELY REVIEWED AND DOCUMENTED CONSTRUCTION ACTIVITIES

Cal Advocates criticizes the review and documentation of SCE's construction activities, arguing it is "impossible to verify" that the installation crew for the Subject Pole in March 2008 or the distribution conductors in May 2008 performed QC for compliance with General Orders.[32] With respect to the Subject Pole, although SCE did not perform formal QC of transmission construction by its own crews as of March 2008 or of conductor transfers by distribution crews,[33] SCE has long designed and constructed its transmission and distribution systems using highly experienced and qualified employees and contractors, including foremen, linemen, equipment operators, line assistants, and others.[34] As described in SCE-03, these personnel also receive extensive training on, and relied on, the TOH and DOH—which, as previously described, were updated on a regular basis to align with industry best practices and comply with and in many instances exceed applicable regulations. The standards themselves were developed by engineers and engineering managers with decades of design and operating experience and training, and implemented in each work order by SCE's planners. In the 2008 time period, the crew foreman on each job was required to sign the work order in order to confirm compliance with the design specified by the planner. And though not a formal QC, SCE's Grid Supervisors (GS) would often review transmission construction activities in the field (either during the work, after the work was completed, or both) to ensure that the job was completed according to its intended design. Likewise, for distribution construction projects completed by contractor crews, SCE's Project General Supervisors (PGS) would review work in the field with regularity to ensure it was being performed properly and provide guidance to the crews as needed.

Regardless, Cal Advocates does not claim that the clearance between the subtransmission guy and the distribution jumper failed to conform to design specifications or otherwise violated GO 95 requirements when the guy was taut. Cal Advocates also does not allege that the subtransmission guy wire was loose from the time the Subject Pole was constructed in 2008 all the way until November 2018. Cal Advocates therefore appears to agree that the subtransmission guy clearance was compliant when the pole construction and transfer of distribution facilities was complete. And though SCE acknowledges a technical clearance violation related to the lower distribution guy, it was the guy's slack condition that allowed contact with the

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32 CA-06, pp. 10-12.

33 SCE did perform formal QC of deteriorated pole replacements performed by distribution contractor crews in 2008.

34 SCE-03, pp. 16–17.

communication line through bolt as part of the chain of events that led to the secondary ignition.[35] Thus, any purported deficiencies with SCE's QC programs with respect to the construction of the Subject Pole are non-causal.

[35] *See* SCE-12 Vol. 2, n. 53 (explaining how the clearance of the distribution down guy, if taut, was more than sufficient to avoid electrical contact with the communication facilities).

IV.

SCE APPROPRIATELY EXECUTED ON ITS POLE LOADING PROGRAM TO HARDEN INFRASTRUCTURE AND REDUCE WILDFIRE RISK

Cal Advocates also claims that there were issues with SCE's pole loading calculations.[36] Their criticisms are immaterial to the prudency analysis. Simply put, there is no evidence that SCE's pole loading calculations had any causal relationship to the ignition of the Woolsey Fire. It is undisputed that there were no pole loading failures on the Big Rock Circuit in the weather conditions on November 8, 2018.

Indeed, Cal Advocates' criticisms of the pole loading calculations criticize certain details,[37] while ignoring the broader prudence of SCE's pole loading practices. Cal Advocates does not dispute that SCE's pole loading standards, including wind loading standards, were more stringent than those contained in GO 95.[38] SCE-03 describes, in great detail, the origin and development of SCE's Pole Loading Program (PLP), which upgraded poles otherwise exempted from such treatment by GO 95.[39] In addition, SCE implemented its pole loading assessments in SPIDACalc software through Finite Element Analysis—a model that has now become the industry standard due in part to SCE's pioneering use. By 2018, SCE had replaced approximately 30,000 poles under its PLP, with around 18,000 located in HFRAs.[40] This was all buttressed by a quality control inspection program that covered 4,000 inspections per year from 2014 to 2018.[41] The poles on the Big Rock Circuit were appropriately inspected as part of the PLP, and the Subject Pole in particular correctly received a "pass" designation. When SCE conducted a SPIDACalc assessment in 2019

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[36] CA-06, pp. 28–32.

[37] Cal Advocates exaggerates, or misconstrues, the import of errors that it identifies in SCE's pre-2019 pole loading calculations for the Subject Pole. For example, the 2014 calculation had the correct number of field-verified guy wires, anchors, cross arms, etc.—it only used a slightly smaller guy wire size than that later identified in the field, which resulted in a *more* conservative safety factor calculation. The 2016 analysis simply sought to re-calculate the 2014 inputs using a newer version of SPIDACalc software and methodology, and therefore did not utilize field verification. The 2018 analysis did not reflect field conditions because it sought to assess a proposed design change. It imported data from a project design for the Subject Pole that had not been implemented. These are hardly reasons to "cast[] doubt on the reliability" of the PLP as a whole. CA-06, p. 30.

[38] SCE-03, pp. 28–29.

[39] SCE-03, p. 29.

[40] SCE-03, p. 30.

[41] SCE-03, pp. 30–31. Cal Advocates' criticism that SCE cannot provide information on the number of flawed pole loading calculations, CA-06, p. 30, only reflects that its QC data does not provide the underlying reason for a fail, and is not searchable to determine which analyses were found to have relied on incomplete or inaccurate information. *See* SCE Response to CalAdvocates-SCE-A2410002-051, Question 12.

based on field-verified information,[42] the Subject Pole again passed. There were no pole failures in the Woolsey Fire, and Cal Advocates does not explain how any purported adjustments to SCE's pole loading calculations would have had any effect on preventing the ignition.

[42] Cal Advocates' only criticism of the 2019 calculation is that it failed to account for deterioration and that visual inspections of deterioration are insufficient. CA-06, pp. 31–32. But Cal Advocates does not identify deterioration (let alone pole loading) as playing a role in the ignition. Although the pole load analysis does not specifically account for additional deterioration of guy wires, the overall safety factors prescribed by GO 95 already account for deterioration across all components.

V.

SCE APPROPRIATELY DESIGNED ITS SYSTEM PROTECTION ON THE BIG ROCK CIRCUIT

SCE demonstrated in its opening testimony that its system protection design and operation, including operating restrictions under SOB 322, reduced the risk of ignition from SCE facilities[43] and showed that system protection operated as expected on the day of the fire to detect and respond to fault current by de-energizing the Big Rock Circuit.[44] Cal Advocates criticizes that the Big Rock Circuit was protected by electromechanical-type relays, rather than microprocessor relays, at the substation; questions SCE's adjustment of relay settings in 2009; and claims that SCE did not adequately consider wildfire risk in its protection settings.[45] None of these arguments has merit.

A. Cal Advocates' Criticism of Electromechanical-Type Relays Does Not Show Imprudence

Cal Advocates asserts that electromechanical-type relays are "seldom used today" because of their inability to record electrical event data and their testing and maintenance requirements.[46] This does not show that SCE's use of electromechanical-type relays at Chatsworth Substation at the time of the Woolsey Fire was flawed or imprudent. While microprocessor-based relays are used more commonly now to support system automation, electromechanical-type relays are as effective as microprocessor relays for detecting and responding to faults, and many utilities use them.

As a preliminary matter, the mere fact that the electromechanical-type relays for the circuit breaker on the Big Rock Circuit were "older vintage"[47] is immaterial. The life cycle of electromechanical-type relays can exceed 40 years. Indeed, inspection records of the relays on the Big Rock Circuit prior to the fire indicated proper functioning and no reason for replacement. Cal Advocates' critique that SCE "failed to replace the [electromechanical-type relays] with modern microprocessor relays . . . prior to the Woolsey Fire"[48] is unwarranted and does not show any imprudence. As described below and in SCE-03, SCE took prudent and proactive steps to replace and enhance its protection devices over time. In the years preceding the Woolsey Fire, SCE installed a substantial number of additional and upgraded remotely-controlled

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[43] SCE-03, pp. 1, 3, 32–35.

[44] SCE-02, pp. 6–7.

[45] CA-11, pp. 1, 7–8, 10.

[46] CA-11, p. 3.

[47] CA-11, pp. 5–6.

[48] CA-11, p. 1.

automatic reclosers (RARs), relays and hardware, as well as fuses, to facilitate more rapid clearing of faults.[49] SCE's efforts to replace older model relays over time were consistent with the actions of other California utilities at the time.[50] It is also worth noting that Cal Advocates resisted increased funding for SCE's substation infrastructure replacement program in SCE's 2015 GRC proceeding, arguing that funding for these upgrades should be reduced in 2014 and 2015 because SCE's 2013 capital expenditures in this area had exceeded its forecast.[51]

Moreover, the speed at which any relay—whether microprocessor or electromechanical—responds to faults is a function of its settings. Even if a microprocessor-based relay operates one or two cycles faster than an electromechanical relay, as suggested by Cal Advocates,[52] this small time differential is not material relative to the settings. Cal Advocates criticizes SCE's decision to adjust the phase settings of the relays for the Big Rock Circuit at Chatsworth Substation in 2009.[53] SCE prudently adjusted the phase minimum trip settings at that time to account for additional load on the Big Rock Circuit.[54] The moderate increase of the phase minimum trip from 600 amps to 720 amps was necessary and appropriate to ensure a sufficient margin between operating load and the relays' trip settings, thus supporting reliable operation of the system and service to customers.

Cal Advocates suggests that SCE should instead have "increased the sensitivity" of the trip settings.[55] Notably, Cal Advocates does not include any load study or assessment of customer reliability and outage impacts of this recommendation. Nor does Cal Advocates address the impact on coordination with

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49 For instance, from January 1, 2014 to November 8, 2018, SCE replaced 759 overcurrent electromechanical-type relays with microprocessor-based relays, 241 of which were in HFTDs.

50 For instance, SDG&E's 2019 WMP described its efforts to replace distribution electro-mechanical type relays with microprocessor-based relays. *See* SDG&E 2019 WMP, p. 39 ("In 2019, FTZAP aims to replace aging infrastructure in substations such as obsolete 12kV substation circuit breakers, electro-mechanical relays, and Remote Terminal Units (RTUs) with new circuit breakers, microprocessor-based relays, and RTUs that facilitate the requirements of SDG&E's advanced protection systems."). PG&E also described relay upgrades in its 2023 application to recover wildfire mitigation and other costs. *See* A.23-06-008, PGE-01, p. 8–9 (describing substation support work during 2021–2022 to enable Enhanced Powerline Safety Settings (EPSS) as including "upgrades to older electromechanical relays").

51 A.13-11-003, ORA-12, pp. 36–37. The Commission ultimately adopted Cal Advocates' proposal over SCE's objection. *See* D.15-11-021, pp. 175–176.

52 CA-11, p. 3.

53 CA-11, pp. 7–11.

54 As described in more detail in SCE-03, SCE further supported safe and reliable service of this increased load through reconductoring and associated pole upgrades to accommodate the larger conductor. *See* SCE-03, p. 18.

55 CA-11, p. 6.

downstream devices on the Big Rock Circuit. In SCE-03, SCE explained that circuit breaker relay settings are designed to coordinate with downstream protection devices so that substation relays de-energize the entire line when there is a fault downstream from the substation and upstream of other protection devices such as fuses or reclosers by allowing time for downstream devices to operate in response to faults that are in their downstream protection zones.[56] For that reason, relay settings for circuit breakers must be calibrated with higher pickup magnitudes and longer time duration than downstream protection devices, but still be able to quickly operate to de-energize the circuit when higher fault currents are experienced close to the substation.[57] While SCE-03 demonstrates how SCE's system protection approach and evolution over time struck a reasonable balance between wildfire mitigation and reliability and was consistent with industry practices, Cal Advocates simply does not address this important aspect of prudent utility operations.[58]

Cal Advocates also does not present any analysis to support its speculative assertion that the pre-2009 or more sensitive settings "may have prevented the Woolsey Fire."[59] Even if the pre-2009 settings or Fast Curve settings could potentially have resulted in quicker operation of the device, the device requires a finite amount of time to make the decision to trip *and* to mechanically operate to de-energize the circuit. While Fast Curve reduces fault energy, it does not reduce it to zero.

Cal Advocates does not dispute that the relays at issue operated as expected on the day of the Woolsey Fire. Although Cal Advocates challenges SCE's account of electrical events because real-time data was not recorded at the substation,[60] SCE drew from other data—specifically, electrical event data from SCADA, event records from the nearby, downstream microprocessor RARs, the relay settings, and a CYME

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[56] SCE-03, p. 33; CA-11, p. 6.

[57] SCE-03, p. 33.

[58] Cal Advocates attempts to elide the effect of SCE's 2009 reduction in the time dial. CA-11, pp. 8–9. But Cal Advocates does not dispute that for overcurrent exceeding 720 amperes, the reduction in the time dial cleared faults more quickly and resulted in similar overall protection device coordination timing. Cal Advocates speculates that an overcurrent from a current-ramp fault might remain above 600 amperes but below 720 amperes so as to exceed the reduction of time from decreasing the time dial. But under Cal Advocates' logic, a current-ramp fault would potentially render any setting imprudent, absent balancing of other system factors, such as coordination and power reliability.

[59] CA-11, p. 6.

[60] As described in SCE-02, electromechanical-type relays are not designed to record electrical event data. While Cal Advocates suggests that SCE should have installed a digital fault recorder (DFR) to provide real-time data at Chatsworth Substation, *see* CA-11, p. 11, this is immaterial to the prudence analysis. DFRs are large, expensive devices that record electrical events and can support post-event analysis. The presence or absence of a DFR has no effect on relay operation in response to a fault event.

model[61]—to estimate that the circuit breaker opened in approximately one second in response to the fault.[62] Cal Advocates does not present any analysis suggesting that SCE's estimate is inaccurate.

B. SCE Considered Wildfire Risk with Respect to Its Relay Settings

Cal Advocates argues that SCE did not adequately consider wildfire risk when adjusting relay settings.[63] This criticism is without merit. Following the destructive 2017 wildfire season, SCE began to evaluate the use of "fast trip" settings for protection devices, which were not standard practice in the industry at that time.[64] SCE subsequently implemented its Fast Curve program, which encompassed reconfigured relay settings for devices in HFRAs intended to reduce fault clearing time and thereby reduce ignition risk. SCE promptly began deploying Fast Curve settings in 2018 on compatible circuit breaker relays and RARs.[65] By the third quarter of 2018, SCE had already reconfigured relay settings for over half of its RARs and approximately 400 existing relays on circuit breakers in HFRAs.[66] In May 2018, SCE implemented Fast Curve settings for RAR 0104, the most upstream protection device on the Big Rock Circuit compatible with Fast Curve settings, thus maximizing the amount of circuitry covered by the Fast Curve settings.[67]

Electromechanical-type relays, including those on the Big Rock Circuit at Chatsworth Substation, were not compatible with Fast Curve settings. Specifically, these devices could not accommodate remote activation and de-activation of Fast Curve settings, which was crucial to balancing fire risk mitigation during specified periods with coordination and reliability (i.e., minimizing nuisance tripping and associated customer impacts). As set forth in SOB 322, Fast Curve settings were activated only during Red Flag

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[61] CYME is a commercially available analytical software used by many utilities. CYME can be used to create an electrical model of a circuit which includes protection devices, source impedances, loads, and the length, size, type, resistance, and reactance of the conductors on the circuit. When a fault occurs, and a fault current is recorded by an Automatic Recloser, that recorded fault current magnitude can be compared to the CYME model to estimate the distance from the substation to the location where the fault occurred. Locations close to the substation generally see higher maximum available fault currents than locations further out from the substation.

[62] SCE-02, p. 7.

[63] CA-11, pp. 1, 11–12.

[64] Prior to 2017, SCE had not yet concluded that the customer impacts of fast trip settings were sufficiently justified in light of the operational mitigations SCE already had in place and its best understanding of risk at the time. The increasing wildfire risk revealed by the destructive 2017 wildfire season changed that calculus. *See* SCE-11.

[65] SCE-03, p. 34.

[66] SCE-03, pp. 33–34.

[67] SCE-03, p. 35 n. 70. SCE implemented Fast Curve settings for RAR 0261, downstream of RAR 0104, in February 2019.

Warning conditions and were activated and de-activated remotely by SCE system operators. Electromechanical-type relays were not compatible with Fast Curve because their settings could only be adjusted *manually*, meaning all settings changes required field personnel to go to the substation, remove the relay's outer covering, and physically adjust the relay's internal settings. In other words, there was no ability to adjust the settings remotely. This process is time-consuming, requires either station switching or customer outages, and was not compatible with SCE's Fast Curve program.

In 2018, SCE initiated a multi-year program to proactively replace circuit breaker relays for distribution circuits in Tier 2 and Tier 3 HFRAs to support expanded deployment of Fast Curve settings. Through its GSRP application, SCE sought and the Commission approved approximately $18 million in incremental capital funding for this effort for the 2019–2020 time period.[68] SCE's selection methodology accounted for HFRA tier, the number of electromechanical-type relays at the substation, and whether substations had a mechanical electrical equipment room (MEER) or space limitations. SCE also reviewed pending projects with relay upgrades to incorporate implementation of Fast Curve settings as part of scheduled work where feasible. Consistent with its planning, SCE replaced the electromechanical-type relays on the Big Rock Circuit in June 2020 and implemented Fast Curve settings at that time. From 2019 to 2024, SCE upgraded 564 circuit breaker relays to microprocessor relays, and by the end of 2024, nearly all SCE Tier 2 and Tier 3 distribution circuits had been upgraded. While this program was proceeding, SCE implemented numerous other wildfire mitigation measures, as described in more detail in SCE-03 and SCE-11.

In short, SCE prudently accounted for wildfire risk with respect to relay settings, including in its approach to upgrading electromechanical-type relays to support Fast Curve settings.

[68] *See* A.18-09-002, SCE-01, pp. 23, 72–73; D.20-04-013, App'x, pp. A-1, A-2. SCE also described this ongoing multi-year effort in its Wildfire Mitigation Plans. *See, e.g.*, SCE's 2020-2022 WMP, pp. 5-63 ("SCE met its 2019 goal of updating settings for existing, compatible microprocessor CB relays, as well as developed a 2020-2022 plan to upgrade non-compatible and/or older vintage electromechanical and microprocessor CB relays for HFRA feeder circuits.").

Appendix A

October 4, 2024 Report of Robert R. Novembri, President, Novembri Consulting, LLC

Novembri Consulting, LLC

October 4, 2024

Mr. Michael A. Behrens
Hueston Hennigan LLP
523 West 6th Street, Suite 400
Los Angeles, CA 90014

Re: Woolsey Fire Litigation (JCCP 5000): Rebuttal to Selected Opinions in the Woolsey Fire Expert Disclosure Report by Jensen Hughes on behalf of Cal OES, Dated April 5, 2024

Dear Mr. Behrens:

You have retained me to prepare a rebuttal report addressing opinions related to vegetation management and communication facilities in the April 5, 2024 Woolsey Fire Expert Disclosure Report by Jensen Hughes on behalf of the California Governor's Office of Emergency Services (Cal OES), prepared by Paul T. Way and reviewed by Sam Shuck (served on August 16, 2024) (the Way Report).

I. SCOPE OF WORK

In connection with preparing this rebuttal report, I have reviewed the Way Report, the documents identified therein related to vegetation management and communication facilities, and documents related to the construction, inspection, and maintenance of electric facilities owned by Southern California Edison (SCE) in the area of Pole Nos. 4047012E and 4650857E at Site #1. This area was identified in the Woolsey Fire report issued by Cal Fire and Ventura County Fire Department (the Cal Fire Report), as well as documents related to the northeast lower subtransmission anchor guy on Pole No. 4534353E (the Subject Pole), which is identified in the Way Report as GW#1. My rebuttal report is based on my review of these documents, and more than 18 years of experience with the design and installation of electric facilities and more than 37 years of experience with the requirements related to tree clearance around electric and communication facilities.

For the purposes of this report, I have analyzed the conclusions in the Way Report regarding the construction, inspection, and maintenance of SCE's

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communication facilities at Pole Nos. 4047012E and 4650857E at Site #1, as well as the conclusions regarding contact between an oak tree and GW#1 at the Subject Pole.

II. DISCUSSION AND CONCLUSIONS

A. Analysis of Specific Conclusions and Statements in the Way Report

1. Opinion 4.8

The Way Report states that the fire at Site #1 resulted, in part, from broken lashing wires on CSC#1.[1] However, the report does not present evidence that lashing wires on SCE's communication line CSC#1 at Site #1 were broken and dangling prior to the incident on November 8, 2018.

There is evidence that communication line inspections were performed in this area in 2014, 2015, and 2016, and multiple communication line inspections were performed in both 2017 and 2018. The Inspection Report Summaries included in the Appendix to this report (*see* Fig. 1 through 8) describe the findings during the 2014, 2015, 2016, 2017, and 2018 inspections of communication lines in this area.[2] The files from which the summaries were copied and the sheets/pages related to Site #1 are footnoted in the figures.

The results of these inspections indicate that there were no issues with the lashing wires on SCE's communication lines at the Site #1 location. Lashing wires requiring maintenance at other locations were noted in various Inspection Report Summaries.

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[1] The Way Report defines the communication line it refers to as CSC#1 as "the SCE communications system conductor at the top" of the span at Site #1, and CSC#2 as "a communications system conductor below CSC #1." I understand the Way Report refers to SCE Line 06051 as CSC#1 and a third-party communication line as CSC#2.

[2] I understand that the specific SCE communication line associated with CSC#1 (SCE Line 06051) was inadvertently omitted from the list of communication lines to be inspected. As described, however, numerous inspections for adjacent lines in the same span were conducted.

2. Opinions 4.10 and 4.18(b)

The Way Report states that "the movement of the tree at Site #2 that was in contact with the downguy GW#1 caused GW#1 to become loose." I disagree.

The Way Report does not present evidence that shows the movement of the tree at Site #2 caused GW#1 to become loose. It is also unlikely this occurred.

In my experience, for a tree limb to loosen an anchor guy, the limb would need to have enough movement to either pull the guy attachment loose from the pole or pull the anchor out of the ground. There is no evidence presented in the Way Report demonstrating that the guy attachment was pulled loose from the pole or the anchor was pulled out of the ground and I observed no such evidence based on my review of the anchor[3] and guy attachment[4] photographs.

In my opinion, the routing of an anchor guy through trees is not uncommon in the industry and is necessary in some cases. The routing of GW#1 through the tree likely had no impact on this incident.

The California Public Utilities Commission's General Order (GO) 95, Rule 35 is the regulation that is related to the maintenance of trees around supply conductors and communication lines. There are no requirements in GO 95, Rule 35 that mandate a clearance be maintained between an anchor guy and trees, nor are there any requirements in GO 95 that preclude the routing of an anchor guy through trees.

Additionally, GO 95, Table 1, describes clearance requirements for various facilities including guys and messengers (Column A). There is no clearance requirement listed for either Case No. 13 or Case No. 14, which are the radial clearances to be maintained between tree branches and guys or messengers.

For these reasons, and because the tree branches were not causing GW#1 to move, the conclusion in the Way Report that SCE could have pruned the tree at Site #2 to prevent it from contacting GW#1 is irrelevant and not evidence of any deficiency.

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[3] Attach 2 - Origin and Cause Report, Site #2, by GREEN.pdf (*see* Attachment #1, Page 123 of 177); Attach 43 - Equipment Inspection.pdf (*see* Page 31 of 77)

[4] Attach 2 - Origin and Cause Report, Site #2, by GREEN.pdf (*see* Attachment #1, Page 45 of 177)

3. <u>Opinion 4.14</u>

The Way Report states that SCE failed to properly inspect and maintain CSC#1 and CSC#2 and to prevent their deterioration and contact with the oak trees at Site #1.

As an initial matter, and as noted above, I understand CSC#2 in the Way Report refers to a third-party communication line. Thus, any failure to inspect or maintain CSC#2 is not attributable to SCE as SCE does not own CSC#2 and is not responsible for its maintenance or inspection.

With respect to CSC#1, the Way Report does not present evidence to support the assertion that SCE failed to properly inspect and maintain the CSC#1 communication line. Communication line inspections at Site #1 were performed annually as described in the response to Opinion 4.8 above. There is no evidence presented in the Way Report that there was deterioration on the CSC#1 communication line.

The failure to inspect and maintain communication facilities is mentioned a number of times in the Way Report but it is purely speculative and likely based on the misinterpretation of the photographic evidence.

The Inspection Report Summaries included in the Appendix to this report (*see* Fig. 1, 2, and 4) describe a number of locations requiring maintenance that were identified and documented during the annual inspections of the SCE communication lines in the area of Site #1.

4. <u>Opinions 4.16 and 4.18(c)</u>

The Way Report states that "the communication conductor, CSC#1, and its messenger and lashing wires were unmaintained and the trees in the area of Site #1 had grown around those wires," and that "it does not appear that any management of the vegetation in the area of Site #1 was conducted between 2008 and 2018." Similarly, the Way Report faults SCE for "routing communications facilities" through trees at Site #1. I disagree with these statements.

The Way Report does not present evidence to support the assertion that the lashing wires were unmaintained at Site #1. As described in response to Opinion 4.8, communication line inspections were performed annually, with no indication that the lashing wires were compromised.

In addition, though there were tree branches in the area of Site #1 that may have grown around communication cables, this is not a violation of a regulation. Furthermore, the routing of communication cables around and near trees is commonly seen in the industry. The Way Report does not provide evidence that the routing of communication cables through trees is unusual or unacceptable.

As described below, there are no regulations that require clearance between communication cables and trees be maintained. If strain or abrasion, as defined in GO 95, Rule 35 are present, the condition must be corrected. There is no evidence provided in the Way Report that shows strain or abrasion on the communication cable was present.[5]

Photos show some minor deflection of the communication cables at Site #1 that was caused by tree limbs but again this is commonly seen in the industry and not a violation of any regulation.

In the area of Site #1, any required tree work would have been identified and documented during two distinct and separate types of inspections (communication line inspections and electric distribution line vegetation management inspections).

As previously mentioned, GO 95, Rule 35 is the regulation that is related to the maintenance of trees around supply conductors and communication lines. GO 95, Rule 35 states the following:

"When a supply or communication company has actual knowledge, obtained either through normal operating practices or notification to the company, that its circuit energized at 750 volts or less shows strain or evidences abrasion from vegetation contact, the condition shall be corrected by reducing conductor tension, rearranging or replacing the conductor, pruning the vegetation, or placing mechanical protection on the conductor(s)."

GO 95, Rule 35 goes on to state:

"For the purpose of this rule, abrasion is defined as damage to the insulation resulting from the friction between the vegetation and conductor. <u>Scuffing or polishing of the insulation or covering is not considered abrasion</u> [emphasis added]. Strain on a conductor is present when vegetation contact <u>significantly compromises the structural integrity of supply or communication facilities</u> [emphasis added]."

[5] Figures 8 and 9 in the Way Report, which are not directly addressed in the report and for which no explanation or context is provided, depict a messenger wire for a communication line that has become embedded in a tree limb. Figures 8 and 9 are not relevant or related to this incident. The photographs do not depict the subject span between Pole Nos. 4047012E and 4650857E at Site #1 but rather a span not implicated in the fire. The Way Report presents no analysis showing that the condition depicted in Figures 8 or 9 is a violation of any regulation or industry practice.

Contact between vegetation and communication cables, in and of itself, does not constitute a nonconformance with GO 95, Rule 35.

Additionally, GO 95, Table 1, describes clearance requirements for various facilities including communication lines (Column B). There is no clearance requirement included for either Case No. 13 or Case No. 14, which are the radial clearances to be maintained between tree branches and communication lines.

The Way Report does not present evidence that SCE was not in compliance with GO 95, Rule 35 or GO 95, Table 1. There is no evidence showing that abrasion, due to tree contact, was present on the communication cables at Site #1. There is also no evidence showing that the structural integrity of the communication cables was compromised due to tree contact. If the structural integrity was compromised it would have been evident at the poles on either side of Site #1. The Way Report did not present evidence that this occurred.

Finally, the Way Report includes an assertion that it did not appear that vegetation management was conducted at Site #1 between 2008 and 2018. This assertion is clearly incorrect. Communication line inspections can and do flag tree conditions, but SCE's communication line inspections did not result in vegetation management work in this area because no conditions requiring mitigation were identified. In addition, electric distribution line vegetation management inspections were conducted in the area on an annual basis from 2012 to 2018 and required vegetation management work was performed.

I have reviewed the electric distribution line vegetation management records from 2012 to 2018 and was able to confirm tree work was completed in the area of the Santa Susana Field Laboratory in June 2012, June 2013, June and July 2014, July 2015, July 2016, and January,[6] February, and July of 2018.

5. <u>Opinion 4.17</u>

The Way Report claims that SCE had opportunities to observe and correct alleged deficiencies with the communication conductors and the condition of the oak trees in the areas of Site #1 and Site #2 "many times."

The Way Report does not present evidence to support the assertion that SCE failed to observe and correct deficiencies in the area of Site #1. As previously described, the communication lines in the area of Site #1 were inspected once each year from 2014 to 2016 by three different inspectors, twice in 2017 by the same inspector,

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[6] Inspections for this work occurred in late 2017.

and twice in 2018 by two different inspectors. A review of the inspection records indicate that no tree related issues were identified at Site #1 that required mitigation.

Electric distribution line vegetation management inspections were also conducted in the area of Site #1 on an annual basis from 2012 to 2018 and required vegetation management work was performed.

Further, as discussed in response to Opinion 4.10 above, there was no deficiency to identify or correct with respect to the oak tree branches adjacent to GW#1 at Site #2.

6. Opinion 4.20

Finally, the Way Report states that the fire at Site #1 was the result of defects in the design, construction, and inspection of SCE communication facilities. I disagree. The Way Report fails to provide evidence to support this opinion. Specifically, and for the reasons discussed above related to Opinions 4.8, 4.10, 4.14, 4.16, 4.17, and 4.18, the Way Report is based on speculation and not on fact.

The opinion that the ignition of the fires was the result of defects in design, construction, and inspection of the SCE facilities is speculative and unproven.

III. CONCLUSION

The fact that this rebuttal report does not specifically respond to certain conclusions or allegations in the Way Report does not indicate that I agree with those conclusions or allegations. This rebuttal report is based on my analysis as of October 4, 2024. I reserve the right to revise my opinions and conclusions if additional facts or evidence are identified.

Robert R. Novembri, President
Novembri Consulting, LLC

BY:

Robert Novembri

Appendix A

Figure 1: 2014 Inspection Report Summary[7]

Page 1

Correction Form

Edison Carrier Solution

HENKELS & McCOY
AS-BUILT
11-3-14

Region/District: WEST REGION

[redacted]

Cable Name & Number:

Start Location Pole # 4244523E Stop Location Pole # 1528775E

	Date	Structure Number	Location	Broken / Loose Lashing Wire	Broken Cable Arm	Broken Riser	Detached Cable	Foreign Object	G.O.95	Ground Molding	Hanging Slack	Hanging Splice	Loose Hardware	Non-Approved Attachment	Other	Over Loaded Anchor	Transfer	Comments
1	10/30/14	4244523E	CABLE SHEET 05												X			RECONSTRUCT POLE.
2	10/30/14	4401079E	CABLE SHEET 7												X			NEEDS (1) JONNY BALL
3	10/30/14	4244735E	CABLE SHEET 8					X										PHONE DROPS ON CABLE ARM
4	10/30/14	4401091E	CABLE SHEET 9												X			NEEDS DOWN GUY, NEVER FRAMED.
5	10/30/14	4734954E	CABLE SHEET 11												X			NEED TO ADD STRAPS + SPACERS.
6	10/30/14	4401094E	CABLE SHEET 12												X			NEED (2) JONNY BALLS
7	10/30/14	4734957E	CABLE SHEET 12												X			NEED TO ADD STRAPS + SPACERS
8	10/31/14	4046918E	CABLE SHEET 13												X			NEED TO UPGRADE DOWN GUY TO 3/8
9	10/30/14	4403477E	CABLE SHEET 16												X			NEED (1) ANCHOR, (1) DOWN GUY TO BACKUP D.E.
10	10/30/14	4389288E	CABLE SHEET 26										X					WIND DAMPNER NEEDS TO BE RE-ATTACHED.
11	10/31/14	4205192E	CABLE SHEET 29	X														E.C.S. COPPER NEEDS TO BE DE/RE LASHED.
12	10/31/14	4630894E	CABLE SHEET 51										X		X			NEEDS P.I.P. INSERT, FOR BLOCK
13	10/31/14	4125798E	CABLE SHEET 51										X		X			NEEDS P.I.P. INSERT FOR BLOCK
14	10/31/14	4574824E	CABLE SHEET 51				X											SEE CABLE SHEET.
15	11/3/14	4198427E	CABLE SHEET 77												X			RECONSTRUCT CABLE ARM.
16	11/3/14	1528775E	CABLE SHEET 80										X		X			NEEDS P.I.P. INSERT FOR BLOCK.
17																		
18																		
19																		
20																		

7 SCE-SEDWS00002897.pdf (*see* Sheets 80-84)

Novembri Consulting, LLC

Figure 2: 2015 Inspection Report Summary[8]

Correction Form

Edison Carrier Solution

HENKELS & McCoy
AS-BUILT
7-29-15

Region/District: WEST REGION

[redacted]

Cable Name & Number: MALIBU - SANTA SUSANA CA#06123

Start Location Pole # 4244523E SHT 5   Stop Location Pole # 4081452E SHT 104

	Date	Structure Number	Location	Broken Lashing Wire	Broken Cable Arm	Broken Riser	Detached Cable	Foreign Object	G.O 95	Ground Molding	Hanging Slack	Hanging Splice	Loose Hardware	Non-Approved Attachment	Other	Over Loaded Anchor	Transfer	Comments
1	7/27/15	2279250E	SHT. 16	✓														BROKE LASHING WIRE, DE/RELASH NEEDED (180')
2	7/24/15	4534353E	SHT. 80												✓			SLACK COIL NEEDS DRESSED
3	7/24/15	7172014E	SHT. 87														✓	NEED TO X-FER F.O.C. & COPPER ONTO NEW POLE
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

8 SCE-SEDWS00002985.pdf (*see* Sheets 80-84)

Figure 3: 2016 Inspection Report Summary[9] [10]

Correction Form

Edison Carrier Solution

EDISON CARRIER SOLUTIONS

A Division of SOUTHERN CALIFORNIA EDISON

Region/District: West

Employee Name:

Cable Name & Number: 06123

Start Location Pole # 4244523E Stop Location Pole # 1344411E

	Date	Structure Number	Location	Broken / Loose Lashing Wire	Broken Cable Arm	Broken Riser	Detached Cable	Foreign Object	G.O 95	Ground Molding	Hanging Slack	Hanging Splice	Loose Hardware	Non-Approved Attachment	Other	Over Loaded Anchor	Transfer	Comments
1	8-30-16	4401091E	Sheet 9											X				Non Approved Attachment
2	8-30-16	4557742E	Sheet 17														X	Pole Transfer
3	8-30-16	4658766E	Sheet 20														X	Pole Transfer
4	8-30-16	4734974E	Sheet 29															Needs Arm to Pole Guy 4734974E to 2303882E
5	8-30-16	1879526E	Sheet 51															Needs DG
6	8-30-16	4297613E	Sheet 51															Needs Pole to Pole Guy Between 4297613E & 4125796E
7	8-30-16	4372896E	Sheet 52											X				Non-Approved Attachment Needs Anchor & DG Fiber not attached properly
8	8-30-16	1879531E	Sheet 52											X				Non-Approved Attachment Fiber not attached properly
9	8-30-16	4297720E	Sheet 53															Needs Anchor & DG
10	8-30-16	4372897E	Sheet 53															Needs Anchor & DG
11	8-31-16	434 3373E	Sheet 90														X	Pole Transfer
12	8-31-16	1344411E	Sheet 90											X				Non Approved Attachment fiber not attached properly
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

9 SCE-SEDWS00003089.pdf (Summary Only)

10 SCE-SEDWS00003090.pdf (*see* Sheets 80-84)

Figure 4: 2017 Inspection Report Summary[11]

Correction Form

Edison Carrier Solution

EDISON CARRIER SOLUTIONS

A Division of SOUTHERN CALIFORNIA EDISON

Region/District:

[redacted]

Cable Name & Number: MALIBU-SANTA SUSANA FO CABLE 06123

Start Location Pole # 2279159 E

Stop Location Pole # 1931920 E

	Date	Structure Number	Location	Broken / Loose Lashing Wire	Broken Cable Arm	Broken Riser	Detached Cable	Foreign Object	G.O 95	Ground Molding	Hanging Slack	Hanging Splice	Loose Hardware	Non-Approved Attachment	Other	Over Loaded Anchor	Transfer	Comments
1	7·6·17	2279159 E	SHEET 10	✓														RE-LASH RE-LASH
2	7·6·17	4401098 E	SHEET 41	✓														DELASH RELASH
3	7·6·17	2303884 E	SHEET 29	✓														DELASH RELASH POLE #IN FIELD 4734974E
4	7·6·17	4572896E	SHEET 52														✓	TRANSFER INCOMPLETE
5	7·6·17	1879531 E	SHEET 52														✓	TRANSFER INCOMPLETE
6	7·5·17	1856647 E	SHEET 66														✓	TRANSFER INCOMPLETE
7	7·5·17	717210 E	SHEET 86														✓	TRANSFER INCOMPLETE
8	7·5·17	4093787 E	SHEET 88														✓	TRANSFER INCOMPLETE
9	7·5·17	4198717E	SHEET 88														✓	TRANSFER INCOMPLETE
10	7·5·17	4219674E	SHEET 88														✓	TRANSFER INCOMPLETE
11	7·5·17	4249675E	SHEET 89														✓	TRANSFER INCOMPLETE
12	7·5·17	1344411 E	SHEET 90														✓	TRANSFER INCOMPLETE
13	7·5·17	1647707 E	SHEET 90														✓	TRANSFER INCOMPLETE
14	7·5·17	4419409E	SHEET 91														✓	TRANSFER INCOMPLETE
15	7·5·17	1931917E	SHEET 91														✓	TRANSFER INCOMPLETE
16	7·5·17	1931919E	SHEET 91														✓	TRANSFER INCOMPLETE
17	7·5·17	1931920E	SHEET 91														✓	TRANSFER INCOMPLETE
18																		
19																		
20																		

11 SCE-SEDWS00003226.pdf (*see* Sheets 80-84)

Figure 5: 2017 Inspection Report Summary[12]

Correction Form

Edison Carrier Solution

EDISON CARRIER SOLUTIONS

Region/District:

[redacted]

...sion of SOUTHERN CALIFORNIA EDISON

Cable Name & Number: CHATSWORTH - NATURAL F.O. CABLE 06137

Start Location Pole # 4B2118E

Stop Location Pole # 4B2118E

	Date	Structure Number	Location	Broken Lashin	Broken Arm	Broken Riser	Detached Cable	Foreign Object	G.O 95	Ground Molding	Hanging Slack	Hanging Splice	Loose Hardware	Non-Approved Attachment	Other	Over Loaded Anchor	Transfer	Comments
1	7-5-17	4B2118E	SHOT 55									X						NEEDS SPLICE SECURED
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

12 SCE-SEDWS00003470.pdf (*see* Sheets 2-6)

Figure 6: 2018 Inspection Report Summary[13]

Transmission Telecom

Region/District: NW Alhambra

[redacted]

Cable Name & Number: 06123 Malibu-Santa Susana

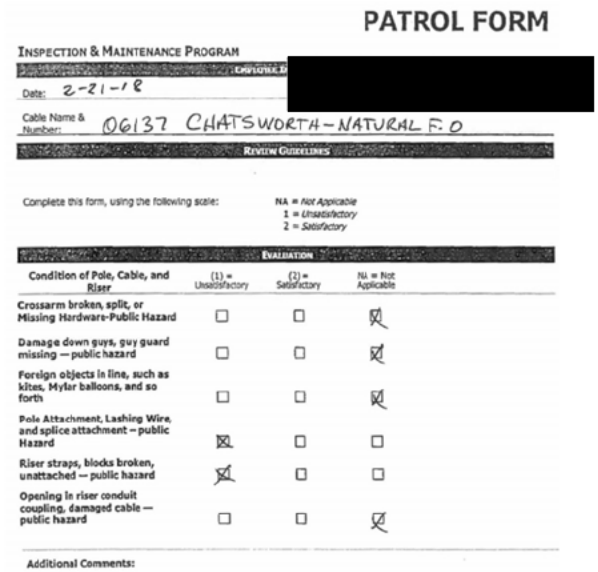
Start Location Pole # ______ Stop Location Pole # ______

	Date	Structure Number	Location	Broken / Lashing W	Broken C Arm	Broken Riser	Detached Cable	Foreign Object	GO 95	Ground Molding	Hanging Slack	Hanging Splice	Loose Hardware	Non-Approved Attachment	Other	Over Loaded Anchor	Transfer	Comments
1	2/28/18	4419489E	Kisty ln											X				re-frame pole. Riser - dead end, doubles
2	2/28/18	1931917E	Kisty ln														X	pole transfer
3	2/28/18	1931920E	Kisty ln											X				PLP straight to pole, Added cable arm (Comp
4	2/28/18	4863762E	Kisty ln				X											placed cable arm
5	2/28/18	1931918E	Kisty ln											X				placed cable arm
6	2/28/18	1931919E	Kisty ln				X							X				not Attached to pole
7	2/28/18	4377300E	Kisty ln														X	pole transfer 2-10CA
8	2/28/18	4343373E	Katherina RD. South														X	Pole transfer 2-10CA
9	2/28/18	1344411E	Katherine RD South												X			Redo doubles. Need one more CA Starter
10	2/28/18	1647707E	Katherine RD South												X			Our cable is Attached to secondary arm (power;
11	2/28/18	4249675E	Katherina DR / Oak Knolls				X											Need 5'CA
12	2/28/18	4198717E	Katy ln / Katherina Dr				X											Need 5'CA
13	2/28/18	4093787E	Katy ln / Katherina Dr				X											Need 5'CA
14	2/28/18	1051067E	Black Canyon Dr														X	pole transfer troubleman truck access only
15	2/28/18	717206E	Black Canyon Dr												X			redo dead end. No truck access
16	2/28/18	717255/216E	Black Canyon Dr												X			re frame for doubles 2-5CA
17	2/28/18	1856647E	Boeing property													X		re frame for doubles dead end dirt road no SCE lock on
18	2/28/18	4372896E	Bell Canyon BLVD													X		re attach 60 bracket to doubles
19		4863784E	101 Fwy / Murray RD														X	Pole transfer Freeway crossing included
20																		

13 SCE-SEDWS00003426.pdf (Summary Only)

Novembri Consulting, LLC

Figure 7: 2018 Inspection Report Summary[14]



PATROL FORM

INSPECTION & MAINTENANCE PROGRAM

[redacted]

Date: 2-21-18

Cable Name & Number: 06137 CHATSWORTH-NATURAL F.O

REVIEW GUIDELINES

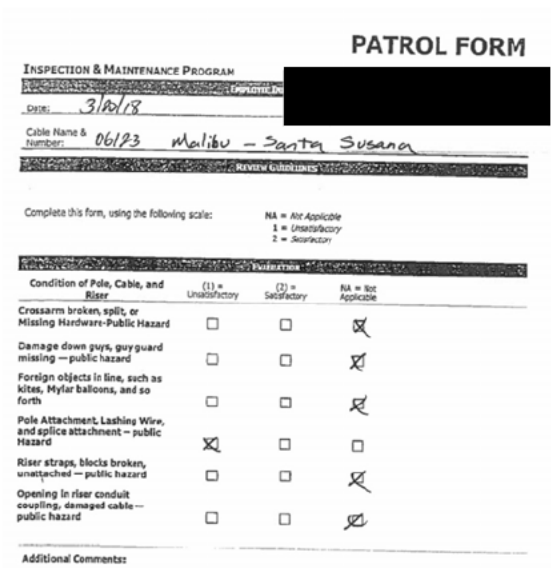
Complete this form, using the following scale: NA = *Not Applicable* 1 = *Unsatisfactory* 2 = *Satisfactory*

EVALUATION

Condition of Pole, Cable, and Riser	(1) = Unsatisfactory	(2) = Satisfactory	NA = Not Applicable
Crossarm broken, split, or Missing Hardware-Public Hazard	☐	☐	☒
Damage down guys, guy guard missing — public hazard	☐	☐	☒
Foreign objects in line, such as kites, Mylar balloons, and so forth	☐	☐	☒
Pole Attachment, Lashing Wire, and splice attachment – public Hazard	☒	☐	☐
Riser straps, blocks broken, unattached — public hazard	☒	☐	☐
Opening in riser conduit coupling, damaged cable — public hazard	☐	☐	☒

Additional Comments:

Figure 8: 2018 Inspection Report Summary[15]



PATROL FORM

INSPECTION & MAINTENANCE PROGRAM

[redacted]

Date: 3/20/18

Cable Name & Number: 06123 Malibu – Santa Susana

REVIEW GUIDELINES

Complete this form, using the following scale: NA = *Not Applicable* 1 = *Unsatisfactory* 2 = *Satisfactory*

EVALUATION

Condition of Pole, Cable, and Riser	(1) = Unsatisfactory	(2) = Satisfactory	NA = Not Applicable
Crossarm broken, split, or Missing Hardware-Public Hazard	☐	☐	☒
Damage down guys, guy guard missing — public hazard	☐	☐	☒
Foreign objects in line, such as kites, Mylar balloons, and so forth	☐	☐	☒
Pole Attachment, Lashing Wire, and splice attachment – public Hazard	☒	☐	☐
Riser straps, blocks broken, unattached — public hazard	☐	☐	☒
Opening in riser conduit coupling, damaged cable — public hazard	☐	☐	☒

Additional Comments:

14 SCE-SEDWS00003526.pdf (*see* Sheets 2-6)

15 SCE-SEDWS00003342.pdf (*see* Sheets 91-95)

Robert R. Novembri - President
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Granite Bay, CA 95746

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Website: www.novembriconsulting.com

STATEMENT OF QUALIFICATIONS

Mr. Novembri has over 50 years of utility experience and over 35 years of experience in the utility vegetation management field.

2007 to Present: President, Novembri Consulting, LLC. Novembri Consulting works nationally and internationally with utility companies, vendors, and regulators on all issues related to utility vegetation management (UVM).

2016-2017 (Concurrent with Novembri Consulting): Subject Matter Expert, North American Transmission Forum; UVM SME supporting NATF Members.

2009-2013 (Concurrent with Novembri Consulting): Senior Investigator, North American Electric Reliability Corporation. Responsible for leading investigations into disruptions on the bulk power system in North America; UVM SME.

1999-2007: Chief Executive Officer and Principal Consultant, CN Utility Consulting, LLC.

1987-1999: Pacific Gas and Electric Co., System Forester, Director of Operations – Utility Vegetation Management. In this capacity was responsible for all UVM field operations, UVM contract development and administration, development of work management systems related to UVM, and litigation support.

1969-1987: Pacific Gas and Electric Co. – Various positions of increasing responsibility in electric engineering, electric construction and operations, gas operations, and corporate.

ACCOMPLISHMENTS

- Participated as the North American Electric Reliability Corporation's representative on the FAC-003-2 and FAC-003-3 Standards Drafting Team.
- Principal UVM investigator for the Joint US/Canada Task Force investigating the August 14th 2003 Northeast Blackout. Commissioned by the Federal Energy Regulatory Commission to investigate the tree related issues that contributed to the blackout.
- Member of the North American Electric Reliability Council UVM Standards drafting committee. This committee developed the first version of the national standard for clearances between vegetation and transmission lines, and other related requirements (FAC-003-1).
- Completed various utility and vendor benchmarking projects focused on identifying UVM industry trends and best practices.
- Completed national assessment of current UVM related laws and regulations.
- Direct involvement with the development, interpretation, and promulgation of numerous industry standards and regulations. This includes, but is not limited to, General Order 95 - Rule 35, NESC 218, PRC's 4293 and 4292, the Uniform Fire Code, the Urban Wildland Interface Fire Code, and ANSI A300.
- Presented at numerous national conferences on UVM related issues.

PROFILE

Mr. Novembri is the Founder and President of Novembri Consulting, LLC, serves as an outside director on the Board of Directors of The Davey Tree Surgery Co., and formerly served as Partner and CEO of CN Utility Consulting, LLC. CNUC and its principals are credited with performing the largest and most comprehensive UVM Benchmarking Study in the industry and developing CNUC Industry Intelligence, a program that brought together western region utilities to exchange and share common problems and solutions. CNUC principals were also an integral part of the Federal Energy Regulatory Commission's investigation into the August 14th, 2003 Northeast Blackout. Mr. Novembri is also credited with developing and implementing new contracting and work methods that resulted in improved productivity for a number of North American utilities.

During a brief time away from consulting (2009-2013) Mr. Novembri was a Senior Investigator with the North American Electric Reliability Corporation, where among other activities, assisted in the development of ERO Best Practices for Vegetation Management, NERC lead on the inquiries into the February 2011 Southwest Cold Weather Event and the October 2011 Northeast Snowstorm, and participated in the development of the NERC vegetation management standard, FAC-003 Versions 2 and 3.

Mr. Novembri has assisted utilities in the development and implementation of various vegetation management program elements including VM Plan, Hazard Tree Management Plan, Post Work Verification Procedure, Vegetation Threat Procedure, Resource Protection Plan, and Pre-inspection Manual.

In addition to an intimate knowledge of utility operations and UVM program activities and attributes, Mr. Novembri has also worked on the development and/or revisions of many UVM related standards and regulations.

Prior to forming Novembri Consulting and CNUC, Mr. Novembri was the Director of Vegetation Management Operations at Pacific Gas & Electric Company. In this capacity, and as part of his 30-year career at PG&E, he was responsible for all field operations at one of the largest vegetation management programs in the United States.

The following is a partial list of clients and projects of both Novembri Consulting and CN Utility Consulting for which Mr. Novembri acted in a lead roll:

Arizona Public Service – Inventory/Strategic Plan (Bug Killed Trees)
AltaLink – Regulatory
ATCO Electric – Regulatory
BC Hydro – Legal
British Columbia Transmission Corp – Program Review; Contract Review
Baltimore Gas & Electric – Program Review
Chelan County PUD – FAC-003, Transmission Vegetation Management Program
Davey Tree Surgery – FAC-003, Transmission Vegetation Management Program Training
Entergy – Tree Line USA
Federal Energy Regulatory Commission – Investigative

FirstEnergy – Legal
GridSME (Astoria) – FAC-003, Transmission Vegetation Management Program
Hawaiian Electric Co. – Contract Review; E-Commerce - Electronic Contract Bidding
Indianapolis Power & Light – Program Review
Liberty Utilities – Vegetation Management Program Design and Implementation, Wildfire Mitigation Plan, VM QA/QC Program, Electric Operations QA/QC Program
North American Electric Reliability Corporation – Investigative
NV5 – Independent Evaluator conducting OEIS Inspections
Office of the Utilities Consumer Advocate, Canada – Regulatory
PacifiCorp – Contract Review; Other
Pacific Gas & Electric Co. – Compliance Evaluation; Regulatory; Legal
Progress Energy (Carolinas and Florida) – Contract Review
Puget Sound Energy – FAC-003, Transmission Vegetation Management Program
San Diego Gas & Electric Co. – Cost Benefit Analysis; Other
Southern California Edison – Gap Analysis; UVM Program Review; Contract Review; Other
Sacramento Municipal Utility District – Contract Review
SLAC National Accelerator Laboratory – Program Review; Contract Review
Utility Arborist Association – Best Management Practices Development; Other
Xcel Energy – Legal

REPORTS AND PUBLICATIONS

Novembri, R.R.; Best Management Practices Working Group. 2009. *Utility Best Management Practices – Tree Risk Assessment and Abatement for Fire-Prone States and Provinces in the Western Region of North America*

Novembri, R.R.; Cieslewicz, S.R. 2006. *Laws, Regulations, and Tree Ordinances Related to Utility Vegetation Management Work*

Novembri, R.R.; Cieslewicz, S.R. 2006. *2006 Utility Vegetation Management Regulatory Requirements, A State by State Review*

Novembri, R.R. 2005. *Evaluation of Contracting Strategies – Single Vendor vs. Multi-Vendor Contracts*

Novembri, R.R.; Cieslewicz, S.R. 2004. *Utility Vegetation Management – Trends, Issues, and Practices*

Novembri, R.R.; Cieslewicz, S.R.; Gray, W.S. 2004. *Utility Vegetation Management Final Report – Commissioned to Support the Federal Investigation of the August 14, 2003 Northeast Blackout*

Novembri, R.R.; Cieslewicz, S.R. 2003. *Utility Vegetation Management Initial Report – In support of the Joint U.S.-Canada Power System Task Force*

Novembri, R.R. 2003. *Arizona Public Service – Tree Mortality Assessment*

Novembri, R.R.; Cieslewicz, S.R. 2003. *Tree Line Connection Benchmarking – UVM Vendor Survey*

Novembri, R.R.; Cieslewicz, S.R. 2002. *Tree Line Connection Benchmarking – Utility Vegetation Management*

Novembri, R.R.; Cieslewicz, S.R.; Dobson, S. 2002. *E-Commerce Applications for Utility Vegetation Management Sourcing*

Novembri, R.R.; Cieslewicz, S.R. 2000. *Planning for the Future – The Utility Arborist's Other Occupation* Utility Arborist Association Quarterly

Novembri, R.R. 1989. *The Computerized Selection Guide to Assist with Tree Replacement Programs* Journal of Arboriculture 15(12)

Costello, L.R.; Berry, A.M.; Chan, F.J.; Novembri, R.R. 1989. *Trees under power lines: a homeowner's guide* Leaflet-University of California Cooperative Extension Service, Berkeley, Calif. (21470) 7 P.

Appendix B

October 4, 2024 Report of Andrew H. Stewart, President, EDM International Inc.

October 4, 2024

Mr. Michael A. Behrens
Hueston Hennigan LLP
523 West 6th Street, Suite 400
Los Angeles, CA 90014

Re: Woolsey Fire Litigation (JCCP 5000): Rebuttal to Selected Opinions in the Woolsey Fire Expert Disclosure Report by Jensen Hughes on behalf of Cal OES, Dated April 5, 2024

Dear Mr. Behrens:

I have been asked to write a report addressing selected opinions within my areas of expertise in the April 5, 2024, Woolsey Fire Expert Disclosure Report by Jensen Hughes on behalf of the California Governor's Office of Emergency Services (Cal OES), prepared by Paul T. Way and reviewed by Sam Shuck (served on August 16, 2024) (the Way Report).

I. SCOPE OF WORK

In connection with my work on the Woolsey Fire matter, I have reviewed the Way Report, the documents identified therein, and documents related to the construction, inspection, and maintenance of SCE's electrical facilities in the area of the subject lightweight steel pole (Pole No. 4534353E or the Subject Pole), including Pole Nos. 984161E and 1631908E near Site #2 as that area was identified in the Woolsey Fire report issued by Cal Fire and Ventura County Fire Department (the Cal Fire Report). I also conducted a site visit to Site #2 on February 21, 2019.

Following the Woolsey Fire, the northeast lower subtransmission downguy on the Subject Pole (identified in the Way Report as GW#1) was found to be in a slack condition. For the purposes of this report, I have analyzed Mr. Way's conclusions regarding the cause of that slack condition, and his conclusions generally regarding the construction, inspection, and maintenance of the Subject Pole and GW#1.

For clarity and the avoidance of doubt, my comments are limited to statements from Sections 2.0, 3.0, and 4.0 of the Way Report that I take exception to, which fall within my area of expertise and relate to the scope of my investigation. For example, I have not addressed Opinions 4.14 and 4.16, as my investigation and analysis were focused on Site #2. I have not commented on Opinion 4.15, as I am not an expert in electrical grounding, and I understand that grounding opinions have been addressed in a separate report by Dr. Don Russell. I also have not analyzed Mr. Way's conclusions regarding Site #1 as identified in the Cal Fire Report,

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as I understand those conclusions are being addressed by Mr. Novembri in a separate rebuttal report.

II. DISCUSSION AND CONCLUSIONS

A. General Concern/Observation Regarding the Way Report

In the Way Report, Mr. Way offers opinions on various mechanical and structural performance issues, as well as electric utility overhead line design, construction, and operating practices. However, his curriculum vitae, as presented in Section 5.0 of the Way Report, does not appear to demonstrate expertise, experience, or training in these areas, except perhaps for his role in coordinating multiple engineering disciplines during his employment at R.W. Beck and Associates in 1989-1990. In contrast, he does appear to have experience and knowledge related to electrical issues.

It is concerning that Mr. Way expresses such strong opinions on matters pertaining to these disciplines without providing substantive grounds for his conclusions or having qualifications and experience that clearly align with offering such opinions.

Furthermore, Mr. Shuck, who is identified as the reviewer of the report, is listed as an electrical engineer with expertise in electrical systems and equipment, as indicated on the Jensen Hughes website (as of September 4, 2024). However, his biographical summary does not reflect any notable experience in mechanical or structural behavior.

This apparent gap in the expertise of both Mr. Way and Mr. Shuck raises questions about the basis for and veracity of Mr. Way's opinions on issues outside his demonstrated areas of knowledge.

B. Analysis of Mr. Way's Conclusions

Mr. Way makes a number of all-encompassing and in some instances, inconsistent conclusions regarding why GW#1 was slack at the time of the Woolsey Fire. Mr. Way also makes various conclusory allegations (without sufficient, or in some cases any, evidentiary support) regarding SCE's construction, maintenance, and inspection of the facilities at Site #2, including the Subject Pole.

As outlined below, I disagree with Mr. Way's conclusions and find them to be unsupported (and in some cases contradicted) by the evidence.

C. Background of Construction, Maintenance, and Inspection Activities at the Subject Pole

In his report, Mr. Way cites various documents regarding the construction, maintenance, and inspection of the Subject Pole and SCE's facilities at Site #2. Mr. Way's recitation of the factual background is incomplete, not entirely correct, and in some instances misleading. For instance, Mr. Way claims that an inspection conducted by Mr. Lapp on or around 5/1/2008 failed to identify alleged defects in the Subject Pole's guying. Yet Mr. Way provides no evidence to indicate that any alleged defects he identified at the time of the Woolsey Fire in November 2018 existed on 5/1/2008. Mr. Way also claims that in connection with SCE's replacement of Pole No. 1631908E, "SCE did nothing to assess the effect of these changes on the downguys of Structure 4534353E." This statement is incorrect and contradicted by the evidence. On 1/29/2018, SCE conducted a pole load analysis on the Subject Pole 4534353E (SCE-WLSY00009036) and Pole No. 1631908E (SCE-WLSY00008938) as part of Project TD1279308, which included the removal of a slack span of distribution conductor between the two poles as part of SCE's Overhead Conductor Program (OCP) reliability upgrades. The analysis showed that Structure 4534353E, including all of its guy wires, passed all load requirements.

Mr. Way's recitation also omits key information. In connection with my analysis of the Way Report, at my request, SCE has provided me a timeline of transmission and distribution-related events at Site #2 relevant to my analysis of the findings in the Way Report, which is attached as Appendix 1.

I also disagree with conclusions that Mr. Way has drawn from the documentation he reviewed. My analysis of Mr. Way's conclusions is discussed below.

D. Analysis of Specific Conclusions and Statements in the Way Report

1. Design and Construction of Subject Pole, Including Installation and Tensioning of GW#1[1]

Without support, Mr. Way states that GW#1 was improperly installed and tensioned at the time of the fire and/or that its tension was not properly analyzed prior to the fire. Similarly, Mr. Way claims that SCE's alleged "failure to properly design the conductors and the configuration of the equipment on Structure 4534353E resulted in contact between the energized Big Rock circuit A-phase jumper and a downguy, GW#1." I disagree.

Mr. Way does not provide support for his allegation that SCE improperly designed the conductors and the configuration of the equipment on Pole No. 4534353E. In contrast, SCE's

[1] Way Report Opinions 4.2, 4.4, 4.18; Way Report at p. 5.

transmission and distribution design personnel appear to have properly configured the equipment including conductors and downguys on Pole No. 4534353E. My analysis specifically related to GW#1 did not reveal any concerns with the design of GW#1 and instead shows that, as it would have been originally constructed, the clearance between GW#1 and the Big Rock 16kV circuit A-phase jumper exceeded the minimum clearance requirement in the California Public Utilities Commission's General Order (GO) 95. Specifically, my analysis of Pole No. 4534353E based on LiDAR data collected shortly after the Woolsey Fire and before any modifications to the structure were made (e.g., removal of evidence) independently found that with GW#1 in a taut condition the clearance between GW#1 and the Big Rock A-phase jumper exceeded the minimum clearance specified in GO 95. While GW#1 may have loosened prior to the Woolsey Fire for reasons that remain undetermined, Mr. Way does not present evidence of any deficiencies related to the construction or installation of the conductors or GW#1.

Furthermore, based on the numerous inspections conducted including transmission patrols and distribution patrols which met the requirements of GO 165, there is no indication that GW#1 was improperly tensioned. In the one recorded instance where GW#1 was noted to be loose, on January 20, 2017, it was subsequently tightened that same day.

In addition to these patrols, immediately after the replacement of Pole No. 1631908E, inspections of Pole No. 4534353E were performed by a Hotline foreman and an SCE Sr. Patrolman, as part of their standard practice, given that this structure supported the interconnected conductors. These inspections found GW#1 to be taut.

Therefore, Mr. Way's opinion seems to be based on circular logic—i.e., GW#1 came into contact with the energized Big Rock circuit A-phase jumper on the day of the fire, therefore the design, construction, and tensioning were improper—rather than on evidence supporting his conclusion that the installation of GW#1 was deficient.

2. <u>Contact Between GW#1 and Tree Branches; Routing of GW#1</u>[2]

Mr. Way claims that because SCE "routed" GW#1 through oak tree branches, movement of the tree at Site #2 that was in contact with GW#1 caused GW#1 to become loose. Mr. Way further claims that SCE "could have" trimmed the tree at Site #2 to prevent it from contacting GW#1.

I disagree with Mr. Way's characterization of the interplay between GW#1 and the oak tree at Site #2. It would be more accurate to describe the situation as incidental contact between the tree branches and GW#1. Incidental contact between a guy wire and tree branches is not uncommon in the industry and does not necessarily represent a condition requiring mitigation.

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[2] Way Report at p. 5; Opinion 4.9, 4.10, 4.18

Trees making incidental contact with guy wires are typically not pruned unless there is another reason, aside from the incidental contact, to do so. In general, good utility practice does not dictate the pruning of trees that make incidental contact with downguys. If pruning is performed at all, it is generally due to major interference or strain, such as contact so forceful that it causes abrasion of the guy wire itself, which there was no evidence of here.[3] There is also no evidence that the incidental contact between the tree branches and GW#1 resulted in the loosened state of GW#1 at the time of the Woolsey Fire ignition.

I also take exception to Mr. Way's conclusion that the vegetation management system failed to recognize the effect that the oak trees had on the tension of GW#1. Because contact between the oak tree and GW#1 was incidental, there would be no reason for inspectors to identify this issue as a condition for remediation.

Similarly, Mr. Way alleges that SCE could have relocated GW#1 and thereby prevented contact between GW#1 and the Big Rock circuit A-phase jumper. I take exception to this opinion because it states the obvious and adds no value or clarity. It is most often the case that any given powerline structure and associated components/equipment could be configured in a different way that would help to avert a particular failure mechanism, but doing so could contribute to the increased probability of another failure mechanism under different circumstances. Nor was SCE's placement of GW#1 improper such that relocation would have been necessary or appropriate, as discussed above.

3. <u>Alleged Defects with GW#2 and GW#3</u>[4]

Mr. Way makes various allegations with respect to GW#2 and GW#3, including claims about how they affected the tension of GW#1. In summary, Mr. Way claims that configurations of GW#2 and GW#3 caused GW#1 to become loose, and/or that movement of Pole No. 984161E against GW#3 caused GW#3 to become loose, causing movement of the Subject Pole and loosening of GW#1.[5]

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[3] There are no known regulations, codified requirements in California, or SCE standards mandating the pruning of trees in contact with downguys.

[4] Way Report at p. 4; Opinion 4.6, 4.7, 4.11, 4.18, 4.20

[5] On p. 5 of the Way Report, Mr. Way also states that GW#3 was in contact with the ramshead on Structure 983161E; however, I assume he intended to reference GW#2, as nowhere else does he mention GW#3 being in contact with the ramshead.

As an initial matter, these various theories (which are unsupported) appear to be inconsistent with Mr. Way's conclusion, discussed below, that work on an adjacent pole in September 2018 caused the loosening of GW#1. Regardless, I disagree that any alleged defects with respect to GW#2 and GW#3 caused GW#1 to become loose.

Mr. Way alleges that failure to properly design, construct, and inspect the downguy, GW#2, on Pole No. 4534353E that he claims was "routed" in contact with the ramshead on Pole No. 1631908E contributed to the loosening of downguy GW#1. Mr. Way's use of the term "routed" here and elsewhere throughout the Way Report can connote a purposeful placement of GW#2 in contact with the ramshead whereas the evidence shows that GW#2, when in a taut state, would not be in contact with the ramshead. Further, he provides no basis for his conclusion that GW#2's contact with the ramshead somehow mysteriously contributed to the loosening of downguy GW#1. In contrast, analysis of Pole No. 4534353E shows that it would be practically impossible in the realm of realistic conditions for GW#2 to have a material impact on the tautness of GW#1 with both downguys installed on Pole No. 4534353E as they were at the time of the Woolsey Fire, i.e., regardless of whether GW#2 was loose or taut prior to the event. This behavior contradicts Mr. Way's conclusion herein.

Mr. Way alleges that SCE could have re-routed GW#2 so that it was not in contact with the ramshead on Pole No. 984161E. Here again Mr. Way uses the term routed (in this case re-routed) in a way that could connote that GW#2 was originally installed in contact with the ramshead, which is misleading. While the buddy pole (Pole No. 984161E) was not removed, Mr. Way provides no evidence that GW#2 was initially installed in contact with the ramshead in 2008, nor am I aware of any. To the contrary, my analysis demonstrates that had GW#2 been taut it would not have been in contact with the ramshead.

Mr. Way then alleges that the failure to properly design, construct, and inspect downguy GW#3 on Pole No. 4534353E, which was routed over the top of Pole No. 984161E, caused the loosening of downguy GW#1. However, Mr. Way provides no basis for this conclusion. In contrast. My analysis of Pole No. 4534353E shows that it would be practically impossible under realistic conditions for GW#3 to have a material impact on the tautness of GW#1, with both downguys installed on Pole No. 4534353E as they were at the time of the Woolsey Fire—regardless of whether GW#3 was routed over the top of Pole No. 984161E prior to the event. I also disagree that movement of Pole No. 984161E caused GW#3 to become loose. LiDAR analysis shows that GW#3 was not in fact loose at the time of the fire, though there was a slight deflection over the top of Pole No. 984161E, and Mr. Way provides no evidence that Pole No. 984161E moved. Regardless, even if theoretical movement of Pole No. 984161E against GW#3 could have caused GW#3 to become loose, as Mr. Way claims, the movement he alludes to would not have resulted in the loosening of GW#1 based on my analysis described above.

Mr. Way also takes issue with SCE's failure to remove Pole No. 984161E, which carried only telecommunication facilities at the time of the fire. When transferring supply facilities from one pole to another, such as from the prior wood Pole No. 984161E to the Subject Pole, it is common practice to leave communication facilities attached to the original pole, particularly when multiple utilities have facilities attached to the original pole. This is often referred to as a "buddy pole," and the buddy pole remains in service until the communication facilities are transferred to an alternative support, typically the same structure to which the supply facilities were transferred. Therefore, it would not be unusual for Pole No. 984161E to remain in place after the supply conductors were transferred to Pole No. 4534353E, pending the transfer of the communication facilities.

In sum, Mr. Way's conclusion that defects in the design, construction, and inspection of the SCE distribution and communication facilities resulted in the ignition is contradicted by the weight of the evidence. Rather, the record of the evidence indicates that the design, construction and inspection of Pole No. 4534353E, and specifically with regard to GW#1, were consistent with good utility practices.

4. Replacement of Pole No. 1631908E and OCP Work in September, 2018[6]

On September 24, 2018, as part of SCE's Overhead Conductor Program (OCP), an SCE contractor removed three 1/0 ACSR conductors on SCE's Energy 16kV circuit from a slack span between Pole Nos. 1631908E and 4534353E. The contractor then removed and replaced Pole No. 1631908E. Mr. Way concludes that SCE's "[r]eplacement of Structure 1631908E and removal of the Energy Circuit conductors that were supported by Structure 4534353E resulted in displacement of 4534353E to the east and loosening of the Structure 4534353E eastern downguy GW#1."[7]

I do not agree that removal of the Energy circuit conductors and increasing the height of Pole No. 1631908E would have caused GW#1 to be loose as of the day of the fire after the work was completed and checked.

The removal of the Energy circuit conductors, which was a shorter, slack span with minimal tension in the conductors,[8] the replacement of Pole No. 1631908E's 55-foot Class 3 wood pole with a 60-foot Class 1 pole, and the replacement of insulators on the Burro Flats-Chatsworth-Thrust

[6] Way Report Opinion 4.13; Way Report at p. 5.

[7] Way Report Opinion 4.13; Way Report at p. 5.

[8] The Way Report does not disclose that this span was slack and thus exerted minimal tension on the Subject Pole before the span was removed. Thus, the span's removal had little effect on the forces exerted on the Subject Pole.

66kV (Chatsworth-Thrust) circuit[9] could all temporarily reduce the mechanical load pulling Pole No. 4534353E to the west while the work is performed. Consequently, this could also lead to a temporary reduction in the tension in the eastern downguys of Pole No. 4534353E. These kinds of changes are a characteristic byproduct of the work associated with the pole replacement and were accounted for and offset when the contractor re-tensioned the Chatsworth-Thrust circuit conductors and ensured that the condition of the adjacent interconnected structures, such as Pole No. 4534353E, were restored to a safe, fit-for-service state before the Chatsworth-Thrust circuit was reenergized.

The Hotline crew foreman who was responsible for assessing the site conditions after the replacement of Pole No. 1631908E confirmed during an interview in which I participated on September 6, 2024 that before leaving the site, as part of his post-construction checks, he would have verified the guy wires on Pole No. 4534353E were taut. Further, during the interview the Hotline crew foreman described the work procedures employed for the replacement of Pole No. 1631908E and I found them to be in accordance with good utility practice. In addition, an SCE Sr. Patrolman verified that the replacement of Pole No. 1631908E was completed in accordance with SCE standards and confirmed that adjacent structures, such as Pole No. 4534353E, were fit for service.

Thus, there is no evidence that any of the guy wires on Pole No. 4534353E were loose as a result of the replacement of Pole No. 1631908E.

5. SCE's Inspections

Mr. Way claims that the Subject Pole conductors, downguys, and their routings, and specifically, GW#1 and its tension were not properly inspected.[10] I disagree. It appears that multiple inspections including annual transmission patrols that complied with the requirements of GO 165 were performed, and collectively these inspections found the downguys on Pole No. 4534353E to be taut. In the one instance where GW#1 was found to be slack following a relay operation on January 20, 2017, this condition was promptly mitigated by tightening the guy.

Mr. Way opines that SCE had many opportunities to observe and correct deficiencies with Pole No. 4534353E's downguys. Yet Mr. Way does not provide evidence showing that GW#1 was in fact loose or that GW#2 was loose and in contact with the ramshead during any of those inspections, aside from the one instance cited above where the loose condition of GW#1 was immediately corrected. Nor does Mr. Way provide evidence that SCE's inspectors should have

[9] The Way Report refers to the Chatsworth-Thrust 66kV Circuit as the Thrust Circuit.

[10] Way Report pp. 5-6; Opinion 4.5

reported a condition associated with the incidental contact between tree branches and GW#1, as this was not a violation or an issue that needed to be corrected. In fact, I understand the troublemen who responded to the January 2017 outage assessed GW#1 and, when they tightened it, ensured that there was no contact with the tree branches. In summary, Mr. Way does not cite any evidence that indicates a failure to properly inspect Pole No. 4534353E.

6. Coordination of Activities on Subject Pole[11]

Mr. Way claims there was a systemic failure for various teams to coordinate design, installation, and inspection activities related to Pole No. 4534353E. He also states, "[b]est practices would be to have all of the various interested parties involved in the revisions to Pole No. 4534353E coordination with each other." I assume he means "coordinate" as opposed to "coordination." However, he provides no clear evidence to support his conclusion that there was a systemic failure, because best practice would actually be for the cited teams to coordinate as needed and not to unnecessarily waste time and resources. The design, construction and inspection records for Pole No. 4534353E, and specifically with regard to GW#1 show that there was appropriate coordination and that it was consistent with good utility practice.

III. CONCLUSION

For avoidance of doubt, the fact that I have not specifically responded to certain conclusions or allegations in the Way Report in this rebuttal does not indicate that I agree with those conclusions or allegations. This rebuttal report is based on my analysis as of October 4, 2024. Should additional facts or evidence come to light, I reserve the right to update or edit my analysis.

Prepared and submitted by:

Andrew H. Stewart, President

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[11] Way Report Opinion 4.19

Appendix 1

Equipment	Date	Event	Cite
Pole No. 4534353E	03/22/2008	Pole installed, replacing Pole No. 1528777E	SCE-WLSY00029330
Pole No. 984161E	05/01/2008	Pole topped and distribution facilities transferred to Pole No. 4534353E	SCE-WLSY00001206
Chatsworth-Thrust 66kV Circuit	03/13/2009	Transmission Circuit Patrol completed	SCE-WLSY00273492
Grid ED35-OH-0034051, including Pole No. 4534353E	07/29/2009	Annual Distribution Grid Patrol Inspection completed	SCE-WLSY00033657
Chatsworth-Thrust 66kV Circuit	03/02/2010	Transmission Circuit Patrol completed	SCE-WLSY00273492
Grid ED35-OH-0034051, including Pole No. 4534353E	07/30/2010	Annual Distribution Grid Patrol Inspection completed	SCE-WLSY00033657
Grid ED35-OH-0034051, including Pole No. 4534353E	01/31/2011	Annual Distribution Grid Patrol Inspection completed	SCE-WLSY00033657
Chatsworth-Thrust 66kV Circuit	03/28/2011	Transmission Circuit Patrol completed	SCE-WLSY00033658
Chatsworth-Thrust 66kV Circuit	05/01/2012	Transmission Circuit Patrol completed	SCE-WLSY00033658
Grid ED35-OH-0034051, including Pole No. 4534353E	07/24/2012	Annual Distribution Grid Patrol Inspection completed	SCE-WLSY00033657
Grid ED35-OH-0034051, including Pole No. 4534353E	01/16/2013	Annual Distribution Grid Patrol Inspection completed	SCE-WLSY00033657
Chatsworth-Thrust 66kV Circuit	03/07/2013	Transmission Circuit Patrol completed	SCE-WLSY00033658

Chatsworth-Thrust 66kV Circuit	03/10/2014	Transmission Circuit Patrol completed	SCE-WLSY00033658
Grid ED35-OH-0034051, including Pole No. 4534353E	04/09/2014	Annual Distribution Grid Patrol Inspection completed	SCE-WLSY00033657
Chatsworth-Thrust 66kV Circuit	03/10/2015	Transmission Circuit Patrol completed	SCE-WLSY00033658
Grid ED35-OH-0034051, including Pole No. 4534353E	04/02/2015	Annual Distribution Grid Patrol Inspection completed	SCE-WLSY00033657
Chatsworth-Thrust 66kV Circuit	01/12/2016	Transmission Circuit Patrol completed	SCE-WLSY00033658
Grid ED35-OH-0034051, including Pole No. 4534353E	03/18/2016	Annual Distribution Grid Patrol Inspection completed	SCE-WLSY00033657
Chatsworth-Thrust 66kV Circuit	01/06/2017	Transmission Circuit Patrol completed	SCE-WLSY00033658
Pole No. 4534353E	01/20/2017	Big Rock 16kV circuit relays due to slack transmission guy wire, which is remediated the same day.	SCE-WLSY00033658; SCE-WLSY00033657; SCE-WLSY00003182; SCE-WLSY00026881
Grid ED35-OH-0034051, including Pole No. 4534353E	04/06/2017	Annual Distribution Grid Patrol Inspection completed	SCE-WLSY00033657
Pole No. 4534353E	01/23/2018	Overhead Detail Inspection	SCE-WLSY00033657
Chatsworth-Thrust 66kV Circuit	09/10/2018	Transmission Circuit Patrol completed	SCE-WLSY00033658
Pole No. 1631908E; Pole No. 4534353E	09/24/2018	Pole replaced by Hotline following patrol inspection; slack distribution span removed between 1631908E and 4534353E pursuant to OCP; SCE and Hotline inspect Pole No. 4534353E pursuant to pole replacement work	SCE-WLSY00026820; SCE-WLSY00026882; SCE-WLSY00029506

ANDREW H STEWART

President

Mr. Stewart has a B.S. in Civil Engineering from the University of Rhode Island, where he received the Academic Excellence Award; and an M.S. in Structural Engineering from Colorado State University, where he was a research associate on the EPRI-sponsored project, "Reliability-Based Design of Transmission Line Structures." He joined EDM International as a Senior Research Engineer in 1983.

His work with EDM has involved the development of inspection methods, design procedures, analytical models and testing programs for use in a variety of structural engineering applications, as well as qualitative and quantitative evaluation of structural performance. For more than 30 years, he has been actively involved in the development and implementation of Asset Management programs directed at cost-effectively extending the useful life of electric utility lines. He served as the project manager for a major EPRI sponsored initiative to improve the state-of-the-art of inspection and assessment methods for overhead lines.

Mr. Stewart has performed technical and managerial activities associated with the inspection, assessment, maintenance, analysis, and design of tens of thousands of miles of utility lines. He managed the development of the maintenance standards for the transmission line and substation facilities of the investor-owned utilities in California that are now under the operational control of the California Independent System Operator. Similarly, he assisted with the development of the generation maintenance standards used for all generators seeking to sell power into the California market.

For more than 10 years, Mr. Stewart has been assisting utilities with wildfire risk mitigation activities focused on both ignition prevention and wildfire protection.

Mr. Stewart is also actively involved in developing technologies to enhance the reliability and capacity of power delivery infrastructure and he holds several related patents. His responsibilities have involved the development and commercialization of technology, products and services for utility line design and management, technology transfer, and new business development.

He has authored more than 50 publications in the area of structural engineering and infrastructure management. He has served as Project Manager on over 80 major projects at EDM. Typical clients include electric utilities, government agencies, the construction industry, and manufacturers of construction materials. Mr. Stewart's expertise encompasses several areas including:

- Asset Management
- Power Line Inspection/Maintenance
- Nondestructive Testing/Evaluation Techniques
- Reliability-Centered Management of Power Lines
- Wildfire Risk Mitigation
- Transmission Line Thermal Rating
- Performance of Structural Systems
- Innovative Structural Analysis and Reliability Methods

Mr. Stewart currently serves as the Chairman of the IEEE Working Group on the Management of Existing Overhead Transmission Lines where he recently led the formation of a Task Force on application of Unmanned Aircraft Systems (UAS) to overhead lines, and development of guidelines to assist utilities in responding to the NERC Alert. His Working Group also developed IEEE standards for collecting and managing inspection and maintenance data. He is a member of the ASCE, IEEE, NACE/IEEE Joint Committee on corrosion of utility assets, Tau Beta Pi, Sigma Xi and Phi Kappa Phi.