Email with Comments from Nancy Macy

From: Nancy Macy [redacted]
Sent: Sunday, April 11, 2021 2:56 AM
To: Wildfire Safety Advisory Board
Subject: Comments re WSAB's Recommendations to WSD re IOU's WMP's
Attachments: COST BENEFIT ASSESSMENT.pdf

Dear Chair Edwards and Members of the Wildfire Safety Advisory Board,

We are grateful for the opportunity to comment on your thoughtfully considered recommendations to the Wildfire Safety Division regarding the Investor Owned Utilities' (IOU's) Wildfire Mitigation Plans Updates. The Valley Women's Club (www.valleywomensclub.org) is a forty-three-year-old 501-c-3 nonprofit community organization, actively involved in a broad range of quality of life concerns. A major focus is on our San Lorenzo River, its waterways and watershed, which are vital to the health and wellbeing of our community, our County and the Monterey Bay itself. The SLV is a major focus for NMFS/NOAA's extensive Salmonid Enhancement Plans, with great importance for the recovery of both threatened Steelhead and endangered Coho.

Our Environmental Committee has been actively working on issues relating to PG&E's impact on our community, and we are deeply worried about PG&E's failure to provide a modern, safe power grid -- both in our Valley and throughout its service area. Our homes and businesses are located in a primarily Tier 3, high utility-associated wildfire hazard area, with many areas that are difficult to evacuate effectively. Increasing drought conditions due to Climate Change are having outsized impacts on our watershed and its waterways already; we need to protect the soils from erosion and the steep slopes from being destabilized; we need the trees for their hundreds of benefits to the ecosystem, to wildlife, waterways, scenic vistas and property values. We need to be assured of a safe and reliable electric infrastructure that will not exacerbate our fire danger. We are struggling to recover from the massive CZU Lightning Complex fire – and we grieve as well for the thousands of others also trying to recover in other counties.

As an organization, we have tried for over thirty years to work with PG&E to reduce its destructive environmental impacts from dangerous equipment. In the mid-1980's we held a series of meetings and consultations with PG&E representatives focused on the dangers of antiquated transformers, and the huge circles of soil treated with herbicides, denuded and eroding. Nothing was changed. More recently, in concert with dozens of others throughout the service area, from Lafayette to Palo Alto to Humboldt, we all tried to stop the knee-jerk PR-motivated effort to clear a 12-foot swath over 7,000-plus miles of pressurized natural gas pipelines. (This was shortly after the San Bruno fiasco.) Lafayette ended up in a lawsuit with PG&E; we were able to provide the Santa Cruz County Board of Supervisors with the data and research needed for it to demand a CEQA EIR. Rather than do that, PG&E just withdrew…so far.

This was before we were cognizant of the distressingly outdated conductor and other equipment throughout the Santa Cruz Coastal Mountains (see attached photo). Before, everyone just saw it as the cause of regular power outages every winter. It was just a part of living in the mountains. It wasn't until 2018 that we realized the regular outages were a real wildfire and safety threat, and that PG&E's business philosophy for greater profit was, and still is, "run to failure," ensuring on-going problems that are now more severe, as you so clearly explain at the beginning of your 2021 Observations. This situation assures the need for PSPS for decades.

Sadly, as with the gas pipelines, PG&E's "solution" was to choose an effective PR move, and to divert attention by embracing its convincingly crafted mythology of the threat of vegetation -- inflating that threat and creating Enhanced Vegetation Management (EVM). Ironically, it was their Regular Vegetation mismanagement, that they had manipulated to increase the bottom line, causing delays that resulted in severe wildfires. (**THE GRID, The Fraying Wires Between Americans and Our Energy Future** by Gretchen Bakke, Ph.D., pp 120 ff.)

Email with Comments from Nancy Macy

The worst distribution line hazard is the 22,000 miles of #6 bare copper wire, just like that used in 1800's telegraph wires and still used as distribution conductor throughout PG&E's urban, rural and forested service areas. Frighteningly, there is over 2,700 miles in HFTD – but PG&E has only upgraded a few hundred miles per year (failing to maximize response in HFTD, and without saying what wire is being replaced). The bare aluminum wire along the coast corrodes rapidly in the salt air causing regular arcing and failures. (This was identified in 2013 by Liberty Consulting in a remarkable analysis of PG&E's egregious safety failures, contracted by the CPUC, which, however, failed to mandate rapid replacement. The Office of Safety Advocate reminded the CPUC and everyone in both 2017 and 2019 in two separate Proceedings. CPUC authorized EVM in 2017 but never mandated upgrading these unsafe powerlines. Please help see that these issues be addressed by the WSD.

Regarding the specifics of your Recommendations, may I note that we have found the WSAB to be responsive and reflective in its discussions and questions during webinar presentations by the IOU's to the Board, and thoughtful and respectful in its consideration of our and other's comments and concerns during those webinars and at your meetings. Thus, we are not surprised at the astute insights and analyses presented in the Draft Recommendations. But we do have important concerns for the Advisory Board to consider as additions to its Recommendations.

We agree with your Format recommendations and would point out that PG&E's WMP is especially frustrating because of its conflation of data. Since this is an on-going issue with PG&E, from Ratemaking to Proceedings, it should be pointed out and curtailed.

We concur with your *Justification for Decisions* observations, but would go a step further. This is where *Risk Spend Efficiency* can be improved: by *mandating risk-benefit assessments relating to mitigation choices*, *including costs,* or even an environmental impact type comparative *presentation of primary mitigation alternatives*. We strongly feel that this would result in the prioritization to modernize infrastructure, at the top of all alternative mitigation choices. Modernization indeed proves to be the least costly over time, the most effective in mitigating ALL wildfire ignition sources, and the most reliable and affordable. (This is proven in our **Cost Benefit Assessment**; please review it for additional, cogent information.) This would meet the utility mandate to deliver safe, reliable and affordable electricity to its rate-payers. In fact, if you examine GOV 11342 (below), it mandates alternatives' comparisons for decision-making by all agencies, and, since the courts have found that IOU utilities are, in effect, agencies, PG&E thus must comply.

PG&E's Plan is deficient, not just in disregard for the environment, but in severely wasting both time and money -- while it insists on prioritizing on its specious, ill-considered, unsafe, and environmentally destructive EVM. This program NOW requires the removal of tens of thousands of large, mature trees, not just dead and dying trees, with thousands of them unfairly identified as "Hazard" trees. We question the validity of this process because, while it has hired many certified arborists, PG&E depends on its own two-week training of not-yet-certified inspectors as well -- many from outside of California, some of whom may be working toward a related degree or arborist certification, but many of whom are the contractors that cut down the tree. The trees identified as "hazard," can be up to 150 and 200 feet from PG&E's right-of-way (ROW)—deep into private property, but frequently without notification of the landowners.

We cannot help but ask, why push EVM? It is most absurd, and you can add this to your comments, since Southern California Edison has already demonstrated through its risk-benefit assessment and thorough testing, that a readily available, steel-core, triple insulated conductor is effective in preventing almost 100% of ignition causes. SCE has proven that it is the antiquated, feeble infrastructure that is the problem, and must be addressed before the system can be considered adequately safe from wildfire. SCE is installing this cable at 3 to 4 times the rate of PG&E's (unspecified) hardening. In addition, SCE states it no longer includes vegetation management in its WMP, but just continues its Regular Vegetation Management. Another safety feature, not yet adopted by PG&E is featured by San Diego Gas & Electric. SDB&E has been installing a version of computerized circuit breakers, a remarkable safeguard whether conductor is bare or covered. PG&E is still "testing," even while there are many tested, proven-effective, affordable (and used throughout Europe) computerized circuit breakers available "off-the-shelf" ready, all from the most respected electronic equipment manufacturers in the world. Why not suggest that SCE's cable and SDG&E's circuit breakers be mandated for all IOU's, as prime examples that the same thing works well in all situations.

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EVM cannot now, nor has it ever, been a reliable or certain way to prevent wildfire. For one thing, it doesn't address the 75% of non-vegetation related ignition causes. For another, it has proven to fail repeatedly, causing fires like the recent Zogg Fire. Why? Because removing trees that inspectors have found hazardous has no guarantee of preventing other trees from falling, or to prevent branches from blowing in from afar to cause arcing or breaking of the line. You have pointed out problems of removing trees. Removing trees actually has the potential of weakening nearby trees, making them susceptible to wind throw (we've seen it). Removing trees opens the area around wires so that, if a tree were to fall from a distance, it has no standing trees impeding its fall, no other trees to cushion its force, so it hits the wires with greater force.

As you so clearly explained, removing trees leaves the area vulnerable to erosion, slope instability, habitat destruction, reduction of property values, destroyed viewshed, and other environmental problems. You explained that removing so many trees exacerbates climate change. You pointed out that removing trees can actually exacerbate wildfire. Be sure to add that removing trees can create long, open wind tunnels that exacerbate a wind-driven wildfire as the wind carries firebrands through the wind tunnels -- until they blast into homes and set them on fire - far ahead of the wildfire itself. This happened in Paradise and in Australia. It is real and should not be allowed – the "cure" is worse than the disease.

An important point that you may want to add is that utility-associated wildfire has rapidly become an emergency situation, and waiting even one more year before addressing these concerns is untenable.

Please consider adding these additional recommendations to your advice to the WSD:

First, mandate that PG&E revisit and adhere to the advice relating to grid safety and vegetation management given by the Office of Safety Advocate that was apparently ignored. Specifically, PG&E should rapidly replace the hundreds of miles of antiquated, bare, repeatedly repaired, 6-gauge copper wire – and the bare aluminum wire that corrodes near the ocean -- starting with HFTD.

Please point out that the CPUC is derelict in its duty, as it still allows this wire under CPUC's outdated General Orders. CPUC MUST modernize its inadequate and outdated CODE. It has allowed an extremely unsafe wire to remain legal for far too many decades, -- wire that is prone to arcing and fragile. (Note: PG&E and the CPUC had ignored the OSA's November, 2017 statement that PG&E decided to push for EVM while failing to bother proving it might work, that PG&E had neglected to provide metrics to demonstrate effectiveness in the new EVM plan and approved it in December, 2017. This has resulted in years of fires and environmental destruction -- and PSPS! Much of which could have been prevented.) **Initially, the EVM plan was to remove thousands of healthy, mature trees (previously protected)**, denuding under the lines and beyond the ROW, 15-feet from the wires – creating a 30-foot wide expanse. By declaring PG&E's EVM exempt from CEQA Environmental review, the CPUC failed to expose of all the problems it is now causing and hadn't had demonstrated that upgrading the infrastructure was the better alternative.

Next, please stress that the emergency nature of the situation needs to be recognized, and that it be mandated that PG&E replace a minimum of 2000 miles, or more, of unsafe wire in 2021, and more in each of the following years.

Additionally, mandate that PG&E choose one of the off-the-shelf ready, computerized protective relays that are tested and proven, and begin to install them by the hundreds throughout HFTD. With such high impedance arc fault interrupters, the wires are turned off within seconds of breaking, so they are no longer arcing when they hit the ground - so no fires, no matter what caused the wire to fail.

We are grateful to see that you are advising the Wildfire Safety Division to require stronger oversight of utility technical practices (bravo!) and a greater role for local municipalities in energy policies, which we can envision could help improve the creation of effective, safer microgrids.

It is important that PG&E be required to work with local government liaisons, and have the wherewithal to do so, both during emergencies and in general. The inability of local governments to have an impact on PG&E's activities, specifically

the EVM, has created extremely angry residents and shown a distinct lack of respect for our local county boards of supervisors who are trying to respond to the concerns and complaints and frustrations of their constituents. And, due to the wildfires and PG&E's illegal tree clearing, has created environmental destruction far beyond the fire's impacts. We are very grateful for your strong and effective language in your recommendations regarding these issues.

Thank you for the opportunity to comment.

Respectfully yours,

Nancy B. Macy, Chair

Environmental Committee for the SLV

Valley Women's Club www.valleywomensclub.org

[redacted]

Cost-Benefit Assessment

GOV CODE SECTION 11345 – Reasonable Alternative

GOV § 11346.5(a)(13)

(13) A statement that the adopting agency must determine that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law. For a major regulation, as defined by Section 11342.548, proposed on or after November 1, 2013, the statement shall be based, in part, upon the standardized regulatory impact analysis of the proposed regulation, as required by Section 11346.3, as well as upon the benefits of the proposed regulation identified pursuant to subparagraph (C) of paragraph (3).

(3) (C) A policy statement overview explaining the broad objectives of the regulation and the specific benefits anticipated by the proposed adoption, amendment, or repeal of a regulation, including, to the extent applicable, nonmonetary benefits such as the protection of public health and safety, worker safety, or the environment, the prevention of discrimination, the promotion of fairness or social equity, and the increase in openness and transparency in business and government, among other thing

PHOTO: ***Typical example of antiquated distribution infrastructure in the San Lorenzo Valley*** (Pilger Road, Boulder Creek). Note: several dozen healthy, mature redwood trees were taken down, and dozens of others were limbed ground to sky to "protect" this unsafe-under-any-circumstances wire. (Photo by Paul Norcutt, taken November, 2018, but it's still there.)

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COST-BENEFIT ASSESSMENT OF PG&E'S EXPENDITURES FOR VEGETATION MANAGEMENT
VS BENEFITS OF INFRASTRUCTURE IMPROVEMENTS
March 30, 2021

Addressing PG&E's Unsafe, Unsuccessful and Inadequate Wildfire Mitigation Plan (WMP)

- This paper demonstrates that on a Cost Benefit basis, it is significantly more efficient to replace bare wire conductors, than to spend billions of dollars on vegetation management. Enhanced Vegetation Management (EVM) has a cost greater on a mile-to-mile basis than the replacement cost of bare wire with covered conductors. Here we compare two Utilities, Pacific Gas and Electric (PG&E) and Southern California Edison (SCE), their philosophies of how to handle drivers of ignition and the cost of their solutions. Beyond that, PG&E's projected cost for line replacement of one million dollars a mile is more than double the actual real world cost: Southern California Edison has shown by modernization, that installing covered conductor can be done for $428K per mile. PG&E has proven that performing non-modernized Enhanced Vegetation Management costs $494K per mile.

- PG&E's solution to protect its lines (EVM) only addresses 25% of all ignition drivers. SCE's solution (replacing aging lines with covered conductors) solves up to 90% of all causes of ignition. It is obvious which solution provides greater safety and reliability, while preventing environmental degradation.

- Wildfire safety for a utility is of paramount importance. PG&E's business practices have been failing the mandate to provide a safe and reliable system for decades. This is due to the excessive expense of a program which cannot achieve its stated goals. As a business, its current handling of wildfire mitigation can only be assessed as a long-term failure. PG&E should be addressing all drivers of wildfire ignition; however, the majority of its monies is only going to one, and that pathway is so repeatedly expensive for the protection of bare line conductors, as to guarantee failure.

- This paper is supported by analyses from the Wildfire Safety Division (WSD), the Wildfire Safety Advisory Board (WSAB), the CPUC, this state's other Investor Owned Utilities (IOU's), Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E).

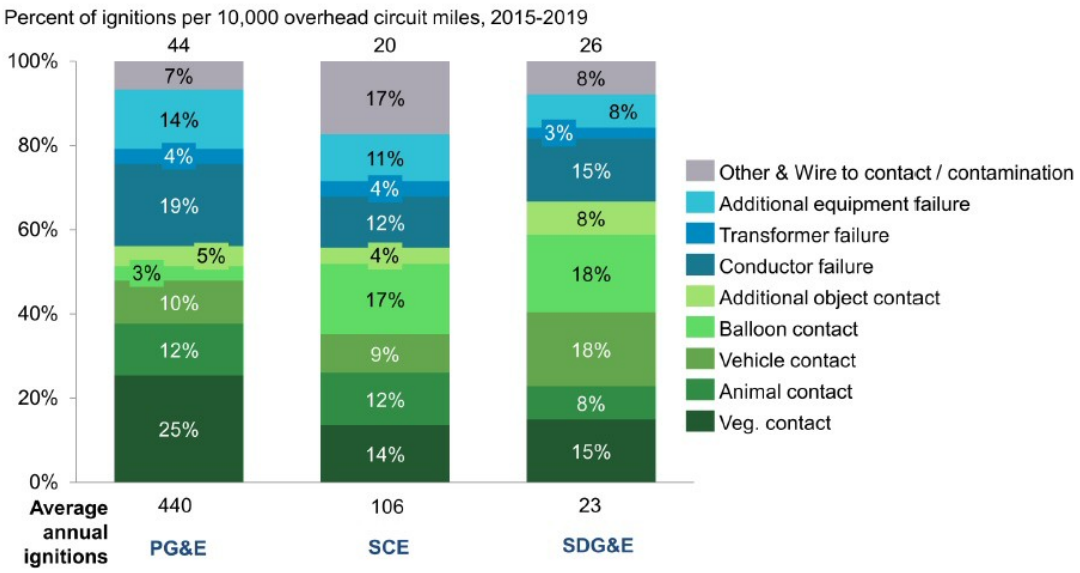
- "PG&E accepts and acknowledges that, with respect to wildfire mitigation measures, there are certain areas in which SDG&E and SCE are more advanced than PG&E."[1] These mitigations are superior to any vegetation management.

- PG&E is spending billions of dollars on a driver that only mitigates 5 fires out of 440 a year, creating a repeatable pathway to bankruptcy while failing to address the real problem (p.3). They are spending huge amounts of money to address a driver of ignition which addresses at most 35% of all ignitions. Compare that with triple layered covered conductor, which addresses a prevention of up to 90% of all ignitions. PG&E for all it does is still left with an aging system.

The charts below are from the ***Wildfire Safety Division (WSD) "Draft Guidance Resolution WSD-002, May, 2020,"*** except Chart 4, 31.1, which is from ***PG&E's "Wildfire Mitigation Plan Report," February 28, 2020.*** What they show is that PG&E's historic narrow focus is a waste of money, and of limited, unproven efficacy in reducing wildfires. WSD charts compare PG&E with SCE and SDG&E.

[1]CASE 3:14-cr-00175-WHA Document 1022 1022.Pitre-and-Campora's-Comments-on-Accuracy-of-PG-E's-Response-(Part-1).pdf Page 45 line 24

Figure 2.6a: Detail: Share of ignitions due to each ignition probability driver (Large utilities)



Note: Conductor failure includes conductor failure (as reported), splice, clamp and connector. Other includes wire to wire contact / contamination.

Source: Tables 11a and 11b from utility WMPs and data request normalized by data from Table 13 of utility WMPs; SDG&E equipment failure numbers adjusted to address inconsistencies in subtotal calculations provided. Since SDG&E has less than 10,000 overhead circuit miles, its average number of total annual ignitions per 10,000 circuit miles is greater than its average number of total annual ignitions.

Chart 1: ***Wildfire Safety Division (WSD) "Draft Guidance Resolution WSD-002" (336461968.pdf), p.118, May, 2020***

Chart 1 shows sources of ignition, *with only 25% attributed to vegetation contact by PG&E*. It shows that PG&E's vegetation ignitions are almost double versus the other IOU's. Most ignitions are within PG&E's forested regions, where thousands of circuit miles are antiquated bare copper wire. (Liberty Consulting Group, *Study of Risk Assessment and PG&E's GRC, May 6, 2013)* We don't know how many of their ignitions are from failed splices igniting ground vegetation but that may be reflected in the Conductor Failure numbers. Pictures from the Tubbs Fire show initial cause was not trees catching fire, but the grass along the highway, something arc-fault interrupters (computerized circuit breakers) would have handled, even with antiquated conductor. Steel-core, triple insulated cable would have prevented ignition in the first place.

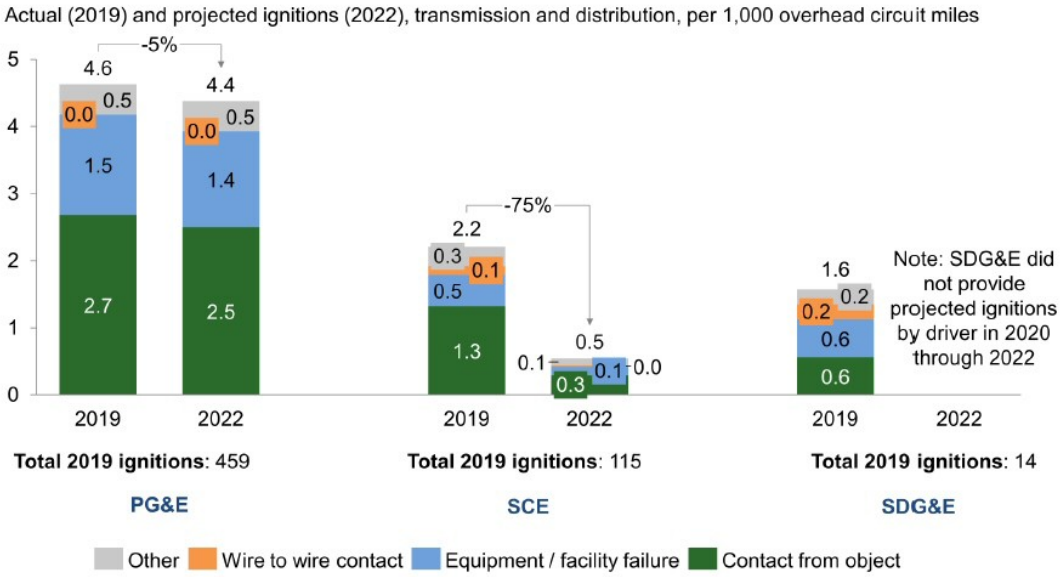
In analyzing PG&E's section of the chart, you will see that 75% of the ignition drivers are unrelated to vegetation. The effort to control Vegetation Contact through Enhanced Vegetation Management (EVM) and expanded inspections, is taking over $1.45 billion annually, while only reducing ignitions by an average of 5 per year out of 440. This is less than a 5% improvement *over three years*, while being ineffective for any other ignition causes. (See following Charts.)

Yet, the WSD and the CPUC are allowing PG&E to continue in this manner rather than requiring alternative solutions, specifically upgrading its systems. Such upgrades must be effective on all on all ignition drivers, this is being better accomplished by the two other major IOU's and include the following: replacing bare distribution cable with steel core, triple insulated conductor (as done by Southern California Edison (SCE)), the installation of computerized circuit breakers for immediate protection from arcing broken cable (as done by San Diego Gas & Electric (SDG&E)), or even installing spacer wire for significantly improved strength and safety at relatively lower cost (about $100,000/mile, plus installation, per Hendricks Spacer Cable and Services for Norman Utilities LLC in New Hampshire).

SCE has committed to replacing all its distribution cable at a rate of over three times PG&E's Wildfire Mitigation Plan (WMP). SDG&E has greater than 60% of its system underground, hence the very low Average Annual Ignitions; it went underground rather than replacing miles of wires. Significantly, in contrast to PG&E, they are rapidly installing computerized circuit breakers to improve their safety on the remaining 40% of its system.

CHART 2 NEXT PAGE

Figure 2.7a: Actual and projected ignitions for top ignition drivers, 2019 and 2022



Note: Projections assume WMP implementation acording to plan and weather pattens consistent with 5 year historical average. See the 2020 WMP Guidelines for further detail.

Small utilities populated Table 31 either not at all or with all zeroes. Specifically: Horizon West Transmission left it blank as it did not yet have operational facilities when it submitted its 2020 WMP; Trans Bay Cable and Bear Valley Electric Service reported anticipating no ignitions (having seen no ignitions in the past 5 years); Liberty did not populate Table 31; PacifiCorp reported only a general reducing trend anticipated with no discrete data available.

Source: Tables 11a, 11b, 31a, and 31b from utility WMPs and data requests; SDG&E equipment failure numbers adjusted to address inconsistencies in subtotal calculations provided by SDG&E.

CHART 2 shows a meager 5% reduction in projected ignitions by PG&E under its vegetation focused plan. Worth noting, PG&E will be spending over $4 billion in the period between 2020 and 2022, for vegetation management alone (see Resource Allocations, Chart 4). Thus, it takes $1.3 billion per year to achieve a reduction of barely 5 fires per year, out of 459 projected fires per year. Southern California Edison (SCE) is projecting a 75% reduction in the 2019-2022 period. That is reduction of 86 fires out of a current level of 115 per year. San Diego Gas & Electric (SDG&E) has 14 total ignitions per year, currently. This is the result of over 60% of their system circuits being undergrounded, hardening of their overhead wires, and on-going installation of arc fault interrupters (computerized circuit breakers).

This failure guarantees that PG&E will be forced to depend upon Public Safety Power Shutoffs (PSPS) to protect its antiquated system. PSPS, however, is not the answer they thought it could be, as demonstrated by the January 18-19, 2021 fires and lengthy outages caused during the high winds in the Santa Cruz Coastal Mountains, in spite of PSPS in the area. (https://sanfrancisco.cbslocal.com/2021/01/19/fire-santa-cruz-county-evacuations-aptos-hills-larkin-valley/)

CHART 3, NEXT PAGE

TABLE 31-1: CHANGE IN DRIVERS OF IGNITION PROBABILITY TAKING INTO ACCOUNT PLANNED INITIATIONS, FOR EACH YEAR OF PLAN – DISTRIBUTION

Incident type by ignition probability driver	Detailed risk driver	Are near misses tracked ?	Number of incidents per year				Average percentage likelihood of ignition per incident			Number of ignitions (mitigated)			
			2019 (Actual)	2020	2021	2022	2020	2021	2022	2019 (Actual)	2020	2021	2022
Contact from object	All types of object contact	Y	13,434.00	13,094.17	12,788.32	12,513.05	1.88%	1.88%	1.88%	253.00	246.60	240.84	235.66
	Animal contact	Y	2,072.00	2,034.33	2,000.42	1,969.91	3.19%	3.19%	3.19%	66.00	64.80	63.72	62.75
	Balloon contact	Y	464.00	464.00	464.00	464.00	3.02%	3.02%	3.02%	14.00	14.00	14.00	14.00
	Vegetation contact	Y	8,167.00	7,807.10	7,483.19	7,191.67	1.44%	1.44%	1.44%	118.00	112.80	108.12	103.91
	Vehicle contact	Y	1,835.00	1,835.00	1,835.00	1,835.00	2.02%	2.02%	2.02%	37.00	37.00	37.00	37.00
	Contact from Object - Other	Y	896.00	896.00	896.00	896.00	2.01%	2.01%	2.01%	18.00	18.00	18.00	18.00
All types of equipment / facility failure	All types	Y	13,031.00	12,835.54	12,659.62	12,501.29	1.07%	1.07%	1.07%	140.00	137.90	136.01	134.31
	Capacitor bank failure	Y	70.00	70.00	70.00	70.00	10.00%	10.00%	10.00%	7.00	7.00	7.00	7.00
	Conductor failure—all	Y	3,382.00	3,328.60	3,280.54	3,237.29	2.25%	2.25%	2.25%	76.00	74.80	73.72	72.75
	Conductor failure—wires down	Y	1,593.00	1,593.00	1,593.00	1,593.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Fuse failure—all	Y	345.00	345.00	345.00	345.00	0.58%	0.58%	0.58%	2.00	2.00	2.00	2.00
	Fuse failure—conventional blown fuse	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lightning arrestor failure	Y	130.00	130.00	130.00	130.00	3.08%	3.08%	3.08%	4.00	4.00	4.00	4.00
	Switch failure	Y	189.00	179.55	171.05	163.39	2.12%	2.12%	2.12%	4.00	3.80	3.62	3.46
	Transformer failure	Y	3,962.00	3,905.40	3,854.46	3,808.61	0.53%	0.53%	0.53%	21.00	20.70	20.43	20.19

5-279

CHART 3 This is PG&E data from their 2020 Wildfire Mitigation Plan. (The WSD has based Chart 2 on this data.) Look closely at the *Contact from Object* section, and the "Number of Ignitions (Mitigated)" column. Subtract the number of ignitions projected each year from the year before to reach the average 5 mitigations per year), at a cost of over $2 billion per year. NOTE THE OTHER TYPES OF EQUIPMENT AND THEIR PROJECTED FAILURES: balloon and animal contacts, though less frequent, have double the likelihood of causing a wildfire than "vegetation." (Further note that the "Conductor Failure-wires down" data is the same for four years, and then "Not Available" (NA) after that because PG&E's record keeping is not granular enough. (Poor record keeping is an on-going problem with PG&E's data.)

CHART 4, NEXT PAGE

1.3 Resource Allocation

Figure 3.1a: Overview of total plan spend across utilities (Large utilities)

		PG&E	SCE	SDG&E
Total spend	2019 planned spend	$2,296M	$671M	$255M
	2019 actual spend	$2,999M	$1,557M	$307M
	2020 planned spend	$3,171M	$1,606M	$444M
	2021 planned spend	$3,130M	$1,404M	$445M
	2022 planned spend	$3,247M	$1,501M	$448M
	Total planned spend as for 2020, 2021 and 2022, as reported by utility	**$9,548M**	**$4,511M**	**$1,336M**[1]
Normalized spend	Total planned spend for 2020, 2021 and 2022 per overhead HFTD circuit mile	$307K	$318K	$291K

1. Totals for SDG&E include a calculation error on the part of SDG&E in which the sum of the reported spend for 2020, 2021, and 2022 is not equal to the reported total 2020-2022 planned spend. This error has not been corrected by the WSD in this table.

Note: "M" stands for millions, "K" stands for thousands.

Source: Tables 21-30 from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs

CHART 4 ***The cost per overhead High Fire-Threat District (HFTD) circuit mile***

Even though the amounts are almost the same, there is a great difference. PG&E is spending empty calories for its EVM, amounting to billions of dollars, but not adding worth to its physical system. SCE on the other hand, is hardening its system, adding worth year after year. Even more interesting is that SCE has recently published an estimate of how much it costs to steel core-triple insulate its lines --$428K per mile. This is far less than PG&E's claimed costs. It is an investment which will pay off for SCE in the coming decades, with far less maintenance cost coupled with greater safety, including wildfire protection, fewer electrocutions, and protection from all causes of ignitions -- and they are justifiably proud of it. Another way to look at this, PG&E's Table 3.4b (p.6) shows that Enhanced Vegetation Management (EVM) costs consumes 24 percent of PG&E's total spend. That works out to 24/28 or 86 percent PG&E's total allocation for "Vegetation management and inspections" . The result is 86% of total expenditures for Vegetation Management are being spent for a mitigation of a 25% ignition driver., Vegetation Contact (Chart 1).

For 2020, PG&E completed 1878 EVM miles (p.7). If PGE had kept to its budget, EVM cost per circuit mile would have been $3,171M x .24/(1878 circuit miles) =$405K/circuit mile. But PG&E didn't keep to its budget.

CHART FIVE, NEXT PAGE

Figure 3.4b: PG&E resource allocation detail for top 4 categories by planned spend

Total plan spend is shown for 2020-2022 plan period as calculated by utility

Category	Total Category Planned Spend	Category spend as percent of total planned spend	Top 3 initiatives by planned spend in category Initiative names as reported in WMP	Initiative spend as percent of total planned spend
Grid design and system hardening	$5.1B	53%	17-1. System Hardening, Distribution	17%
			15. Transmission tower maintenance and replacement	10%
			6. Distribution pole replacement and reinforcement, including with composite poles	7%
Vegetation management and inspections	$2.6B	28%	15. Remediation of at-risk species-Enhanced Veg Mgt.	15%
			2. Detailed inspections of vegetation-Distribution	6%
			9. Other discretionary inspection of veg. around distribution lines and equipment, beyond those required by regulations	3%
Asset management of inspections	$499M	5%	1. Detailed inspections of distribution electric lines/equip.	3%
			2. Detailed inspections of transmission electric lines/equip.	2%
			15-1 Substation inspections - Transmission Substation	0%
Grid operations and protocols	$788M	8%	5-1. PSPS events and mitigation of PSPS impacts-Distribution	4%
			5-3. PSPS events and mitigation of PSPS impacts - Additional PSPS Mitigation Initiatives, Distribution	2%
			2. Crew-accompanying ignition prevention and suppression resources and services	1%

Note: "M" stands for millions, "B" stands for billions.

Source: Tables 21-30 of utility WMP

CHART 5 shows PG&E's vegetation planned spend is 28% of total spend for years 2020-2022. Grid design and system hardening is 53% of planned spend. This value is in light of what actually has been accomplished, which is deeply disturbing. For decades, PG&E has consistently specified vegetation management as solution to their problems. Hence, it fails the mandate to provide a SAFE and RELIABLE system. Instead, with a system of bare wires, antiquated age, and thousands of pole attachments and line splices which will necessarily fail, it spends millions annually removing healthy, mature trees at enormous cost and enormous environmental damage, for little benefit. It is certainly not an upgrade to a modern system.

Not only has PG&E's 53% hardening expense been equaled, it is woefully short of SCE's 70% projected spending and conductor replacement mileage in the same period. PG&E's monies allocated for 2000 miles in this period, have resulted in 370 miles of hardening with covered conductors in 2020, and even that low figure is debatable. The difference between what they claim in their rate case (2,000) and their actual (370), is systemic in their language in a multitude of documentation. **The percentage of cost for vegetation management by PG&E is 6 times that of SCE. In contrast, PG&E's percentage spending on system hardening is not only significantly less than the other large Investor Owned Utilities (IOU's), it fails to prioritize modernization of its system by replacing bare line conductors (with less than 400 miles planned yearly for replacement, almost half of SCE's projected mileage).**

Calculated Cost per Mile for Enhanced Vegetation Management and Enhanced Inspection

Note	Amounts	Reference found Online
1.	$2645M	Total Vegetation Maintenance and inspection Figure 3.3a in 336461968.pdf
2.	$229M	Routine VM (RVM) projected spend for full year 2020 in ELEC_5951-E.pdf
3.	$319M	EVM (Enhanced Vegetation Management) full year in ELEC_5951-E.pdf
4.	$416M	EVM spend by end of August 2020 in ELEC_5951-E.pdf
5.	$494M	RVM spend by end of August 2020 in ELEC_5951-E.pdf
6.	1878	EVM miles completed by end of 2020 in 2021-Wildfire-Safety-Plan.pdf
7.	15%	Remediation of at-risk species EVM Figure 3.4b in 336461968.pdf
8.	6%	Detailed inspection of vegetation Figure 3.4b in 336461968.pdf
9.	$1451M	Total Cost of VM by end of 2020 in 2021-Wildfire-Safety-Plan.pdf

$229M + $319M = $548M (Total projected spend for RVM and EVM 2020) [2][3]
$548M x 3 =$1644M (Total cost for 3 year period for RVM and EVM 2020-2022)

$2645M - $1644 =$1001M (cost for 3 years of vegetation inspection, non-VM) [1]
$1001M/3 =$333M (spend per year for vegetation inspection)

8/12 =.67 (67, percent of months in the year-to-date, as of end of Aug. 2020)

$416M = Real cost reported for Enhanced Vegetation Management as of August 31 [4]
$494M = Real cost reported for Routine Vegetation Management as of August 31 [5]

$416M/.67 =$621M (new projected cost of EVM for whole year) [4]
$494M/.67 =$737M (new projected cost of RVM for whole year) [5]

$621M + $737M = $1358M (Total new projected cost for RVM and EVM as of December 31)
$1358M/$548M = 2.48 (ratio of overspending for RVM and EVM)

$621M/$1358M = .46 (46 percent of projected cost for EVM)
$737M/$1358M = .54 (54 percent of projected cost for RVM)

$1451M = Total VM as reported in 2021-Wildfire-Safety-Plan[9]
1.068 =Ratio of estimated to reported VM ($1451M/$1358M)
1878 =(EVM, Crews completed 1,878 miles in 2020)[6]

6%/15% =.40 (ratio of spend for inspection of EVM and EVM cost)[7][8]

$663M = 1.068 * $621M (ratio of estimated to real, times estimated EVM)
$265M = $663M x .40 (calculated enhanced inspection spend as a percentage of EVM)

$663M + $265M = $928M (Total spend for EVM and enhanced inspection for 2020)

$928M/1878 miles = $494K/mile (spending per mile for EVM and enhanced inspection for 2020)

Conclusion from Charts

Vegetation Management (VM) costs 28% of the monies of PG&E's Wildfire Mitigation Plan (WMP). Vegetation Contact is responsible for 25% of ignitions, **75% of known causes of ignition are not addressed by PG&E's VM** (see Chart 1, p.2). On-going total vegetation management costs are an unnecessary waste of funds when bare line conductors are not replaced. PG&E has historically fought modernization.

Additional Documented Cost-Benefit Arguments

Excessive Vegetation Management (VM) Expenditures

From: https://www.pge.com/en_US/safety/electrical-safety/safety-initiatives/system-inspections.page
"In 2020, we plan to inspect more than 15,000 miles of electric lines, including all lines in Tier 3 areas and one-third of lines in Tier 2 areas. We inspect infrastructure in non-high fire-threat areas at least every five years.

PG&E's data is manipulated to confuse. Even so, it is obvious that its vegetation management costs are out of control. In PG&E's *Advice 5951-E, October 20, 2020* (to the CPUC), it admits to massive overspending for *total* vegetation management (VM). Its projected total for VM expenditures for 2020 was $548M.

"The GRC Settlement Agreement, if approved, would adopt an expense amount of $548M for Vegetation Management costs in 2020, including both Routine VM and EVM activities: Routine VM $229M EVM $319M = $548M"

However, their Enhanced Vegetation Management (EVM) costs alone, *through August, 2020,* came to $416M. Combined with the additional $494M spent, in that time, for Routine Vegetation Management (RVM), the total spent far exceeds the projected costs for a year. EVM costs for a full year, at the same pace, would reach $621M; RVM would reach $737M. The grand total reaches $1358M versus real reported $1451M (see page 7). PG&E is spending two and a half times what was planned for 2020. **This equates to $494K per mile for EVM for 1878 miles completed for the year.** Place that against Southern California Edison's (SCE) **cost for hardening a mile is $428K for modernization with covered conductors (p.11).** Another important reason for covered conductors, it **reduces fire risk by at least 75% versus at most 35% for EVM.**

These figures strongly challenge PG&E's assertion that covered conductor installation is too expensive and costs over $1,000,000/mile.

Here is where system hardening estimations comes into the calculations, changing EVM to RVM with up to a 5 year maintenance service cycle for covered conductors.

What the calculations show is that costs for System Hardening are less than for EVM and its associated, on-going costs alone. This is a revealing and remarkable cost analysis. The current cost-benefits are abysmal for Vegetation Management, only a 1.4% of their ignitions are mitigated per year (see p.3). For a one-time System Hardening $428K/mile cost-benefits are superior in every way. Costs for System Hardening in Tiers 2 and 3, if accelerated, provide economies of scale for new installations, lead to significant reduction of on-going equipment maintenance costs, and major reductions in all Routine Vegetation Management costs, due to a far-stronger, modern, and a more resilient infrastructure. It also shows a benefit for the environment in saving more than 100 million trees which convert CO2 to Oxygen, helping to mitigate Climate Change, along with fewer fires and a greener environment –as opposed to an EVM which is counter to California's Climate Change laws. The result of a faster deployment of System Hardening, is a safer system, fewer fires and greatly reduced year-after-year costs to rate-payers.

In addition, EVM never ends while failing to significantly reduce wildfire ignitions, leaving PG&E continuously vulnerable to increasing liability and forced usage of Public Safety Power Shutoffs (PSPS) with all its devastating economic impacts.

PG&E's Distorted Information

Importantly, determining these costs required the analysis of data that is not in PG&E's documentation. This is an example of PG&E's typical manipulation of data. The Wildfire Safety Division (WSD) points out in its comments on PG&E's 2019 WMP that there are many areas where PG&E's data is incomplete, conflated or otherwise manipulated. For example, "PG&E reported all inspection types together, providing no basis for comparison of PG&E to its peers by inspection type and making it difficult to determine the effectiveness of PG&E's various inspection types."[4] This meant that it became very difficult to differentiate inspection of individual trees by arborists to determine trees for removal, vs inspection of circuit lines for defects or age and ready to fail –a crucial distinction.

Another paragraph states, "A continuing issue from 2019 that persists in 2020 WMPs is the extensive use of non-committal equivocating language. The prevalent use of equivocating language results in sparse commitment from utilities for achieving the intended goal of WMPs – reducing the risk of catastrophic wildfire posed by electrical lines and equipment."

And "In R.18-10-007, as noted above, the Commission directed the electrical corporations to use metrics that do not simply count trees trimmed or miles of covered conductor installed, but that measure **the effectiveness of these actions in mitigating utility-caused wildfire."**

For PG&E, a 5% reduction of mitigated fires over a 4 year period is not demonstrating the reliability or trustworthiness of its documents and data.

SCE Sets the Standard

Southern California Edison (SCE) is replacing lines with superior covered conductor, with the approval of the CPUC, "the first large-scale deployment of covered conductor in California to harden the distribution system against extreme weather events and designed to reduce wildfire ignition events". Southern California Edison's projected cost for triple covered conductors is $428K/mile. It is cheaper to harden their system which protects over 75% of their circuits from wildfires. Along with their normal vegetation management (no EVM), over 90% of sources of ignitions are addressed. (see p.11)

PG&E Fails to Respond to Emergency Nature of Increasing Wildfires

Touting a meager few hundred miles hardened, while counting on PSPS and massive expenditures on EVM to protect us from wildfire, PG&E's accomplishments don't hold up when the facts are known. PG&E's **Currents** article, "*PG&E Crews Meet the Challenge-- Hardening Infrastructure as They Rebuild in Areas Burned by Wildfires,"* posted on December 2, 2020, is a case in point: "To date, PG&E has completed over 370 miles of hardening work in the field this year –that's 370 miles of more resilient and fire-resistant distribution system."

That statement is not untrue but it is an empty boast. PG&E had set an extremely low goal for distribution cable replacement in its 2019 Wildfire Mitigation Plan (to last through 2021), resulting in a disturbingly minimal number of miles (370) upgraded in 2020, in face of the following facts:

- The number of overhead circuit miles, Figure 1.2a (from WSD Report on 2019 WMP) is 25,921 miles of distribution line in high fire threat areas.
- Add transmission lines of 5,448 miles to make 31,369 circuit miles. Much of these, and their related equipment and poles/support structures are antiquated and severely degraded.
- In "https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M272/K342/272342923.PDF" 2,713 miles of those distribution lines are obsolete bare 6-gauge copper line, critically in need of replacement due to severe deterioration and age. PG&E gives no indication of where the replacements will be installed, nor with what type of cable will be used (i.e. tree wire vs the far superior SCE, cost-benefit-assessed, steel core/triple insulated conductor.).
- In its current 2020-2022 General Rate Case argument, PG&E promises mitigation through Smart Meters software

[4] Resolution WSD-003 WSD/CTJ/gp2 DRAFT

that will "detect downed wires within minutes." However, SmartMeters data won't show if the wires are arcing or broken, and therefore a wildfire ignition point, requiring on-site investigation to determine any hazard and taking unknown minutes to respond. The time taken respond and inspect the site will allow damaged wires to ignite and cause a fire.

- However, with readily available, well tested, off-the-shelf ready computerized circuit breakers, such as arc fault interrupters, that cut the power within a second or so, the danger is eliminated quickly –no matter the cause, whether branch or balloon, vehicle or animal, wind or vandalism. It can even give the precise location to PG&E so it will take far less time to repair.

PG&E 's Slow-moving Infrastructure Improvements

PG&E's failure in planning and prioritizing decision-making is evident in this statement of its *2020-General-Rate-Case-Fact-Sheet-121218.pdf, p.1*: "**Hardening Wires and Poles**: Installing stronger and more resilient poles and covered power lines across 2,000 miles of high fire-risk areas." PG&E obviously wants the CPUC to be impressed by this inadequate number.

Significantly, that 2,000 miles of hardening will take place over three years, while there is a total of 25,921 miles of distribution lines in high-fire threat areas. After 2020, the first year with the increased Rate Case income, PG&E touted replacing 370 miles. (Only about 25,551 miles to go.) In previous documents, PG&E claimed that there are only 7,100 miles of wire that needs hardening and it would take ten years. Later, PG&E stated that there were 2,713 of obsolete bare #6 copper wire conductor in Tier 2 and 3 High Fire-Threat areas. This is out of a total of 22,000 miles of bare #6 copper wire system-wide as presented in CPUC's *Study of Risk Assessment* by Liberty Consulting, 2013). At 2,000 miles in three years, it will be almost a decade to replace that bare copper wire alone, based on PG&E's own information. There are many other unsafe wire types requiring replacement but there is no way to tell what wires PG&E will focus on, nor where, nor how much.

Without major changes in priorities, it will take far more money to "protect" degraded wires over time, by cutting down trees, than replacing the wires would cost. This does not account for the reduction of Routine Vegetation trimming (the 4-foot radial trim requirement) when it is reduced to a 6-inch radial trim with such covered conductor.

See SCE approach to system hardening in pages 3, and next page 11.

From: "SCE 2021 WMP Update.pdf"
"SCE has already seen real-world success from covered conductor. For example, when a vehicle hit a pole and caused energized 16kV covered conductor to fall into adjacent trees, no fault or ignition occurred."

We also learned some success stories of covered conductor that prevented wildfire ignitions from United Power in Colorado, From: "Feb. 27th Workshop SCE Covered Conductor Presentation.pdf"

"United Power has experienced wildfires in years past in the forested area, typically in high elevation of Colorado. To mitigate this issue, United Power installed covered conductor on spacer configuration due to compact right-of-way. United Power received a notification from the forest services tree fall on line after a wind storm on Fall 2018 United responded to the site and removed the tree, found the covered conductor intact, with no interruption or wildfire ignition. The manager at United Power reflected that this wind storm event would have resulted in a wire down event, and possibly a wildfire ignition if the tree fell on bare conductor span."

Southern California Edison (SCE) is replacing lines with superior covered conductor, with the approval of the CPUC, "the first large-scale deployment of covered conductor in California to harden their distribution system against extreme weather events and designed to reduce wildfire ignition events," as this article explains:

CPUC Oks the Largest Rollout of Covered Conductor
Modern Insulated Lines More Effective Than Traditional Tree Wire Proponents Say
By Hudson Sangree
April 21, 2020
RTO Insider

The California Public Utilities Commission on Thursday approved Southern California Edison's ambitious plan to install nearly 600 miles of covered conductor to prevent its higher-voltage distribution lines from starting wildfires. The move comes after devastating utility-sparked fires swept Northern and Southern California in 2017 and 2018, causing the state and utilities to rethink prevention efforts.

Covered conductor, with layers of insulation to protect it from sparking vegetation, is one of the main tools that utilities plan to use in fire-prone areas.

SCE's Wildfire Covered Conductor Program would replace bare wires with insulated ones across a sizable slice of its service territory. This is the first large-scale deployment of covered conductor in California to harden the distribution system against extreme weather events and designed to reduce wildfire ignition events.

Administrative Law Judge Robert Haga wrote in a proposed decision that the commission adopted unanimously, without discussion as one of the items on its consent agenda. In its ruling. the commission accepted a settlement between its Public Advocate's Office consumer groups and SCE, granting the utility more than $407 million for its Grid Safety and Resiliency Program, including nearly $285 million to install 592 circuit miles of covered conductor representing about 6% of SCE's primary distribution lines (typically rated at 12 to 16 kV) in high-risk fire areas.

SCE estimated a cost of $428,000 per circuit mile, including replacing wooden poles with stronger composite ones and installing fiberglass crossarms as needed.

High-voltage transmission lines have been blamed for sparking some of the worst fires in recent years. including the 2018 Camp Fire, the state's deadliest and most-destructive blaze. A Pacific Gas and Electric line fell from a broken C-hook, igniting dry vegetation, state fire investigators found.

Distribution lines have been less prone to starting major fires. But SCE said that from 2015 to 2017, its distribution lines in high-risk regions sparked at least 132 fires large enough to report to the CPUC. The utility said 22 of the fires were started by lines contacting vegetation. more than any other identifiable cause. “All else [being] equal, there was a relatively greater likelihood that a vegetation-related fault was ultimately associated with a fire event” SCE said in *written testimony* to the CPUC in September 2018 that urged it to approve rate increases to fund its fire-prevention efforts, including covered conductor.

SCE said the covered conductor now used is a big improvement over traditional tree wire that had one layer of low-density polyethylene insulation. Today's wire, the new standard, has three layers, an outer coating of high-density polyethylene, an inner wrapping of cross-link polyethylene, and a semi-conducting sleeve wrapped around aluminum or copper wires. The old covered conductor was heavy, required careful handling to avoid damage, and reduced load capacity because it heated up without the cooling properties of bare wire. It also was subject to degradation from the sun's ultraviolet rays. SCE said.

The new insulated conductor is lighter but still weighs more than bare wire. It catches the wind because of its added bulk and needs stronger poles and cross arms. It also takes longer to install, said Brian Wilbur, electrical service manager with the Los Angeles Department of Water and Power. Wilbur made his case in a separate meeting Wednesday of the CPUC's Wildfire Safety Advisory Board. a group created last year to advise the commission's new Wildfire Safety Division.

Wilbur said LADWP is using covered conductor in high fire-risk areas. "Covered conductors or tree wire is certainly nothing new to the industry,” Wilbur said. "But the advancement of the technology used today has made tree wire a

viable solution in a lot of areas. The old tree wire that we used —that we've had in the systems for a long time —was heavy. required more robust construction techniques, had reduced loading capabilities and was very difficult to work with. Today's tree wire is essentially a stronger construction material, and a lighter installation available on these conductors is becoming a great solution where other mitigating measures are not possible."

"Covered conductor is being used with along with vegetation management, composite poles, fiberglass crossarms and other measures", he told the board. "The conductor adds an additional layer of safety." he said. "One of the major things that we learned from the past wildfires is that even the most thorough vegetation management plan may not prevent branches from being blown into lines from an untrimmed palm tree on private property 50 feet away from our lines", Wilbur said. "They can still dislodge, blow long distances and wreak havoc on our system." **"Covered conductors and resilient construction materials are critical in the high-fire-threat area …" prevent these hazards" he said.**

End-of -article.

Prepared Testimony in Support of Southern California Edison Company's Application for Approval of Its Grid Safety and Resiliency Program – Annotated (September 10, 2018, p. 35)

"Given the significance of contact from objects as a cause of fire ignitions, SCE evaluated a number of potential risk mitigation measures focused on: (1) reducing the population of potential objects (i.e., reducing tree branches, metallic balloons, animals, etc. near overhead lines); and (2) **designing the system to be able to withstand such contact without leading to a fire ignition.** Regarding the first approach, enhanced vegetation management practices can further reduce the likelihood that vegetation will contact overhead distribution system by increasing clearances and removing even more trees. **But this approach has limitations, including the utility's limited ability to increase clearances in certain areas, the fact that wind can often blow debris into lines from significant distances despite appropriate clearances to nearby trees, and that taller trees can fall onto lines even when located well outside of the utility's right of way. Thus, SCE also evaluated mitigation measures focused on the second approach (withstanding contact), concluding that covered conductor is the most feasible mitigation solution for fault and ignition prevention.**"

Respectfully submitted,
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