

**Before the Public Utilities Commission
of the State of California**

Order Instituting Rule Making to Implement
Electric Utility Wildfire Mitigation Plans
Pursuant to Senate Bill 901 (2018)

Rulemaking 18-10-007
Filed October 25, 2018

**Comments Addressing the Wildfire Safety Division Draft Action Statement on
Pacific Gas and Electric Company's 2020 Wildfire Mitigation Plan
(Resolutions WSD-002 and 003) Conditional Approval**

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May 26, 2020

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Introduction

This letter is in addition to my comment letter addressing PG&E's 2020 Wildfire Mitigation Plan. I focus on the issues I regard as most urgent for fire safety. These are: (1) An inventory of the types (gauge, composition, insulation or lack thereof), ages, and failure rates of the cable and wire in PG&E distribution voltage inventory of conductors. (2) Technological circuit safety innovations and where, and how quickly they will be employed, and what criteria will be used to select the circuits to be updated most quickly. (3) The Commission and the Division must finally assert their authority aggressively, especially in regard to PG&E. (4) PG&E's false characterization of my prior comments. (5) How many circuit miles will eventually be upgraded. (6) Correcting the distinction between maintenance repairs and system hardening. (7) Addressing vegetation management and inspections. (8) The Risk Spend Efficiency of EMV.

1. BACKGROUND, Page 2.

Resolution WSD-002

“Building on lessons learned from the WMP review process in 2019, WSD developed and required all electrical corporations to conform their WMPs to a set of new WMP Guidelines starting in 2020. In a change from the Commission’s 2019 process, the WMP Guidelines add requirements on detail, data, and other supporting information, as discussed in detail below. The WMP Guidelines are designed: 1) to increase standardization of information collected on electrical corporations’ wildfire risk exposure; 2) to enable systematic and uniform review of information each electrical corporation submits; and 3) to move electrical corporations toward an effective long-term wildfire mitigation strategy, with systematic tracking of improvements over time.”

Comment:

There is a fundamental issue not addressed in the PG&E 2020 WMP. The Wildfire Safety Division addresses this in 6.3. (inserted below). None of the references to distribution voltage equipment in PG&E’s WMP specify any details of the type, age and failure rate of the various types of conductors (wire and cable) in use. It is unclear if PG&E possesses such information. Any effective assessment of how to improve wildfire ignition safety must include an inventory of the conductor in service. Only with this information is it possible to prioritize the rapid replacement of the most failure prone conductors.

“6.3. BASELINE IGNITION PROBABILITY AND WILDFIRE RISK EXPOSURE

- ii. List the specific locations and assets that are most likely to experience conductor failure based on:
 - (1) the root cause analysis,
 - (2) attributes of PG&E’s conductors (*i.e.*, age, type, condition, etc.) and
 - (3) other relevant factors (*e.g.* peak wind speeds); and...”

Comment:

There can be no more useful or important metric than “(2) attributes of PG&E’s conductors (*i.e.*, age, type, condition, etc.)” for determining safety improvements to reduce fire ignition and conductor failure. Conductors are the most fundamental component of any electric power supply system. Effective root cause analysis is fundamental, but such analysis relies upon knowing what type of conductor is involved in any failure of safety performance.

This matter is designated as a Class C Deficiency *i.e.* PGE-3 High incidence of conductor failure.
6.2. METRICS AND UNDERLYING DATA (page 21).

I disagree with the designation of “Class C”.

Class C is defined “as gaps in baseline or historical data, as required in 2020 WMP Guidelines.” On the other hand, Class A gaps are defined as “aspects of the WMP are lacking or flawed.” PGE-3 is a Class A deficiency in PG&E’s 2020 WMP. Without a distribution conductor inventory, including locations, ages, type, voltages and so forth, a utility cannot prioritize the cable that needs to be replaced most urgently.

To illustrate I refer back to a CPUC commissioned report from 2013. My point here is to demonstrate how both the California Public Utilities Commission, historically as an institution, and now the new Wildfire Safety Division, process repeatedly though major issues over time without addressing the solutions that were available at various past steps in a years long administrative review process. The Wildfire Safety Division is of course a recent addition to this historic timeline and as such it is not responsible for the Commission’s administrative history. Nevertheless at this point the WSD becomes part of this record.

This matter of conductor types etc. was addressed for the Commission in a May 6, 2013 GRC report from the Liberty Consulting Group titled "Risk Assessment and PG&E's GRC" presented to the Safety and Enforcement Division. This report was cited by the Office of the Safety Advocate to the Commission on more than one occasion during the 2019 WMP development. The last I am aware of was signed by Chris Clay on March 17, 2019

On page S-7 of this Liberty Consulting Group document one finds:

"6. PG&E should consider the addition of an "infrastructure sustainability risk" to its enterprise risks. For example: **"The risk that infrastructure deteriorates (due to age and/or other factors) at a pace and to an extent that makes future recovery prohibitively expensive."**

"3. Distribution Conclusions (page S-10)

1. Several aspects of the PG&E distribution system present significant safety issues, including especially:

- The ungrounded 12,470 volt three-wire system that serves as the predominant 12 kV Configuration.
- PG&E employs about 22 thousand miles (approximately 20 percent of primary voltage overhead distribution conductor) of obsolete #6 copper.
- PG&E also has 47,542 miles of #4 Aluminum Conductor Steel Reinforced (ACSR) conductor on its distribution system. Corrosion issues make this conductor no longer recommended for use in coastal areas. "

"6. LOB-Specific Conclusions - Electricity Distribution" (page 23-24)

"Several aspects of the PG&E distribution system present significant safety issues for the Company:

- The ungrounded 12,470 volt three-wire system that serves as the predominant 12 kV configuration. Very few utilities use similar three-wire systems. They cause downed lines often to remain energized until a dispatched PG&E Troublemaker can respond on site.
- PG&E employs about 22 thousand miles (approximately 20 percent of primary voltage overhead distribution conductor) of obsolete #6 copper. The small size of this once popular conductor makes it comparatively more subject to breakage as it ages.
- PG&E also has 47,542 miles of #4 Aluminum Conductor Steel Reinforced (ACSR) conductor on its distribution system. Corrosion issues make this conductor no longer recommended for use in coastal areas.”

Comment:

The importance of rapidly replacing outdated obsolete, age and corrosion degraded wire and cable with modern, fully insulated and strong cable is fundamental to utility wildfire safety. The Commission and the WSD err by failing to take on this issue directly and without further delay. This matter can no longer be relegated to an endlessly elaborate process. The CA PUC is a regulatory agency at the center of an expanding crisis of utility wildfire ignitions and Public Safety Power Shut Off (PSPS) events.

Discussion of WMP Assessment**Summary**

Initiatives [Innovative Technologies] page 5.

“While PG&E’s approach to piloting innovative technologies to detect system problems that can lead to ignitions is promising, PG&E does not describe in detail a concise review period to determine if these technologies are effective and scalable or outline a detailed plan for deploying these technologies at scale. The WSD expects the 2021 WMP update to include a detailed report on the status of these initiatives. It is imperative that PG&E makes

a meaningful reduction in the scale and scope of PSPS for the 2020 fire season and beyond.”

Comment:

The CPUC has failed to address this and related outdated infrastructure problems. The General Orders remain silent regarding crucial components of a fire safe electrical grid. I am hopeful that the WSD is in a position to correct these problems. PG&E, in a random manner, provided vague references to several technological advances in circuit safety relay and switch gear designs that, when finally installed and operational, will dramatically increase the fire safety of electric power circuits. But PG&E did not state what, when, or where they will install any of the gear they reference, nor what criteria they will use to select the circuits that need updating first.

The Commission, as an agency and institution of state government, errs in its long standing apparent deference to PG&E in regard to what the company may or may not do. PG&E is legally culpable for the dangerous, degraded and outdated equipment it retains in use.

Commission staff told me that the Commission does not wish to micromanage the power utilities. Especially in the case of PG&E, the Commission has no choice. PG&E has forced the issue with its decades of neglect. Along with specifying new classes of circuit protection, the WSD and the Commission must require the rapid phase out of the old, obsolete equipment used by PG&E. The Commission possesses all the legal authority and access to expertise necessary.

PG&E is not an electrical engineering research and development company. It is the customer of companies that design and build the components PG&E then uses in its grid. I have, on two occasions, provided to the Commission (and now the WSD) specific references for the advanced safety relays and circuit monitoring systems that are available on the international electrical

engineering market. These development laboratories and manufacturers have equipment available today to solve the utility wildfire ignition problem.

Southern California Edison has led the way in selecting and installing triple insulated, steel reinforced, distribution circuit cable. San Diego Gas and Electric has undergrounded 60% of its distribution circuit miles and engaged with Schweitzer Engineering to test and install synchrophasor based protection relays that have millisecond reaction times to safety shutdown.

High impedance arc fault interruption relays have been available for years. These can protect branch circuits when mounted on power poles, and in some cases can be integrated with certain recloser designs. These computerized safety relays can also be installed in substations to protect entire feeder circuits. These fully developed and highly effective safety devices have yet to be installed by PG&E despite a proven record of effectiveness in de-energizing broken / fallen conductors that remain energized and flash arcing to earth. Virtually every type of dangerous electrical fault can now be detected instantly by these computer integrated systems.

Below inserted are PG&E's comments upon the letter from Kevin Collins contained in their document published April 16, 2020, "Reply Comments On the 2020-2022 Wildfire Mitigation Plan of Pacific Gas and Electric Company (u 39 e).

"D. Kevin Collins

Mr. Collins comments address in a very high-level way a number of system hardening issues. For example, Mr. Collins states that non-exempt fuses create higher wildfire risk.²⁰ PG&E agrees and thus is making efforts to replace the remaining non-exempt fuses.²¹ Mr. Collins also quotes a number of emerging technologies that PG&E is testing and offers a sentence or two of commentary on each of these technologies.²² PG&E agrees with Mr. Collins that many of these technologies require further review and testing, which is why they are listed as emerging. As additional data becomes available,

the efficacy of these technologies and whether they should be more broadly implemented can be considered.”

Comment:

PG&E selectively chose two of several fundamental issues addressed in my letter commenting to the Wildfire Safety Division upon PG&E’s 2020 Wildfire Mitigation Plan. PG&E uses the curious term “very high-level” when referring to these comments. PG&E has inverted the meaning of both of the comments they selected.

When discussing expulsion fuses, I pointed out that: “The fact that such clearly dangerous fire igniting equipment has remained in service so long after CalFire / CDF’s determination of a fire hazard is another indication of the outdated and obsolete nature of so much of PG&E’s infrastructure.” PG&E’s characterization of this statement was: “For example, Mr. Collins states that non-exempt fuses create higher wildfire risk.²⁰ PG&E agrees and thus is making efforts to replace the remaining non-exempt fuses.”

In regard to recent technological advances in circuit safety, PG&E states: “PG&E agrees with Mr. Collins that many of these technologies require further review and testing, which is why they are listed as emerging.”

On the contrary, I stated: “It is quite odd that the major IOUs in CA all appear to be re-inventing the wheel. The advanced computer operated circuit management and protection equipment that would dramatically improve the fire safety of CA power utility equipment has been through R&D and is available today from the companies above and others that I do not have time to mention. It is the obligation of the Commission to get to the source of this confusion and require the installation of new safety relays and circuit management.”

The WSD and Commission should not to be influenced by these intentionally reversed characterizations of informed comment. Also if the WSD and Commission agree with PG&E that my comments are “very high level”, then they should consult with the Commission’s electrical engineers, who presumably have the expertise to evaluate these matters.

6.5.1. RISK ASSESSMENT AND MAPPING

“Deficiency (PGE-5, Class B): PG&E provides little discussion of how it uses the results of relative risk scoring method.

“On p. 5-274 of its WMP, PG&E provides Figure PG&E 5-26, which depicts relative risk scores as a function of system hardening in HFTD. The figure and supporting narrative indicate that 95 percent of PG&E’s wildfire risk pertains to approximately 5,500 circuit miles in HFTD areas. PG&E’s WMP lacks detail and discussion regarding: (1) how this information was used to prioritize WMP initiatives, (2) how this information was used to target where to implement WMP initiatives, and (3) which and what portion/percentage of its 2020 WMP initiatives are targeted toward these identified 5,500 circuit miles.

Condition (PGE-5, Class B): In its first quarterly report, PG&E shall detail:

“i) Where each of these 5,500 miles are located within its grid, including supporting GIS files;

ii) How this information was used to prioritize WMP initiatives;

iii) How this information was used to target where to implement WMP initiatives;

iv) What percentage of its total planned spend for each of the years 2020-2022 are targeted toward these identified 5,500 circuit miles comprising 95 percent of PG&E’s wildfire risk;

v) What percentage of total vegetation management personnel hours are targeted toward these identified 5,500 circuit miles comprising 95 percent of PG&E’s wildfire risk; and

vi) Its rationale for this level of spend and resource allocation to these 5,500 circuit miles and whether PG&E expects to change its allocation of spend and resources from these 5,500 circuit miles.”

Comment:

I agree with the questions asked by the WSD. But there is a larger issue here in regard to how many circuit miles will eventually be upgraded or “hardened”. The Commission Proceeding that set the stage for R. 18-10-007 produced the utility wildfire hazard map for California and established Tier 2 and 3 wildfire HFTD.

That Commission (and CDF/CalFire) map defined 25,200 circuit miles of PG&E’s service territory as at Tier 2 and 3 risk. In PG&E’s 2019 WMP the company stated that it planned to upgrade 7,100 miles of that 25,200 circuit miles. This reduction down to less than one third of PG&E Tier 2 and 3 circuits was never clearly justified by PG&E, nor assessed by the Commission. Now PG&E asserts that 5,500 circuit miles of the originally mapped 25,200 circuit miles comprise 95 percent of PG&E’s wildfire risk.

Obvious questions arise. Where are the justifications for these progressive reductions in the circuit miles that will eventually be updated or “hardened”, and are they logical? Is PG&E only required to upgrade 5,500 miles? Or is that number still 7,100 miles? The Commission adopted map covers 25,200 circuit miles. Is the Commission now abandoning its own hazard map?

There must be fact based answers to these questions. What evidence has PG&E presented that renders the Commission’s HFTD map now apparently irrelevant? The Wildfire Safety Division is the entity now most directly responsible for unraveling these discrepancies pertaining to what circuits will be rebuilt, hardened, or merely relegated to general non-elevated wildfire risk status, like any other circuit that does not fall with the HFTD.

The Distinction Between Maintenance Repairs and System Hardening

“6.5.3. GRID DESIGN AND SYSTEM HARDENING (Resolution WSD-003)

Failure to disaggregate WMP work from standard maintenance

Each of the large electrical corporations state that programs for cross arms, poles, transformers, transmission towers and similar infrastructure changes that reduce wildfire risk are embedded within standard maintenance programs litigated in GRCs. Therefore, it is difficult to determine whether and how these incrementally impact wildfire risk reduction.

“It is not clear how PG&E is tracking its WMP activities in memorandum accounts if it does not budget for them by type of mitigation. The Commission will scrutinize its memorandum accounts for WMP carefully, and if all costs are simply lumped together or included in general operations and maintenance accounts, PG&E risks failing to provide entitlement to cost recovery.”

Comment:

I wish to thank the WSD for addressing this issue. PG&E has merged these two very different categories. PG&E repair tag work is fundamentally different from “system hardening”. This distinction is crucial for how a General Rate Case Proceeding (GRC) will set utility customer rates in a situation where an electrical grid needs new safety design updating in response to climate change.

A repair tag usually results in an in-kind replacement of existing equipment. This may include (as examples of repairs) corroded leaking transformers, rotting wooden cross-bars, cracked ceramic insulators or replacements of old wood power poles. **These tasks are not system hardening, they are general maintenance.** It will be a mistake if the Commission were to allow

the classification of maintenance repairs as “system hardening”. I am encouraged that the WSD has pointed out this discrepancy.

I have a specific example to illustrate this distinction. PG&E has tagged a number of power poles along the private road where I’m the road association president. When I noticed these repair tags, I contacted PG&E to discuss access for the heavy equipment necessary to replace power poles. The road is narrow, unpaved and extends through a steep mountain canyon. Therefore heavy equipment must be used very carefully so as not to damage the road’s fragile substructure geology. I was informed by the PG&E Division Operations Specialist, Central Coast Division, that she saw listed in her records, various repairs planned for the circuit in my location. I asked if conductor replacement was listed. I was told no. My conversation with this Operations Specialist was clear and understandable. PG&E uses 6 gauge (or #6) copper wire, 0.14 inches in diameter, as the conductor on this circuit. To re-attach bare #6 wire after replacing power poles is **NOT system hardening**. This #6 wire is fragile, filled with compression splices and it is negligent to use this wire anywhere, but especially in a tall forest.

In regard to distribution repair work, PG&E stated in its 2020 WMP the following:

“5.132 PG&E WMP 2020

Wildfire Safety Inspection Program Distribution Repair Work: As discussed in Section 5.3.4, in 2019, PG&E began a Wildfire Safety Inspection Program or “WSIP” to expedite and expand the routine detailed inspections performed in Tier 2 and Tier 3 HFTD areas. PG&E has completed its extensive inspections of overhead electric distribution facilities and substations in High Fire-Threat District (HFTD) areas as part of the WSIP Program. As a result of these enhanced and accelerated inspections, PG&E identified a substantial amount of repair and replacement work to be completed. In 2019, PG&E completed high priority corrective actions created from deficiencies identified resulting from these enhanced inspections, and will complete the lower priority tags over the next three years. Completion of lower priority tags are prioritized based on location and potential wildfire

risk. This wildfire risk is based upon a failure mode and effects analysis, historical asset ignition analysis, wildfire spread and consequence, and egress for each maintenance tag.”

The Wildfire Safety Division and the Commission must not allow these general repairs to be misconstrued as “system hardening”. These two categories of work are very different and must be considered separate activities. The repairs planned on my road are likely consistent with those in similar rural and mountain locations considering that PG&E has stated its intent to install covered conductor on only 240 circuit miles of its system in 2020. I do not understand why PG&E would not replace the conductor here when they will have the lineman and most of the equipment necessary for conductor replacement already on site. I filled adjudicatory Complaint C.18-09-011 docketed in 2018 in an unsuccessful attempt to address this problem on a broad scale for California.

6.5.5. VEGETATION MANAGEMENT AND INSPECTIONS

“Deficiency (PGE-18, Class B): PG&E does not describe in detail how its hazard tree analysis focuses on at-risk trees.

“PG&E does not describe in detail how its hazard tree analysis focuses on at-risk areas (based on wind conditions, outage history and the link) and specific species that pose a high risk (due not only to fast growth rate but other risk factors) to focus its current proposal. That is, PG&E’s hazard tree program should focus on at risk trees first, rather than on every tree within striking distance. PG&E also now accounts for removal of hazard trees under both its EVM program and an existing Tree Mortality Program. Trees that are dead or that will die as a result of trimming are removed under the Tree Mortality Program. PG&E’s memorandum account for Tree Mortality work is separate from the memorandum account allowed in AB 1054 for WMP work.

“Condition (PGE-18, Class B): In its first quarterly report, PG&E shall detail:

- i) How it will ensure its hazard tree program prioritizes the highest risk areas and types of trees; and
- ii) How it accounts for hazard tree programs in its memorandum accounts.“

Comment:

PG&E's Enhanced Vegetation Management EMV program (in general terms) did not begin with the Commission's Proceeding R.18-10-007. The felling of trees and heavy tree trimming beyond General Order 95 rules began by PG&E contractors more than a decade ago. Contractors to PG&E have been selecting large, often heritage and old growth trees for destruction based upon the arbitrary opinions of individuals with an inherent financial self-interest in removing trees.

Tree cutting has always been chosen by PG&E as its "go to" solution for reducing service interruptions, and now for wildfire mitigation. I have observed with dismay the random destruction of large specimen examples of many different tree species.

Cases of tree felling where there was no indication of any hazard to an overhead electric circuit are common. No overhead circuit in a forested area should use conductors with so weak a tensile strength that mere wind-blown branch debris will break those conductors. Such strong cable equipment and systems have long been readily available. The obsolete #6 copper where I live is filled with repair splices. Small light weight objects break this wire. The splices occasionally fail from conductive heating when there is a power surge as this circuit is re-energized after a lineman repair.

In early spring of 2020 a large healthy and straight douglas fir, growing in a riparian corridor, eight feet from the high water line of the ESA listed salmonid bearing stream where I live, was felled into that creek. This tree grew at the bottom of a 1,200 foot deep slot canyon and was at no risk of wind storm blowdown.

The notion that it is possible to objectively select hazard trees for removal, or that an arborist certification is sufficient for this selection is erroneous. Too many factors are involved and the financial self-interest distortions bearing upon that selection process overwhelm any notion of professional objectivity. An experienced individual can distinguish an imminent threat of vegetation (tree) interference with an overhead circuit. Beyond this, all else is guess work and speculation. The Commission erred by ignoring its obligation to address this major environmental impact in 2017 when it inserted a "Guideline" into Rule 35 of General Order 95 and then stated that there was no environmental impact and conducted no impact analysis. If the Commission had conducted the required analysis then the issue of the definition of hazard trees could have been clarified. At this point there is no definition other than the arbitrary notions of PG&E and its contractors.

Risk Spend Efficiency of EMV

In regard to **Risk Spend Efficiency**, PG&E's Enhanced Vegetation Management or EMV is likely to be the most difficult to justify, or to account for its effectiveness in mitigating wildfire ignitions. The notion that it is effective or reasonable to cut living trees at "strike distance" or 200 feet distant from an overhead circuit for safety reasons, is ridiculous. This activity also results in the repeated harassment of homeowners and in completely unreasonable adverse environmental impacts. The Wildfire Safety Division should advise the Commission to reverse the passive acceptance of PG&E's EMV program as it currently exists, and to strictly review cost accounting for the expenses incurred. EMV is an invention of PG&E intended to avoid or to limit the more effective expansion of system hardening. PG&E themselves stated that system hardening is more effective for reducing wildfire ignitions. EMV is not a program to comply with any standard of the Commission.

Conclusion

The Wildfire Safety Division's draft Action Statement on Pacific Gas and Electric Company's 2020 Wildfire Mitigation Plan is very thorough. It is also as precise as a reasonable person could expect, considering the vague and inconsistent nature of PG&E 2020-2022 Wildfire Mitigation Plan. However the Division had the authority to recommend the rejection of PG&E's 2020 WMP, and I would have preferred this outcome. The WSD's conditional approval recommendation to the CPUC leaves large complex questions waiting for valid responses from PG&E in the coming months. The resolution of this matter now moves again to the Commission. The landscape of California is experiencing a rapid escalation in wildfire risk as an impact of global warming. There is little to no reasonable expectation that this elevating wildfire risk will abate. It is my hope that the Commission will exercise its extensive authority to require the safety infrastructure improvements to electric power utility distribution and transmission that are absolutely necessary. My research into circuit protection relays and new insulated and strong conductor systems has convinced me that this is entirely feasible.

Executed this date May 26, 2020 in Felton CA

Regards,

A handwritten signature in black ink, appearing to read "Kevin Collins", is placed over a light gray rectangular background.

Kevin Collins