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FORMAL SAFETY COMPLAINT: CALIFORNIA PUBLIC UTILITIES COMMISSION

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Date of submission, August 10, 2018

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Filed this day, August 10, 2018 Felton California by Kevin Collins. A docket filing number has yet to be assigned.

Complaint:

PG&E's "Community Wildfire Safety Program" evades the primary issue that it purports to address. This plan fails to address wildfire ignition from its own equipment and instead places the burden for misguided wildfire mitigations onto its customers in the form of damage to easements on private and public land.

Filed reports by PG&E to the Commission on subject of fire, neglect to address basic analysis necessary for legitimate assessments of fire safety. This fact was pointed out by the Commission's own Office of the Public Safety Advocate when evaluating "wires down" events reported by PG&E. [Investigation 17-11-003] (Filed November 9, 2017): As follows:

"PG&E should support its mitigation proposals with metrics to allow the Commission to consider the effectiveness of current mitigation efforts are effective in mitigating risk. PG&E reports on a limited set of metrics. This provides limited insight into the effectiveness of specific PG&E mitigation programs.

For example, it does not appear that PG&E evaluated the individual effectiveness of its mitigation programs to reduce wires down, including wires down that remain

energized, or the other various root cause mitigation programs related to this risk. PG&E does include accountability metrics, which provide targets for PG&E to meet certain mitigation measures; for example, a maximum of wires down for additional overhead conductor replacement.

However, there is no indication whether those metrics were met or, more importantly, whether meeting those metrics has reduced risk. It would be useful to present the data that shows how each of the different mitigation efforts individually affect the percentage of wires down which remained energized. Wires that remain energized present both an electrical hazard to the public and a potential wildfire ignition source." (Report is Attachment #9.)

PG&E's plan focuses upon vegetation management rather than upon the root causes of the fire ignitions caused by their own distribution equipment. Their plan is destructive, misleading, and will fail to solve the problem of electric utility caused wildfires.

PG&E's plan will however cause immense damage to the private properties crossed by their easements and to the environment generally.

The fundamental question is why wildfire ignitions from downed wires and exploding flash arcing transformers are so common.

In the California Department of Forestry's Redbook, the records of wildfire ignitions caused by arcing down utility wires are consistently a major annual cause of CA wildfires. Answering the question of why this continues to be the case should be the major element in any wildfire safety program. PG&E thoroughly evades this fire ignition issue in their "Community Wildfire Safety Program".

The answers to this ignition question are several. Physical contact between overhead wires and tree limbs, and even falling trees, is secondary and need not cause so many wildfires. This plan fails to address the underlying reasons for utility caused wildfire ignitions. PG&E's plan also fails to address the implementation of effective measures to prevent wildfire ignition.

It is misleading to present the issue and the burden of correcting it upon homeowners and landowners. The primary problem is not theirs, and to expect them to endure the harm to their property under the assumption that vegetation is the primary reason for utility related wildfires is misleading. Vegetation is not the underlying problem causing wildfire from electric power distribution systems.

General Electric published a widely read and available report some years ago entitled "High Impedance Fault Detection on Distribution Systems", Craig G. Wester, Member IEEE, GE Power Management. That paper concludes with the following statement: "The introduction of the microprocessor has made the technology possible to detect a high percentage of previously undetected high impedance faults. Field tests have proven that

many of the HIF detectors are secure and reliable. Utilities must ask themselves whether they want to be proactive or reactive in applying HIF detectors, now that proven technology is available and affordable."

There are today, solutions being implemented by other regulated electric power utility companies including San Diego Gas and Electric (SDG&E) that directly address these root causes of fire ignition.

No sensible person would dispute that tree branches and falling trees are a problem for overhead power wire. But the plan that PG&E has made public will change wildfire behavior for the worse by opening and expanding wind corridors that enhance wildfire spread and fire intensity. Flying embers and firebrands are how wildfires rapidly spread, especially in wind driven fires that are the most difficult to control. Enlarging fires create their own wind through the processes of heat convection and wind vortex development. The problem of tree blow-down is made worse. When large trees are felled, forest edges are expanded and forest openings are enlarged. This enhances the impact of wind in wildfire spread.

This is precisely the effect that PG&E's Fire Plan will have. It will result in more frequent tree blow-down and thus more downed energized wires (conductors). The remaining trees are no longer shielded from high winds by adjacent trees removed from a stand of conifer or large hardwoods. In many areas with PG&E's overhead wires, the trees are very tall. Widening to 30 feet the cleared area beneath distribution lines does nothing to stop 100+ ft. tall conifers from breaking conductors if they fall. But this widening will increase blow-down events.

PG&E may picture all housing as a grid pattern subdivision. But many parts of PG&E's service area bear no relationship to this type of housing or parcel size and arrangement.

Wildfire behavior is a huge subject. It is not the purpose of this complaint to elaborate upon it. It is sufficient to address only the basics, such as when specific topics are in conflict with PG&E's logic.

The Fundamental Problem is the "High Impedance Arc Fault".

This is primarily the "down wires" issue. When a broken conductor falls to earth it begins to immediately flash arc. This hot electrical arc does not produce a burn out of PG&E fuses or trip other circuit protection devices. The earth is a poor conductor of electricity and the returning "short circuit" from a fallen wire does not have enough amperage to burn out a conventional fuse or to trip Reclosure devices in most situations. The wire, most often bare uninsulated, will flash arc at extreme temperatures, far higher than necessary to ignite dry vegetation. Therefore any dry flammable material near the arc will begin to burn. This is why falling utility wires start wildfires. Even when PG&E fuses do burn out, these fuses can drop molten metal to the ground and still ignite a wildfire. The same is true for faults in step down transformers.

Insulation of overhead wire would dramatically reduce the ignition of standing trees that lean (or blow) into contact with overhead wires, but have not fallen.

In 2015 PG&E produced a report: "Wires Down Improvement Program at Pacific Gas and Electric" (Attachment #8). In their report PG&E states that 36% of downed energized wire events were the result of physical interference with vegetation (trees). 66% of these wire down events were caused by equipment failure (usually failed wire splices) or by actions of third parties interfering with power-poles or conductors (6% of this 66% were reported as cause unknown).

Vegetation interference is not the primary cause of arcing wires.

Wildfire ignition from falling energized conductors, and less often from other electrical faults, is a problem that has been solved, after over thirty years of research by electrical engineers.

New devices called "high impedance arc fault interruptors" use computer technology to recognize the particular waveform distortions in the electrical current and detect a break in the overhead wire with a high degree of accuracy (attachments). **This safety detection takes milliseconds. The detection and reaction time is so fast that the detector can trip a switch to shut off current in an overhead wire before it even falls to earth and begins to ignite a wildfire (attachment #1).**

This is a ground breaking safety development. I cannot find it discussed anywhere on the website of the Commission despite the fact that San Diego Gas and Electric has begun to install high impedance arc fault interruption gear.

This equipment is available and in use in electric power utility distribution and transmission systems as well as in large buildings, at industrial sites and in major public facilities such as airports.

There are several other methods that could make PG&E electric power distribution much more wildfire safe. For the sake of brevity I will not elaborate in length about these additional safety measures.

(1) Undergrounding of Circuits. It is not difficult to understand why underground power lines are far more fire safe (and visually attractive) than overhead circuits. It was recently reported by KTVU News in 2018 that public documents show over the past seventeen years \$246,000,000 set aside for city and county power line undergrounding was not spent. A 2016 CA Public Utilities Commission investigation revealed a statewide unused credit balance (for undergrounding) of approximately one billion dollars. It's obvious that Rule 20A which established an undergrounding fund process needs updating to address fire safety effectively. The rule was originally understood primarily as civic beautification, but it is also clearly a wildfire ignition safety issue.

<http://www.cpuc.ca.gov/General.aspx?id=4401>

(2) Use higher tensile strength and insulated overhead conductors and replace spliced wires.

(3) Reset existing Reclosure devices so that they do not send current into line faults until that fault has been identified and corrected.

(4) Install SCADA type equipment to sense and to remotely and rapidly shut down sections of the grid or individual sectionalized circuits where a fault is detected.

(5) Additional safety measures are available beyond these listed above. This Complaint addresses the mistake of prioritizing tree removals when it is the poor condition of the grid itself that is the primary ignition cause for wildfire. **Without an ignition source, there are no wildfires caused by electric power utilities.**

Discussion, Personal Experience with Downed Arcing Wires:

Twice in the last 10 years a downed energized bare, 6 gage copper distribution wire, has flash arced to earth in front of my home for hours without ever activating any circuit protection switch or fuse device. In other words, these arcs continued until linemen arrived to cut the circuit with manual switches. This is the 21st Century. The public has a right to safer modern equipment.

In the location of my home and for large distances along connected circuits, a burnout fuse is the only circuit protection for the overhead branch circuits. There is no functional circuit protection for high impedance ground faults to earth by downed energized wires. These down wires remain energized until a lineman arrives to pull a mechanical switch.

In the winter of 2016-2017 a downed 12Kv wire arced along the ground and road surface for hours before linemen arrived to terminate the current. Near nightfall a vehicle drove past my home and would have contacted this energized wire had I not been outside and shouted repeatedly for this car to stop. This vehicle stopped 4 feet from contact with the downed flash arcing wire. I instructed the driver to stay in their vehicle and back up.

Approximately 8 years ago a similar energized downed wire arc fault in front of my home continued burning for 24 hours before PG&E linemen arrived to cut the circuit. It is absurd for PG&E to use its most fragile and failure prone equipment in a canyon where the taller trees are 175 feet in height. I had called PG&E and Zayante Fire immediately upon discovering this dangerous arcing wire. The Zayante Fire Dept. flagged the location with warning tape. However there is no way to stop pedestrians from walking into these deadly hazards and my neighbors had to drive past this arcing wire to reach their homes. It was, to say the least, disturbing to have this immediate deadly electrocution hazard continue for 24 hours.

Both incidents described occurred during winter rainstorm periods. The earth and vegetation were saturated. Therefore wildfire was not a risk in these events. However,

dry season windstorms occur in this area. This is a mixed redwood, fir and hardwood forest canyon with very tall trees and steep mountain terrain. In our common high wind gust storms, broken branches from tall timber can fly latterly for scores of feet from their source trees before potentially striking an overhead conductor. The crowns of blown down trees easily extend out over 100 feet to a power-line conductor's pathway. This area has high soil erosion rates and abundant landslide risks. Large trees are what reduce this landslide risk with their extensive root systems. These trees protect my property and its geological stability.

The small gage bare copper wires used in my area are full of splices. Recently upon reenergizing this circuit, after the repair of another line break about 1/2 mile from my home, one of these many splices failed immediately and dropped another live wire to earth, again near my home. This line was energized and arcing. Linemen were on site and corrected this fault quickly. I've observed a section of conductor near my home with 3 splices within approximately 20 feet of wire length, mid span. These conductors are old, fragile and uninsulated. It is clearly dangerous to use weak tensile strength and uninsulated conductors in this tall forest.

There are no circuit protections installed on PG&E's branch distribution electric power circuits for downed energized power lines in my location, and probably across much, if not all of PG&E's entire service area, except for underground power.

No reasonable tree-trimming program can adequately reduce the risk of downed energized conductors igniting wildfires or causing human electrocutions in this setting. Another solution is necessary. That solution and the relief sought by filing this Complaint follows.

Relief Sought by this Complaint

This raises an interesting question. Is it the obligation of the general public to bring a Petition to Adopt, Amend, or Repeal a Regulation Pursuant to Pub. Util. Code § 1708.5 ?

The Commission itself is obligated to direct the advancement of the safety of California's electric grid. The Commission established per Senate Bill 62 (Chapter 806, Statutes of 2016) the Office of the Safety Advocate (OSA).

"OSA is established to advocate, on behalf of the interest of public utility customers, for the continuous and cost-effective improvement of the safety management and safety performance of public utilities. OSA is an advocacy unit within the CPUC staffed with engineers and policy analysts, who will:

- 1) Intervene in CPUC proceedings to advocate for effective public utility safety management and infrastructure improvements and for the transparency of safety information;
- 2) Recommend improvements to the CPUC's safety management policies and procedures to spearhead the CPUC's safety culture transformation, and;

3) Sponsor testimony and exhibits in CPUC proceedings on safety related risks to assist the CPUC in holding public utilities accountable for their safe operation."

It is my contention that the Office of the Safety Advocate (OSA) and the Commission themselves, bear the obligation to initiate effective proceedings to address the issues raised in this Complaint. How cost effective is it for PG&E to continue ignoring the available new safety infrastructure that could be used to make dramatic safety improvements to its grid? The massive liability claims PG&E now bears from the 2017 October fires north of San Francisco should be considered when the issue of "cost effectiveness" is evaluated.

Not incidentally, natural gas was reported by the press and fire agencies to be emitting from recently burned out subdivisions in both Santa Rosa and now Redding. Apparently PG&E remains unable to adapt its public safety response even after its six federal criminal convictions arising from the 2010 San Bruno CA Gas Transmission Line Explosion Disaster.

Scoping Memo:

This is not an expedited complaint. It is adjudicatory. This complaint involves fundamental issues of electric power infrastructure quality, maintenance and safety. PG&E bears the obligation to install modern, state of the art power distribution equipment and specifically to not keep in service the antiquated and needlessly dangerous equipment that PG&E retains in service.

- An investigation of violations of the following codes and rules that apply to PG&E is necessary. Also including public statements of the intent, and descriptions of the obligations, of the Commission regarding the Commission's commitment to public safety are necessary.
- This recitation of CPUC code is not intended to be comprehensive, but merely sufficient. The administrative record, including fire incident reports that could be cited to support this Complaint is immense.

(1.) General Order (GO) 95, Rule 31.1, states in part:

“Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use, regard being given to the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service.

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of communication or supply lines and equipment.”

Note: The Commission and PG&E share an inherent obligation to upgrade electric power distribution infrastructure through the use of modern developments that improve the public safety of power distribution equipment. These systems can dramatically improve public safety. This is particularly true in cases where the risks of using outdated, old and

fragile equipment lead to injury, death and massive destruction of public and private property and the environment.

(2) Section 451. (Amended by Stats. 1977, Ch. 700.)
Cal. Pub. Util. Code §451 states:

"All charges demanded or received by any public utility, or by any two or more public utilities, for any product or commodity furnished or to be furnished or any service rendered or to be rendered shall be just and reasonable. Every unjust or unreasonable charge demanded or received for such product or commodity or service is unlawful.

Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities, including telephone facilities, as defined in Section 54.1 of the Civil Code, as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public."

Note: It is not "reasonable" nor is it "just" for PG&E to continue to use equipment that is understood by the electric power and the power equipment engineering industries to present a major public safety problem.

High impedance arc fault detection and circuit interruption switch gear is in wide use by private industry at manufacturing sites and in large complex buildings that operate their own internal power systems. Arc fault circuit interrupters or AFCIs are required in main and sub-panel circuit breakers by the National Electric Code in residential construction.

The technology to detect and switch off circuits experiencing high impedance arc faults on medium to high voltage utility distribution circuits is more complex. However these technical problems have been solved. This equipment is available from various manufacturers internationally (see attachments to this Complaint).

(3) ARTICLE 3. Equipment, Practices, and Facilities [761 - 788]

(Article 3 enacted by Stats. 1951, Ch. 764.)

761

"Whenever the commission, after a hearing, finds that the rules, practices, equipment, appliances, facilities, or service of any public utility, or the methods of manufacture, distribution, transmission, storage, or supply employed by it, are unjust, unreasonable, unsafe, improper, inadequate, or insufficient, the commission shall determine and, by order or rule, fix the rules, practices, equipment, appliances, facilities, service, or methods to be observed, furnished,

constructed, enforced, or employed. The commission shall prescribe rules for the performance of any service or the furnishing of any commodity of the character furnished or supplied by any public utility, and, on proper demand and tender of rates, such public utility shall furnish such commodity or render such service within the time and upon the conditions provided in such rules."

(Enacted by Stats. 1951, Ch. 764.)

Note: Article 3 sec. 761 specifically obligates the Commission to require the updating of rules, practices, equipment standards, appliances used, service provided and methods employed so as to ensure safe electric power distribution.

It is the privilege of the Commission to hold hearings on this matter. CalFire has already assigned responsibility for the ignition of 16 of the numerous October 2017 wildfires to PG&E equipment and vegetation conflicts. These fire ignitions were caused by energized conductors falling to earth and arcing, as well as from other equipment throwing sparks and hot material. The final report is pending as of the date of this Complaint.

The following is the text of the: "**Safety Policy Statement of the California Public Utilities Commission**" dated July 10, 2014.

The inclusion of this document is self-explanatory in the context of this Complaint. An effective safety policy requires that the use of modern upgraded equipment be the standard for safe electric power utility use.

"Purpose of this Policy. This is the Safety Policy adopted by the Commissioners of the California Public Utilities Commission (CPUC). It defines the role of the Commissioners, binds together the agency in constantly strengthening our safety efforts, and provides a unifying vision and guidance for the organization's multiple and disparate functions. As described below, as a first step in applying this policy, we also will direct our staff to provide to the CPUC a more detailed Safety Plan within 180 days, laying out specific elements and staff actions on how the entire organization - including the five Commissioners and their staff, our legal and judicial staff, our policy and program staff, as well as our administrative staff - will respond to this policy in all their work."

CPUC Overarching Safety Mission

"The safety mission and goal of the CPUC is to assure to the State of California that all of us will work every day to assure that the regulated utilities we depend on for critical services are as safe and resilient as they can possibly be.¹ The CPUC not only will assure compliance with safety laws and regulations, but also challenge itself and the utilities to excellence.

1. The CPUC's overall mission is to protect consumers and ensure the provision of safe, reliable utility service and infrastructure at reasonable rates, with a

commitment to environmental enhancement and a healthy economy.

2. The concept of zero accidents and injuries is based on the Vision Zero Initiative established in Sweden in the 1990s. It began as an approach to roadway safety, and can be summarized as a single sentence: "No loss of life is acceptable." Since 1997, England and the Netherlands have adopted this policy goal, and in 2014, the cities of New York, Boston, and San Francisco also adopted it as their road safety policy expectation. Similarly, the USDOT Pipeline and Hazardous Material Safety Administration states, "our vision is that no harm results from hazardous materials transportation.

Ultimately we are striving to achieve a goal of zero accidents and injuries across all the utilities and businesses we regulate, and within our own workplace.

We have a broad obligation in this mission, and we must assure that safety will always be an important component in all that we do and everywhere we have authority and responsibility. Our efforts must improve protection for the public, for utility workers and CPUC employees in their work, for the environment, and for utility infrastructure and systems. To realize this Vision, the CPUC commits to these guiding principles:

- Continually assess and reduce the safety risk posed by the companies we regulate
- Hold companies (and their extended contractors) accountable for safety of their facilities and practices
- Be accountable for the oversight of safety in the industries we regulate
- Provide clear guidance on expectations for safety management and outcomes
- Provide transparent and effective procedures for enforcement of those expectations
- Promote reliable access to utility services that support health and safety
- Promote a culture of safety vigilance by CPUC staff, and in the industries we regulate
- Learn from experience and continuously improve safety oversight and outcomes."

Note: Section 768.6 below is included for the convenience of Santa Cruz County and other similarly affected jurisdictions.

768.6

(1) (A) In developing and adopting an emergency and disaster preparedness plan, an electrical corporation providing service in California shall invite appropriate representatives of every city, county, or city and county within that electrical corporation's service area in California to meet with, and provide consultation to, the electrical corporation. (B) Every city, county, or city and county within the electrical corporation's service area in California may designate a point of contact for the electrical corporation to consult with on emergency and disaster preparedness plans. (C) The electrical corporation shall provide the point of contact designated pursuant to subparagraph (B) with an opportunity to comment on draft emergency and disaster preparedness plans and disaster preparedness plan shall

address recent emergencies and disasters associated with the electrical corporation or similarly situated corporations, and shall address remedial actions for possible emergencies or disasters that may involve that corporation's provision of service.(3) Every two years, in order to update and improve that electrical corporation's emergency and disaster preparedness plan, an electrical corporation providing service in California shall invite appropriate representatives of every city, county, or city and county within that electrical corporation's service area to meet with, and provide consultation to, the electrical corporation. **(4) For the purposes of best preparing an electrical corporation for future emergencies or disasters, an electrical corporation updating its emergency and disaster preparedness plan shall review the disasters and emergencies that have affected similarly situated corporations since the adoption of the plan, remedial actions taken during those emergencies or disasters, and proposed changes to the plan. The electrical corporation shall adopt in its plan the changes that will best ensure the electrical corporation is reasonably prepared to deal with a disaster or emergency.**(c) A meeting pursuant to subdivision (b) shall be noticed and shall be conducted in a public meeting that allows for the participation of appropriate representatives of counties and cities within the electrical corporation's service area.(1) A county participating in a meeting pursuant to subdivision (b) may inform each city within the county of the time and place of the meeting. (2) An electrical corporation holding a meeting pursuant to subdivision (b) shall provide participating counties and cities with the opportunity to provide written and verbal input regarding the corporation's emergency and disaster preparedness plan. For purposes of this public meeting, an electrical corporation may convene a closed meeting with representatives from every city, county, or city and county within that electrical corporation's service area to discuss sensitive security-related information in the electrical corporation's emergency and disaster preparedness plan and to solicit comment. (3) An electrical corporation shall notify the commission of the date, time, and location of a meeting pursuant to subdivision (b). (d) An electrical corporation shall conduct a meeting pursuant to subdivision (b) no later than April 1, 2013, and every two years thereafter."

"Adjudicatory" proceedings are: (1) enforcement investigations into possible violations of any provision of statutory law or order or rule of the Commission; and (2) complaints against regulated entities, including those complaints that challenge the accuracy of a bill, but excluding those complaints that challenge the reasonableness of rates or charges, past, present, or future, such as formal rough crossing complaints (maximum 12 month process if hearings are required)."

List of Readily Available Safety Upgrades Necessary:

Note: A list of available and necessary safety upgrades has already been included in this document. However the list below is more thorough, and there is good reason to include it in this "Scoping" section.

The upgrading of electrical distribution circuits in rural Santa Cruz County and across the rural, high wildfire risk PG&E service areas is necessary so that the equipment in service is "Fire Hardened".

These upgrades include:

(1) The installation of High Impedance Arc Fault Circuit Interruption Gear. (Something San Diego Gas and Electric is already doing, as it is with several of the other matters following.

(2) Replacement of the small gage uninsulated distribution wire in use by PG&E with strong insulated wire.

(3) When necessary, the replacement and addition of power poles capable of supporting stronger heavier wire and the other additional communication equipment now supported by PG&E's often overloaded wooden power poles.

(4) The selective risk based undergrounding of distribution circuits in locations where adjoining forests are tall and overtop PG&E's equipment. Rule 20A funded undergrounding of distribution circuits has become so administratively awkward and difficult, that city and county jurisdictions are not using this program adequately to improve public safety.

(5) Improved falling object and wildlife contact protection of transformers and the tangle of conductors that bridge between the distribution wiring and individual service drops at step-down transformers and similar locations.

(6) The installation of other equipment such as improved power pole wire insulator supports and stronger crossbeams necessary to abate the wildfire and electrocution hazards now extant in rural Santa Cruz County and across PG&E's service area.

Need for Hearing

I anticipate that the issues in this proceeding may possibly be addressed without the need for hearings. However it is possible there may be disputed issues. I will preliminarily assume that hearings will be needed. The designated Commissioner's Scoping Memo and Ruling, will determine whether there is a need for a hearing.

The assigned Commissioner will issue a ruling that specifies the category, whether a hearing is appropriate, and will establish a schedule for this proceeding. A presiding officer will be assigned (Rule 13.2). The ruling, as to category, may be appealed under the procedures in Rule 7.6.

Additional Scoping Memo Information

This Complaint alleges that Pacific Gas and Electric knowingly uses old outdated and unsafe equipment and fails to use available funds to improve the safety of its electrical power distribution infrastructure. Instead PG&E is diverting the complex issue of wildfire safety to vegetation clearing alone and is ignoring the more fundamental issue of how these fires are ignited by their own equipment.

Vegetation removal is a secondary issue to the question of fire ignitions. Without an ignition there is no fire. It is the contention of this Complaint that PG&E's approach will not significantly improve public safety except possibly in settings with extensive drought killed trees. Even in these settings there has been no independent review of PG&E's plan nor any clearly stated goal other than to advance the concept that flammable materials burn.

Once again PG&E prioritizes illusory and misguided cost savings over public safety, just as it did in the deadly 2010 San Bruno Gas Line Explosion Disaster when it was revealed (despite PG&E lies to federal investigators) that PG&E did not have adequate records of the location and condition of its gas transmission pipelines and was testing these lines at pressures exceeding FERC guidelines. The corollary here is that PG&E is neglecting to install sufficient new generation fire safe electric power equipment even in the regions of its service area that the CPUC has determined to pose a high or extreme fire risk.

The preceding text of this document contains virtually all of the information necessary to file this Complaint. However a list of supporting attachments to this document must be considered as additional scoping information. These include authoritative engineering reports as well as reports from PG&E and the Commission Staff itself.

This attached information is too extensive to be logically included in the basic text of this Complaint and Scoping document. But it is directly applicable to both.

These attachments include:

- (A) Engineering documents explaining "high impedance arc fault interruption" and brochures from engineering companies that supply this equipment.
- (B) Documents produced by PG&E and the Commission that elaborate upon the scale of the "wires down" problem, the failed wire splices problem, etc.

Index of attachments:

- 1) "Catching Falling Conductors in Midair – Detecting and Tripping Broken Distribution Circuit Conductors at Protection Speeds"
- 2) "High Impedance Fault Detection on Rural Electric Distribution and Power Quality Control Systems"
- 3) "A Method to Detect High Impedance Faults in Distribution Feeders" (IEEE/PES Report)
- 4) "Fire-Hardening the Power Grid One Community at a Time: Protecting the Historic Town of Julian with Fire Safety Upgrades" (SDG&E webpage capture)
- 5) "A Protection Scheme using Ultra-fast Circuit Breakers for Wildfire Mitigation and Reliability (IEEE / PES/ Seimens)
- 6) ARC SENSE™ TECHNOLOGY, Schweitzer Engineering Laboratories Inc. (AST) (brochure)
- 7) Safe and Secure Power Distribution Arc fault Protection Solutions (ABB corporation brochure)
- 8) "Wires Down Improvement Program at Pacific Gas and Electric" (2015)
- 9) Before the Public Utilities Commission of the State of California -Order Instituting Investigation Into the November 2017 Submission of Pacific Gas and Electric Company's Risk Assessment and Mitigation Phase. Investigation 17-11-003 (Filed November 9, 2017)

