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COMMITTEE ON
ENERGY, UTILITIES AND COMMUNICATION
BEN HUESO, CHAIRMAN

SUBCOMMITTEE ON GAS, ELECTRIC, AND TRANSPORTATION SAFETY

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WILDFIRES CAUSED BY POWER LINES:

WHAT HAVE ELECTRIC UTILITIES DONE TO IMPROVE SAFETY SINCE THE 2007 FIRE SIEGE?

September's Butte Fire—which burned 70,868 acres in Amador and Calaveras Counties, destroyed 818 structures, and caused two fatalities—may have been caused by contact between a power line and a tree. The purpose of this hearing is to examine how electric utilities and state agencies have responded to the multiple power line-related wildfires of 2007 and to the enhanced wildfire hazard of today's drought conditions.

Findings

- Power line fires occur hundreds of times a year, though only a small number grow to become large and destructive.
- California's largest electric utilities spent considerable sums of ratepayer money to prevent their infrastructure from sparking destructive wildfires like those of 2007, but September's Butte Fire—which is suspected to have been caused by a power line—suggests that their efforts may not have been sufficient.
- The public has no means to evaluate the sufficiency of the wildfire prevention measures undertaken by major electric utilities, as these measures have not been evaluated by the California Public Utilities Commission, despite the Commission's approval of rate increases to fund them.

- One likely reason the Commission has not examined the efficacy of the major electric utilities safety measures is that the Commission has been bogged down for 6 years in the process to adopt prescriptive electric safety rules that have little bearing on those measures.
- A performance-based approach, similar to that adopted in Victoria, Australia for wildfire prevention (and similar to approaches the Commission has adopted for safety in other areas), would likely be more successful in overseeing electric utility wildfire prevention efforts.
- The Commission's efforts to incorporate safety into utility general rate cases cannot be successful if the Commission doesn't analyze the utilities' safety measures outside of general rate cases.

The 2007 "Fire Siege"

In 2007, California faced one of the worst fire seasons in history. Over 3,700 structures were destroyed and a million acres were burned.[1] At least 346,000 homes were under evacuation order in San Diego County alone.[2] Several of these fires were ignited by power lines, and one—the Witch Fire—burned 197,990 acres, destroyed 1,624 structures, killed 2, and injured 40 firefighters.[3] The Witch Fire became the fifth largest California wildfire of all time[4] and the third most damaging.[5] For the all of the 2007 power line wildfires, San Diego Gas and Electric Company (SDG&E) paid out $2.4 billion in third-party settlement claims. Whether or not some of these costs will be borne by SDG&E's customers has yet to be determined.[6]

While the Witch Fire of 2007 was one of the worst in California history, wildfires caused by power lines are not uncommon, nor are they restricted to Southern California. Several notable fires are listed in Table 1. A number of fires in the early 1990s prompted the Legislature, in a Supplemental Report of the 1996 Budget Act, to require the California Public Utilities Commission (CPUC) to adopt standards for electric distribution operations and maintenance, including tree trimming and brush clearing requirements.[7] For one of those fires—the Trauner Fire—Pacific Gas and Electric Company (PG&E) was convicted of 739 misdemeanor counts of criminal negligence for failing to trim trees near its power lines in a case in which it had been accused of diverting $77

Table 1: Notable Wildfires Caused by Power Lines

Year	Fire	County	Acres Burned	Structures Destroyed	Citation
1923	Berkeley	Alameda	130	584	[5]
1970	Laguna	San Diego	175,425	382	[4], [5]
1990	Campbell	Tehema	125,892	27	[4]
1994	Trauner	Nevada	500	34	[8]
2007	Witch	San Diego	197,990	1650	[3]
2007	Malibu Canyon	Los Angeles	3,836	8	[3]
2007	Grass Valley	San Diego	1,247	184	[3]
2007	Rice	San Diego	9,472	248	[3]

million dollars from its tree trimming budget into shareholder profits.[8] The CPUC would approve a settlement in which PG&E paid a $28.7 million penalty related to this issue.[9]

More recently, PG&E has reported that September's Butte Fire—which burned 70,868 acres in Amador and Calaveras Counties, destroyed 818 structures, and caused two fatalities—may have been caused by contact between a power line and a tree.[10] The fire is the subject of a current Cal Fire investigation.

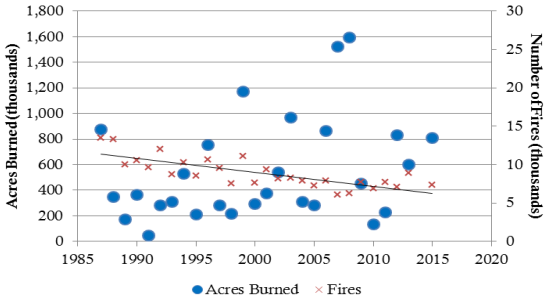
Along with vehicles, power lines were the second-leading cause of wildfires in 2013 (the most recent year for which statistics are available) after debris burning.[11] Electrical equipment can act as an ignition source through a variety of mechanisms, including conductor contact with trees, downed power lines, and arcing between power lines. As conditions that cause power line fires—particularly high wind—are the same conditions that contribute to the spread of fires, power line fires tend to be disproportionately larger than those caused by other ignition sources.[12]

While power equipment does not routinely spark large fires, it causes hundreds of small fires every year. In response to the Subcommittee's request in advance of the August 6, 2014 hearing "Electric Grid Safety: What Do We Know? How Are We Doing?"[13] Cal Fire provided the number of fires reported to the Office of the State Fire Marshall (OSFM) from electrical distribution equipment for the years 2010 (**212 fires**), 2011 (**267 fires**), and 2012 (**443 fires**). Clearly fires caused by electrical equipment are common, but only a small number grow to become catastrophic. When these fires have occurred, however, they have been some of the most destructive in the state's history.

The Trend Toward Larger, More Destructive Wildfires

The fires of late 2015 have included some of the largest and most destructive in the California's history. The Rough Fire, 50 miles east of Fresno, has become the 13th largest fire in history, and the Valley and Butte Fires are now ranked #3 and #7 in the numbers of structures destroyed, at 1,958 and 818, respectively. The current drought is the largest driver, but the fires of 2015 are a part of a trend of larger and more destructive fires. Of the 20 largest fires in California's history, 13 have occurred since the year 2000, as have 9 of the 20 most destructive. This is in contrast with the clear and steady decline in the number of fires in the last 25 years (Figure 1[14]).

Figure 1: California Wildfires and Acres Burned Since 1987



Several factors contribute to the size and destructiveness of recent fires, not least of which is continued development at the urban/wildland interface. As structures are built in more remote areas, electric utilities' obligation to serve remains constant, and they must string more distribution power lines through wildland

areas. SDG&E reports to have added 386 miles of distribution lines in to high wildfire risk areas since 1995. Drought conditions have also favored the tree-killing bark beetle, as trees do not have sufficient water to produce the sap that counters infection of the beetles, which have attacked in greater numbers as the warmer winters have allowed their continual growth. Increased tree mortality is thought to increase wildfire risk generally, and dead trees and tree limbs can fall on nearby power lines. On October 30th of this year, Governor Brown requested federal assistance from U.S. Secretary of Agriculture Tom Vilsack in response to the estimated 22 million California trees that have succumbed during the drought.[15]

California Public Utilities Commission Oversight

Oversight of electric utility fire safety is a shared responsibility between fire agencies—notably the Department of Forestry and Fire Protection (Cal Fire)—and the CPUC. A summary of statutes and regulations may be found in Appendix 1. The CPUC is tasked with the challenge of developing regulatory requirements that prevent the catastrophic fires without driving up electric bills with ineffective solutions.

In June of 2014, the CPUC issued Resolution ESRB-4, which ordered the investor-owned electric utilities to "to go above and beyond normal operating requirements" and "take practicable measures necessary to reduce the likelihood of fires associated with their facilities," with a focus on management of vegetation in the vicinity of power lines. The resolution allowed electric utilities to track costs for future reimbursement through rates.[16] The expenditures would be subject to financial audit that "does not address or assess the operational effectiveness of [the utility's] mitigation efforts."[17]

This resolution was one of several CPUC actions to encouraged safety-related spending without any method to review the cost-effectiveness of those expenditures or any effort to see if their safety goals are being met. The primary reasons for this is 1) that the CPUC's main procedural vehicle to address wildfire safety is a rulemaking[18] that has lingered for seven years with limited progress and 2) that electric utilities can't wait for the conclusion before making fire safety improvements. Wildfire safety has thus been bifurcated into procedural vehicles for safety and procedural vehicles for ratesetting in a way that has compromised the CPUC's ability to fulfill either its mission to ensure safety or its mission to maintain just and reasonable rates.

One clear expression of the problem caused by the slow rulemaking process is the argument made by Southern California Edison (Edison) in its 2015 General Rate Case (GRC) application that its request for 35,000 new poles a year is reasonable, as it "is actively participating in the [Fire Safety] Rulemaking to mitigate the risk that different, higher standards will be implemented than those SCE will be employing as part of" its GRC request.[19] The CPUC should recognize that Edison's commitment in its GRC to fight against too high safety standards in the fire safety rulemaking in order to gain CPUC approval to fund a safety improvement is a tangle of the CPUCs own making, and it should modify its approach to the fire safety rulemaking so that the CPUC's safety regulation may operate at a sufficient speed to inform its rate regulation.[20]

Fire Safety Rulemaking

Significant actions taken by the CPUC in proceedings to address the 2007 wildfires—including actions taken in the fire safety rulemaking—are listed in Appendix 2. The first phase of the rulemaking adopted fire hazard maps of high-risk areas in Southern California where more frequent vegetation management activities and safety inspections would be required. Currently, the rulemaking is in the process of developing a more refined fire hazard map that is intended to be used in the development of more stringent construction standards, a process that is unlikely to conclude before 2018, at which time SDG&E, PG&E, and Edison will have completed three to four three-year GRC cycles since the 2007 Southern California wildfires, expending billions of customer dollars in improvements without knowing what the new construction specifications will be. There are a number of reasons that this process has taken so long:

1. *Loss of Focus.* After the adoption of the initial fire maps in 2009, the assigned commissioner at the time allowed proposals for changes of the prescriptive rules to be admitted, including some that decreased safety standards, even when those proposals were questionably related to fire safety. Instead of directing the parties—primarily electric and communications utilities—to follow the established CPUC precedent and file a petition for a separate rulemaking to make the changes,[21] the CPUC allowed these proposals to be litigated. The CPUC's wildfire safety proceeding is often called the "G.O. [General Order] 95" proceeding—a moniker that belies this lack of focus.

2. *Expectation that fire and weather science advancement will conform to the Commission's schedule.* The electric and communication utilities successfully argued that increased construction standards within high fire risk zones should be discussed only after the development of high-resolution fire threat maps of the kind that do not currently exist. This effort has required experts from Cal Fire, the Desert Research Institute, the University of San Francisco, Penn State University, and the University of California at Berkeley, and has employed supercomputers at Argonne National Laboratory to crunch the numbers. Since the CPUC begun working on this portion of the proceeding in early 2012, the schedule has been extended multiple times, as can be seen in Box 1. While the effort has merit and should continue, the scientific nature of the project makes uncertain whether its results will be suitable for regulatory purposes.

3. *Use of prescriptive rules where performance-based rules more appropriate.* The fire safety rulemaking has examined 72 proposed rule changes, adopting the majority of them. Apart from the enhanced vegetation management requirements in the 2009 CPUC decision, the choices and investments SDG&E, Edison, and PG&E have made to improve fire safety have been almost wholly unrelated to the rule changes. To track fire hazardous weather conditions, SDG&E has built a network that includes 173 weather stations. The utility has converted many wooden poles in fire hazard areas into steel poles. It has installed hundreds of reclosers which, after detection of a fault, provide only a fraction of the normal test current in an effort to prevent

arcing that can cause fires. PG&E has adopted the use of LiDAR (a laser-based radar-like system that can detect both electric infrastructure and vegetation) to image its electric distribution system to assist with vegetation management. CPUC rules require none of these efforts, and all three large electric utilities appear to currently conduct more frequent patrols in some high fire risk areas than required by CPUC rules. In some cases, access to affordable insurance coverage has likely been a larger driver for utility action than CPUC rules and enforcement.[22]

Performance-Based Safety Regulation

As discussed during the subcommittee's August 2014 hearing, the CPUC's rules for electric safety are largely prescriptive—they dictate the clearances between power lines and trees, the weight of equipment allowed on poles, permissible sag of power lines—and assume that compliance with those requirements will sufficiently ensure safety.[23] Performance- or risk-based safety rules, on the other hand, focus on the identification of hazards and the setting of goals, giving the utility

Box 1: Extensions to Fire Threat Mapping in CPUC Proceeding R.08-11-005.

6/1/12: Assigned Commissioner Scoping Ruling
"There was general agreement at the PHC that Phase 3 [Fire Threat Mapping] will take a fair amount of time to complete because of the number and complexity of the issues in Phase 3, and because of the need for a lengthy workshop process. To provide the necessary time, today's Scoping Memo extends the proceeding schedule pursuant to § 1701.5(b). All issues within the scope of Phase 3 shall be resolved within 24 months from the date of today's Scoping Memo."

5/15/13: Assigned Commissioner Scoping Ruling *
"There was general agreement at the PHC that the remainder of this proceeding will require 24 months to complete because of the number and complexity of the issues. Accordingly, this Amended Scoping Memo extends the proceeding schedule pursuant to § 1701.5(b). All remaining issues shall be resolved within 24 months from the date of today's Amended Scoping Memo."

12/30/14: Administrative Law Judge Ruling
"This ruling notes that it has been nearly two years since the Fire Map 1 Work Plan was adopted by D.14-01-010. During that time, CAL FIRE and the parties have worked diligently to develop Fire Map 1. However, this task has taken much longer than anticipated by D.14-01-010, and completion of the Fire Map 1 Work Plan is still 12 months away under the revised schedule adopted by this ruling. Parties should avoid additional extensions of the schedule if at all possible."

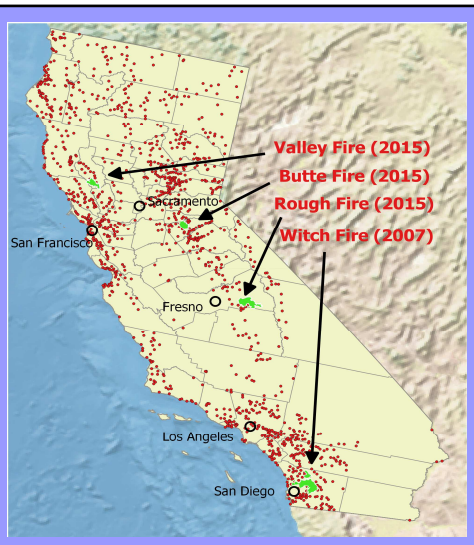
2/18/15: Assigned Commissioner Scoping Ruling
"It was apparent at the PHC that the Track 3 Technical Panel has been meeting less frequently than required by D.14-01-010. Today's Scoping Memo directs the Track 3 Technical Panel to meet at least as frequently as required by D.14-01-010 [quarterly] so as to avoid any potential delays in this proceeding."

5/4/15: Administrative Law Judge Ruling
"This ruling also notes that it has been nearly 2.5 years since the Fire Map 1 Work Plan was adopted by D.14-01-010. During that time, CAL FIRE and the parties have worked diligently to develop Fire Map 1. However, this task has taken much longer than anticipated by D.14-01-010, and completion of the Fire Map 1 Work Plan is still 12 months away under the revised schedule adopted by this ruling. Parties should avoid additional extensions of the schedule if at all possible."

* The ruling also discussed the direction by the assigned commissioner, no longer with the CPUC, for the utilities to engage in a sole-source contract with Lawrence Livermore National Laboratory. Further discussion is beyond the scope of this hearing, but interested persons may explore material provided by the Assembly Utilities and Commerce committee for its 8/17/15 hearing "California Public Utilities Commission Contracting Practices." http://autl.assembly.ca.gov/2015hearings

Box 2: Communities at Risk

Once the CPUC finishes its mapping effort to determine areas at high risk for power line fires, it will determine where utilities will have increased fire mitigation responsibilities. The CPUC's fire hazard map is dependent on modeling environmental factors—wind speed being a primary factor. Cal Fire has determined that communities along the Sierras—including where the 2015 Butte Fire occurred—are at high risk from wildfire (map right), though wind gusts there are not as high as wind gusts from the Santa Ana Winds in Southern California. The CPUC has not yet articulated how it will consider at-risk communities in its development of heightened utility fire mitigation standards.



flexibility in achieving these safety goals. These rules have a heavy reliance on the identification of metrics to judge success in reaching a particular safety goal. This type of safety regulation is not new to the CPUC, as it has begun to carry out the recommendation of the Independent Review Panel, tasked by the CPUC with investigation of the 2011 San Bruno pipeline explosion to "adopt, as a formal goal, the commitment to move to more performance-based regulatory oversight of utility pipeline safety."[24]

Prescriptive regulations, however, have a number of advantages. They are clear to and easy to follow for the regulated entity, effective when based on an established body of knowledge, and straightforward to audit and enforce. Prescriptive regulation fails, however, where different industry operating environments differ enough that no one standard is universally suitable, or when technology or conditions evolve fast enough that the timescale of new prescriptive regulations is too slow.

The CPUC' prescriptive electric safety rules are common for state regulations, most of which are based on (or even incorporate by reference) the industry-developed National Electric Safety Code (NESC). Unlike other modes of transportation and energy delivery, no federal safety regulator exists, nor is there a federal-level investigatory body such as the National Transportation Safety Board (NTSB). In many respects, prescriptive rules are appropriate for electric safety, as, compared to refinery or chemical processing, electrical systems are relatively simple, and, unlike buried pipelines, the condition of above-ground electrical equipment is easily verifiable.

While prescriptive rules may be effective for regulating many aspects of electric safety, it

Box 3: Preference of performance-based rules over prescriptive rules for physical security of electric infrastructure

- Some prescriptive requirements might be applicable to some facilities and not others,
- Security, technology and best practices rapidly evolve. Prescriptive rules could impose inefficient, ineffective, and out-of-date requirements,
- Prescriptive requirements may not address significant new threats,
- Prescriptive requirements could require almost constant revision.

may not be effective for preventing wildfires. As noted above, electric equipment causes hundreds of fires a year despite existing rules. While the source of these ignitions—electrical infrastructure—is engineered, the consequence of failure is determined by conditions a utility can't control, such as heat, humidity, and wind speed, but to which the utility must instead react. A recent CPUC white paper discussing physical security argues for performance-based regulation for reasons also relevant to wildfire safety—some of which are found in Box 3.[25]

Additionally, the focus on prescriptive regulations has been a procedurally ineffective tool because of the time required to develop new prescriptive regulations. The Chemical Safety and Hazard Investigation Board (CSB), in analyzing the regulatory environment that existed at the time of the August 6, 2012 Richmond Refinery Fire, determined that a performance-based "regulatory model provides the adaptability necessary to keep current with improving standards and advancing technology, without requiring the lengthy and often unproductive rulemaking on the part of the regulator."[26] CSB further criticized California and federal refinery safety standards that,

> *"in practice appear to function primarily as reactive and activity-based regulatory schemes that require extensive rulemaking to modify. As a result, the federal and California [Process Safety Management] standards have become static in the face of advancing best practices and technology, with the emphasis placed on completion of a task or activity rather than achievement of continuous risk reduction."*[27]

If the CPUC has focused on the development of new rules without evaluating their success, couldn't it be subject to similar criticism?

Case Study: Performance Focus in Australia's Response to 2009 Bushfires

Contrast the slowness of the CPUC's regulatory proceeding with that of the electric safety regulator in the Australian state of Victoria in response to catastrophic "Black Saturday" bush fires of February 7, 2009. At the tail end of the continent's "Millennial Drought," high heat and wind conditions caused as many as 400 fires that killed 173.[28] Of the 15 large fires, 4 were ignited by power infrastructure. The 2009 Victorian Bushfires Royal Commission investigated the fires and made a number of recommendations, including both prescriptive rule changes and the recommendation that its regulator strengthen its existing performance-based regulatory system.[29]

The Victorian Parliament passed,[30] and the electric safety regulator (Energy Safe Victoria) adopted regulations to implement,[31] a requirement that electric utilities develop bushfire mitigation plans for review and approval by the regulator. The regulator may order an independent validation of the plan and require the utility to conduct independent audits of its compliance with the plan. Regulations require each plan to cover 19 individual elements, including the utilities' policies; objectives; mitigation strategies and analysis underlying their selection; inspection plans; process to monitor, audit, identify deficiencies in, and change the plan; mutual assistance policies; public awareness processes and procedures; and measures to be used to evaluate the plan's effectiveness. In addition, electric utilities are required to report a host of at least 37 performance measures quarterly, including the numbers of

equipment failures by type, the number of fires ignited from equipment by type, the number of faults recorded due to vegetation, the number of urgent vegetation removal events, and the failure of protection systems.[32] This data has allowed Energy Safe Victoria, in its annual reports, to determine trends and come to conclusions such as that its regulated utilities have reduced fires from equipment contact with vegetation increased fires caused by equipment faults and failures.[33] In its annual reports, Energy Safe Victoria staff make utility company-specific recommendations. Energy Safe Victoria has performance data for every year starting in 2010—the year after "Black Saturday." The CPUC did not required any enhanced reporting until January of 2014—more than six years since the 2007 fires—and the utilities provided the first listing of their fires in April 2015.

The CPUC has required the electric utilities to develop fire protection plans (FPPs),[34] but those plans only require the utility to list and describe the mitigation measures; the rule requires no justification for the choice of mitigation, no quality control or quality assurance audits, no articulation of how to determine the success of the plans, and no description of the procedures by which the plan will be carried out. The CPUC was very careful to state that it did not take any position on the contents of the plans, and that the vote to approve the electric utility FPP filings "should not in any way be construed as approving or disapproving the contents of the FPPs attached to the [advice letter filings]. This resolution addresses the question whether the IOUs complied with D.12-01-032."[35]

Risk Phase of General Rate Cases Is No Substitute for CPUC Fire Safety Oversight

A recent initiative to insert risk considerations into electric utility general rate cases has the appearance of a performance-based regulatory approach, but lacks a number of necessary elements. The CPUC recognized that the investments of electric and natural gas utilities had direct relevance to safety performance, and created a new phase in GRCs to address utility safety risk. Utilities are required describe their top risks, the mitigation efforts used to address those risks, and their risk-scoring methodology. The utilities are then required to report annually on the safety performance of those efforts.[36]

The focus of the safety phase of GRCs is not, however, to evaluate the efficacy of the proposed mitigation measures but the methodology with which the utility allocates funds to manage its safety risks. Given the breadth of the safety hazards inherent in the operation California's utilities, it would be unreasonable for GRCs—already long, contentious proceedings—to evaluate the quality of proposed safety mitigations. Unfortunately, GRCs—in the absence of relevant fire safety oversight elsewhere—have become the defacto procedural vehicle for the approval of safety-related projects.

Recognizing this gap between the proceedings where safety was considered and the GRCs where funding was approved, the Legislature enacted Public Utilities Code §750, effective January 1, 2014, requiring the CPUC to develop procedures to consider safety in rate cases, to include

> *"a means by which safety information acquired through monitoring, data tracking and analysis, accident investigations, and audits of an applicant's safety programs may inform the commission's consideration of the application."*

This requirement is consistent with the Independent Review Panel's concern that, for gas safety, that "ratemaking staff in the Division of Ratepayer Advocates may episodically challenge the level of spend, but that challenge is not informed by integrity management results the safety staff is auditing."[37] If a utility presents a safety risk and its mitigation that CPUC safety staff have not seen or analyzed, that may indicate a poor risk analysis on the part of the utility or a weakness in CPUC oversight. Conversely, if CPUC safety staff's audits, investigations, and other data collection methods are not relevant to a utility's risk profile, then perhaps the CPUC is not most effectively using its engineers.

The CPUC has not audited the electric utilities' fire prevention plans or, it appears, examined their vegetation management quality control/quality assurance audits. Without a means by which the CPUC can assess, monitor, and audit utility spending programs to improve safety, GRC intervenors have no way to evaluate program cost-effectiveness, and CPUC commissioners cannot determine what constitutes just and reasonable rates. Without evaluation of utility safety plans by CPUC safety staff, safety improvements are determined through compromise between utilities and rate advocates.

The disjunction between CPUC policy-setting may not be specific to wildfire prevention. The Legislature might wish to ask to what extent legislation that has called for utility plans—such as gas safety plans submitted pursuant to SB 705 (Leno, 2012) and smart grid deployment plans pursuant to SB 17 (Padilla, 2009)—have auditable products with relevance in utility GRCs.

CPUC Has the Experience to Implement Effective Fire Safety Regulation

The lack of a performance-based approach for fire safety—and concomitant disjunction between what is approved in rate cases and what is audited by safety staff—is not due to a lack of institutional experience. The CPUC has implemented a performance-based regulatory regime for California power plants. General Order 167 requires power plants to have operation and maintenance plans, and CPUC safety staff regularly audit those plans. CPUC gas safety staff have undertaken intensive audits of the implementation of PG&E's gas transmission pipeline test and replacement plans. CPUC electric safety staff have proposed rule changes that would replace defined inspection cycles in favor of a risk-based approach and require trend analyses of equipment failures and fault currents,[38] though their proposals had been rejected in the rulemaking in which they were proposed due to scope.[39] CPUC staff have the experience to implement a performance-based approach for wildfire prevention.

Box 4: Chemical Safety Board Key Features of Effective Safety Regulation

- Duty holder safety responsibility, including written case for safety
- Continuous risk reduction to ALARP
- Adaptivity and continuous improvement
- Active workforce participation
- Process safety indicators that drive performance
- Regulatory assessment, verification, and intervention
- Independent, competent, well-funded regulator

The CPUC might consider modifying its existing requirements for electric utilities in the preparation

of their fire safety plans to include the following:

- An accounting of responsibilities, perhaps including management sign-off, as was required in utility gas safety plans filed pursuant to SB 705
- A description of metrics the utilities plan to use to evaluate the plan's performance and the assumptions that underlie them
- A discussion of how performance measured against previously-identified metrics has informed the utility's current plan
- A description of the utility's quality control/quality assurance procedures for both employees and contractors

When confronted with a utility fire prevention plan, the CPUC might consider developing criteria for approval, disapproval, or modification of the plan through a Commission vote—such as via a Tier 3 advice letter—and for directed audits of utility plan elements. As approval of expenditures would remain the purview of GRCs, the CPUC's role in reviewing utility plans would be to evaluate the utility's approach and present the utility's safety performance to the public and in venues such as GRCs. In addition to the Energy Safe Victoria model, CPUC staff might examine key features described by CSB for an effective major accident prevention regulatory approach, found in Box 4.[40]

The CPUC's Office of Utility Safety and Reliability Should Determine Whether its Resource Level and Allocations Are Sufficient

The Electric Safety and Reliability Branch (ESRB) is housed within the Office of Utility Safety and Reliability in the CPUC's Safety and Enforcement Division. It has 26 approved positions (not including the program manager) in two sections:

- 15 positions cover electric and communications safety equipment (both overhead and underground), including substations.
- 11 positions cover power plant operations and maintenance.

Staff are split between Northern and Southern California. The Office of Utility Safety and Reliability might consider evaluating whether the types of electric and communication facility audits and investigations ESRB currently undertakes—most of them based on prescriptive rules—are the best use of ESRB's limited resources. Were the CPUC to engage in a performance-based approach to wildfire prevention, ESRB would need, at least in the short term, to redeploy staff who are engaged in other activities.

Upon conducting such a risk-informed analysis of its safety activities, the Office of Utility Safety and Reliability will nonetheless likely find that ESRB is under-resourced to provide the level of oversight utility customers expect of it and will need to find a way to convince CPUC management, the

Department of Finance, and the Legislature of the need for more resources, whether in permanent positions or in consultants. In explaining the need for an independent, well-funded regulator (in Box 4), CSB explains:

> *"To ensure that companies are managing risks and employing the best available standards and technologies, the regulator must be independent, well-resourced, and retain a sufficient number of technically competent, experienced, and well-trained staff that can critically assess companies' safety case reports and performance."*[41]

Historically, ESRB has not been able to secure more resources for a number of reasons, only some of which have been under its control.

- *The CPUC's budget requests for electric safety positions have not always included sufficient explanation of how incremental proposed activities were related to existing workload.* In the 2012-13 Budget process the CPUC had requested an additional 11 positions for electric safety, ten of which would have been dedicated toward communication line and substation safety. This request identified a number of risks that continue to be relevant—such as power pole overloading—but did not articulate how the nearly doubling of electric and communications safety staff would be integrated into the existing workflow. For this and other reasons the Legislature rejected this request, and no electric safety budget change proposal has appeared in a Governor's Budget since that time.

- *Endemic fiscal and organizational problems have led to increased Legislative scrutiny of CPUC budget change proposals.* In 2013, an unflattering Department of Finance audit[42] and questions about whether the CPUC use of resources were consistent with statutory priorities[43,44] led the Legislature to impose a requirement to develop a zero-based budget. This past February the Legislative Analyst's Office (LAO), finding weaknesses in the CPUC's zero-based budgeting document, noted that

  > *"while the report includes a* description *of current activities and resources, it lacks a comprehensive* analysis *of these activities and resources. The report does not provide an analysis of the minimum level of funding needed to achieve current service levels or an analysis of the degree to which having higher or lower funding levels would affect the amount or quality of services provided"*[45]

  LAO did not see the fault as solely that of the CPUC, but remarked that the Legislature "did not include details about the Legislature's goals and expectations" for the zero-based budget, and that if the Legislature were to request additional analysis, "its goals and expectations should help inform what *type* of additional analysis it needs." The Legislature has not yet requested such additional analysis.

- *ESRB's mission is one of a large number of the CPUC's competing priorities.* The Independent Review Panel, in its examination of the CPUC's gas safety capabilities, noted "a struggle for resources"—specifically in augmentation of the number of authorized positions.[46] It remains unclear whether the budget change proposal process—in which he myriad of CPUC priorities

compete for resources and are then successively filtered by CPUC management, the Department of Finance, and the Legislature—can be expected to sustainably attend to any needs that may be demonstrated in a safety risk-based resource analysis.

For these reasons, ESRB may be at a particular disadvantage in securing more resources to bridge any gap between its capabilities and public expectations. Under these conditions, the value of a clear analysis of whether its resources are most effectively deployed and a clear demonstration of the incremental benefit of additional resources is all the more necessary. Without such an analysis, the Office of Utility Safety and Reliability may continue to find difficulty convincing CPUC management, the Department of Finance, and the Legislature to entrust it with more electric utility customer funds.

Performance-Based Regulation: A Process, Not a Panacea

The use of performance-based regulation has its own set of pitfalls. Year-to-year differences in fire safety performance are not easily comparable, as weather events vary, though the extensive fire hazard map modeling conducted in the fire safety rulemaking can assist the CPUC in establishing year-to-year performance comparison. The choice of a process to determine what constitutes an acceptable risk reduction—such "as low as reasonably practicable" (ALARP), objective quality evidence, or other standard—is not simple. Confirmation bias—the tendency to find reasons for why a safety plan will be successful instead of searching for reasons why it may not be—has contributed to serious accidents.[47] Perhaps most importantly, regulatory commitment is necessary. As CSB notes, "without independent and competent examinations, the safety case report becomes a meaningless document in terms of controlling risk and preventing major accidents."[48] Whatever the challenges to performance-based analysis of utility fire prevention programs, the existing prescriptive rule development process does not appear to have greatly informed utility decision-making.

Prepared by:

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[20] When asked by the committee for clarification of that passage, Edison described its belief that it would not be prudent to wait until the conclusion of the fire safety rulemaking before beginning its pole loading program.

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Appendix 1: Selected Statutes and Regulations Governing Fire Safety and Electric Power Equipment

North American Reliability Corporation (NERC) Standards

FAC-003-2: Requires electric transmission utilities to prevent vegetation-related transmission line outages that could lead to cascading failures.

Public Resources Code

Section 4291: Requires persons owning structures in mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material to maintain 100 feet of defensible space, among other requirements.

Section 4292: Requires electric utilities to clear of vegetation a 10-foot radius around power poles, except for equipment determined by Cal Fire to not be a fire hazard.

Section 4293: Requires electric utilities to maintain clearances free of vegetation around electrical conductors of 4 feet (2.4kV to 72kV), 6 feet (72kV to 110kV), and ten feet (110kV or more).

Government Code

Section 51178: Requires Cal Fire to identify areas in the state of high wildfire risk.

California Code of Regulations

Section 1255: Outlines equipment exempt from the clearance requirements of Public Resources Code Section 4292.

Public Utilities Code

Section 316: Requires electrical corporations to cooperate fully with CPUC investigations into major incidents concerning overhead electrical facilities regardless of any pending litigation.

Section 364: Requires the CPUC to adopt inspection, maintenance, repair, and replacement standards for electric distribution systems.

Section 8037: Gives the CPUC authority to set safety rules for overhead electric line construction.

CPUC General Order 95: Overhead Electric Line Construction

Rule 35: Requires minimum clearances between overhead lines (electrical conductors and communication lines) and vegetation. Requires the removal of dead, dying, or rotten trees, or any other portion of a tree that may fall onto the lines.

Rule 44: Outlines the safety factors that must be used in determining the minimum material strengths of overhead line equipment.

Rule 48/Rule 49: Outlines the strength and use of materials in overhead line construction.

General Order 165: Outlines inspection cycles for overhead electric facilities, and requires an annual report. Specifies more frequent patrols and inspections of overhead equipment in areas of Southern California of heightened fire risk.

General Order 166: Outlines electric operating standards for emergency preparedness. Requires CPUC-jurisdictional electric utilities to submit annual Fire Prevention Plans.

Appendix 2: CPUC Action in Response to the 2007 Wildfires and Drought*

R.08-11-005/R.15-05-006: Rulemaking to improve fire safety following the 2007 wildfires

- D.09-08-029: Adopted measures to improve fire safety in advance of the 2009 fall fire season, including adopting interim high fire threat zones in Southern California where enhanced vegetation management and more frequent inspections would be required.
- D.12-01-032: Adopted rule changes to require electric utility fire prevention plans, inspection cycles for communications utilities, and interim high fire threat zones for communications lines.
- D.14-01-010: Approved a fire map work plan.
- D.14-02-015: Adopted overhead power line rules that include pole safety standards that account for increased pole worker weight, expanded load calculation requirements for additional equipment attached to utility poles, and record retention requirements, and require electric utility fire incident reports.

I.08-11-006/ I.08-11-007: Investigations into the 2007 Witch, Rice, and Guejito Fires

- D.10-04-047: Approval of settlement agreement requiring SDG&E to pay $14,350,000 and Cox Communications to pay $2,000,000 to the General Fund for the fires.

I.09-01-018: Investigation into the Malibu Canyon Fire

- D.12-09-019: Approval of settlement agreement requiring AT&T, Sprint, Cellco, and Verizon to pay $6,900,000 to the General Fund for the fire and $5,100,000 to strengthen utility poles in Malibu Canyon.
- D.13-09-026: Approval of settlement agreement requiring NextG Networks to pay $8,500,000 to the General Fund for the fire and an additional $6,000,000 for an audit of its pole attachments in California.
- D.13-09-028: Approval of settlement agreement requiring Southern California Edison to pay $20,000,000 to the General Fund for the fire and an additional $17,000,000 to assess and improve utility poles in the Malibu area.

A.09-08-020: Application by SDG&E, Edison, and PG&E to Bill Customers for Liability Claims for Future Wildfires

- D.12-12-029: Denied the application, finding that indemnification of utilities for wildfire damages does not create appropriate incentives for utilities to reduce wildfire damages.

* Proceeding/Decision numbering format: YY-MM-III (YY = [Year], MM=[Month], III = [Document Index])

Resolution ESRB-4: Directs electric utilities to take measures to reduce the likelihood of fires started by or threatening utility facilities and authorizing the tracking of expenditures for future recovery in rates.

[*PENDING*] A.15-05-016: PG&E's application to recover $26.6 million in wildfire prevention expenditures

[*PENDING*] A.15-09-010: SDG&E's application to recover $379 million in claims for liability expenses from the 2007 wildfires