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PUBLIC ADVOCATES OFFICE COMMENTS ON ASSIGNED COMMISSIONER'S RULING AND PROPOSAL FOR COMMUNICATIONS SERVICE PROVIDER RESILIENCY AND DISASTER RESPONSE REQUIREMENTS [PUBLIC VERSION]

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I. INTRODUCTION

Pursuant to the March 6, 2020 *Assigned Commissioner's Ruling and Proposal,* the Public Advocates Office at the California Public Utilities Commission (Public Advocates Office) submits these comments on the *Communications Service Provider Resiliency and Disaster Response Requirements* (Proposed Requirements) contained in Attachment A. By Administrative Law Judge Ruling of March 23, 2020, the due date for these comments was changed to April 3, 2020. Therefore these comments are timely.

Previous, recent, and recurring widespread communications outages have compromised the public health and safety of customers, their families, their communities, and first responders. The Public Advocates Office supports the Proposed Requirements to:

- Require facilities-based communications providers (providers) to maintain service during power outages and emergency disasters, including having backup power available for a minimum of 72 hours at all essential communications facilities;
- Require providers to submit Backup Power Plans, Emergency Operations Plans and waivers for facilities that are redundant or out of compliance to the Commission on an annual basis; and
- Require providers to report detailed outage and critical infrastructure information to emergency first responders and the Commission.

The Public Advocates Office's analysis suggests that there is inadequate backup power deployed at macro cell sites statewide. Seventy-seven percent of macro cell sites in California have eight hours of backup power or less, including nearly seventy percent of macro cell sites in Tier Two and Tier Three High Fire Threat Districts (HFTDs). See Appendix A for a county by county analysis of backup power deployment statewide.

The Public Advocates Office recommends that the Proposed Requirements be modified to:

- Ensure adequate backup power is available at communications facilities in Tier 2 and Tier 3 HFTDs within three months of the adoption of the decision;
- Include additional enforcement and monitoring mechanisms by requiring requests for waivers to be filed as Tier Two Advice Letters;
- Provide additional specificity of the terms "resiliency," "outage," and "clean energy;"
- Increase specificity of reporting requirements in Emergency Operations Plans; and
- Include enforcement requirements with sanctions and penalties for providers that fail to comply with the Proposed Requirements.

II. DISCUSSION

A. Communications Service Provider Resiliency And Disaster Response Requirements

The comments below are in response to the issues and questions in the Assigned Commissioner's Ruling and Proposal.

1. Applicability of Requirements

The Public Advocates Office supports the current application of requirements on communications service providers that own, operate, or are otherwise responsible for infrastructure that provide access to or carry 9-1-1 calls, voice, text messages, or data. The Commission's focus on facilities-based communication providers will help ensure that communications infrastructure is adequately equipped with backup power to maintain service for a minimum of 72 hours following a power outage.

2. Applicability of Requirements – Alternative Proposal

The Public Advocates Office supports the Commission's applicability of requirements specified in Section 1 above. Decision (D.)19-08-025 defined communications service providers to include non-facilities-based communications providers. The Proposed Requirements apply to communications infrastructure; therefore, non-facilities-based communications providers that do not own or operate infrastructure should not be included in these requirements. Nonetheless, non-facilities-based service providers that obtain services from facilities-based providers should ensure that the facilities-based providers they rely on meet the Commission's Proposed Requirements. The Commission should consider requirements related to non-facilities-based providers' service quality during emergencies in subsequent proposals.

3. Definition of Resiliency

The definition of "resiliency" is too broad and instead should be tailored to the context of resiliency in communications systems. The definition should emphasize that a resilient network should be able to withstand emergencies and damages, thereby minimizing the probability of an outage.

The Department of Homeland Security (DHS) Cyber and Infrastructure Security Agency's (CISA) suggests conducting assessments of resiliency at consistent intervals.[1] The

[1] *See* Public Safety Communications Network Resiliency Self-Assessment Guidebook (*available at:* https://www.cisa.gov/sites/default/files/publications/DHS%20ECD%20Public%20Safety%20Communications%20Network%20Resiliency%20Self-Assessment%20Guidebook_11.29.18%20-%20FINAL.pdf)

edits to the definition of resiliency and to resiliency strategies below are directly applicable to the communications industry and include additional elements of resiliency.[2]

RECOMMENDATION

The definition of "Resiliency" and the list of resiliency strategies should be edited to state:

> "Resiliency" is defined as the ability to recover from or adjust easily and immediately to adversity or change. In the context of resiliency in communications systems, this means that a communications network can withstand emergencies and damages and minimize the likelihood of service outages to end users. Resiliency is the result of three key elements: route diversity, redundancy, and protective/restorative measures. Resiliency is achieved by Providers through a variety of strategies, including but not limited to the following:
>
> - Resiliency assessments: Network operators conduct regular assessments of public safety measures to ensure continuity of service in the event of an emergency, prioritization of areas for network improvement, and fulfillment of the proposed resiliency best practices on proposed timelines.

4. Backup Power Requirement

The Public Advocates Offices supports the proposed 72-hour backup power requirement. The requirement aligns with the Federal Communications Commission's (FCC) standard for backup power at Central Offices that route calls to 9-1-1 call centers.[3] Only 8 percent of power outages at macro cell sites during the 2019 Public Safety Power Shutoff (PSPS) events lasted longer than 72 hours. A seventy two hour backup standard would have provided uninterrupted power to 92 percent of the macro cell sites in California that lost commercial power during the PSPS events in 2019 (see Table 1).

[2] *See* Public Safety Communications Network Resiliency Self-Assessment Guidebook
[3] *See* Title 47 of the Code of Federal Regulation Section 9.19.

Table 1: Summary of Duration of Power Outages in California Macro Cell Sites that Lost Commercial Power during PSPS Events in 2018 and 2019

Power Failures	Verizon	AT&T	Sprint	T-Mobile	All
Percent under 24 hrs	33%	83%	34%	50%	51%
Percent 24-48 hrs	38%	12%	35%	35%	30%
Percent 48-72 hrs	20%	3%	14%	10%	12%
Percent over 72 hrs	9%	2%	17%	5%	8%

In April 2018, the Commission's Communication Division issued a report analyzing major communication outages during the 2017 winter storms and found that power outages contributed to a significant number of service a total of 964,003 subscribers, or 2.5% of Californians, did not have the capability to dial 9-1-1 for some period of time. The report emphasized that "many of [the] outages could have been prevented with better availability of backup power for wireless providers and improved reliability of cable facilities for wireline providers".[4] The FCC Rule for backup power is consistent with this 72-hour requirement.[5] Further, according to data reported by the Commission's Safety and Enforcement Division, during 2019, there were 2,290 circuit de-energizations by electric utilities.[6] The average outage duration was just under 46 hours, and over 16% of the outages were longer than 72 hours.[7] Therefore, the requirement for providers to have 72 hours of backup power in the Proposed Requirements would mean most macro cell sites would retain power during de-energization events similar to what occurred in 2019.

The Proposed Requirements do not include a timeframe for when providers are required to install backup power necessary to ensure uninterrupted service for at least 72 hours after a commercial electrical outage The requirements require providers to submit their Backup Power

[4] *See* Communications Division Staff Report: Analysis of Major Communication Outages in California during the 2017 January-February Storms, April 2018 (*available at: https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Communications_-_Telecommunications_and_Broadband/Consumer_Programs/Service_Quality/StormsReport.pdf).*

[5] See Title 47 of the Code of Federal Regulation Section 9.19.

[6] A circuit in this case is a major electrical line that provides power to an area.

[7] *See* Utility De-Energization Reports (*available at:* https://www.cpuc.ca.gov/deenergization/).

Plans to the Commission within six months of the adoption of the decision implementing the Proposed Requirements. However, the requirements do not establish a specific deadline for when implementation of the 72-hour minimum requirement must be completed.

Because fire season in California starts as early as May 2020[8], the Commission should, at minimum, require communications service providers to meet backup power requirements in Tier 2 and Tier 3 High HFTDs within three months of the adoption of the decision, and meet backup power requirements for all other facilities in within six months of the adoption of the decision. This would require facilities-based wireless providers[9] to install adequate backup power on 4,626 macro cell sites located in Tiers Two and Three HFTDs in the recommended time period. Currently, 71% and 69% of macro cell sites in Tier 2 and 3 HFTDs, respectively, are equipped with less than eight hours of on-site backup power (see Table 2: Macro Cell Sites and Permanent, On-Site

Backup Power Status in California).

In response to a Public Advocates Office data request, the four major facilities-based wireless providers in California indicated that all of their macro cell sites were designed with a minimum of two hours and a maximum of eight hours of permanent, on site backup battery power.[10] A majority of the providers' sites were equipped with additional backup power, mainly in the form of generators.[11] Seventy-seven percent of macro cell sites are designed to have 8 hours of battery backup or less. These current battery backup capabilities are therefore insufficient to maintain power through a 72-hour power outage. All carriers said that, with an on-site generator, their macro cell sites could operate continuously for a minimum of 24 hours, and all stated that their macro cell sites could sustain operations for at least 72 hours with

[8] *See* CAL 2019 Fire Season Declarations (*available at:* https://www.fire.ca.gov/stats-events/).

[9] AT&T Mobility, Sprint, T-Mobile, and Verizon.

[10] Data provided to the Public Advocates Office in response to Data Request 03 (issued November 6, 2019) from AT&T, T-Mobile, Sprint, and Verizon in November and December 2019. The four wireless providers listed provided narrative response to a Public Advocates Office Data Request regarding the backup power availability of their macro cell sites.

[11] Not all of the backup power sources are traditional generators. At least one provider has deployed hydrogen fuel cells to a minority of their macro cell sites. However, it is true for the overwhelming majority of macro cell sites that if a site has onsite backup in addition to battery power, it is in the form of a diesel or propane generator.

refueling. Table 2 provides an overview of the amount of onsite backup power currently available at macro cell sites in California owned by the four major facilities-based providers.

Table 2: Macro Cell Sites and Permanent, On-Site Backup Power Status in California[12]

Fire Threat Areas	Backup Power Standard	Total
Tier 2 HFTDs	Up to 8 Hours[13]	2,062
	8 to 72 Hours	860
	Total Sites	2,922
	% with less than 8 Hours	**71%**
Tier 3 HFTDs	Up to 8 Hours	1,182
	8 to 72 Hours	522
	Total Sites	1,704
	% with less than 8 Hours	**69%**
Not Tier 2 or Tier 3 HFTDs	Up to 8 Hours	17,311
	8 to 72 Hours	4,779
	Total Sites	22,090
	% with less than 8 Hours	78%
All Sites	Total Sites	26,716
	% with less than 8 Hours	**77%**

The lack of adequate backup power in the communications network has directly impacted communities. For example, failures in the communications network during the 2018 Camp Fire, in Paradise, California, significantly impacted residents' ability to receive information and may have hindered evacuation efforts.[14] Of the four providers serving Paradise, two had no macro

[12] Based on statewide data obtained via Public Advocates Office's Data Request 03 from four major facilities-based providers, AT&T, Sprint, T-Mobile, and Verizon.

[13] Sites without an onsite generator are assumed to be designed for eight hours of backup battery power at most.

[14] *See* Camp Fire Created A Black Hole of Communication, Yolo County Daily Democrat, (*available at* https://www.dailydemocrat.com/2018/12/17/camp-fire-created-a-black-hole-of-communication/)

cell sites with backup capacity beyond batteries. Two providers had at least one macro cell site with additional on-site backup capacity in the form of generators. A total of four macro cell sites had additional generators deployed. Of the fifteen macro cell sites near Paradise in Tier 3 HFTD, only three (20%) of the macro cell sites have onsite backup generators.

RECOMMENDATION

The following changes should be made to the "Backup Power Requirements" section:

> All Providers shall have on-site emergency backup power to support all essential communications equipment including, but not limited to, switching centers, central offices, wire centers, head ends, network nodes, field cabinets, remote terminals, and cellular sites (or their functional equivalents) necessary to maintain service for a minimum of 72 hours immediately following a power outage. Service must be sufficient to maintain access for all customers to use 9-1-1 service, to receive emergency notifications, and to access web browsing for emergency notices. Providers shall comply with this requirement in Tier 2 and 3 High Fire Threat Districts within three months of the adoption of this decision. Providers shall comply with this requirement for all service areas in the state within six months.

4.1 Definition of Outage

Section 4 (b) of the Assigned Commissioner's Ruling and Proposal asks how "outage" should be defined. The terminology used in the Proposed Requirements does not consistently define and differentiate between communication outages and power outages. The definition for "Communications Outage" should align with the FCC's definition of "Outage" in Code of Federal Regulations (CFR) 47 Section 4.5:

> Outage is defined as a significant degradation in the ability of an end user to establish and maintain a channel of communications as a result of failure or degradation in the performance of a communications provider's network.

See: We Have Fire Everywhere: Escaping California's Deadliest Blaze, New York Times Magazine, (*available at* https://www.nytimes.com/interactive/2019/07/31/magazine/paradise-camp-fire-california.html).

See Ahead of Camp Fire Anniversary, New Details Emerge of Troubled Evacuation, PBS Frontline, (*available at* https://www.pbs.org/wgbh/frontline/article/camp-fire-anniversary-new-details-troubled-evacuation/)

The "Communications Outage" definition should also include disruption of service. The Proposed Requirements should include thresholds for disruption of service and degradation of service set forth in D.18-08-025.[15]

The term "Power Outage" is undefined in the California Public Utilities (PU) Code, however, PU Code Section 334 states that California utilities voluntarily adhere to reliability standards developed by the Western Electricity Coordinating Council (WECC).[16] WECC defines a power outage as "[t]he period during which a generating unit, transmission line, or other facility is out of service. Outages are typically categorized as forced, due to unanticipated problems that render a facility unable to perform its function &/or pose a risk to personnel or to the system, or scheduled / planned for the sake of maintenance, repairs, or upgrades."[17] Because this glossary is from June 25, 2015 and predates California's Public Safety Power Shutoffs, it omits any reference to those events. The Commission should also include de-energization events and Public Safety Power Shutoffs as part of the "power outage" definition.

RECOMMENDATION

The following changes should be made to the Proposed Requirements in a new "Definitions" section:

> Communications Outage is defined as a significant degradation in the ability of an end user to establish and maintain a channel of communications as a result of failure, disruption, or degradation in the performance of a communications provider's network.[4]
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> Disruption of Communications Service:
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> Disruption of the delivery or receipt of service when a disaster(s) has resulted in: (1) loss of dial tone, or access to web browsing, or ability to receive emergency notifications; (2) no connection or otherwise non-functioning service; (3) circumstances in which the caller cannot make or receive a voice call, including a 9-1-1 call, receive emergency

[15] *See* D.19-08-025 at pp. 24-25.

[16] *See* California Public Utility Code Section 334, (*available at* http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PUC&sectionNum=334.&article=2).

[17] *See* Western Electricity Coordinating Council Glossary, (*available at* https://www.wecc.org/_layouts/15/WopiFrame.aspx?sourcedoc=/Administrative/04%20Glossary.docx&action=default&DefaultItemOpen=1).

notifications, or access web browsing for emergency notices because the disaster has rendered the service nonfunctional.

Degradation of Communications Service:

Degradation of service where the disaster(s) that led to an emergency has rendered the service as not being completely out, but callers still encounter poor service quality, including, but not limited to, static, failure to connect, fast busy signal, and/or dropped calls, including 9-1-1 calls, and/or lack of ability to receive emergency notifications, or to access web browsing for emergency notices.

Power Outage: A Power Outage is defined as the period during which a generating unit, transmission line, or other facility is out of service. A power outage may be due to a variety of causes including, but not limited to, de-energization events, Public Safety Power Shutoffs, unanticipated problems that render a facility unable to perform its function and/or pose a risk to personnel or to the system, or scheduled/planned for the sake of maintenance, repairs, or upgrades.

5. Backup Power Plans

The Public Advocates Office supports the requirement for providers to submit Backup Power Plans describing the providers' abilities to maintain access to communications services for 100 percent of customers. As further discussed below, the Commission should make changes to reduce the time allotted to adopt backup power plans, amend the definition of "clean energy", and introduce enforcement and monitoring mechanisms in the waiver process.

Time is of essence to ensure Californians have access to emergency services, including 9-1-1 and public health and safety information platforms, whenever it is needed. Due to the immediate need for backup power plans to be implemented, providers should submit their backup power plans within three months rather than six months after the adoption of the decision.

RECOMMENDATION

The following changes should be made to the "Backup Power Plans" section:

Providers shall submit their backup power plans to the Communications Division Director within ~~six~~ three months from the adoption of the decision. Providers shall annually submit to the Communications Division Director updates to their plans,

including detail on any changes and certification of compliance of new facilities that are built.

5.2 Clean Energy Generation

The Public Advocates Office supports the Proposed Requirement for providers to use clean energy backup power options before using diesel generators to meet the backup power requirement. Although the requirement to provide 72 hours of uninterrupted power[18] could present a challenge for clean energy generators in certain situations, it by no means precludes their use. Clean energy technology has developed to the point where efficiency, reliability[19] and cost are now comparable to conventional power sources.

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[18] *See* Communications Service Provider Resiliency and Disaster Response Requirements (Proposed Requirements) contained in Attachment A.

[19] Reliability has been defined by the Commission "by several criteria: the availability of sufficient electric power generation to meet growing customer demand; the time required to restore power to customers following an outage; and the ability of the system to withstand sudden disturbances, such as electric short circuits or unanticipated loss of system facilities" (See *Glossary and Acronyms, San Diego Gas and Electric Company's Divestiture of Electric Generating Assets. Available* at https://www.cpuc.ca.gov/environment/info/esa/divest-sdge/chapters/07-gloss.htm.)

Table 3 compares solar power, fuel cells and diesel generators.[20] The comparison demonstrates that clean energy backup is technically and fiscally feasible. For example,

Table **4** shows a cost analysis completed by *PlugPower*, a clean energy backup power provider that presented on the "Using Technology to Improve Network Resiliency" panel at the CPUC's Communications En Banc. The analysis compares capital and operational costs of fuel cells to diesel generators.

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[20] There are a few other clean energy alternatives such as wind and biogas, however solar power and fuel cells are most commonly used in telecommunications.

Table 3: A Comparison of Diesel Power to Clean Energy Alternatives based on the Commonly Publicized Barriers to Clean Energy

	Clean Energy Fuel Cells[21]	Solar Power and Energy Storage[22]	Diesel Generators[23]
Cost	Savings of up to 30% on capital cost over diesel generators for fuel cells.	Savings of up to 35% over diesel generators for Solar Power.	Ongoing quarterly maintenance costs have significant impact on operations budgets.
Re-Fueling[24]	Multiple clean energy storage and refueling methods make fuel cells easy to refuel for normal or disaster recovery operations.	No fuel is needed for Solar Powered systems.	Robust diesel fueling infrastructure is needed, which may cause refueling to be challenging or infeasible during disasters.
Reliability[25]	Fuel Cells have ~99.6% reliability.	Solar Power Storage has shown estimates of ~93% reliability.	Up to 88%
Environmental Sustainability	No hazardous emissions, low noise, vibration, and heat signatures.	No hazardous emissions, low noise, vibration, and heat signatures.	High Pollution, noise, vibration, and fuel toxicity.

[21] *See* Comparing Backup Power Options for Communications (*available at:* https://www.plugpower.com/wp-content/uploads/2015/07/FCvGen_Stat_F1_101416.pdf).

[22] *See Schneider Electric Telecom Towers* (available at: https://solar.schneider-electric.com/solution/telecom-tower/).

[23] *See* Comparing Backup Power Options for Communications.

[24] Duration of times backup power sources can last is dependent upon a number of factors, including initial fuel supply, storage system size and amperage of the site.

[25] *See* Glossary and Acronyms, San Diego Gas and Electric Company's Divestiture of Electric Generating Assets. *(available* at https://www.cpuc.ca.gov/environment/info/esa/divest-sdge/chapters/07-gloss.htm.).

Table 4: Capital Cost Comparison for a *PlugPower* Fuel Cells and Diesel Generators at a macro cell sites.[26, 27]

Item	Typical Fuel Cell: 5kW system in Integrated Power Cabinet with fuel storage	Diesel Generator: 20kW with ATS and fuel storage
Capital Cost		
Hardware	$35,920	$20,000
Permitting/Installation	$13,000	$17,500
Incentives: Federal Tax Credit*	$14,676	$0
Total First Cost	$34,244	$37,500
Operational Costs		
Annual Maintenance / materials	$300	$1,400
Annual fuel & delivery	$223	$500
Total Annual Operational Costs	$523	$1,900
Cost savings	**Immediate**	
Cost comparison in year 2	$34,767	$39,400
Cost comparison after 5 years	$36,859	$47,000
Cost comparison after 10 years	$39,474	$56,500
* Federal tax credit is $3/W or 30% of the installed cost of the fuel cell, whichever is less. In this case, $3/W * 5kW = $15,000; 30% of cost is $14,676.		

Additionally, an anlysis by EnergySage shows that while batteries (which can be charged by clean energy resources) might have higher upfront costs than natural gas generators, they require much less annual maintenance, making the lifetime costs of batteries and natural gas generators similar.[28]

The defintion of "Clean Energy" should align with the California Public Resources Code definition of renewable electrical generation facility. The California Public Resources Code defines "Renewable Electrical Generation Facility" as one that "uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation

[26] *See* Comparing Backup Power Options for Communications that shows Cost Savings Table and states: "Fuel cells in communications environments can offer savings of up to 30% on capital cost over diesel generators".

[27] *See* Fuel Cells for Backup Power in Telecommunication Facilities for additional comparisons of fuel cells and diesel generators (available at: https://www.hydrogen.energy.gov/pdfs/44520.pdf).

[28] *See* Batteries vs. Gas-Powered Generators for Backup Power (Available at https://www.energysage.com/solar/solar-energy-storage/storage-resiliency/batteries-vs-gas-generators/).

of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and any additions or enhancements to the facility using that technology."[29] Providers should be required to prove that clean energy options are not viable before being allowed to use diesel or other non-renewable generators.

RECOMMENDATION

The following changes should be made to the "Clean Energy" section:

> Providers shall utilize clean energy backup power options (e.g., battery, solar, wind, renewable fuel cell, etc.) as reasonable before using diesel generators to meet the backup power requirement. Clean energy shall be defined as electricity generated by fuel sources that restore themselves over a short period of time and do not diminish. Although some renewable energy technologies have an impact on the environment, renewables are considered environmentally preferable to conventional sources and, when replacing fossil fuels, have significant potential to reduce greenhouse gas emissions. Clean energy technology shall include power sources that are sourced from biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation, digester gas, solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and any additions or enhancements to the facility using that technology. In Backup Power Plans, providers shall prove that clean energy options were implemented or were considered but determined not to be viable at locations where diesel or other non-renewable generators are installed.

5.3 Waivers

The Public Advocates Office supports the waiver for redundant facilities and waiver for non-compliant facilities outlined in the Proposed Requirements. The waivers for non-compliant facilities should require providers to identify ways by which they will ensure essential services are provided to customers in affected areas through the deployment of mobile assets (e.g. Cells on Wheels or COWs, Cells on Light Trucks or COLTs, and portable backup power sources).

In order to allow the Commission to monitor and enforce proposed requirements, all waivers requests should be submitted through Tier Two Advice Letters and be accompanied by an affidavit or declaration under penalty of perjury signed by a duly authorized officer of the

[29] *See* Section 25741 of the California Public Resources Code (*available at:* https://codes.findlaw.com/ca/public-resources-code/prc-sect-25741.html).

Provider that represents and warrants that service will be maintained without interruption for a minimum of 72 hours, even in the absence of onsite backup power, to allow all customers to make 9-1-1 calls, receive emergency notifications, and access web browsing for emergency notices.

RECOMMENDATION

The following changes should be made to the "Waivers" section:

> Providers may submit requests for ~~include, within their Backup Power Plans,~~ specific facilities ~~or classes of facilities~~ that require a waiver from the backup power requirements proposed in this section through Tier Two Advice Letters. Waiver requests must be accompanied by an affidavit or declaration under penalty of perjury signed by a duly authorized officer of the Provider that represents and warrants that service will be maintained to all customers to make 9-1-1 calls, receive emergency notifications, and access web browsing for emergency notices, without interruption, for a minimum of 72 hours immediately following a commercial power outage, even in the absence of onsite backup power, Waivers may be submitted for one or both of the following two reasons:
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> > Waiver for Redundant Facilities: A Provider may seek a waiver for each facility or class of facilities that does not need 72-hours of backup power to maintain overall consumer access to 9-1-1, as well as the ability to receive emergency notifications and access web browsing for emergency notices for 100 percent of customers. The waiver shall include information on the location of the facility(s), detailed information on how the Provider will maintain service for a minimum of 72 hours immediately following the loss of power and why backup facilities are unnecessary to do so.
> >
> > Waiver for Noncompliant Facilities: A provider may seek a waiver to address each facility or class of facilities that is unable to comply with the 72-hour backup power requirement because of significant risk to safety of life or health; or specific existing federal, state, tribal or local law. The waiver shall include the specific location of the facility(s) and a detailed description of facts supporting the basis of the Provider's claim of preclusion from compliance, including legal citations, and how the provider plans to continue to provide essential services to

customers in affected areas through the deployment of mobile assets (i.e. Cells on Wheels, Cells on Light Trucks, or portable backup power sources).

5.4 Critical Facility Information Sharing

The Public Advocates Office supports the proposal directing providers to share critical facility location information with emergency responders and the Commission to enhance their ability to prevent damage to facilities during disasters, respond to communities' health and safety needs, and ensure facility redundancy. The Proposed Requirements should use consistent terminology and define what is meant by "emergency responders," but at a minimum this term should include the Cal Office of Emergency Services, CALFIRE, and state and local fire departments and police.

Both consumers and providers will benefit from emergency responders' knowledge of and allocation of resources to protect critical communication facilities. For instance, during a Wireless Emergency Alert (WEA) tests done in Sonoma County in 2019, "telecommunication providers did not effectively communicate, participate, or provide information critical to mission success… This includes requiring telecommunications companies to provide critical information such as cell tower locations."[30] WEAs are a cornerstone of disaster relief, and local governments need to have confidence that these systems work as publicized.

6. Emergency Operations Plans

The Public Advocates Office supports the requirement that providers submit annual Emergency Operations Plans that include emergency contact information, information on the provider's emergency preparedness exercises, and public communications plans.

The Commission should provide more specificity for Emergency Operations Plans. The Commission should include a timeframe for which providers must implement emergency preparedness exercises. The Commission should also increase specificity regarding the timeframe within which providers must share information about outages on their website and require providers to follow customer outreach best practices outlined in D.19-08-025, Ordering Paragraph 9.[31]

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[30] *See* Sonoma County Operational Area Alert and Warning Functional Exercise After Action Report/Improvement Plan (*available at:* https://ecfsapi.fcc.gov/file/1009087255343/Final%20A%26W%20AAR%20Plan%20100418.pdf).

[31] *See* D.19-08-025, Ordering Paragraph 9.

RECOMMENDATION

The following changes should be made to the "Emergency Operations Plans" section:

> Emergency Preparedness Exercises. Each Provider is required to train its operating personnel in the proper procedures for implementing its emergency plan. Each provider must train personnel, and conduct or participate in preparedness exercises within six months of the adoption of the decision. Each Provider shall conduct or participate in an annual Emergency Preparedness Exercise to test its emergency procedures unless it has implemented its emergency procedures in response to an actual event within the last 12 months. Following the annual Emergency Preparedness Exercise, the Provider shall assess the effectiveness of the exercise, include this assessment in its emergency operations plan, and modify its emergency operations plan as needed.
>
> Public Communication Plans. ~~As soon as reasonably possible at the onset~~ Within 24 hours of a disaster or PSPS event, each provider shall post on its website an outage map, a description of anticipated outage impacts, and the expected restoration time. This information shall be distributed to impacted customers and the general public by posting relevant information on the Provider's website and social media accounts, by sharing information with local media, and by providing updates to local and state elected officials and public safety stakeholders. Information will be communicated in English, Spanish, Chinese (including Cantonese and Mandarin)[32], Tagalog, and Vietnamese, as well as Korean and Russian where those languages are prevalent within the landline and wireless service providers' service territories. Customer outreach shall also be communicated in accessible formats for customers with disabilities impacting their ability to use standard forms of communication.

7. Current Mitigation Efforts

The Commission requires communications service providers to respond to this section. The Public Advocates Office will respond in reply comments to the communications service providers' mitigation efforts.

[32] Mandarin and Cantonese, though different as spoken languages, are written using the same characters. To ensure that these messages are understood by those who read Chinese, it is important to have relevant emergency messages written in both simplified and traditional characters.

8. Other Topics for Commission Consideration

The current proposal does not include enforcement mechanisms that will help to ensure that providers are meeting backup power and reporting requirements. The Commission should develop enforcement requirements that include sanctions and penalties from the Commission for failure to comply with the Proposed Requirements.

In the "Ensuring Resiliency in Communications Provider Networks" section, the Proposed Requirements discuss the complexity and diversity of communications networks. The Proposed Requirements then offers a definition of resiliency that recognizes that providers may achieve resiliency through a variety of methods. The Proposed Requirements should contain a basic requirement that providers ensure the resiliency of their networks.

RECOMMENDATION

The Commission should direct the Consumer Protection and Enforcement Division to propose a citation program to enforce the provider's compliance with the Proposed Requirements. The citation program should include, but not be limited to, fines regarding the following:

1. Failure to meet the Backup Power Requirement;
2. Failure to timely submit Backup Power Plans;
3. Failure to submit relevant waivers;
4. Failure to share critical facility location information with emergency responders;
5. Failure to provide critical infrastructure resiliency, hardening and location information to Communications Division; and
6. Failure to submit Emergency Operations Plans.

Penalties should be set at a level sufficient to deter continued or repeated non-compliance and take into consideration the financial means of the provider, in addition to other penalty factors.[33]

[33] See D.98-12-076, factors for determining a fine, pp. 20-21.

Additionally, the following change should be made in the "Ensuring Resiliency in Communications Provider Networks" section:

> Providers shall ensure that their communications networks meet the definition of "resiliency" herein and are always capable of providing safe and continuous service, including during emergencies, outages and PSPS events.

III. CONCLUSION

Communication service providers have not adequately provided reliable service or relief measures on a voluntarily basis or under D.19-08-025 requirements. It is a matter of public health and safety for the public to access essential communications services, including emergency evacuation alerts, 9-1-1, and information available on the Internet regarding emergency updates and relief efforts. The Commission should make the following changes to the proposed requirements:

- Ensure adequate backup power is available at communications facilities in Tier 2 and 3 HFTDs within three months of the adoption of the decision;
- Include additional enforcement and monitoring mechanisms in the waiver process through Tier Two Advice Letters;
- Increase the specificity of the terms "resiliency," "outage," and "clean energy;"
- Increase specificity of reporting requirements in Emergency Operations Plans; and
- Include enforcement requirements that state that providers will be subject to sanctions and penalties from the Commission for failure to comply with the Proposed Requirements.

Respectfully submitted,

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Appendix A

The following tables show the distribution of onsite backup power at macro cell sites by county. Four providers, AT&T, Sprint, T-Mobile, and Verizon, provided the Public Advocates Office with a list of all macro cell sites in the state, by location and with information as to whether or not each site had a generator.

Each provider's macro cell sites are equipped with battery backup. Backup generators are located at some sites, in addition to baseline battery backup. Out of 26,716 total macro cell sites in California, there are 6,161 macro cell sites in the state with on-site backup generators. Each provider responded with the different ranges of time for each of its on-site backup generators, with a cumulative range from 24-120 hours of capacity. Sites without onsite backup generators were designed to last for a maximum of 8 hours on battery power.

Table 5 provides a summary of onsite backup generator deployment by County. Statewide, 77% of macro cell sites do not have backup generators. The proportion of sites with backup generators differ greatly by county, ranging from 98% without onsite backup generators in San Francisco to 13% without onsite backup generators in Trinity County.

Table 5: Onsite Backup Generation Deployment by County in California

County	Sites with Battery Power Only	Sites with Backup Power Generation	Total	% with Battery Power Only
Alameda	939	172	1,111	85%
Alpine	4	3	7	57%
Amador	21	16	37	57%
Butte	74	55	129	57%
Calaveras	26	18	44	59%
Colusa	13	13	26	50%
Contra Costa	618	143	761	81%
Del Norte	7	6	13	54%
El Dorado	125	83	208	60%
Fresno	316	152	468	68%
Glenn	12	15	27	44%
Humboldt	63	58	121	52%
Imperial	72	79	151	48%
Inyo	10	18	28	36%
Kern	343	231	574	60%
Kings	38	39	77	49%
Lake	18	22	40	45%
Lassen	13	20	33	39%

Los Angeles	5,255	1,141	6,396	82%
Madera	56	51	107	52%
Marin	186	29	215	87%
Mariposa	7	19	26	27%
Mendocino	28	38	66	42%
Merced	102	69	171	60%
Modoc	4	6	10	40%
Mono	19	16	35	54%
Monterey	248	87	335	74%
Napa	72	33	105	69%
Nevada	62	34	96	65%
Orange	1,851	333	2,184	85%
Placer	239	118	357	67%
Plumas	5	13	18	28%
Riverside	981	473	1,454	67%
Sacramento	669	199	868	77%
San Benito	24	11	35	69%
San Bernardino	975	551	1,526	64%
San Diego	2,354	492	2,846	83%
San Francisco	704	17	721	98%
San Joaquin	230	139	369	62%
San Luis Obispo	204	86	290	70%
San Mateo	575	76	651	88%
Santa Barbara	259	80	339	76%
Santa Clara	1,139	149	1,288	88%
Santa Cruz	124	33	157	79%
Shasta	64	49	113	57%
Sierra				50%
Siskiyou	33	40	73	45%
Solano	214	61	275	78%
Sonoma	267	85	352	76%
Stanislaus	190	89	279	68%
Sutter	34	28	62	55%
Tehama	24	26	50	48%
Trinity	1	7	8	13%
Tulare	123	100	223	55%
Tuolumne	11	30	41	27%
Ventura	377	126	503	75%
Yolo	102	61	163	63%
Yuba	30	22	52	58%
Grand Total	**20,555**	**6,161**	**26,716**	77%

Table 6 shows the proportion of macro cell sites by Tier 2 and 3 HFTDs by county. Over 17% of macro cell sites are in HFTDs. Tier 2 and Tier 3 HFTDs are areas of very high and extreme fire threat, respectively.[34]

Table 6: Macro Cell Sites in HFTDs by County in California

County	Tier 2 HFTDs (Very High Fire Threat)		Tier 3 HFTDs (Extreme Fire Threat)		Not Tier 2 or Tier 3 HFTDs		All Sites
Alameda	72	6%	39	4%	1,000	90%	1,111
Alpine	1	14%	0	0%	6	86%	7
Amador	24	65%	4	11%	9	24%	37
Butte	1	1%	33	26%	95	74%	129
Calaveras	37	84%	4	9%	3	7%	44
Colusa	3	12%	0	0%	23	88%	26
Contra Costa	127	17%	25	3%	609	80%	761
Del Norte	0	0%	0	0%	13	100%	13
El Dorado	100	48%	48	23%	60	29%	208
Fresno	13	3%	9	2%	446	95%	468
Glenn	2	7%	0	0%	25	93%	27
Humboldt	30	25%	3	2%	88	73%	121
Imperial	0	0%	0	0%	151	100%	151
Inyo	0	0%	0	0%	28	100%	28
Kern	34	6%	33	6%	507	88%	574
Kings	0	0%	0	0%	77	100%	77
Lake	24	60%	4	10%	12	30%	40
Lassen	26	79%	0	0%	7	21%	33
Los Angeles	573	9%	388	6%	5,435	85%	6,396
Madera	14	13%	4	4%	89	83%	107
Marin	26	12%	22	10%	167	78%	215
Mariposa	22	85%	2	8%	2	8%	26
Mendocino	43	65%	7	11%	16	24%	66
Merced	0	0%	0	0%	171	100%	171
Modoc	0	0%	0	0%	10	100%	10
Mono	33	94%	0	0%	2	6%	35
Monterey	64	19%	0	0%	271	81%	335
Napa	13	12%	16	15%	76	72%	105
Nevada	50	52%	18	19%	28	29%	96
Orange	150	7%	140	6%	1,894	87%	2,184
Placer	123	34%	28	8%	206	58%	357

[34] The Commission maintains the High Fire Threat District (HFTD) map at https://ia.cpuc.ca.gov/firemap/ per GO 95 and R.15-05-006.

Plumas	18	100%	0	0%	0	0%	18
Riverside	177	12%	132	9%	1,145	79%	1,454
Sacramento	0	0%	0	0%	868	100%	868
San Benito	8	23%	0	0%	27	77%	35
San Bernardino	134	9%	107	7%	1,285	84%	1,526
San Diego	414	15%	195	7%	2,237	79%	2,846
San Francisco	0	0%	0	0%	721	100%	721
San Joaquin	0	0%	0	0%	369	100%	369
San Luis Obispo	94	32%	26	9%	170	59%	290
San Mateo	53	8%	10	2%	588	90%	651
Santa Barbara	78	23%	35	10%	226	67%	339
Santa Clara	45	3%	9	1%	1,234	96%	1,288
Santa Cruz	15	10%	38	24%	104	66%	157
Shasta	63	56%	9	8%	41	36%	113
Sierra	[redacted]	50%	[redacted]	0%	[redacted]	50%	[redacted]
Siskiyou	43	59%	9	12%	21	29%	73
Solano	23	8%	0	0%	252	92%	275
Sonoma	48	14%	33	9%	271	77%	352
Stanislaus	1	0%	0	0%	278	100%	279
Sutter	0	0%	0	0%	62	100%	62
Tehama	17	34%	0	0%	33	66%	50
Trinity	8	100%	0	0%	0	0%	8
Tulare	9	4%	0	0%	214	96%	223
Tuolumne	23	56%	7	17%	11	27%	41
Ventura	32	6%	262	52%	209	42%	503
Yolo	6	4%	0	0%	157	96%	163
Yuba	7	13%	5	10%	40	77%	52
Grand Total	**2,922**	**11%**	**1,704**	**6%**	**22,090**	**83%**	**26,716**

Table 7 combines the information of the tables 5 and 6, showing the deployment of onsite backup generator by High Fire Threat Tier and county in California. 860 macro cell sites in High Fire Threat Tier 2 and 522 macro cell sites in High Fire Threat Tier 3 zones have backup generators. There are a total of 4,626 total macro cell sites in all High Fire Threat areas. Under 30% of macro cell sites in High Fire Threat areas have backup generators.

Table 7: Onsite Backup Generation Deployment by HFTD by County in California

	High Fire Threat Tier 2				High Fire Threat Tier 3				Not Tier 2 or Tier 3 Fire Threat				All Sites			
County	Sites with Battery Power Only	Sites with Additional On-site Generation	Total Sites	% with Battery Power Only	Sites with Battery Power Only	Sites with Additional On-site Generation	Total Sites	% with Battery Power Only	Sites with Battery Power Only	Sites with Additional On-site Generation	Total Sites	% with Battery Power Only	Sites with Battery Power Only	Sites with Additional On-site Generation	Total Sites	% with Battery Power Only
Alameda	63	9	72	88%	30	9	39	77%	846	154	1,000	85%	939	172	1,111	85%
Alpine		1	1	0%				0%	4	2	6	67%	4	3	7	57%
Amador	13	11	24	54%	2	2	4	50%	6	3	9	67%	21	16	37	57%
Butte		1	1	0%	20	13	33	61%	54	41	95	57%	74	55	129	57%
Calaveras	21	16	37	57%	3	1	4	75%	2	1	3	67%	26	18	44	59%
Colusa		3	3	0%				0%	13	10	23	57%	13	13	26	50%
Contra Costa	97	30	127	76%	20	5	25	80%	501	108	609	82%	618	143	761	81%
Del Norte				0%				0%	7	6	13	54%	7	6	13	54%
El Dorado	59	41	100	59%	26	22	48	54%	40	20	60	67%	125	83	208	60%
Fresno	4	9	13	31%	3	6	9	33%	309	137	446	69%	316	152	468	68%
Glenn		2	2	0%				0%	12	13	25	48%	12	15	27	44%
Humboldt	9	21	30	30%	3		3	100%	51	37	88	58%	63	58	121	52%
Imperial				0%				0%	72	79	151	48%	72	79	151	48%
Inyo				0%				0%	10	18	28	36%	10	18	28	36%
Kern	17	17	34	50%	14	19	33	42%	312	195	507	62%	343	231	574	60%
Kings				0%				0%	38	39	77	49%	38	39	77	49%
Lake	10	14	24	42%	1	3	4	25%	7	5	12	58%	18	22	40	45%
Lassen	11	15	26	42%				0%	2	5	7	29%	13	20	33	39%
Los Angeles	505	68	573	88%	308	80	388	79%	4,442	993	5,435	82%	5,255	1,141	6,396	82%
Madera	8	6	14	57%	1	3	4	25%	47	42	89	53%	56	51	107	52%
Marin	18	8	26	69%	15	7	22	68%	153	14	167	92%	186	29	215	87%
Mariposa	6	16	22	27%	1	1	2	50%		2	2	0%	7	19	26	27%
Mendocino	15	28	43	35%	4	3	7	57%	9	7	16	56%	28	38	66	42%
Merced				0%				0%	102	69	171	60%	102	69	171	60%
Modoc				0%				0%	4	6	10	40%	4	6	10	40%
Mono	18	15	33	55%				0%	1	1	2	50%	19	16	35	54%
Monterey	44	20	64	69%				0%	204	67	271	75%	248	87	335	74%
Napa	10	3	13	77%	7	9	16	44%	55	21	76	72%	72	33	105	69%
Nevada	30	20	50	60%	10	8	18	56%	22	6	28	79%	62	34	96	65%
Orange	124	26	150	83%	121	19	140	86%	1,606	288	1,894	85%	1,851	333	2,184	85%

Placer	86	37	123	70%	15	13	28	54%	138	68	206	67%	239	118	357	67%
Plumas	5	13	18	28%				0%				0%	5	13	18	28%
Riverside	111	66	177	63%	92	40	132	70%	778	367	1,145	68%	981	473	1,454	67%
Sacramento				0%				0%	669	199	868	77%	669	199	868	77%
San Benito	5	3	8	63%				0%	19	8	27	70%	24	11	35	69%
San Bernardino	89	45	134	66%	59	48	107	55%	827	458	1,285	64%	975	551	1,526	64%
San Diego	315	99	414	76%	119	76	195	61%	1,920	317	2,237	86%	2,354	492	2,846	83%
San Francisco				0%				0%	704	17	721	98%	704	17	721	98%
San Joaquin				0%				0%	230	139	369	62%	230	139	369	62%
San Luis Obispo	67	27	94	71%	20	6	26	77%	117	53	170	69%	204	86	290	70%
San Mateo	41	12	53	77%	7	3	10	70%	527	61	588	90%	575	76	651	88%
Santa Barbara	53	25	78	68%	26	9	35	74%	180	46	226	80%	259	80	339	76%
Santa Clara	36	9	45	80%	3	6	9	33%	1,100	134	1,234	89%	1,139	149	1,288	88%
Santa Cruz	12	3	15	80%	28	10	38	74%	84	20	104	81%	124	33	157	79%
Shasta	35	28	63	56%	6	3	9	67%	23	18	41	56%	64	49	113	57%
Sierra	[redacted]			100%				0%		[redacted]		0%	[redacted]			50%
Siskiyou	21	22	43	49%	4	5	9	44%	8	13	21	38%	33	40	73	45%
Solano	18	5	23	78%				0%	196	56	252	78%	214	61	275	78%
Sonoma	32	16	48	67%	18	15	33	55%	217	54	271	80%	267	85	352	76%
Stanislaus		1	1	0%				0%	190	88	278	68%	190	89	279	68%
Sutter				0%				0%	34	28	62	55%	34	28	62	55%
Tehama	8	9	17	47%				0%	16	17	33	48%	24	26	50	48%
Trinity	1	7	8	13%				0%				0%	1	7	8	13%
Tulare	4	5	9	44%				0%	119	95	214	56%	123	100	223	55%
Tuolumne	9	14	23	39%	1	6	7	14%	1	10	11	9%	11	30	41	27%
Ventura	25	7	32	78%	193	69	262	74%	159	50	209	76%	377	126	503	75%
Yolo	3	3	6	50%				0%	99	58	157	63%	102	61	163	63%
Yuba	3	4	7	43%	2	3	5	40%	25	15	40	63%	30	22	52	58%
Grand Total	**2,062**	**860**	**2,922**	71%	**1,182**	**522**	**1,704**	69%	**17,311**	**4,779**	**22,090**	78%	**20,555**	**6,161**	**26,716**	77%