

Use of Back-up Engines for Electricity Generation During Public Safety Power Shutoff Events

Disclaimer

The guidance that follows is intended to help provide an understanding of the California Air Resources Board (CARB) regulations that apply to the use of back-up engines for power during Public Safety Power Shutoff (PSPS) events. This guidance was developed in consultation with local air districts and does not alter or replace any specific requirements of applicable State or local regulations. Users should contact the air district in which the back-up reciprocating engine will be operated to ensure compliance with applicable regulatory and permitting requirements.

Background Regarding PSPS Events

Wildfires in California are occurring more often and are more destructive than ever. Fifteen of the 20 most destructive wildfires in the state's history have occurred since 2000; ten of the most destructive fires have occurred since 2015.¹ The state's fire season is now almost year round.² More than 25 million acres of California wildlands are classified under very high or extreme fire threat.³ Approximately 25 percent of the state's population – 11 million people – lives in a high-risk area.⁴ Within these high-risk fire areas, there are approximately 4.2 million wooden utility poles and 200,000 miles of overhead electric distribution lines.⁵ These distribution networks have caused devastating wildfires, resulting in the loss of human life and billions of dollars in property damage over the past several years.

To reduce the risk of wildfires caused by electricity transmission and distribution networks – and the associated public health and safety impacts – State law and California Public Utilities Commission (CPUC) regulations require California's Investor-Owned Utilities (IOUs) to develop Wildfire Mitigation Plans (WMP).⁶ The purpose of WMPs is to systematically reduce the risk of wildfires ignited by utility infrastructure over the next 10 years and beyond through a clearly articulated statewide vision to coordinate efforts, evaluate mitigation options, and assess progress.⁷ Strategies in

¹ Wildfires and Climate Change: California's Energy Future, A Report from Governor Newsom's Strike Force April 12, 2019, <https://www.gov.ca.gov/wp-content/uploads/2019/04/Wildfires-and-Climate-Change-California%E2%80%99s-Energy-Future.pdf>.

² *Id.*

³ *Id.*

⁴ *Id.*

⁵ California Public Utilities Commission, Press Release, November 26, 2018, <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M244/K299/244299545.PDF>.

⁶ While CPUC requires IOUs to prepare WMPs, municipally owned utilities may also de-energize their lines during fire-risk conditions. This guidance would cover PSPS-related back-up engines in those instances, as well.

⁷ California Public Utilities Commission, Utility Wildfire Mitigation Strategy, September 17, 2019, page 3,

WMPs include: vegetation management (e.g. clearing vegetation growth near power lines), system hardening (e.g. installation of insulated conductors), and, as a last resort, de-energization of transmission and distribution systems (also referred to as Public Safety Power Shutoffs or PSPS events). The design of the utility system, the vegetation, terrain, and weather conditions each play a role in the utility companies' decisions to de-energize their infrastructure.

Since 2013, when San Diego Gas and Electric Company first began de-energizing its lines to proactively prevent wildfires, California's IOUs have de-energized their lines on nearly 30 days, with each PSPS event lasting an average of more than 30 hours.⁸ The number of people impacted by each PSPS event, to date, varies greatly, ranging from very few customers to thousands.⁹ PSPS events affect primarily rural and suburban areas with a high fire risk throughout the State.¹⁰ However, because of the design of California's electricity transmission and distribution network, PSPS events may also impact people living in highly urbanized areas remote from high-risk fire areas.

When a utility provider de-energizes its power lines, the risk of the system sparking a wildfire is greatly reduced. However, power loss has many negative impacts, especially to vulnerable populations (including residential customers that rely on reliable electric service to power life-saving medical devices), medical and emergency service providers (including hospitals, fire departments and police stations), and important public service providers (such as water agencies, gas stations and grocery stores). In order to mitigate the damage of power loss, many of these critical service providers may rely on back-up engines to replace lost grid power. Additionally, many businesses may use back-up engines to avoid catastrophic system disruptions and to minimize economic disruption that could result from prolonged power outages. This use of back-up engines may result in air quality and public health impacts, as discussed further herein.

Use of Back-up Engines to Provide Power During PSPS Events

When electric utilities de-energize their electric lines, the demand for back-up power increases. This demand for reliable back-up power has health impacts of its own. Of particular concern are health effects related to emissions from diesel back-up engines. Diesel particulate matter (DPM) has been identified as a toxic air contaminant, composed of carbon particles and numerous organic compounds, including over forty known cancer-causing organic substances. The majority of DPM is small enough to be inhaled deep into the lungs and make them more susceptible to injury. Much of the back-up power produced during PSPS events is expected to come from engines

https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/AB%201054%20Impact%20%20Wildfire%20Strategy%20Project.pdf.

⁸ CPUC, De-Energization (PSPS), <https://www.cpuc.ca.gov/deenergization/>.

⁹ In September 2017, San Diego Gas and Electric Company de-energized parts of its system affecting only three commercial customers. One year later, Pacific Gas and Electric Company de-energized parts of its system, causing more than 60,000 residential and commercial customers to lose power. Data on PSPS events can be downloaded from CPUC's website at: <https://www.cpuc.ca.gov/deenergization/>.

¹⁰ Fire threat maps are available online at: <https://www.cpuc.ca.gov/firethreatmaps/>.

regulated by CARB and California's 35 air pollution control and air quality management districts (air districts). The following sections discuss the requirements applicable to such engines.

Requirements Applicable to Stationary Engines

[Air District Permitting and Rule Requirements](#)

Stationary back-up engines are often subject to air district requirements. These requirements vary by air district, and they may include permitting requirements, emission limits, and operational restrictions. Owners and operators of stationary back-up engines should contact the air district in which the engine would be operated to ensure that such engines are operated in accordance with applicable air district rules and requirements.

[Airborne Toxic Control Measure for Stationary Compression Ignition Engines](#)

CARB's Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines¹¹ (Stationary Engine ATCM) establishes emission limits and operational restrictions for stationary compression-ignition engines rated at greater than 50 brake horsepower (bhp). Portable engines, as defined by the Stationary Engine ATCM, and spark-ignition engines are not subject to the requirements of the Stationary Engine ATCM.¹²

The Stationary Engine ATCM allows for the use of older, more polluting, "emergency standby engines."¹³ However, because these emergency standby engines can emit significantly more DPM than newer, state-of-the-art equipment, the Stationary Engine ATCM limits their use during non-emergency activities such as maintenance and testing. The most polluting engines are limited to 20 hours of maintenance and testing operations each year.¹⁴ Engines with lower emissions are afforded additional maintenance and testing hours per the ATCM and air district approval.

The Stationary Engine ATCM allows owners and operators of emergency standby engines to use those engines to provide electrical power when a facility experiences the loss of normal electrical service that is beyond the reasonable control of the facility.¹⁵ Electrical service loss resulting from PSPS events is beyond the reasonable

¹¹ Title 17, California Code of Regulations (Cal. Code Regs.) section 93115, et seq.

¹² The Stationary Engine ATCM distinguishes between portable and stationary engines. For example, engines with indicators of portability that remain at the same facility location for more than 12 consecutive rolling months or 365 rolling days, whichever occurs first, not including time spent in a storage facility, are deemed stationary engines and are subject to the requirements of the Stationary Engine ATCM. 17 Cal. Code Regs. § 93115.4(a)(57); 17 Cal. Code Regs. § 93115.4(a)(72).

¹³ 17 Cal. Code Regs. § 93115.4(a)(29).

¹⁴ If the engine fails during maintenance and testing hours, the Stationary Engine ATCM allows the Air Pollution Control Officer of the air district in which it is located to allow additional operation needed to repair the failure, without counting those additional hours towards the annual limitation. 17 Cal. Code Regs. § 93115.4(a)(47)(D).

¹⁵ 17 Cal. Code Regs. § 93115.4(a)(30).

control of most back-up engine owners and operators, and therefore, appropriately-permitted emergency standby engines may be operated to provide electrical power during such an event pursuant to the Stationary Engine ATCM.

Requirements Applicable to Portable Engines

[Air District Permitting and Rule Requirements](#)

Like stationary back-up engines, portable back-up engines may also be subject to air district requirements. These requirements vary by air district, and may include permitting requirements, emission limits and operational restrictions. Portable engines may be permitted by the air district for use at multiple locations within a single facility or may be permitted for use in multiple locations across the air district.

Owners and operators of portable back-up engines should contact the air district in which the engine would be operated to ensure that such engines are operated in accordance with applicable air district rules and requirements.

[Voluntary Portable Equipment Registration Program In Lieu of Air District Permits](#)

To facilitate the use of portable engines,¹⁶ CARB's Portable Equipment Registration Program (PERP)¹⁷ allows an owner or operator of a portable engine to voluntarily apply for a statewide registration, allowing the engine to be operated anywhere in the state without the need for air district permits. PERP-registered engines are exempt from district permitting when operated in compliance with the PERP requirements – which include the ATCM for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower or Greater (Portable Diesel Engine ATCM), discussed in the following section.

Statewide registration under PERP is not valid where engines are “used to provide primary or supplemental power to a building, facility, stationary source, or stationary equipment” except during, “unforeseen interruptions of electrical power from the serving utility.”¹⁸ At this time, CARB staff believes that PSPS events qualify as “unforeseen interruptions of electrical power” for purposes of PERP. Accordingly, PERP-registered engines may be used during a PSPS event by most owners or operators to provide primary or supplemental power.

It is important to note a significant caveat regarding the use of PERP. PERP registrations are not valid if the engine is part of a stationary source. If CARB or an air district determines that an engine is used as part of a stationary source, the PERP

¹⁶ See 13 Cal. Code Regs. § 2452(dd) for the complete definition of “Portable” established by the PERP regulation. By definition, an engine is not portable if (among other things) such engine is attached to a foundation, or if not so attached, will reside at the same location for more than 12 consecutive months. In this case, the engine is considered to be a stationary engine, is subject to the Stationary Engine ATCM, and may require an air district permit.

¹⁷ 13 Cal. Code Regs. § 2450, et seq.

¹⁸ 13 Cal. Code Regs. § 2453(m)(4)(E).

registration is not valid at that location, and an air district permit may be required. Engines that reside at the same location for 12 consecutive months are, by definition not portable.¹⁹ Additionally, engines that routinely return to the same location to serve the same function may be considered by the air districts to be “part of a stationary source”. Owners or operators of portable engines consult the air district to ensure that a PERP registration is valid.

[Use of Unregistered/Unpermitted Portable Engines Operated During Emergency Events](#)

PERP allows for the temporary operation of otherwise unregistered and/or unpermitted engines²⁰ during an “Emergency Event” so long as certain conditions are met. “Emergency Event” means a “situation arising from sudden and reasonably unforeseen natural disaster such as earthquake, flood, fire, or other unforeseen events beyond the control of the portable engine or equipment unit operator... that threatens public health and safety and that requires the immediate temporary operation of portable engines or equipment units to help alleviate the threat to public health and safety.”²¹ CARB staff believes that PSPS events generally qualify as unforeseen events for purposes of PERP, and therefore use of unregistered portable engines may be allowed for the duration of a PSPS event – but only if necessary to alleviate a threat to public health and safety.

Under PERP, engines may be operated during an Emergency Event only if:

- The engine to be used is certified to meet a California or federal emission control standard;
- The owner or operator demonstrates that there is an immediate temporary need to operate the engine to help alleviate a threat to public health and safety that is the result of a reasonably unforeseen event, that is beyond the control of the owner or operator;
- The owner or operator notifies CARB within 24 hours of commencing operation; and
- The engine is operated only for duration of the Emergency Event, or up to 12 months, whichever comes first.

Notification to CARB is completed by submitting a Form 40 “Notification of Operation in an Emergency Event.”²² In response to receiving a Form 40 submittal, CARB, in consultation with the local air district, may refute that an Emergency Event exists, in which case operation of the engine must cease immediately.²³ Misrepresentation of an Emergency Event and failure to cease operation is a violation of PERP.²⁴

¹⁹ See 13 Cal. Code Regs. § 2452(dd).

²⁰ See 13 Cal. Code Regs. § 2455(c) for the specific regulatory provisions.

²¹ 13 Cal. Code Regs. § 2452(j).

²² PERP registration and reporting forms, including the Form 40, are available online at:

<https://ww2.arb.ca.gov/resources/documents/perp-application-record-keeping-reporting-forms>

²³ 13 Cal. Code Regs. § 2455(c).

²⁴ *Id.*

As a practical matter, CARB forwards copies of the Form 40s it receives to the appropriate air districts and works closely with the air districts to ensure that operation during an Emergency Event complies with the requirements of PERP, including the requirement that unregistered engines are only operated as necessary to alleviate threats to public health and safety.

[CARB ATCM for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater](#)

CARB's Portable Diesel Engine ATCM²⁵ establishes requirements for portable diesel engines, including "Emergency-use Engines."²⁶ As explained further herein, Emergency-use Engines that comply with the Portable Diesel Engine ATCM may be used to provide back-up power during PSPS events, subject to the terms and conditions of the applicable air district permit or PERP registration.²⁷

[Portable Diesel Engine ATCM Provisions for the Use of Designated "Emergency-use Engines" During Emergencies and Emergency Events](#)

The Portable Diesel Engine ATCM allows owners of certain portable engines to be designated as "Emergency-use Engines" in air district permits or PERP registrations. Designated "Emergency-use Engines"²⁸ are limited to operation only during an "Emergency" or "Emergency Event", and are also exempt from the portable diesel engine phase out schedule and the fleet-average emission standard option. While seemingly similar, the definitions of Emergency and Emergency Event are distinct.

- "Emergency"²⁹ includes the failure or loss of all or part of normal electrical power service, which is caused by any reason other than the enforcement of a contractual obligation the owner or operator has with a third party or any other party; and which is demonstrated by the owner or operator to the air district Air Pollution Control Officer's (APCO) satisfaction to have been beyond the reasonable control of the owner or operator.

CARB staff believes that PSPS events meet the definition of "Emergency" under the Portable Diesel Engine ATCM. However, owners or operators of such

²⁵ 17 Cal. Code Regs. § 93116, et seq.

²⁶ As with the PERP regulation, the Portable Diesel Engine ATCM excludes engines that are attached to a foundation, or if not so attached, will reside at the same location for more than 12 consecutive months from the definition of "Portable." See 17 Cal. Code Regs. § 93116.2(a)(29).

²⁷ In air districts where no permitting requirement exists for a portable engine, such engine may be used without an air district permit to operate or PERP registration. In these areas, if the engine has a valid PERP registration, the owner or operator of such engine shall comply with the conditions established by the PERP registration.

²⁸ See 17 Cal. Code Regs. § 93116.2(a)(15) for the complete definition of "Emergency-use Engines" established in the Portable Diesel Engine ATCM.

²⁹ See 17 Cal. Code Regs. § 93116.2(a)(12) for the complete definition of "Emergency" established in the Portable Diesel Engine ATCM.

engines must make appropriate demonstrations to the APCO prior to commencing operation of such engines.

- “Emergency Event”³⁰ refers to a situation arising from a sudden and reasonably unforeseen natural disaster such as an earthquake, flood, fire, or other unforeseen event that requires the use of portable engines to help alleviate the threat to public health and safety.

CARB staff believes that PSPS events are generally unforeseen events for purposes of the Portable Diesel Engine ATCM, and certified portable engines may be used help alleviate the threat to public health and safety during such events.

The Portable Diesel Engine ATCM exempts engines used exclusively in “Emergency Events”³¹ Nonetheless, such engines may be subject to air district rules, including the requirement to obtain an air district permit.

[Portable Diesel Engine ATCM Provisions for the Use of Designated “Low-use Engines” During Emergency Events](#)

The Portable Diesel Engine ATCM allows owners of certain portable engines to be designated as “Low-use Engines”³² in air district permits or PERP registrations. Designated “Low-use Engines” are limited to 200 hours of operation per year, except that the hours of operation used for a qualifying “Emergency Event” (i.e. as needed to protect public health and safety) are not counted toward the allowed annual hours of operation. All hours of operation for other uses, (i.e. to provide electrical power not related to protecting public health and safety) are counted toward the 200 annual hours of operation limit.

Use of Small Generators (under 50 bhp)

Small off-road engines, such as those used in small generators sold at retail stores, are required to be certified by CARB to be able to be sold in California. CARB does not establish in-use restrictions for such certified engines, and small generators are generally exempt from air district rules. Owners of small generators should check with the air district in which they would be used to determine if the air district has established usage limitations or permit requirements.

³⁰ See 17 Cal. Code Regs. § 93116.2(a)(13) for the complete definition of “Emergency Event” established in the Portable Diesel Engine ATCM.

³¹ See 17 Cal. Code Regs. § 93116.1(b)(14).

³² See 17 Cal. Code Regs. § 93116.2(a)(23) for the complete definition of “Low-use Engine” in the Portable Diesel Engine ATCM.

Monitoring the Need for Public Safety Power Shutoffs and the Use of Back-up Power Sources

CARB, in partnership with California's air districts, is committed to reducing the health risks from air pollution. Protecting the public from wildfire is a public health concern not only for those directly impacted by catastrophic fires, but also for those breathing smoke, often for weeks at a time, while the fire is brought under control and extinguished. While PSPS events reduce utility liability and protect the public from health risks associated with wildfire, they also expose local populations to more diesel exhaust. This impact is especially significant to sensitive populations, including children, the elderly and people with chronic respiratory conditions.

In the short-term, utilities may rely on PSPS events because they have not sufficiently invested in equipment and procedures needed to prevent their infrastructure from starting wildfires. As California's electric utilities implement the vegetation management, system-hardening, and other non-PSPS actions identified in their WMPs, the need for widespread electricity line de-energization – and consequently the need to use back-up engines – is expected to decrease.

CARB staff will monitor the progress utilities are making to implement their WMPs, as well as the frequency of PSPS events, and it will work with the air districts to understand the extent to which back-up engines are used, both by commercial and residential customers, during PSPS events. If the frequency and duration of PSPS events does not decline with time (e.g., if utilities do not make timely system improvements), CARB staff will explore opportunities to ensure that back-up power is produced using the cleanest technologies available. Air districts may also assess the need to modify permitting requirements, emission limits and operational restrictions to address PSPS events.

CARB will work with the air districts and the public to identify approaches to reduce emissions from back-up engines. Many zero and near-zero emission technologies are available today to provide back-up power. Certain emerging technologies, such as battery electric storage (which can be combined with solar electric generation), fuel cells, and natural gas fueled engines may be useful in meeting the back-up power needs of California residents and some businesses. CARB will continue to encourage the development and use of these clean technologies, especially in areas subject to PSPS events.

List of Air District Contacts

Air District	Telephone Number
Amador County APCD	(209) 257-0112
Antelope Valley AQMD	(661) 723-8070
Bay Area AQMD	(415) 749-5000
Butte County AQMD	(530) 332-9400
Calaveras County APCD	(209) 754-6399
Colusa County APCD	(530) 458-0590
Eastern Kern APCD	(661) 862-5250
El Dorado County AQMD	(530) 621-7501
Feather River AQMD	(530) 634-7659
Glenn County APCD	(530) 934-6500
Great Basin Unified APCD	(760) 872-8211
Imperial County APCD	(442) 265-1800
Lake County AQMD	(707) 263-7000
Lassen County APCD	(530) 252-4247
Mariposa County APCD	(209) 966-3689
Mendocino County AQMD	(707) 463-4354
Modoc County APCD	(530) 233-6401
Mojave Desert AQMD	(760) 245-1661

Air District	Telephone Number
Monterey Bay Air Resources District	(831) 647-9411
North Coast Unified AQMD	(707) 443-3093
Northern Sierra AQMD	(530) 274-9360
Northern Sonoma County APCD	(707) 433-5911
Placer County APCD	(530) 745-2330
Sacramento Metropolitan AQMD	(916) 874-4800
San Diego County APCD	(858) 586-2600
San Joaquin Valley APCD	(559) 230-6000
San Luis Obispo County APCD	(805) 781-5912
Santa Barbara County APCD	(805) 961-8800
Shasta County AQMD	(530) 225-5674
Siskiyou County APCD	(530) 841-4025
South Coast AQMD	(909) 396-2000
Tehama County APCD	(530) 527-3717
Tuolumne County APCD	(209) 533-5693
Ventura County APCD	(805) 645-1400
Yolo-Solano AQMD	(530) 757-3650