DRAFT REGULATION ORDER

Subchapter 10. Climate Change

Article 4. Regulations to Achieve Greenhouse Gas Emission Reductions

Subarticle 3.1. Regulation for Reducing ~~Sulfur Hexafluoride~~Greenhouse Gas Emissions from Gas Insulated ~~Switchgear~~Equipment

§ 95350. Purpose, Scope, and Applicability.

(a) *Purpose*. The purpose of this regulation is to achieve greenhouse gas emission reductions by reducing ~~sulfur hexafluoride (SF_6)~~ emissions from gas insulated ~~switchgear~~equipment.

(b) *Applicability.* The provisions of this subarticle apply to owners of gas insulated ~~switchgear~~equipment. Any person who is subject to this subarticle must meet the requirements of this subarticle, notwithstanding any contractual arrangement that person may have with any third parties.

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

§ 95351. Definitions.

(a) For the purposes of this subarticle, the following definitions apply**:**

(1) **"Active Gas Insulated~~S~~ Equipment"** means non-hermetically sealed ~~SF_6~~ gas insulated ~~switchgear~~ equipment that is:

(A) Connected through busbars or cables to the ~~GIS~~ owner's electrical power system; or

(B) Fully-charged, ready for service, located at the site ~~in~~ at which it will be activated~~, and employs a mechanism to monitor SF_6 emissions~~.

"Active Gas Insulated~~S~~ ~~e~~Equipment" does not include equipment in storage.

(2) "**Adjusted System Nameplate Capacity"** means the total nameplate capacity of an owner's GIE adjusted due to GWP of the insulating gas,

(3) **"Electrical Power System"** means the combination of electrical generators (i.e., power plants), transmission and distribution lines, equipment, circuits, and transformers used to generate and transport electricity from the generator to consumption areas or to adjacent electrical power systems.

(3) **"Emergency Event"** means a situation arising from a sudden and unforeseen event including, but not limited to, an earthquake, flood, or fire.

(4) **"Emission rate"** means, subject to the provisions of section 95356(e), a GIES owner's total annual SF_6 GWP-weighted emissions from all active GIES equipment divided by the average annual SF_6 adjusted system nameplate capacity of all active GIES equipment.

(5) **"Executive Officer"** means the Executive Officer of the Air Resources Board (ARB) or his or her designee.

(6) **"Gas container"** means a vessel containing or designed to contain SF_6 a gas used as an insulating gas in GIE. "Gas container" includes pressurized cylinders, gas carts, or other containers.

(7) **"Gas-insulated switchgear equipment or GISE"** means all electrical power equipment insulated with SF_6 gas (including for purposes of this regulation, extremely low pressure gas "vacuum" technologies are considered gas insulated equipment) regardless of location. Gas insulated switchgear equipment or GIES includes switches, stand-alone gas-insulated equipment, and any combination of electrical disconnects, fuses, electrical transmission lines, transformers and/or circuit breakers used to isolate gas insulated electrical equipment.

(8) **"GISE Owner"** means the person who owns gas insulated switchgearequipment. For purposes of this regulation "GIES owner" excludes temporary ownership by the original equipment manufacturer during GIS equipmentE transport and installation at a customer's site.

(9) **"Global Warming Potential or GWP"** means according to a metric that indicates the relative climate forcing of a kilogram of emissions when averaged over a 100-year period relative to carbon dioxide, reflecting how long emissions remain in the atmosphere and how strongly they absorb energy. This regulation shall use the GWPs estimated in the 2013 Fifth Assessment (AR5) of the Intergovernmental Panel on Climate Change (IPCC). If the IPCC AR5 does not have a GWP for a specific gas, the GWP will be based the Code of Federal Regulations, title 40, Chapter I, subchapter C, part 98, subpart A, Table A-1 as published on November 8, 2017.

(9) **"Hermetically Sealed Gas Insulated SwitchgearEquipment"** for purposes of this regulation, means switchgear GIE that is designed to be gas-tight and sealed for life. This type of switchgear GIE is pre-charged with SF_6 an insulating gas, sealed at the factory, and is not refillable by its user.

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(10) **"Nameplate Capacity"** means the design capacity of ~~SF_6~~ the insulating gas (in pounds) specified by the manufacturer for optimal performance of a GIES~~S~~ device. Nameplate capacity may be found on the nameplate attached to the GIES~~S~~ device, or may be stated within the manufacturer's official product specifications or as determined per section 95354.1.

(11) **"NIST-Traceable Standards"** means national, traceable measurement standards developed by the National Institute of Standards and ((Technology (NIST).

(12) **"Person"** shall have the same meaning as defined in Health and Safety Code section 39047.

(13) **"Rankine"** means a scale used to measure temperature wherein zero degrees Rankine is the theoretical absolute zero temperature. The temperature in degrees Rankine is equal to the temperature in degrees Fahrenheit plus 460.

(13) **"Responsible Official**" means one of the following:

(A) For a corporation, a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person; or

(B) For a partnership or sole proprietorship, a general partner or the proprietor, respectively; or

(C) For a municipal, state, federal, or other public agency, either a principal executive officer or a ranking elected official.

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

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§ 95352. Maximum Annual ~~SF_6~~ Emission Rate.

For each calendar year specified below, the maximum annual ~~SF_6~~ emission rate for each GI~~E~~S owner's active GIE fleet ~~S equipment~~ shall not exceed the following:

Maximum Annual ~~SF_6~~ Emission Rate	
Calendar Year	**Maximum Allowable Annual ~~SF_6~~ Emission Rate**
2011	10.0%
2012	9.0%
2013	8.0%
2014	7.0%
2015	6.0%
2016	5.0%
2017	4.0%
2018	3.0%
2019	2.0%
2020, and each calendar year thereafter	1.0%

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

§ 95352.1. Sulfur Hexafluoride Phase Out

Beginning January 1, 203~~0~~25, no GIE utilizing sulfur hexafluoride as an insulating gas can be installed in California; nor shall an existing device be converted to use sulfur hexafluoride as an insulating gas.

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

§ 95353. Emergency Event Exemption.

(a) A GI~~S~~E owner may request that emissions from an emergency event ~~to~~ be exempted from the calculation of the maximum allowable annual emission rate if it is demonstrated to the Executive Officer's satisfaction that the release of insulating gases ~~SF_6~~:

(1) Could not have been prevented by the exercise of prudence, diligence, and care; and

(2) Was beyond the control of the GI~~S~~E owner.

(b) A request for an exemption pursuant to this section must be submitted in writing to the Executive Officer within 30 calendar days after the occurrence of the emergency event, and must contain the following information:

(1) The GI~~S~~E owner's name, physical address, mailing address, e-mail address and telephone number;

(2) A detailed description of the emergency event, including but not limited to the following:

(A) The nature of the event (e.g., fire, flood, earthquake);

(B) The date and time the event occurred;

(C) The location of the event;

(D) The GI~~S equipment~~ E that was affected by the event;

(E) The type, amount (in pounds), and GWP of ~~SF_6~~ insulating gas released ~~(in pounds)~~;

(3) ~~A statement and s~~Supporting documentation that the release occurred as a result of an emergency event; and

(4) A signed and dated statement, under penalty of perjury, provided by ~~the appropriate~~a responsible official that the statements and information contained in the submitted request are true, accurate, and complete.

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

§ 95354. ~~SF_6~~ Insulating Gas Inventory Measurement Procedures.

(a) Beginning January 1, 2011, GIE~~S~~ owners must do all of the following:

(1) Establish and adhere to written procedures to track all gas containers as they are leaving and entering storage;

(2) Weigh all gas containers on a scale that is certified by the manufacturer to be accurate to within one percent of the true weight;

(3) Calibrate all scales used to measure quantities that are to be reported under this subarticle by:

(A) Using calibration procedures specified by the scale manufacturer; or

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(B) If a scale manufacturer has not specified calibration procedures, using:

1. A NIST traceable standard; and

2. A published calibration method identified as appropriate for that scale by either the International Society of Weighing and Measurement or the National Conference on Weights and Measures.

(4) Calibrate scales used to measure quantities reported under this subarticle prior to the first reporting year.

(5) Recalibrate scales used to measure quantities reported under this subarticle at least annually, or at the minimum frequency specified by the manufacturer, whichever is more frequent.

(b) Beginning January 1, 2011, GIE~~S~~ owners must:

(1) Establish and maintain a log of all measurements required by this section;

(2) Record the scale calibration methods used pursuant to this section; and

(3) Retain all documents and records required by this section for a minimum of three years.

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

§ 95354.1. Nameplate Capacity Adjustments

Prior to January 1, 2023, if the manufacturer's nameplate capacity of devices manufactured prior to 2011 is determined by the GIE owner to be inaccurate, the owner may establish a new nameplate capacity in accordance with the following process:

(a) Notify ARB in writing at least 60 days before this process is utilized of the intent to determine a new nameplate capacity.

(b) Record initial system pressure (in Torr).

(c) Record the temperature (in Rankine) of the gas in the GIE device.

(d) Connect an evacuation hose to primary side of a mass flow meter, and another hose from the outlet of the mass flow scale calibrated for the

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insulating gas to be measured to the inlet of the insulating gas recovery system.

(e) Remove insulating gas from the GIE device until the pressure in the device is less than 3.5 Torr.

(f) Record amount of insulating gas removed (in pounds).

(g) The pressure in the GIE device must remain less than 3.5 Torr for at least 5 minutes.

(h) Record final system press (in Torr)

(i) Determine the new nameplate capacity using the following equation:

$$NC = \frac{mT_1P_2}{T_2P_1}$$

Where:
- NC = new nameplate capacity, in pounds
- m = mass of gas removed from the device, in lbs
- T_1 = Temperature of GIE insulating gas, in degrees Rankine
- T_2 = Temperature of insulating gas per manufacturer's ideal fill instructions, in degrees Rankine
- P_1 = Pressure of GIE insulating gas at start of gas removal, in torr
- P_2 = Pressure of insulating gas per manufacturer's ideal fill instructions, in torr

(j) Submit copies of all documentation of measurements, calculations, and the new nameplate capacity to the Executive Officer within 30 days of the date on which the measurements were taken.

(k) The new nameplate capacity shall be permanently affixed to the device within 30 days of the date on which the measurements were taken.

This process can only be undertaken once for a GIE device. Once a new nameplate capacity has been determined, it must be used for the remainder of the device's service life.

Prior annual reports shall be amended to reflect revised nameplate capacities and emission rates. Amended annual reports shall be submitted by June 1st of the calendar year following the year in which nameplate capacities have been revised.

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

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§ 95355. Recordkeeping.

Beginning January 1, 2011, GI~~S~~E owners must:

(a) Establish and maintain a current and complete GI~~S~~E equipment inventory, which includes the following information for each piece of equipment:

(1) Manufacturer serial number;

(2) Equipment type (e.g., circuit breaker, transformer, etc);

(3) Seal type (hermetic or non-hermetic);

(4) Equipment manufacturer name;

(5) Date equipment was manufactured;

(6) Equipment voltage capacity (in kilovolts);

(7) Insulating gas

(8) Insulating gas' GWP

(~~9~~7) Equipment insulating gas ~~SF$_6$~~ nameplate capacity (charge in pounds);

(10~~8~~) A chronological record of the dates on which insulating gas ~~SF$_6$ ww~~as transferred into or out of active GI~~S equipment~~E;

(11~~9~~) The amount, in pounds, of insulating gas ~~SF$_6$~~ transferred into or out of the active GI~~S equipment~~E;

(12~~0~~) Equipment status (active or inactive); and

(13~~1~~) Equipment location:

(A) The physical address for each piece of equipment must be listed; and

(B) Complete records must be kept of changes to the equipment inventory and the dates the changes occurred (such as installation of new equipment, removal of equipment, and disposition of the equipment (e.g., sold, returned to manufacturer, etc.)).

(b) Establish and maintain a current and complete inventory of gas containers, which includes the following information for each container:

(1) A unique identification number;

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(2) Size;

(3) Location;

(4) Insulating gas and its GWP;

(54) The weight, in pounds, of ~~SF_6~~ insulating gas in each container at the end of each calendar year, and when gas containers are added or removed from inventory.

(c) Retain ~~SF_6~~ insulating gas and equipment purchase documentation (such as contracts, material invoices, receipts, etc.);

(d) Retain all records required by this subarticle for a minimum of three calendar years;

(1) GIE~~S~~ owners headquartered in California must retain all records at a location within California;

(2) GIE~~S~~ owners headquartered in other states may retain all records at location in California or at their business offices nearest to California;

(e) Have all records available for ARB inspection at time of inspection; and

(f) Upon request by ARB, provide these records to the Executive Officer.

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

§ 95356. Annual Reporting Requirements.

(a) By June 1, 2012, and June 1st of each year thereafter, each GIE~~S~~ owner must submit an annual report to the Executive Officer for emissions that occurred during the previous calendar year.

(b) Annual reports must contain all of the following information:

(1) ~~Reporting entity~~Owner's name, physical address, and mailing address;

(2) Location of records and documents maintained in California if different from the ~~reporting entity's~~ owner's physical address.

(3) Name and contact information including e-mail address and telephone number of the person submitting the report, and the person primarily responsible for preparing the report;

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(4) The year for which the information is submitted;

(5) A signed and dated statement provided by the appropriate responsible official that the information has been prepared in accordance with this subarticle, and that the statements and information contained in the submitted emission data are true, accurate, and complete.

(6) Annual ~~SF_6~~ emissions for each insulating gas used in GIE as calculated using the equation specified in subsection (d), below;

(7) Annual ~~SF_6~~ emission rate as calculated using the equation specified in subsection (e), below;

(8) A ~~gas insulated switchgear~~GIE inventory report containing the information required by section 95355, subsections (a)(1) through (a)(1~~0~~2); and

(9) A gas container inventory report containing the information required by section 95355, subsections (b)(1) through (b)(5~~4~~).

(c) The annual report shall be submitted to the Executive Officer as follows:

(1) GI~~E~~S owners subject to the requirements of title 17, California Code of Regulations, section 95100 *et seq*., shall use the ARB Greenhouse Gas Reporting Tool or other mechanism, as specified in title 17, California Code of Regulations, section 95104.

(2) GI~~E~~S owners not subject to the requirements of title 17, California Code of Regulations, section 95100 *et seq*., may either:

(A) Use the ARB's Greenhouse Gas Reporting tool, or other mechanism, as specified in title 17, California Code of Regulations, section 95104; or

(B) Submit reports in writing to ARB through the US Postal Service, electronic mail, or by personal delivery.

(d) *Annual ~~SF_6~~ Emissions*. GI~~S~~E owners must use the following equation to determine their ~~SF_6~~ GHG emissions:

Equation for determining annual ~~SF_6~~ emissions for each insulating gas used in GIE:

User Emissions = (Decrease in ~~SF_6~~ insulating gas inventory) + (Acquisitions of insulating gas~~SF_6~~) – (Disbursements of insulating gas~~SF_6~~) − (Net increase in total nameplate capacity of active GI~~S~~E ~~equipment~~ owned).

Where:

Decrease in insulating gas~~SF$_6$~~ inventory = (insulating gas~~SF$_6$~~ stored in containers, but not in equipment, at the beginning of the year) - (insulating gas~~SF$_6$~~ stored in containers, but not in equipment, at the end of the year).

Acquisitions of insulating gas~~SF$_6$~~ = (insulating gas~~SF$_6$~~ purchased in bulk from chemical producers, distributors, or other entities) + (insulating gas~~SF$_6$~~ purchased from equipment manufacturers, distributors, or other entities with or inside active GI~~S equipment~~E) + (insulating gas~~SF$_6$~~ returned to site after off-site recycling).

Disbursements of insulating gas~~SF$_6$~~ = (insulating gas~~SF$_6$~~ in bulk and contained in active GI~~S equipment~~ E that is sold to other entities) + (insulating gas~~SF$_6$~~ returned to suppliers) + (insulating gas~~SF$_6$~~ sent off site for recycling) + (insulating gas~~SF$_6$~~ sent to destruction facilities).

Net increase in total nameplate capacity of active GI~~S equipment~~ E owned = (The nameplate capacity of new active GI~~S equipment~~E) - (Nameplate capacity of retiring active GI~~S equipment~~E).

(e) *Annual ~~SF$_6$~~ Emission Rate.* GI~~S~~E owners shall use the following equations to determine their annual ~~SF$_6$~~ emission rate.

Equation for determining annual emission~~s~~ rate:

~~*ER* = Emissions~~
~~C_{avg}~~

$$ER = \frac{\sum_{i=1}^{n}(Emissions_i * GWP_i)}{AC}$$

Where: ER = Emission Rate
n = Number of insulating gases
GWP_i = GWP of insulating gas *i*
$Emissions_i$ = Annual emissions, per subsection (d), of insulating gas *i*
AC = Adjusted system nameplate capacity as determined by the equation below

~~Where: ER = Emission Rate~~
~~n = Number of insulating gases~~
~~GWP_i = GWP of insulating gas *i*~~
~~$Emissions_i$ = Annual emissions, per subsection (d), of insulating gas *i* (lbs)~~
~~C_{avg}~~AC = ~~Average~~ Adjusted system nameplate capacity as

~~expressed determined by in the equation below (lbs)~~

$$C_{avg} = \frac{\sum_{i=1}^{n}(d_i C_i)}{365}$$

$$AC = \frac{\sum_{i=1}^{n}(d_i * C_i * GWP_i * A_i)}{365}$$

Where: ~~C_{avg}~~AC = ~~The a~~Average ~~djusted~~ system nameplate capacity (lbs)

n = ~~The n~~Number of GI~~ES~~ devices

d_i = ~~The n~~Number of days during the year ~~the GIS~~ device *i* was in active service

C_i = ~~The n~~Nameplate capacity (lbs) ~~of the GIS~~

GWP_i = GWP of insulating gas used in device *i*

A_i = Capacity adjustment factor for device *i* based on the GWP of the insulating gas as expressed in the table below

GWP	Capacity Adjustment Factor
5,000 and above	1
1,000 up to 5,000	2
100 up to 1,000	3
10 up to 100	4
Below 10	5

If a zero GWP technology is used, $d_i C_i GWP_i$ ~~C~~A~~F~~$_i$ shall be assigned a value of 1 lb for every 1,000 volts that the device is designed to safely accommodate.NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code.
Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

§ 95357. Treatment of Confidential Information.

Information submitted pursuant to this subarticle may be claimed as confidential. Such information shall be handled in accordance with the procedures specified in title 17, California Code of Regulations, sections 91000 through 91022.

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NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, 39601, and 41511, Health and Safety Code. Reference: Sections 38560, 39600, 39601, and 41511, Health and Safety Code.

§ 95358. Enforcement.

(a) *Penalties.* Penalties may be assessed for any violation of this subarticle pursuant to Health and Safety Code section 38580. Each day during any portion of which a violation occurs is a separate offense.

(b) Each day or portion thereof that any report required by this subarticle remains unsubmitted, is submitted late, or contains incomplete or inaccurate information, shall constitute a single, separate violation of this subarticle.

(c) Any exceedance of the maximum allowable ~~SF_6~~ emission rate for a calendar year shall constitute a single, separate violation of this subarticle for each day of the calendar year.

(d) *Injunctions.* Any violation of this subarticle may be enjoined pursuant to Health and Safety Code section 41513.

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, 39601, 41510, and 41513, Health and Safety Code. Reference: Sections 38560, 38580, 39600, 39601, 41510, and 41513, Health and Safety Code.

§ 95359. Severability.

Each part of this subarticle is deemed severable, and in the event that any part of this subarticle is held to be invalid, the remainder of this subarticle shall continue in full force and effect.

NOTE: Authority cited: Sections 38510, 38560, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38560, 39600, and 39601, Health and Safety Code.

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