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**LEGAL DISCLAIMER & USER'S NOTICE**

**DISCUSSION DRAFT of Potential Changes to  
the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated  
Switchgear**

This document is a discussion draft of potential changes to the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear (Regulation), and the language following this disclaimer was produced by California Air Resources Board (CARB) staff for the purpose of soliciting stakeholder feedback on potential revisions to the Regulation. The following version is neither an official legal edition of title 17, California Code of Regulations (CCR), sections 95350-95359, nor an unofficial version of the current Regulation. This discussion draft is intended to help inform an upcoming formal rulemaking, but all potential changes included in the document continue to be subject to discussion and may not reflect what is ultimately included in the formal rulemaking. CARB staff's intent is that the current version of the Regulation remain in effect through data year 2019, and that any changes finalized through the formal rulemaking take effect in mid- to late-2020.

**Note:** Due to the extensive nature of the potential changes from the current Regulation, changes are not displayed here in underline-strikeout format. For some provisions, staff may include concept boxes to solicit stakeholder feedback, in lieu of potential regulatory changes.

An unofficial copy of the current regulation can be found at [https://www.arb.ca.gov/regact/2010/sf6elec/completesf6.pdf?\\_ga=2.32605886.1647826591.1549299890-1969458777.1524516934](https://www.arb.ca.gov/regact/2010/sf6elec/completesf6.pdf?_ga=2.32605886.1647826591.1549299890-1969458777.1524516934).

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**DISCUSSION DRAFT REGULATION ORDER**

Amend Subarticle 3.1, Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear sections 95350 to 95359, title 17, California Code of Regulations, to read as follows:

**Subchapter 10. Climate Change**

**Article 4. Regulations to Achieve Greenhouse Gas Emission Reductions**

**Subarticle 3.1. Regulation for Reducing Greenhouse Gas Emissions from Gas Insulated Equipment**

**§ 95350. Purpose, Applicability, and Exemptions.**

- (a) *Purpose.* The purpose of this regulation is to achieve greenhouse gas (GHG) emissions reductions from the operation of electrical equipment that uses GHG as an insulating medium.
- (b) *Applicability.* Except as stated in sections 95352(a) and 95352.3(a) the provisions of this subarticle apply to each owner of gas-insulated equipment (GIE). Any GIE owner who is subject to this subarticle must meet the requirements of this subarticle, notwithstanding any contractual arrangement that GIE owner may have with any third parties. A single annual report containing the information required by section 95353 must be submitted by each GIE owner regardless of whether the GIE owner's GIE is located in a single physical location or multiple non-contiguous locations within California.

GIE owners with an average system nameplate capacity equal to or greater than 5,500 metric tons of carbon dioxide equivalent (MTCO<sub>2e</sub>) in any data year are subject to the annual emissions limit in section 95352.2 for the following data year.

- (c) *Exemptions.* GIE owners are exempt from the provisions of sections 95352 and/or 95352.2 under the following conditions.
  - (1) *Exemption from the sulfur hexafluoride (SF<sub>6</sub>) phase out (section 95352).* A GIE owner may purchase GIE that uses SF<sub>6</sub> as the insulating gas beyond the dates specified in Table 1 for a specific project or application if the conditions of section 95355.3 are met.
  - (2) *Emergency-based exemption to the annual emissions limit (section 95352.2).* A GIE owner may exclude emissions from the annual

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emissions reported pursuant to section 95353(i)(5) if it is demonstrated to the Executive Officer's satisfaction that the release of insulating gases associated with an emergency event meets the requirements of section 95355.4.

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 and Acronyms.**

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

**“Active Gas-Insulated Equipment” or “Active GIE”** means GIE insulated with a GHG or gas mixture which contains at least one GHG that is non-hermetically sealed and is connected through busbars or cables to an electrical power system or that is fully charged, ready for service, and located at the site at which it will be activated. This does not include equipment in storage.

**“ARB Identification Number”** means, for the purposes of this article, the unique identification number assigned to each GIE owner that reports GHG emissions to the California Air Resources Board (CARB) through the CARB Greenhouse Gas Reporting Tool.

**“Carbon Dioxide Equivalent” or “CO<sub>2</sub>e”** means the amount of CO<sub>2</sub> emissions equivalent to the emissions of a given quantity of another GHG when calculated using the individual global warming potentials as specified in the “global warming potential” definition of this subarticle.

**“Data Year”** means the calendar year in which GHG emissions occurred.

**“Day”** means one calendar day.

**“Designated Representative”** means the person responsible for certifying, signing, and submitting the GHG emissions data report.

**“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.

**“Emergency Event”** means a situation arising from a sudden and unforeseen event that could not have reasonably been prevented, including but not limited to an earthquake, flood, or fire.

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**“Executive Officer”** means the Executive Officer of the California Air Resources Board or her or his designee.

**“Gas Container”** means a vessel containing or designed to contain a GHG, or gas mixture which contains at least one GHG, used as an insulating gas in GIE. This includes pressurized cylinders, gas carts, or other containers, but does not include GIE.

**“Gas-insulated Equipment” or “GIE”** means all electrical power equipment insulated with a GHG or gas mixture which contains at least one GHG, regardless of location. GIE includes switchgear, switches, stand-alone GIE, and any combination of electrical disconnects, fuses, electrical transmission lines, transformers, and/or circuit breakers used to isolate GIE. This includes hermetically sealed GIE and non-hermetically sealed GIE.

**“Gas-Insulated Equipment Owner” or “GIE Owner”** means the person who owns GIE. For purposes of this regulation, “GIE owner” excludes temporary ownership by the original equipment manufacturer during GIE transport and installation at a customer’s site. Each corporation or limited liability company which owns GIE is considered to be a distinct GIE owner and is independently subject to this regulation.

**“Global Warming Potential” or “GWP”** means the ratio of the time-integrated radiative forcing from the instantaneous release of one unit of a trace substance relative to that of one unit of a reference gas, in this case, carbon dioxide. The GWP values for this subarticle are as specified in Table A-1 to Subpart A of Title 40 CFR Part 98 as published to the Federal Register on December 11, 2014, which is hereby incorporated by reference.

**“Greenhouse Gas” or “GHG”** means CO<sub>2</sub>, methane, nitrous oxide, SF<sub>6</sub>, hydrofluorocarbons, perfluorocarbons, and other fluorinated GHGs or GHG groups included in Table A-1 to Subpart A of Title 40, CFR Part 98 as published to the Federal Register on December 11, 2014.

**“Insulating Gas”** means the gas used in GIE to interrupt electrical currents.

**“Hermetically Sealed Gas-Insulated Equipment” or “Hermetically Sealed GIE”** means GIE that is designed to be gas-tight and sealed for the life of the equipment. This type of GIE is pre-charged with an insulating gas, sealed at the factory, and is not refillable by its user.

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**“Nameplate Capacity”** means the design capacity of the insulating gas (in pounds) specified by the manufacturer, or as determined per section 95355.2, for optimal performance of a piece of GIE. Nameplate capacity may be found on a nameplate attached to the piece of GIE or within the manufacturer’s official product specifications.

**“Non-Hermetically Sealed Gas-Insulated Equipment” or “Non-Hermetically Sealed GIE”** means GIE that is not designed to be gas-tight and sealed for the life of the equipment. This type of GIE is fillable by its user.

**“NIST-Traceable Standards”** means national, traceable measurement standards developed by the National Institute of Standards and Technology.

**“Person”** shall have the same meaning as defined in Health and Safety Code section 39047.

**“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.

**“Responsible Official”** means one of the following:

- (1) 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
- (2) For a partnership or sole proprietorship, a general partner or the proprietor, respectively; or
- (3) For a municipal, state, federal, or other public agency, either a principal Executive Officer or a ranking elected official.

**“Substantive Error”** means an error that affects calculated emissions, data used to calculate emissions, or any other data element required to be reported pursuant to section 95353(a), (b), (e), (f), (g), (h), (i) and (j) of the annual report, resulting from a nonconformance of this regulation.

**“Sulfur Hexafluoride Gas-Insulated Equipment” or “SF<sub>6</sub> Gas-Insulated Equipment” or “SF<sub>6</sub> GIE”** means GIE configured to use SF<sub>6</sub> as the insulating gas.

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(b) For the purposes of this subarticle, the following acronyms apply:

“**ARB**” or “**CARB**” means the California Air Resources Board.

“**CFR**” means the Code of Federal Regulations.

“**CO<sub>2</sub>**” means carbon dioxide.

“**CO<sub>2e</sub>**” means carbon dioxide equivalent.

“**GHG**” means greenhouse gas.

“**GIE**” means gas-insulated equipment.”

“**GWP**” means global warming potential.

“**kV**” means kilovolts.

“**MT**” means metric tons.

“**MTCO<sub>2e</sub>**” means metric tons of carbon dioxide equivalent.

“**NIST**” means National Institute of Standards and Technology.

“**SF<sub>6</sub>**” means sulfur hexafluoride.

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. Sulfur Hexafluoride Phase Out.**

(a) Use of SF<sub>6</sub> GIE will be restricted for each voltage size on the phase-out dates provided in Table 1 below.

*Table 1. Phase-out Dates*

Voltage (kV)	Phase-out Date
≤ 145	January 1, 2025
145 < kV ≤ 245	January 1, 2029
> 245	January 1, 2031

(1) After the phase-out date, no person may:

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- (A) Manufacture, purchase, import, transfer, sell, lease, or offer for sale or lease SF<sub>6</sub> GIE for use in California.
  - 1. This provision does not apply to a GIE owner who has received a technical infeasibility exemption pursuant to section 95355.3.
  - 2. This provision does not apply to SF<sub>6</sub> GIE purchased, transferred, sold, leased or offered for sale or lease that was present in the State and reported to CARB pursuant to section 95353(f) for a data year prior to the appropriate phase-out date listed in Table 1.
- (B) Convert non-SF<sub>6</sub> GIE to SF<sub>6</sub> GIE.
- (2) Starting January 1, 2022, GIE owners must ensure that all GIE and gas containers are clearly marked or labeled such that it is readily apparent which gas they are to be filled with.

**§ 95352.1. Determining Emissions Limit Applicability**

- (a) GIE owners are subject to the annual emissions limit in section 95352.2 if average CO<sub>2</sub>e capacity is equal to or greater than 5,500 MTCO<sub>2</sub>e for the prior data year. All other GIE owners are not subject to the annual emissions limit in section 95352.2.
- (b) GIE owners must calculate their average system nameplate capacity,  $C_{avg}$ , as follows on an annual basis:

$$C_{avg} = \sum_i^n \frac{(d_i * C_i)}{365}$$

Where:

- $C_{avg}$  = Average system nameplate capacity (pounds)
- $n$  = The number of active GIE devices ( $i$ )
- $d_i$  = The number of days during the year GIE device  $i$  was in active service
- $C_i$  = The nameplate capacity of GIE device  $i$  (pounds)

- (1) For data year 2020, GIE owners must calculate  $C_{avg}$  for SF<sub>6</sub> only.
- (2) For all other data years, GIE owners must calculate  $C_{avg}$  for each insulating gas used in GIE.

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- (c) GIE owners must determine their average CO<sub>2</sub>e capacity as follows on an annual basis.

$$\text{Average CO}_2\text{e capacity} = \sum_j^n \frac{GWP_j * C_{avg}}{2,205}$$

Where:

<i>Average CO<sub>2</sub>e capacity</i>	=	The average system nameplate capacity of a GIE owner’s active GIE, expressed in units of metric tons of carbon dioxide equivalent (MTCO <sub>2</sub> e).
<i>GWP<sub>j</sub></i>	=	The global warming potential of insulating gas <i>j</i> .
<i>C<sub>avg</sub></i>	=	Average system nameplate capacity for insulating gas <i>j</i> (pounds).
2205	=	The number of pounds in a metric ton.

**§ 95352.2. Annual Emissions Limit.**

- (a) GIE owners that are subject to the annual emissions limit shall establish their emissions limit using the following formula:

$$\text{Emissions Limit} = \frac{AEF_i}{100} * \text{Average CO}_2\text{e Capacity}$$

Where:

<i>Emissions limit</i>	=	The GIE owner’s emissions limit in data year <i>i</i> (MTCO <sub>2</sub> e).
<i>AEF<sub>i</sub></i>	=	The annual emission factor from Table 2 for data year <i>i</i> .
<i>Average CO<sub>2</sub>e capacity</i>	=	The GIE owner’s <i>average CO<sub>2</sub>e capacity</i> value for the first data year, after 2018, in which average CO <sub>2</sub> e capacity is equal to or greater than 5,500 MTCO <sub>2</sub> e.

*Table 2. Annual Emission Factors*

Year ( <i>i</i> )	AEF <sub><i>i</i></sub>
2020 through 2034	1.0
2035 through 2039	0.95
2040 through 2042	0.90



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2043 through 2045	0.80
2046 through 2048	0.70
2049 and beyond	0.60

- (b) No GIE owner's annual emissions, as calculated pursuant to section 95355.1(c), shall exceed their annual emissions limit.
- (c) *Combining of GIE Owners.* Whenever multiple GIE owners with annual emissions limits combine to be under the same GIE owner, the GIE owner's new annual emissions limit will be the sum of the annual emissions limits that would have been established for each GIE owner should the GIE owners not have combined.

The GIE owner must notify CARB that the combination has occurred within 30 days of the effective date of the combination. The notification must include the date of the combination, the names and ARB identification numbers (if assigned) of the GIE owners who combined, the emissions limits previously assigned to each GIE owner and the GIE owner's new annual emissions limit.

- (d) *Splitting of a GIE Owner.* Whenever a GIE owner with an annual emissions limit splits into multiple GIE owners, the annual emissions limit that would have been assigned to the original GIE owner must be split and assigned to the new GIE owners proportionally based on each new GIE owner's share of the original system's active, non-hermetically sealed nameplate capacity at the time of the split.

All GIE owners who were previously part of another GIE owner must notify CARB that the split has occurred within 30 days of the effective date of the split. The notification must include the date of the split, the name and ARB identification number (if assigned) of the GIE owner that split, the emissions limit previously assigned to the GIE owner that split, the new GIE owner's active, non-hermetically sealed nameplate capacity at the time of the split and the new GIE owner's annual emissions limit.

All GIE owners whose annual emissions limits were established after such a split must continue to comply with their respective annual emissions limits for any data year where the combined average CO<sub>2e</sub> capacity from the former GIE owner is greater than or equal to 5,500 MTCO<sub>2e</sub>. Only when the combined average CO<sub>2e</sub> capacity of the former (pre-split) GIE owner is less than 5,500 MTCO<sub>2e</sub> in any data year, will the GIE owners that were involved in the split be exempt from the annual emissions limit for that data year or any future data year in which the combined average CO<sub>2e</sub> capacity is less than 5,500 MTCO<sub>2e</sub>. GIE

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owners that underwent such a split may request information from CARB about the combined average CO<sub>2</sub>e capacity of all GIE owners that resulted from the split.

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

**§ 95352.3. Nameplate Capacity Labeling.**

- (a) Beginning January 1, 2021, in California, no person may transfer, sell, lease, or offer for sale or lease GIE, unless:
  - (1) The listed nameplate capacity is accurate to within one pound of gas or one percent, whichever is greater, of the actual capacity of the device, or
  - (2) The GIE was present in the State and reported to CARB pursuant to section 95353 before January 1, 2021.

**§ 95353. Reporting Requirements.**

- (a) *Retirement.* Any GIE owner who permanently relinquishes ownership of all GIE must report to the Executive Officer that they are no longer subject to this subarticle within 30 days. The notification must contain the following information:
  - (1) GIE owner name and address;
  - (2) Responsible official's name, title, address, phone number, and email address;
  - (3) The final date the entity was a GIE owner;
  - (4) The method by which the GIE was relinquished from the following list of options: sold, transferred, disposed of, other. Other may only be reported if the method by which the GIE was relinquished does not fall into the categories listed.
    - (A) If the method is reported as "other," report the method.
    - (B) If the method is reported as "sold" or "transferred," report the name of the entity which received the GIE.

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- (C) If the method is reported as “disposed of,” report the location where the GIE was disposed of, either expressed as a physical street address or latitude and longitude.
  
- (b) *Changes in Ownership.* If all GIE owned by a GIE owner undergoes a change of ownership, and becomes the property of an entity not previously subject to this section, the following requirements apply regarding notifications to CARB and reporting responsibilities. These requirements do not apply when the previous owner retains at least one piece of GIE and remains subject to this section.
  - (1) *CARB Notifications.* Within 30 days of the change of ownership, the previous GIE owner and the new GIE owner must provide the following information to CARB.
    - (A) The previous GIE owner must notify CARB of the ownership change including the name of the new GIE owner and the date of the ownership change.
    - (B) The new GIE owner must notify CARB of the ownership change, including the following information:
      - 1. The name of the previous GIE owner;
      - 2. The name of the new GIE owner;
      - 3. Date of ownership or change;
      - 4. Name, official title, address, phone number, and email address of the new responsible official.
  - (2) If the previous GIE owner submitted the most recent annual report using CARB’s Greenhouse Gas Reporting Tool, the GIE owner must update the reporting GIE owner’s name, designated representative and other registration related information, as applicable, in the CARB Greenhouse Gas Reporting Tool within 30 days of the change of ownership.
  
- (c) *Designated Representative.* Within 30 days of the designated representative of a GIE owner being relieved of their duties, the GIE owner must appoint a new designated representative and notify CARB of the change. The notification must include the name, official title, address, phone number, and email address of the new designated representative. A GIE owner who submitted their prior annual report using the CARB Greenhouse Gas Reporting Tool must update the name and contact information of the designated representative in the electronic system.

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- (d) By June 1 of each year, any person who was a GIE owner at any point during the previous calendar year must submit an annual report to the Executive Officer for emissions that occurred during the previous data year.
- (e) Annual reports must contain all of the following information:
  - (1) GIE owner's name, physical address, and mailing address;
  - (2) Location in California of records and documents maintained pursuant to this subsection, if the location is different from the GIE owner's physical address;
  - (3) Name and contact information, including e-mail address and telephone number, of the person submitting the report, and of the person primarily responsible for preparing the report;
  - (4) The data year for which the information is submitted;
  - (5) An attestation by the submitter:
    - (A) If the report is submitted using the CARB Greenhouse Gas Reporting Tool the attestation must state "By submitting my electronic signature via the California Air Resources Board's Greenhouse Gas Reporting Tool, I hereby certify that I am authorized to make this submission on behalf of the gas-insulated equipment owner for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information in this report submitted pursuant to title 17, California Code of Regulations, sections 95350-95358. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment."
    - (B) If the report is not submitted using the CARB Greenhouse Gas Reporting Tool the attestation must state "I hereby certify that I am authorized to make this submission on behalf of the gas-insulated equipment owner for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information in this report submitted

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pursuant to title 17, California Code of Regulations, sections 95350-95358. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

1. GIE owners who submit annual reports through a means other than the CARB Greenhouse Gas Reporting Tool must sign, date, and submit this attestation to CARB with the annual report.
- (f) The annual report must contain a current and complete GIE inventory, which includes the following information for each GIE device:
- (1) Equipment manufacturer name;
  - (2) Date manufactured;
    - (A) If the date the device was manufactured cannot be determined, report a best estimate of date of manufacture and record how the estimated date was determined.
  - (3) Serial number assigned by the manufacturer;
    - (A) For any GIE that do not have a serial number, another permanently affixed unique identifier must be used in place of the serial number.
    - (B) Whenever a GIE owner owns multiple GIE with identical serial numbers, unique permanently affixed identifiers must be used as the serial number for each piece of GIE. The GIE owner must retain documentation that allows for each piece of GIE to be readily identifiable.
  - (4) Equipment type from the following list of options: busbar, bushings, capacitor, circuit breaker, GIS, switch, transformer, and other. Other may only be reported if the equipment type does not fall into the other options listed. If the equipment type is reported as “other,” report the type of equipment.
  - (5) Seal type (hermetic or non-hermetic);

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- (A) If the equipment type is reported as “hermetic,” report whether the equipment was in service all of the year, some of the year, or none of the year;
  - (B) If the equipment type is reported as “non-hermetic,” report the number of days the device was active GIE during the year;
  - (6) Date acquired (not required for non-SF<sub>6</sub> GIE and SF<sub>6</sub> GIE acquired prior to January 1, 2021);
  - (7) Equipment voltage capacity (kV);
  - (8) Insulating gas used;
    - (A) If the insulating gas is a mixture containing at least two gases, report the greenhouse gases in the mixture and the percentage, by mass, of each greenhouse gas.
  - (9) GWP of each insulating gas reported under 95353(f)(8);
  - (10) Nameplate capacity (charge in pounds);
    - (A) For GIE that are jointly owned, each joint GIE owner must apply its equity share (ownership or entitlement share) of the relevant GIE when calculating nameplate capacity and report their share of the nameplate capacity.
  - (11) Whether the equipment was added to the GIE inventory during the data year, or if it was removed from the GIE inventory during the data year, and the date of the change.
- (g) The annual report must contain a current and complete inventory of gas containers owned by the GIE owner, stored on the property of the GIE owner, or used by the GIE owner to transfer insulating gas into or out of the GIE owner’s GIE, which includes the following information for each container:
- (1) Whether the gas container is owned by or stored on the property of the GIE owner, or not.
  - (2) A unique identification number;

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- (A) GIE owners who do not know the identification number for gas containers not owned by or stored on the property of the GIE owner may use an invoice or transaction number as the identification number.
- (3) Insulating gas
  - (A) If the insulating gas is a mixture containing at least two gases, report the greenhouse gases in the mixture and the percentage, by mass, of each greenhouse gas.
- (4) GWP of each insulating gas reported under 95353(g)(3);
- (5) For gas containers owned by or stored on the property of the GIE owner, the weight of insulating gas in each container (pounds):
  - (A) At the end of the data year. The measurement must occur between December 1 and December 31 of the data year;
  - (B) At the beginning of the data year. For containers reported in the previous data year, this value must be the same as the value reported for the end of the previous data year;
  - (C) When the container is added to the inventory;
  - (D) When the container is removed from the inventory.
- (6) For gas containers that are neither owned by or stored on the property of the GIE owner, but are used by the GIE owner to transfer insulating gas into or out of the GIE owner's GIE, the weight of insulating gas in each container (pounds):
  - (A) Before use at the GIS owner's facilities;
  - (B) After use at the GIS owner's facilities;
- (7) The date each measurement required pursuant to section 95353(g)(5) and (6) was made.
- (h) Each time insulating gas is transferred into or out of GIE, report:
  - (1) The GIE serial number.

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- (2) The container identification number.
  - (3) Whether the insulating gas was transferred into or out of GIE;
  - (4) The date of the transfer;
  - (5) The type of insulating gas;
  - (6) The quantity of gas (pounds).
- (i) Annual reports must include the following information related to emissions:
- (1) Average system nameplate capacity ( $C_{avg}$ ), as calculated pursuant to section 95352.1(b) for each insulating gas required to be reported during the data year.
  - (2) Average CO<sub>2</sub>e capacity, as calculated pursuant to section 95352.1(c).
  - (3) The GIE owner's emissions limit for the data year, as calculated pursuant to section 95352.2, if applicable (MTCO<sub>2</sub>e).
  - (4) Annual emissions for each insulating gas used in GIE as calculated pursuant to section 95355.1(a) (pounds), and all the following values used to calculate this value:
    - (A) Insulating gas stored in containers, but not in GIE, at the beginning of the data year;
    - (B) Insulating gas stored in containers, but not in GIE, at the end of the data year;
    - (C) Insulating gas obtained in bulk from chemical producers, distributors, or other entities;
    - (D) Insulating gas obtained with or inside active GIE;
    - (E) Insulating gas returned to site after off-site recycling;
    - (F) Insulating gas disbursed with or inside active GIE;
    - (G) Insulating gas returned to suppliers;



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- (H) Insulating gas sent off site for recycling;
- (I) Insulating gas sent to destruction facilities;
- (J) Nameplate capacity of new active GIE;
- (K) Nameplate capacity of active GIE permanently taken out of service;
- (5) Annual emissions as calculated pursuant to section 95355.1(b) (MTCO<sub>2e</sub>);
- (6) Emissions (pounds), insulating gas GWP, and type of insulating gas(es) associated with each emergency event exemption approved by CARB for the data year;
- (7) Annual emissions excluding emergency events as calculated pursuant to section 95355.1(c) (MTCO<sub>2e</sub>);
- (j) Annual reports must include all nameplate capacity adjustments made pursuant to section 95355.2 during the data year, including manufacturer's serial number, the type of insulating gas, the original nameplate capacity value, the revised nameplate capacity value, and the date the revised nameplate capacity was established. Whenever one or more nameplate capacity adjustments were completed during a data year, entities subject to section 95352.2 must report their previously reported  $C_{avg}$  for 2019, the revised  $C_{avg}$  for 2019, the previous emissions limit, and the revised emissions limit;
- (k) The annual report shall be submitted to the Executive Officer as follows:
  - (1) GIE owners subject to this regulation that own, are owned by, have previously owned, or have previously been owned by an entity subject to the requirements of title 17, California Code of Regulations, section 95100 shall use the CARB Greenhouse Gas Reporting Tool or another mechanism specified in title 17, California Code of Regulations, section 95104.
  - (2) GIE owners not subject to the requirements of title 17, California Code of Regulations, section 95100 *et seq.*, may either:
    - (A) Use the CARB Greenhouse Gas Reporting Tool, or other mechanism, as specified in title 17, California Code of Regulations, section 95104; or
    - (B) Submit reports to CARB through electronic mail.

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- (l) *Revisions to annual GHG reports.* This paragraph applies to all data years for which the GIE owner has records, including, at a minimum, the time period specified in subsection 95354(i).
  - (1) The GIE owner must submit a revised annual report within 45 days of discovering that an annual report that the GIE owner previously submitted contains one or more substantive errors. The revised report must correct all substantive errors.
  - (2) CARB may notify the GIE owner in writing that an annual report previously submitted by the GIE owner contains one or more substantive errors. Such notification will identify each such substantive error. The GIE owner shall, within 45 days of receipt of the notification either:
    - (A) Provide information demonstrating that the previously submitted report does not contain the identified substantive error(s),
    - (B) Demonstrate that the identified error(s) is (are) not a substantive error(s), or
    - (C) Revise, recertify, and resubmit an annual report to CARB that corrects all substantive errors in accordance with the applicable requirements of this section. CARB will review the revised report. If necessary, CARB will notify the GIE owner that substantive errors remain in the revised report and specify the deadline by which the errors must be corrected and a new revised report must be submitted and certified.
  - (3) Upon request by the GIE owner, CARB may provide a single extension, of up to 30 days, to the 45-day period for revising the annual report.

**§ 95354. Recordkeeping.**

GIE owners must comply with the following recordkeeping requirements:

- (a) Retain all records required to be reported pursuant to section 95353;
- (b) Retain the location, either expressed as a physical address or a latitude and longitude, of each device included in the GIE inventory and each container included in the inventory of gas containers reported pursuant to section 95353(f) and (g)(5);

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- (c) Retain insulating gas and equipment purchase documentation (e.g., contracts, material invoices, receipts);
- (d) Retain copies of all information used to determine *average CO<sub>2</sub>e capacity*.
- (e) Retain the following records:
  - (1) Copies of notifications sent to CARB regarding combining of GIE owners or splitting of a GIE owner as required pursuant to section 95352.2(c) or (d), respectively, and any associated correspondence with CARB.
  - (2) Copies of notifications sent to CARB pursuant to section 95353(a) regarding cessation of reporting obligations under this subarticle, and any associated correspondence with CARB.
  - (3) Copies of all documentation submitted to the Executive Officer pursuant to section 95355.2 regarding nameplate capacity adjustments, and any associated correspondence with CARB;
  - (4) Copies of all technical infeasibility exemptions submitted to CARB pursuant to section 95355.3 regarding technical infeasibility exemptions, and any associated correspondence with CARB;
  - (5) Copies of all requests sent to CARB pursuant to section 95355.4 for emergency event exemptions, and any associated correspondence with CARB.
- (f) Retain a description of the methodology used to estimate the date of manufacture for any GIE for which the date the GIE was manufactured cannot be determined.
- (g) Retain documentation that allows for each piece of GIE with identical serial numbers to be readily identified from the unique serial number reported to CARB.
- (h) Retain documentation to support any revisions to previously submitted annual reports.
- (i) Retain all records required by this subarticle for a minimum of five calendar years;
  - (1) GIE owners headquartered in California must retain all records at a location within California;

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- (2) GIE owners headquartered elsewhere may retain all records at a location in California or at their business offices nearest to California;
- (j) Have all records available for CARB inspection at time of inspection; and
- (k) Upon request by CARB, provide these records to the Executive Officer within 30 days.

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

**§ 95355. Measurement Procedures.**

- (a) GIE 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;
    - (A) By April 1, 2021, GIE owners must electronically submit written procedures used to track gas containers to CARB. CARB staff may notify the GIE owner that additional information must be added to the procedures to meet the requirements of section 95355(a)(1)(C). In the event said notification is received by the GIE owner, the GIE owner must update the procedures and electronically submit the revised procedures to CARB within 60 days.
    - (B) The GIE owner must review the procedures annually and revise them as needed to ensure the information is current and the requirements of section 95355(a)(1)(C) are met. Upon request, the updated procedures must be made available to CARB within 14 days.
    - (C) The procedures must contain a mechanism to record the following information, at a minimum:
      - 1. The date of the gas container's transfer from one location to another;
      - 2. The gas container's identification number as it leaves or enters the location;
      - 3. The name of and the location to which the gas container has been moved, and;

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4. The name of the individual receiving the gas container at the location.
- (2) Whenever a gas container is required to be weighed, weigh the gas container on a scale that is certified by the manufacturer to be accurate to within one percent of the true weight;
  - (3) Prior to a scale's initial use to measure quantities reported under this subarticle the scale must be calibrated according to the calibration procedures specified by the scale manufacturer. If a scale manufacturer has not specified calibration procedures, use NIST-traceable standards and 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) Recalibrate scales used to measure quantities reported under this subarticle annually, or at the minimum frequency specified by the manufacturer, whichever is more frequent. If a scale manufacturer has not specified calibration procedures, use NIST-traceable standards and 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.
  - (5) Whenever the quantity of gas transferred must be reported pursuant to section 95353(h)(6), if the gas container was required to be weighed before and after use pursuant to section 95353(g)(6), the quantity transferred must be determined by calculating the difference between the weight before and after the transfer. Whenever the gas container was not weighed before and after use, the quantity of gas transferred may be based on a best estimate.
- (b) GIE owners must:
- (1) Establish and maintain a log of all measurements and calibrations 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 five calendar years.

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

**§ 95355.1. Calculating Annual Emissions.**

- (a) *Annual Emissions by GHG.* GIE owners must use the following equation to determine and report their annual emissions by GHG:

Equation for determining annual emissions for each GHG used as insulating gas in GIE:

$$\text{Emissions} = (\text{Decrease in insulating gas inventory}) + (\text{Acquisitions of insulating gas}) - (\text{Disbursements of insulating gas}) - (\text{Net increase in total nameplate capacity of active GIE owned}).$$

Where all of the following values are measured in pounds of gas:

*Decrease in insulating gas inventory* = (insulating gas stored in containers, but not in GIE, at the beginning of the data year) - (insulating gas stored in containers, but not in GIE, at the end of the data year).

*Acquisitions of insulating gas* = (insulating gas obtained in bulk from chemical producers, distributors, or other entities) + (insulating gas obtained with or inside active GIE) + (insulating gas returned to site after off-site recycling).

*Disbursements of insulating gas* = (insulating gas disbursed with or inside active GIE) + (insulating gas returned to suppliers) + (insulating gas sent off site for recycling) + (insulating gas sent to destruction facilities).

*Net increase in total nameplate capacity of active GIE owned* = (The nameplate capacity of new active GIE) - (Nameplate capacity of active GIE permanently taken out of service).

When accounting for emissions associated with GIE that are jointly owned by multiple GIE owners, each joint GIE owner must apply its equity share (ownership or entitlement share) of the relevant GIE when calculating annual emissions based on the information provided by the operator to each joint GIE owner.

- (b) *CO<sub>2</sub>e emissions.* GIE owners must use the following equation to determine their annual GHG emissions in MTCO<sub>2</sub>e:

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$$CO_2e \text{ emissions} = \sum_i^n \frac{GWP_i * Emissions_i}{2205}$$

Where:

<i>CO<sub>2e</sub> emissions</i>	=	The GIE owner’s total GHG emissions for the data year (MTCO <sub>2e</sub> ).
<i>GWP<sub>i</sub></i>	=	The global warming potential of insulating gas <i>i</i>
<i>Emissions<sub>i</sub></i>	=	Annual emissions of insulating gas <i>i</i> (pounds).
2205	=	The number of pounds in a metric ton.

(c) *CO<sub>2e</sub> Emissions Excluding Emergency Events*. GIE owners must use the following equation to determine their annual GHG emissions in MTCO<sub>2e</sub> excluding emergency events approved by CARB:

$$CO_2e \text{ emissions excluding E.E.} = CO_2e \text{ emissions} - \sum_i^n \frac{GWP_i * E.E. Emissions_i}{2205}$$

Where:

<i>CO<sub>2e</sub> emissions excluding E.E.</i>	=	The GIE owner’s total GHG emissions excluding emissions from emergency events for which CARB approved an exemption (MTCO <sub>2e</sub> ).
<i>GWP<sub>i</sub></i>	=	The global warming potential of insulating gas <i>i</i> released during one or more emergency events
<i>E.E. Emissions<sub>i</sub></i>	=	Annual emissions of gas <i>i</i> from all emergency event exemptions approved by CARB during the data year (pounds).
2205	=	The number of pounds in a metric ton.

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**§ 95355.2. Nameplate Capacity Adjustments.**

**Potential new section 95355.2  
“Nameplate Capacity Adjustments”**

Manufacturers of SF<sub>6</sub> GIE include a nameplate on each piece of GIE sold that includes several important pieces of information about the device including the serial number, rated voltage, frequency, and current. The nameplate also includes the design capacity of the insulating gas for optimal performance of the device. The current regulation requires GIE owners to meet an emission rate limit measured in terms of emissions per unit of system nameplate capacity, which is calculated by taking the sum of the nameplate capacity of each active, non-hermetically sealed device owned by the GIE owner. Further, the nameplate capacity of new GIE and retiring GIE are terms in the equation GIE owners use to calculate their annual emissions.

GIE owners have demonstrated that the capacity value provided by manufacturers on the nameplate may be inaccurate, which may lead to discrepancies between the actual emissions/emission rate and the emissions/emission rate reported to CARB, following the current regulation’s methodology.

GIE owners have requested that a nameplate capacity adjustment process be added to the regulation to allow GIE owners to determine revised nameplate capacity values and use those values for purposes of reporting emissions to CARB.

CARB shares the goal of improving nameplate capacity accuracy while minimizing GIE owner costs. CARB believes the nameplate capacity adjustment process must aspire to meet the following goals:

- GIE owners should obtain consistent results,
- SF<sub>6</sub> emissions that result from performing the process should be minimized,
- Objective criteria should be used to identify the GIE that shall go through the process, and
- All nameplate capacity adjustments should occur in a reasonable timeframe.

In submitting comments on this section, CARB requests that commenters consider the following and supply CARB with data to justify their positions:

- Does the proposed methodology minimize the risk of emissions?



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- Which non-hermetically sealed SF<sub>6</sub> GIE should be required to go through the process (e.g., non-hermetic, equipment of a specific type, equipment manufactured by a certain manufacturer, equipment manufactured before a certain date, equipment above a certain capacity or above a certain percentage of the GIE owner's total capacity)?
- Should all GIE owners be required to complete the process (e.g., GIE owners not subject to the emissions limit, grant GIE owners a choice)?
- When should the process be performed (e.g., end of GIE life, as part of routine maintenance schedule)?
- What should the cut-off date be after which the process can no longer be performed?
- Should CARB require that a consistent method be used for calculating revised nameplate capacity? If not, how can CARB be assured of consistent results?

Revised nameplate capacity values shall be determined through the following process.

- (a) Provide an electronic notification to CARB of the intent to determine a revised nameplate capacity at least seven days before beginning the process described below. The notification must include:
  - (1) GIE owner name and address;
  - (2) Responsible official's name, title, address, phone number and email address;
  - (3) The following information about the device:
    - (A) Manufacturer name;
    - (B) Manufacturer's serial number;
    - (C) Equipment type (circuit breaker, transformer, etc);
    - (D) Voltage capacity (kV);
    - (E) Existing nameplate capacity (charge in pounds);
  - (4) Anticipated start date of the nameplate capacity revision process.
- (b) Record the initial system pressure prior to removing any insulating gas (Torr).

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- (c) Record the initial temperature (degrees Rankine) of the insulating gas in the device prior to removing the gas.
- (d) Connect an evacuation hose to the primary side of a mass flow meter, and another hose from the outlet of the mass flow scale calibrated for the insulating gas to be measured to the inlet of the insulating gas recovery system.
- (e) Remove the insulating gas from the device until the pressure in the device is less than 3.5 Torr.
- (f) Record the amount of insulating gas removed (pounds).
- (g) Maintain the pressure in the device below 3.5 Torr for at least 5 minutes.
- (h) Record the final system pressure (Torr).
- (i) Determine the revised nameplate capacity using the following equation:

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

Where:

- $RNC$  = Revised nameplate capacity (pounds).
- $m$  = Mass of insulating gas removed from the device (pounds).
- $T_1$  = Temperature of GIE insulating gas at the start of gas removal (degrees Rankine).
- $T_2$  = Temperature of insulating gas per manufacturer's ideal fill instructions (degrees Rankine).
- $P_1$  = Pressure of GIE insulating gas at the start of gas removal (Torr).
- $P_2$  = Pressure of insulating gas per manufacturer's ideal fill instructions (Torr).

- (j) Electronically submit copies of all documentation of measurements, calculations, and the revised nameplate capacity to the Executive Officer within 30 days of the date on which the measurements were taken. The Executive Officer shall acknowledge receipt within 15 days. Subsequently, the Executive Officer shall notify the submitter in writing of his or her approval or denial to use the calculated revised nameplate capacity as the nameplate capacity for all future reporting. If necessary, the Executive Officer will solicit additional data from the submitter in order to inform the decision. In the event the Executive Officer has not responded to the submitter within 60 days of acknowledging receipt of the

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nameplate capacity adjustment, or within 60 days of receiving additional data from the submitter, the nameplate capacity adjustment is approved. GIE owners must update their GIE inventory and begin to use the revised nameplate capacity as the nameplate capacity for complying with this subarticle 30 days after approval of the nameplate capacity adjustment.

- (k) The GIE owner must permanently affix a revised nameplate capacity label to the device no later than 30 days from the date on which the GIE owner updates their inventory. The manufacturer's original nameplate capacity label must remain visible after the revised nameplate capacity label is affixed to the device, and the two labels must be in close proximity to one another. The revised nameplate capacity label must include the following information, at a minimum:
- (1) The revised nameplate capacity (pounds);
  - (2) Type of insulating gas;
  - (3) Manufacturer's serial number;
  - (4) Date revised nameplate capacity was established.

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

**§ 95355.3. Technical Infeasibility Exemption.**

Pursuant to section 95350(c)(1), a GIE owner who wishes to acquire SF<sub>6</sub> GIE after the phase-out date indicated in Table 1 must electronically submit a technical infeasibility exemption to CARB under one of the conditions described in section (a) following the process described in section (b).

- (a) A GIE owner may submit a technical infeasibility exemption to allow for the acquisition of SF<sub>6</sub> GIE after the phase-out date indicated in Table 1 if either:
- (1) Non-SF<sub>6</sub> GIE meeting the specifications for the particular project or application are unavailable; or
  - (2) Available non-SF<sub>6</sub> GIE cannot meet the size requirements for the particular project or application; or
  - (3) Available non-SF<sub>6</sub> GIE cannot be used for the specific project or application due to incompatibility with existing equipment, wiring, or connectors; or

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- (4) Available non-SF<sub>6</sub> GIE is not suitable based on safety or reliability requirements.
- (b) A technical infeasibility exemption request pursuant to this section must be electronically submitted to the Executive Officer at least 75 days prior to the intended date of SF<sub>6</sub> GIE acquisition. The submittal must contain the following information:
- (1) GIE owner's name and ARB identification number (if assigned);
  - (2) Responsible official's name, title, address, phone number and email address;
  - (3) The specific project (including location) and application to which the technical infeasibility exemption would apply;
  - (4) Description and quantity of electrical equipment to be exempted, including but not limited to GIE equipment type, GIE seal type, GIE manufacturer and model, GIE maximum rated voltage capacity and GIE SF<sub>6</sub> nameplate capacity;
  - (5) Summary of bid solicitation and responses received from vendors;
  - (6) Signed and stamped certification from a professional electrical engineer accredited under California Code of Regulations, Title 16, Division 5, Board for Professional Engineers and Land Surveyors that the information contained in the submittal is true, accurate and complete;
  - (7) Certification signed by a responsible official that the information contained in the submittal is true, accurate, and complete, and the date of signature;
  - (8) The section number under which the exemption is being submitted (95355.3(a)(1), (2), (3), or (4)); and
  - (9) A justification for the exemption.
    - (A) For exemptions submitted under section 95355.3(a)(1), this includes the specific requirement(s) that cannot be met (e.g., voltage, short-circuit amperage rating).
    - (b) For exemptions submitted under section 95355.3(a)(2), this includes measurements of existing GIE and available GIE identified

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in the bid solicitation and a picture showing the location where the GIE would be installed.

- (c) For exemptions submitted under section 95355.3(a)(3), this includes an explanation that describes why the available GIE identified in the bid solicitation are incompatible.
  - (d) For exemptions submitted under section 95355.3(a)(4), this includes an explanation that describes why the available GIE identified in the bid solicitation fail the safety or reliability requirements.
- (c) The Executive Officer shall acknowledge receipt within 15 days. Subsequently, the Executive Officer shall notify the submitter of her or his approval or denial of the technical infeasibility exemption, pursuant to section 95355.3(b). If necessary, the Executive Officer will solicit additional data from the submitter to inform the decision. In the event the Executive Officer has not responded to the submitter within 60 days of acknowledging receipt of the technical infeasibility exemption, or within 60 days of receiving additional data from the submitter, the technical infeasibility exemption is approved.
- (d) All emissions from SF<sub>6</sub> GIE acquired utilizing a technical infeasibility exemption must be included in the GIE owner's annual emissions reported pursuant to Section 95353(i).

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

**§ 95355.4. Emergency Event Exemption.**

Pursuant to section 95350(c)(2), a GIE owner may apply for an emergency event exemption under one of the conditions described in section 95355.4(a) following the process described in section 95355.4(b).

- (a) A GIE owner may exclude emissions from an emergency event that impacted one or more active GIE from the GIE owner's annual emissions as calculated pursuant to section 95355.1(b) if it is demonstrated to the Executive Officer's satisfaction that the release of insulating gases could not have been prevented by the exercise of prudence, diligence, and care, and was beyond the control of the GIE owner.

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- (b) A request for an exemption pursuant to this section must be submitted to the Executive Officer within 30 days of the beginning of the emergency event, and must contain the following information:
- (1) The GIE owner's name, physical address, mailing address, and the e-mail address and telephone number of the responsible official;
  - (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 manufacturer's serial numbers of GIE that were affected by the event,
    - (E) The type and amount of each insulating greenhouse gas released (pounds);
  - (3) Supporting documentation that the release occurred as a result of an emergency event; and
  - (4) A signed statement, under penalty of perjury, provided by a responsible official that the statements and information contained in the submitted request are true, accurate, and complete; and the date of signature.

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. 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.

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.

**\*\*FOR DISCUSSION PURPOSES ONLY –  
NOT PART OF A FORMAL RULEMAKING PROCESS\*\***

Legal Disclaimer: This is an unofficial electronic version of a *discussion draft* of the SF<sub>6</sub> from Gas Insulated Switchgear Regulation that contains potential text revisions for the purpose of soliciting stakeholder feedback on possible changes.

**§ 95357. 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 emission rate limit 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.

**§ 95358. 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.

**§ 95359. Reserved**