



MITSUBISHI ELECTRIC POWER PRODUCTS, INC.
THORN HILL INDUSTRIAL PARK
512 KEYSTONE DRIVE
WARRENDALE, PA 15086-7538, U.S.A.

Phone: (724) 772-2111 Fax: (724) 772-2146
Home page: www.meppi.com

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Ms. Mary Jane Coombs
Manager, Program Development Section
Climate Change Program Evaluation Branch
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: MEPPI Comments Regarding Potential Changes to the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear

Dear Ms. Coombs,

Mitsubishi Electric Power Products, Inc. (MEPPI) appreciated the opportunity to participate in the workshop to discuss a new CARB regulation concerning gas insulated equipment.

Section 95352.2

The requirement added in the latest draft version of section 95352.2 to limit annual emissions to the first data year after 2019 is overly restrictive.

Presently alternate technologies do not exist in 2019 to immediately stop installing new SF₆-based GIE at the higher transmission class voltage levels, and will not exist for several more years or until closer to the phase-out dates. This leaves GIE owners with no means to continue to install equipment to meet California's growing loads and renewable generation. Additionally, projects are planned up to 3-5 years in advance, and this sudden change would go into effect immediately.

An equitable baseline should allow the owner's SF₆ "footprint" and calculated CO₂e baseline to increase when non-phased out GIE is added to their systems. In short the phase-out dates put forth by CARB would then dictate when GIE can be added to average CO₂e capacity. As long as equipment is in a voltage class that has not passed the phase-out date, that equipment should be added to a GIE owner's capacity. This would allow for new technologies to develop while GIE owners continue to safely and reliably support California's electricity needs.

Section 95352.3

Proposed Nameplate Capacity Labeling in the draft regulation is currently impractical. A 4-5% value is a more achievable value.

Present (and past) industry standards do not require a stated accuracy. The intent of the nameplate is a nominal value to aid the end user in project planning and ensure adequate supply at commissioning. There have been no operational or reliability issues related to this methodology as the GIE is designed to a specific density (along with margin) to operate to the requirements set by standards at the various voltage ratings.

In practice, gas does not have the same ease of volume measurement as liquids and solids. Using calibrated equipment with very high accuracy, the designed gas volume in GIE will often not match the measured value in a substation by an error of more than 1%. Manufacturing tolerances of the equipment components are sufficient to create inaccuracies on individual units with the same design. Additionally, measuring the "actual capacity" of the device is likely to include more than 1% error due to temperature variations. Ambient temperature, the rate of change in ambient temperature throughout the day, solar radiation, and wind can all cause different distributions of temperature across the GIE, making the pressure measurement at the fill valve incorrectly compensated for temperature with no consistent means for correction. Consequently the manufacturer and end user can easily arrive at different values on the same piece of equipment.

A suggested way to improve emissions calculations of SF₆ in a weight based inventory would be to record the amount of gas used to fill the GIE during installation (by measured weight or gas mass flow meter). This would allow for unique measurements on each piece of equipment and account for any under- or over-filling. The values recorded during this process would then be used in calculating Average System Nameplate Capacity (C_{avg}; Reference Section 95352.1).

To facilitate this method, equipment could be shipped into California with a dry benign gas such as Nitrogen, evacuated and filled at the installation site. The use of a gas flow meter or weighing of bottles out and back into inventory will provide an accurate weight of SF₆ used. Careful handling will be encouraged to avoid the presumed emission that will occur if maintenance or decommissioning amounts SF₆ are less than the initial recorded field fill amount. For equipment that can ship filled with SF₆ at rated pressure, this measurement could be at the factory instead.

Best Regards



John Marzula
Design Engineering Manager
High Voltage Switchgear Division
Mitsubishi Electric Power Products, Inc.