

IEEE SF6 Nameplate TF

Meeting: October 10, 2016



Chair: Eldridge Byron

Meeting Minutes

1. Call to order and introduction:

The meeting was called to order at 8:03AM with introductions.

2. Attendance

There were 16 attendees present plus two via phone conference. Refer to Annex A for details.

3. Previous Meeting Minutes

No previous Meetings.

4. Meeting Highlights

1. Eldridge went through an overview presentation (as written by Jonathan Stewart of NEMA).
 - a. No standards currently have a requirement for the accuracy of the SF6 value on the nameplate. The working group for C37.20.9 has added some information.
 - b. Nameplate inaccuracies come from the OEM (typical vs as filled, design differences) as well as field errors (Temperature measurements, intentional overfill).
 - i. Comment (Patrick D): Yes, some inaccuracies come from OEM calculations and some from customer procedural issues. The only way to attach this is to use a mass-flow meter (every time) and have procedures that fully capture all excess gas.
 - ii. Comment (George B): Is everyone (OEMs) measuring the gas the same way? Is there consistency?
 - c. Question to Lukas on data shown on Prevalence of Error slide.
 - i. Nameplate Discrepancy: Equipment contains more or less than the amount of gas on the nameplate based on the temperature/pressure chart. (Unit is not at the correct PSI for the temperature.)
 - ii. Inaccurate Nameplates: Breakers where the unit was at the correct PSI for the temperature, but the actual measured value of SF6 mass in the breaker was not within 1% of the amount listed on the nameplate.
 1. Question: After evacuating the CB (and vacuuming), did you then fill it with a calibrated mass-flow meter to the amount on the nameplate and then compare the pressure to the temperature/pressure chart?
 - a. Calibrated gauges and temperature measuring equipment, and mass flow were used.
 - iii. Discussion on process and results ensued.
 - d. George B: What about utilities who specify an overfill?
 - e. Ken E: Did you evaluate differences between units that are the same model of breakers (Same OEM)?
 - f. Patrick D: What is the 1% you are mentioning for California? Isn't that the regulation for total leak rate, not accuracy?

- i. Debbie Ottinger: 1% includes retired or installed with the total nameplate capacity in the denominator.
 - g. Steve C: So the question is: what is an acceptable accuracy?
 - h. Debbie O: The 184 had a density discrepancy (vs a “nameplate”).
 - i. Ken E: The bigger issue is the 184 which were filled wrong vs the few with nameplate issues.)
 - j. One way to address this is accuracy requirement on the nameplate value:
 - i. Patrick D: Every breaker will have to have its own nameplate based on the fully assembled, fully filled amount. The user will have to fill to the exact same amount.
 - ii. Eldridge B: The OEM measures this during testing and it should be recorded and provided to the customer.
 - 1. Ken E: the value should be on the test report, with the value on the nameplate at +/- some % (10?)
 - 2. This would mean the regulatory side would have to be looked at as the nameplate would not be the exact data.
 - a. Michael W: We need to remember that 10% on a piece of gear is going to be different that 10% on a breaker. We need to look at what will have the biggest effect.
 - 3. Debbie O: The idea of the test report is attractive. In the current regulation, “Nameplate capacity” is not described. If the test report if acceptable and useful to the users (and likely to survive the lifetime of the unit), the user could comply with the EPA regulations by using the test report. EPA might have to issue a FAQ to help with clarification.
 - a. George B: Ideally it would be great, there is probably quite a bit of existing equipment where the customer does not have the test report.
 - b. Patrick D: ConEd is using the nameplate value and has had to do multiple tests to determine “actual” filed amount for classes of breakers. (This has allowed them to recalculate and supply updated information in their reporting.)
 - k. Two items need to be addressed.
 - i. Get a tighter hold on value on nameplate/ test reports
 - 1. Eldridge B presented what PC37.20.9 is working on
 - 6.4.1 Nameplate marking*
 - The following minimum information shall be given on switchgear assemblies nameplates:*
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 - l) Insulating gas (at 20°C), identified in either absolute or relative values (per vertical section or switchgear assembly whichever is appropriate):*
 - 1 Type of gas (chemical formulation and/or mixture formulation)*
 - 2) Rated filling pressure*
 - 3) Alarm pressures*
 - 4) Minimum functional pressure*
 - 5) Weight of gas (see Clause 6.13)*
- 6.13 Requirements for tightness for other gasses.*
....This weight shall be verified during production testing and is to be within a 1% accuracy.....

2. Discussion on what is the correct % (it may need to differ by type of equipment).
 - a. Michael W: Suggestion: Standardized nameplate with technical and separate nameplate that ships with the as filled value (which could be installed by the filler)?
 - i. This could be significant for GIS or equipment with many segments.
 - b. Patrick D: For ConEdison, 0.5lb across a 1000 breakers adds up. We need the most accurate number possible.
 - c. Vince C: It is possible to provide nameplates with “accurate” nameplate (nameplate filled in after test), but it is much easier for smaller (10 lbs of SF6) vs larger.
3. Michael W: Maybe there needs to be a procedural standard with two parts, how you measure and how to address labeling/reporting of individual products.

- ii. Create a procedure for how to handle equipment in the field.

1. Lukas R is working draft of C37.122.3 which will address at least part of this.

2. Next steps:

- a. Lukas R will review C37.122.3 to determine how some of the customer procedures can be added.
- b. Karla T noted that RODE, based on Spring 2016 meeting, does not want to revise the standards to add an accuracy requirement.
 - i. Andy K: Salt River Project is adding it to their specifications as a requirement.
 - ii. Michael W: S&C is seeing it as well.
- c. **Several subcommittees will be approached by members of the specific subcommittee to incorporate the concepts here into specific standards (C37.09, C37.04, 37.20.9, 37.122.3). 37.122 would also need to be changed.**

5. **Next meeting: No additional meetings are currently planned for this task force.**

6. **Meeting was adjourned at 9:43 AM EDT.**

Submitted by:

Eldridge Byron
IEEE SF6 Nameplate Task Force Chair

Karla Trost
Secretary

Annex A: Meeting Attendance October 10, 2016

X = present at meeting

	First Name:	Last name	Company	
1	Eldridge	Byron	Schneider	x
2	Karla	Trost	G&W Electric	X
3	Francois	Trichon	Schneider	X
4	Michael	Whitney	S&C Electric	X
5	Rahul	Jain	S&C Electric	X
6	Pete	Marzec	S&C Electric	X
7	Steve	Cary	GE	X
8	Matt	Williford	Schneider	X
9	Ken	Edwards	BPA	X
10	Patrick	DiLillo	ConEd	X
11	George	Becker	Power Engineering	X
12	Terry	Woodyard	Siemens	X
13	Vince	Chiodo	HICO	X
14	Chris	Borck	Eaton	X
15	Dave	Nyberg	3M Company	X
16	Andy	Keels	Salt River Project	X
Phone	Lukas	Rothlisberger	DILO	X
Phone	Debbie	Ottinger	EPA	X