IEEE Std C62.92.1™-2016
(Revision of
IEEE Std C62.92.1-2000)

Errata to IEEE Guide for the Application of Neutral Grounding in Electrical Utility Systems—Part I: Introduction

Sponsor

Surge Protective Devices Committee

of the

IEEE Power and Energy Society

Correction Sheet
Issued 30 November 2017

Page 11, change the definition of coefficient of grounding (COG) to read as follows:

coefficient of grounding (COG): The ratio, E_{LG}/E_{LL} (expressed as a percentage), of the highest root-mean-square (rms) line-to-ground power-frequency voltage E_{LG} on a sound phase, at a selected location, during a fault to ground affecting one or more phases to the line-to-line power-frequency voltage E_{LL} that would be obtained at the selected location with the fault removed.

Page 13, change the Notes below Figure 1 to read as follows:

NOTE 1—V_a , V_b , and V_c are the respective source voltages (line-to-neutral).

NOTE 2— R_S and X_S are the equivalent source resistance and reactance, per phase.

NOTE 3— R_n and X_n are the neutral resistance and reactance of the system as seen at the source.

NOTE 4— C_g is the total system capacitance to ground and is obtained by connecting all three phases together and measuring the capacitance with the neutral grounding branch open-circuited.

NOTE 5— C_g /3 is the grounded-wye partial, or zero-sequence, capacitance of the system.

NOTE 6— C_S is the ungrounded wye equivalent of the interphase partial capacitances of the system, obtained by subtracting the zero-sequence capacitance $C_g/3$ from the positive sequence capacitance C_1.

NOTE 7— f is frequency in hertz.

NOTE 8—The switch S, simulates a single-line-to-ground fault on a-phase.

NOTE 9—V_f is the prefault line-to-ground voltage at the fault, the energization voltage.

Page 15, the first paragraph under subclause 6.2 should read as follows:

Various classes of grounding are available to the system designer, each having a unique set of attributes. The response characteristics of the various classes of grounding may be defined or classified in terms of the ratios of symmetrical component parameters, such as the positive-sequence reactance X_1, the negative-sequence reactance X_2, the zero-sequence reactance X_0, the positive-sequence resistance R_1, the negative-sequence resistance R_2, and the zero-sequence resistance R_0 (see Clarke [B6], Wagner and Evans [B22], and Willheim and Waters [B23]).

Page 16, change the Notes below Figure 2 to read as follows:

NOTE 1—V_f is the Thevenin circuit pre-fault voltage.

NOTE 2—V_a is the line-to-neutral source voltage of Figure 1.

NOTE 3— $3I_0$ is the fault line current through closed switch S of Figure 1.

NOTE 4—The equivalence sign (≈) indicates the result when capacitance is negligible.

NOTE 5—The remaining variables are defined in the notes following Figure 1.

Page 16, subclause 6.3 should read as follows:

The term coefficient of grounding (COG) is used in system grounding practice. COG is defined as $E_{LG} / E_{LL} \times 100\%$, where E_{LG} is the highest root-mean-square (rms), line-to-ground power-frequency voltage on a sound phase, at a selected location, during a line-to-ground fault affecting one or more phases. E_{LL} is the line-to-line power-frequency voltage that would be obtained, at the selected location, with the fault removed. The COG for three-phase systems is calculated from the phase-sequence impedance components, as viewed from the fault location. The COG is useful in the selection of a surge arrester rating for a selected location (see IEEE Std 32-1972 [B11], IEEE Std C62.2™-1987 [B13], IEEE Std C62.22™-2009 [B15], and IEEE Tutorial Course [B17]).

Pages 16 and 17, subclause 6.4 should read as follows:

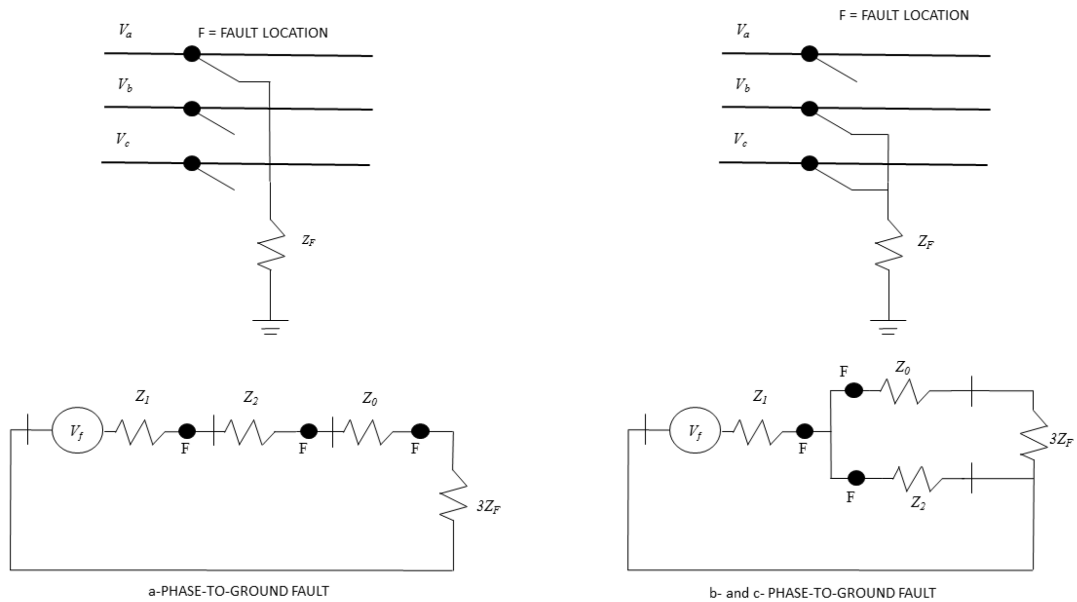
The term ground-fault factor (GFF) is, to a limited extent, now used instead of COG. At a selected location on a three-phase system, and for a given system configuration, the GFF is the ratio of the highest rms line-to-ground power-frequency voltage (as measured phase-to-ground) on a sound phase during a fault to ground (affecting one or more phases at any point) to the rms power-frequency voltage (as measured phase-to-ground) that would be obtained at the selected location with the fault removed (see IEEE Std C62.82.1-2010 [B16]). Thus, the GFF is related to the COG by $\sqrt{3}$, as shown in Equation (1) below:

$$GFF = \sqrt{3} \times \frac{COG}{100} \qquad (1)$$

where

GFF	is the ground-fault factor
COG	is the coefficient of grounding expressed as a percentage

Page 23, Replace Figure A.1 with the following figure:



Page 24, the text between equation (A.9) and equation (A.10) should read as follows:

Where

COG_a, COG_b, and COG_c are the coefficients of grounding for each respective phase.

Z_1, Z_2, and Z_0 are the positive, negative, and zero sequence impedances, respectively, (Ω)

R_F is the fault resistance, (Ω)

a and a^2 are phasor operators

$$a = -0.5 + \mathrm{j}\frac{\sqrt{3}}{2} = 1\angle 120°; \quad a^2 = -0.5 - \mathrm{j}\frac{\sqrt{3}}{2} = 1\angle 240°$$

In order to eliminate one parameter, it is convenient to divide each impedance by X_1.

Defining the ratios $R'_1 = R_1/X_1$; $R'_0 = R_0/X_1$, $X'_0 = X_0/X_1$, $R'_F = R_F/X_1$

Page 33, equation (B.1) should read as follows:

$$Z_g = 0.0592 \times \frac{f}{60} + j \times 0.1736 \frac{f}{60} \times \log_{10} \frac{D_e}{h} \ \Omega/\text{km} \qquad \text{(B.1)}$$