

# Fifth Meeting: TF Neutral Grounding Resistors (under WG C57.32)

9/5/2023 | 19:00-20:00 UTC

Chair: Ryan Hogg Bureau of Reclamation  
Vice Chair: Sergio Panetta I-Gard Corporation  
Secretary: None

## Attendees:

Name	Organization	Status
Davoud Aliverdi	Megaresistors	Member
Bob Berger	Post Glover	Member
Yann El Assad	MS Resistances	Member
Richard Field	Post Glover	Member
Ryan Hogg	Bureau of Reclamation	Member (Chair)
Bruce Kielgas	Hubbell Powerohm	Member
Jusuf (Joe) Krvavac	Sargent & Lundy	Member
Sergio Panetta	I-Gard Corporation	Member (Vice Chair)
Edmundo Perich	I-Gard Corporation	Member
Pablo Sanchez	Controles y Servicios	Member
Federico Turner	MegaResistors	Member
Malia Zaman	IEEE SA	Guest

*Note: Guests may request membership after attending 2 of last 3 meetings*

## Minutes (items varying from agenda in **bold-red** or ~~strikethrough-red~~)

1. [Behavior](#) – use hand raise meeting tool – **reviewed**
2. [Copyright](#) – **reviewed**
3. Establish Quorum – **Established with 11 of 18 members present**
4. Approve previous meeting minutes (8/14/2023)
  - a. **Motion to approve by El Assad, seconded by Panetta**
  - b. **Approved by unanimous consent**
5. Approve agenda for this meeting (9/5/2023)
  - a. **Motion to approve by Panetta, seconded by El Assad**
  - b. **Approved by unanimous consent**
6. Continue to review comments provided by task force members
  - a. Continue Section 7.3 discussions
    - i. **Four motions made during meeting**

ii. **Motion 1** by Ellassad, seconded by Turner:

1. Motion: To change text as shown in following image  
(add in red, remove red-strikethrough)

**7.3 ~~Temperature coefficient of resistance~~ Resistance variation**

The resistor element resistance changes with temperature. The change may be calculated from the temperature coefficient of resistance.

$$\alpha = \frac{R_2 - R_1}{R_1(\theta_2 - \theta_1)} \quad (10)$$

$$R_2 = R_1[1 + \alpha(\theta_2 - \theta_1)] \quad (11)$$

$R_1$  and  $R_2$  are resistances in ohms at temperatures  $\theta_1$  and  $\theta_2$  in degrees Celsius, respectively, and  $\alpha$  is the temperature coefficient of resistance ( $1/^\circ\text{C}$ ).

~~The resistance of the NGR should not change by more than 67% from the initial value over the temperature range. This is to help ensure that the final fault current is sufficiently high to allow protective circuitry to operate as intended. Where a specific temperature coefficient is required, such data are to be brought to the attention of those responsible for the design of an unusual service condition.~~

The maximum allowable resistance change of the NGR over the temperature range shall be specified by the purchaser. The limitation shall be defined considering the effects of the current change on protective circuitry.

2.  
3. Discussion held, then vote held  
4. Votes:

a. For: 4

- i. Ellassad, Sanchez, Turner, Aliverdi

b. Against: 6

- i. Field, Perich, Panetta, Krvavac, Berger,  
Kielgas

c. Abstain: 0

d. Motion did not pass/fails

iii. **Motion 2** by Field, seconded by Panetta

1. Motion: To update title of section 7.3 to “Resistance variation”  
2. Discussion held, then vote held  
3. Votes:  
a. For: 10  
i. Field, Kielgas, Ellassad, Berger, Krvavac,  
Aliverdi, Sanchez, Turner, Perich, Panetta  
b. Against: 0  
c. Abstain: 0  
d. Motion passes

iv. **Motion 3 by Field, seconded by Panetta:**

- 1. Motion: To change text as shown in following image  
(add in red, remove red-strikethrough)**

**7.3 Resistance variation**

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The maximum allowable resistance change of the NGR over the temperature range should be specified by the purchaser. The limitation shall be defined considering the effects of the current change on protective circuitry.

The resistance of the NGR should not change by more than 67% from the initial value over the temperature range ~~unless specified by the purchaser~~. This is to help ensure that the final fault current is sufficiently high to allow protective circuitry to operate as intended. ~~Where a specific temperature coefficient is required, such data are to be brought to the attention of those responsible for the design of an unusual service condition.~~

- 2.**
- 3. Discussion held, then vote held**
- 4. Votes:**
- a. For: 6**
    - i. Field, Berger, Krvavac, Panetta, Kielgas, Perich**
  - b. Against: 3**
    - i. Ellassad, Aliverdi, Sanchez**
  - c. Abstain: 1**
    - i. Turner**
  - d. Motion passes**

v. **Motion 4** by Turner, seconded by Ellassad:

1. **Motion: To change text as shown in following image  
(add in red, remove red-strikethrough)**

**7.3 Resistance variation**

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The maximum allowable resistance change of the NGR over the temperature range should be specified by the purchaser. The limitation shall be defined considering the effects of the current change on protective circuitry.

The resistance of the NGR ~~shall~~ **should** not change by more than ~~100%~~ **67%** from the initial value over the temperature range unless specified by the purchaser. This is to help ensure that the final fault current is sufficiently high to allow protective circuitry to operate as intended.

- 2.
3. **Discussion held, then vote held**
4. **Votes:**
- a. **For: 4**
    - i. **Turner, Ellassad, Sanchez, Aliverdi**
  - b. **Against: 6**
    - i. **Field, Krvavac, Berger, Panetta, Perich, Kielgas**
  - c. **Abstain: 0**
  - d. **Motion did not pass/fails**

**vi. Screenshot of section 7.3 per passed/failed motions during this meeting**

**7.3 Resistance variation**

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**1.**

b. Remainder of comments

**i. Did not have time to begin on any other comments/section**

7. Old Business – none
8. New Business?
9. Adjourn