

IEEE PES Transformers Committee

DISTRIBUTION TRANSFORMER SUBCOMMITTEE

TASK FORCE TRANSFORMER TANK TOUCH TEMPERATURE

WELCOME

Monday October 23 , 2023

Introductions

The image features a solid dark green background. A diagonal line, colored in a dark charcoal gray, runs from the bottom-left corner towards the top-right corner, dividing the frame. The area to the right of this line is a light gray, creating a triangular shape in the upper right corner.

Chair's Remarks

Officer Introductions

Chair

Name: **Bruce Webb**
Affiliation: Knoxville Utilities Board
Email: bruce.webb@kub.org
Role: My role is to lead the discussions in an unbiased manner. I will not vote unless my vote will change the outcome.

Vice-Chair

Name: **Ali Ghafourian**
Affiliation: H-J Enterprises, Inc.
Email: Asghar.ghafourian@gmail.com
Role: To serve as interim-Chair if the Chair is unable to participate.

Secretary

Name: **OPEN**
Affiliation: -----
Email: -----
Role: To capture and record attendance, major discussion topics, and decisions made during meetings.

Housekeeping

Attendance & Contact Sheets
Participant Behavior
Essential Patent Claims
IEEE Copyright Policy

Attendance Rosters

- Please sign in to record your attendance
- If you are not already one of our thirty-one (31) TF members and you are interested in becoming one, kindly indicate that you would like to become one
- Attendance at two consecutive meetings (and a formal request to the Chair) will be required to attain membership.
- ***Please note that I have asked for your email address on the roster form. If you would like to be a member but do not want to put your contact information on the roster, please see me after the meeting.***

Housekeeping - *Participant Behavior* (1 of 3)

Participant behavior in IEEE-SA activities is guided by the IEEE Codes of Ethics & Conduct.

- All participants in IEEE-SA activities are expected to adhere to the core principles underlying the:
 - [IEEE Code of Ethics](#)
 - [IEEE Code of Conduct](#)
- The core principles of the IEEE Codes of Ethics & Conduct are to:
 - *Uphold the highest standards of integrity, responsible behaviour, and ethical and professional conduct.*
 - *Treat people fairly and with respect, to not engage in harassment, discrimination, or retaliation, and to protect people's privacy.*
 - *Avoid injuring others, their property, reputation, or employment by false or malicious action.*
- The most recent versions of these Codes are available at <http://www.ieee.org/about/corporate/governance>

Participants in the IEEE-SA “individual process” shall act independently of others, including employers.

- The [IEEE-SA Standards Board Bylaws](#) require that “*participants in the IEEE standards development individual process shall act based on their qualifications and experience*”
- This means participants:
 - **Shall act & vote** based on their personal & independent opinions derived from their expertise, knowledge, and qualifications.
 - **Shall not act or vote** based on any obligation to or any direction from any other person or organization, including an employer or client, regardless of any external commitments, agreements, contracts, or orders.
 - **Shall not direct** the actions or votes of other participants or retaliate against other participants for fulfilling their responsibility to act & vote based on their personal & independently developed opinions.
- By participating in standards activities using the “*individual process*”, you are deemed to accept these requirements; if you are unable to satisfy these requirements then you shall immediately cease any participation.

IEEE-SA standards activities shall allow the fair & equitable consideration of all viewpoints.

- The [IEEE-SA Standards Board Bylaws](#) (clause 5.2.1.3) specifies that *“the standards development process shall not be dominated by any single interest category, individual, or organization”*
 - This means no participant may exercise *“authority, leadership, or influence by reason of superior leverage, strength, or representation to the exclusion of fair and equitable consideration of other viewpoints”* or *“to hinder the progress of the standards development activity”*
- This rule applies equally to those participating in a standards development project and to that project’s leadership group.
- Any person who reasonably suspects that dominance is occurring in a standards development project is encouraged to bring the issue to the attention of the Standards Committee or the project’s IEEE-SA Program Manager.

Participants Have A Duty To Inform The IEEE

- Participants shall inform the IEEE (or cause the IEEE to be informed) of the identity of each holder of any potential Essential Patent Claims of which they are personally aware if the claims are owned or controlled by the participant or the entity the participant is from, employed by, or otherwise represents.
- Participants should inform the IEEE (or cause the IEEE to be informed) of the identity of any other holders of potential Essential Patent Claims.

**Early identification of holders of potential
Essential Patent Claims is encouraged**

Ways To Inform The IEEE

- **Cause an Letter of Assurance (LOA) to be submitted to the IEEE SA (patcom@ieee.org); or**
- **Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible; or**
- **Speak up now and respond to this Call for Potentially Essential Patents.**

If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance, please respond at this time by providing relevant information to the TF Chair

Other Guidelines for IEEE Working Group Meetings

- All IEEE SA standards meetings shall be conducted in compliance with all applicable laws, including antitrust and competition laws.
 - **Don't discuss the interpretation, validity, or essentiality of patents/patent claims.**
 - **Don't discuss specific license rates, terms, or conditions.**
 - Relative costs of different technical approaches that include relative costs of patent licensing terms may be discussed in standards development meetings.
 - Technical considerations remain the primary focus.
 - **Don't discuss or engage in the fixing of product prices, allocation of customers, or division of sales markets.**
 - **Don't discuss the status or substance of ongoing or threatened litigation.**
 - **Don't be silent if inappropriate topics are discussed. Formally object to the discussion immediately.**

*For more details, see IEEE SA Standards Board Operations Manual, clause 5.3.10
and Antitrust and Competition Policy: What You Need to Know at
<http://standards.ieee.org/develop/policies/antitrust.pdf>*

Patent Related Information

The patent policy and the procedures used to execute that policy are documented in the:

- **IEEE SA Standards Board Bylaws**
(<http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6>)
- **IEEE SA Standards Board Operations Manual**
(<http://standards.ieee.org/develop/policies/opman/sect6.html#6.3>)

Material about the patent policy is available at

<http://standards.ieee.org/about/sasb/patcom/materials.html>

**If you have questions, contact the IEEE SA
Standards Board Patent Committee Administrator
at patcom@ieee.org**

Housekeeping – *Copyright Policy* (1 of 2)

- **By participating in this activity, you agree to comply with the IEEE Code of Ethics, all applicable laws, and all IEEE policies and procedures including, but not limited to, the IEEE SA Copyright Policy.**
- Previously Published material (copyright assertion indicated) shall not be presented/submitted to the Task Force nor incorporated into a Working Group draft unless permission is granted.
 - Prior to presentation or submission, you shall notify the TF Chair of previously Published material and should assist the Chair in obtaining copyright permission acceptable to IEEE SA.
- For material that is not previously Published, IEEE is automatically granted a license to use any material that is presented or submitted.

Housekeeping – *Copyright Policy* (2 of 2)

- The **IEEE SA Copyright Policy** is described in the *IEEE SA Standards Board Bylaws and IEEE SA Standards Board Operations Manual*
 - IEEE SA Copyright Policy, see
Clause 7 of the *IEEE SA Standards Board Bylaws*
<https://standards.ieee.org/about/policies/bylaws/sect6-7.html#7>
Clause 6.1 of the *IEEE SA Standards Board Operations Manual*
<https://standards.ieee.org/about/policies/opman/sect6.html>
- IEEE SA Copyright Permission
 - <https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/permissionltrs.zip>
- IEEE SA Copyright FAQs
 - <http://standards.ieee.org/faqs/copyrights.html/>
- IEEE SA Best Practices for IEEE Standards Development
 - http://standards.ieee.org/develop/policies/best_practices_for_ieee_standards_development_051215.pdf
- Distribution of Draft Standards (see 6.1.3 of the IEEE SA Standards Board Operations Manual)
 - <https://standards.ieee.org/about/policies/opman/sect6.html>

Quorum Check

Quorum Check

Members = thirty-one (31)

Ante	Greg
Arteaga	Javier
Ayala	Alex
Bates	Jared
Biggie	Kevin
Brown	Darren
Callsen	Thomas
Chapa	Raymundo
Chesser	Noah
Cruz Valdes	Juan Carlos
Dahlke	Michael
Ghafourian	Ali
Grandbois	Richard (Luke)
Hogg	Ryan
Kennedy	Gael
Kozer	Patrick

Quorum = sixteen (16)

Minikel	Justin
Murphy	Jerry
Parkinson	Dwight
Reepe	Robert
Schneider	Jeff
Shull	Stephen
Stankes	Dave
Thibault	Mike
Tillery	Tim
Valentin	Reinaldo
Van Horn	Jeremy
Verdell	Joshua
Wang	Evanne
Webb	Bruce
Wilks	Alan

Review & Approval of Agenda

Agenda – Review and Approval

1. 4:45 Call to Order, **Welcome and Introductions**
2. Housekeeping: Attendance, Participant Behavior, Essential Patent Claims, Copyright Policy
3. Quorum Check: **thirty-one (31)** members, need **sixteen (16)**
4. Review and Approval of Agenda
5. Approval of Minutes - S23 Meeting (Milwaukee, WI)
6. **Review TF Directive**
7. Old Business: Follow-up Guest Presentation - Jean C. Hernandez-Mejia (Georgia Institute of Technology) “NEETRAC’s Project on Padmounted Tank Temperatures”
8. New Business:
 - a) Access TF Status for possible reporting back to Distribution Transformer SC
 - b) Other
9. Next Steps, **Next Meeting**, and Adjournment

- **Review TF Directive**

... from Annex C.4 New Business Distribution Transformer SC Report S22

‘... the Task Force is to further investigate perceived safety concerns regarding tank touch temperatures for transformers that are accessible to the public by...

- 1. exploring input and feedback from outside resources and experts,**
- 2. evaluating opportunities to specifically address such concerns, and**
- 3. making recommendations to the SC for next steps, if any.’**



Old Business

Follow-Up Guest Presentation
Jean C. Hernandez-Mejia
(Georgia Institute of Technology)

“NEETRAC’s Project on
Padmounted Tank Temperatures”



Source:

https://www.army.mil/article/234846/ground_transformers_designed_to_be_safe_not_for_childs_play

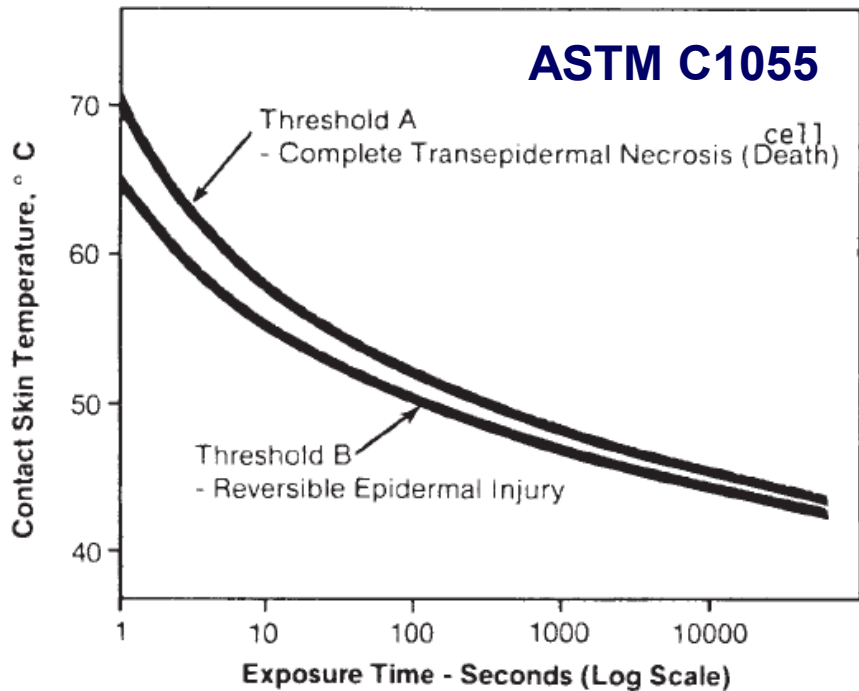
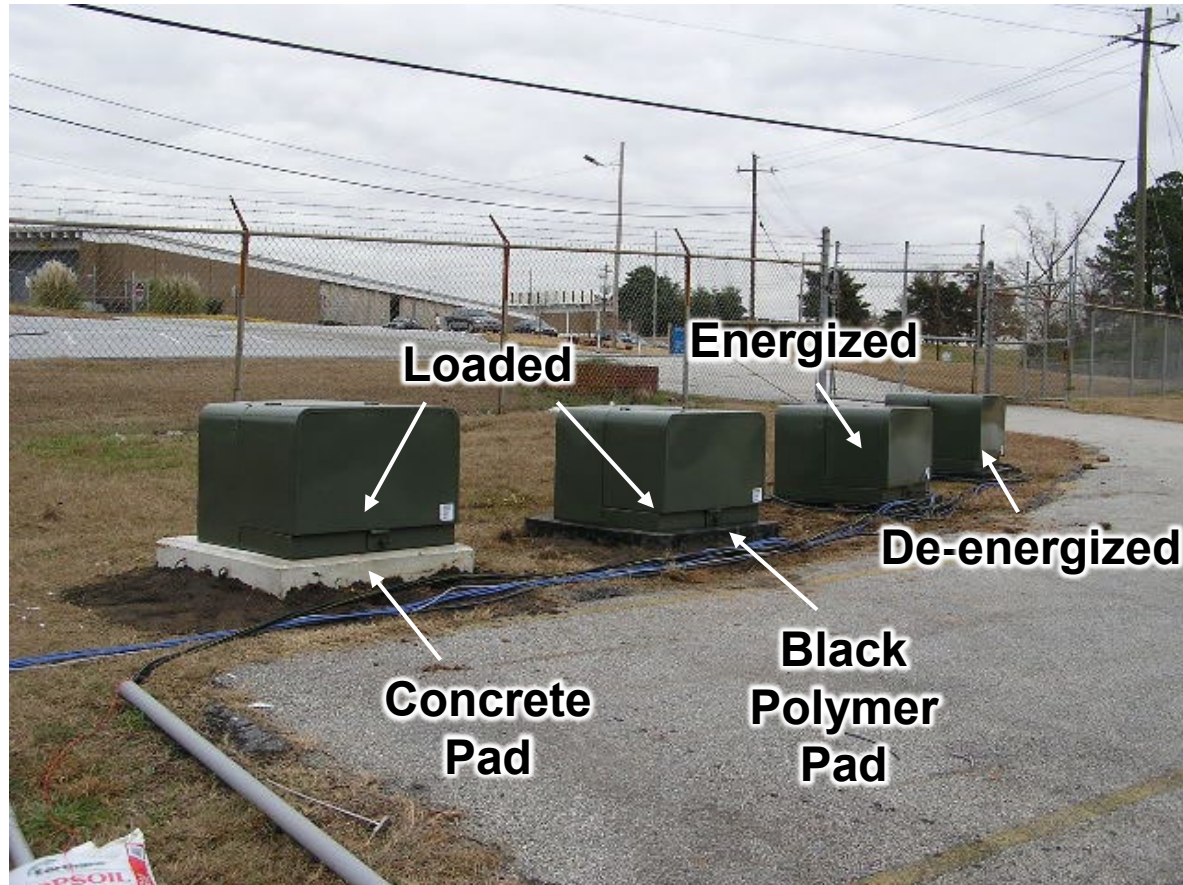


FIG. 1 Temperature-Time Relationship for Burns

- Severity of burns is dependent on surface temperature and composition, as well as duration of contact.
- Age, portion of body affected, perspiration, and individual variance all affect burn severity.
- At 44 ° C, damage occurs only after 6 hours.
- For bare, uncoated metals at 70 °C, damage begins to occur in less than 1 second (less than reaction time).
- Paint layer exhibits reduced thermal conductivity and increases the time to injury for high surface temperatures.

50 kVA Units
Under Test



Loaded

Energized

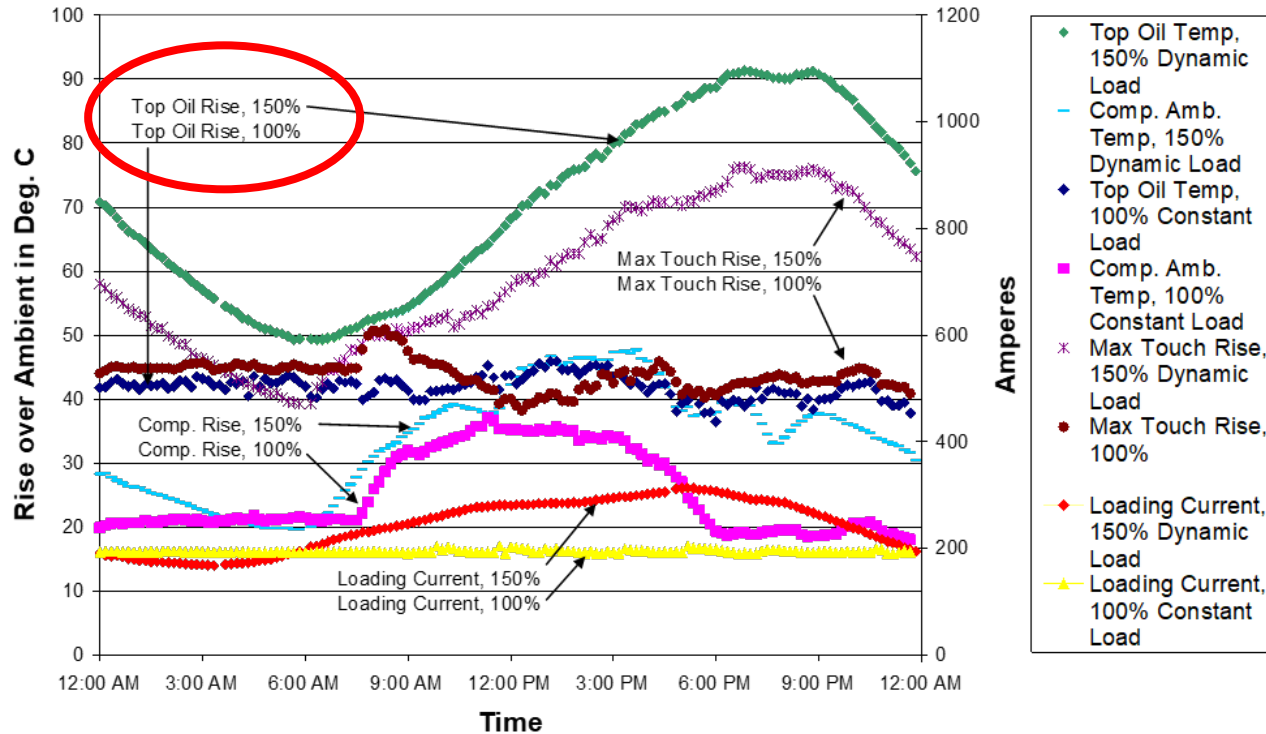
De-energized

**Concrete
Pad**

**Black
Polymer
Pad**

04-089 Transformer 2 Temperatures (Polymer Pad) 150% Peak Dynamic Loading vs. 100% Constant Loading

Rise or
Actual
Temp?



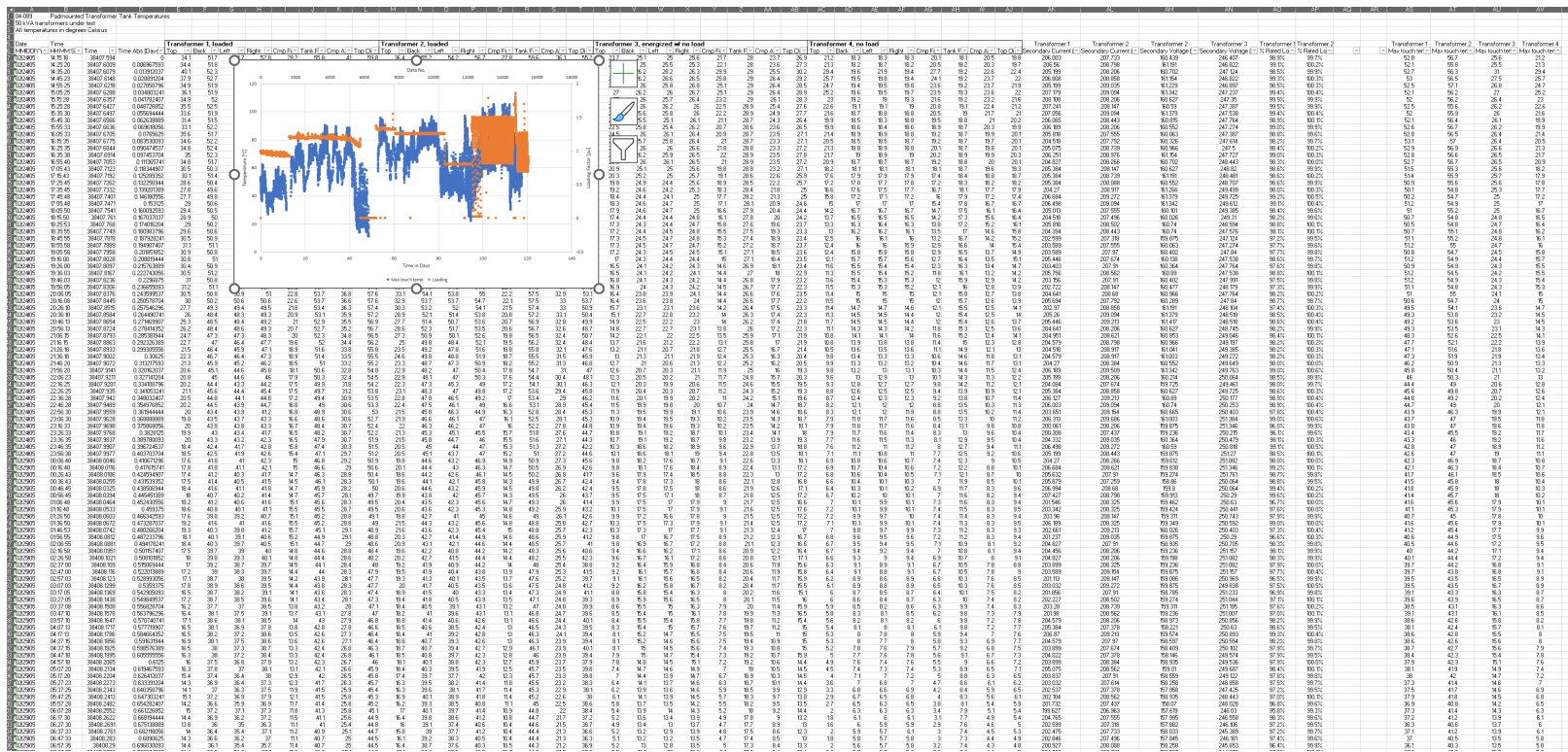
50kVA transformer under test with instrumentation



50kVA transformer thermocouple locations



50 kVA XFMR



50 kVA XFMR



Maximum Touch Temperatures - 50kVA XFMRs

Table 3. Maximum Touch Temperatures, 50kVA Transformers				
Condition	Predicted (°C)	Actual (°C)	Ambient (°C)	Date
50kVA, 80%-constant	67	72	28	05-26-05
50kVA, 100%-constant	67	60	18	03-04-05
50kVA, 125%-constant	88	95	29	05-08-05
50kVA, 150%-dynamic	----	102	32	06-07-05

- Temperatures of electrically loaded transformers rise noticeable as a function of incident light.
 - For lower loading levels, ambient temperature and solar loading largely determines maximum touch temperature.
- For higher loading levels, ambient temperature and transformer loading and losses determine the maximum touch temperature.
- Maximum tank temperatures may reach 100 °C before the dual element fuse operates.
 - Compartment ambient air temperatures can exceed 75 °C under certain conditions significantly impacting cable and accessories ampacity ratings.

Two Items

1. Access TF Status for possible reporting back to Distribution Transformer SC
 - Individual or Company situational conditions for any incidents or actions taken related to tank touch temperatures, and
 - February 21st Brainstorming Session Recap
2. Other

Spring 2024 Meeting
Vancouver, British Columbia, CANADA
March 10 - 14, 2024

THE END

Thank You for Your Participation!