

T&I Meeting Minutes

April 19th & 23rd, 2021 – Virtual meetings



Chair: Nenad Uzelac
Secretary: Alex Lizardo
Teams meeting: [Click here to join the meeting](#) (Full URL listed on page 4)
Time: April 19th, 3.45PM – 5.30PM/April 23rd, 10-11AM (CDT)

Meeting Minutes

1. Call to order

April 19th: The web meeting was opened at 3:15pm and called to order at 3:45pm (with hold for 2 minutes while people joined). April 20th: The web meeting was opened 10:45am and called to order at 11am.

2. Meeting etiquette

A quick overview of web-based meeting etiquette, AKA “netiquette”, was presented to ensure a successful meeting.

3. Introductions of guests

Introductions were given via meeting chat.

4. Attendance

April 19th: There were 13 members and 26 guests in attendance. Quorum was met.
April 23rd: There were 10 members and 18 guests in attendance. Quorum was met.

5. Approval of the agenda

The agenda was shared at the start of both online meetings. Motion to approve by P. Luefkens, 2nd by A. Livshitz. Approved by unanimous consent.

6. Patent Slides

IEEE patent slides were shared with the attendees with no comments from the group.

7. Meeting minutes approval

The meeting minutes from the Fall 2020 meeting were confirmed as received. Motion to approve by P. Luefkens, 2nd by J. Mizener. Approved by unanimous consent.

8. Chairman report

- Subcommittee scope: The chair affirmed messages from prior meetings.
- Subcommittee membership and structure: The chair shared the current members list – currently we have 16 members and 2 vacancies. S. Shinde volunteered to join as member.

9. Taskforce reports:

- a. "Testing for power frequency over-voltages >200% open gap" by M. Chhabra.
 - M. Chhabra presented the white paper draft noting the literature he surveyed – gathered different standards and assembled them into a table and created a test matrix (example for 15kV voltage class was given). There were a few questions and lengthy discussion. The instruction given by the chair for next steps is for M. Chhabra to finish the outline and identify areas where contribution is needed.
 - M. Chhabra will follow up with those who volunteered to continue the discussion: A. Livshitz, V. Hermosilla, S. Cochran. Lab time was identified as another aspect needing volunteers: M. Chhabra confirms he will do some tests, N. Uzelac, and H. Milnikel volunteered potential lab time needed to support the paper.
- b. "T&D equipment for special applications" by S. Shinde.
 - S. Shinde shared an update – his taskforce has been meeting monthly with the goal of having a draft paper by the fall meeting. Currently the task force is still seeking volunteers for contribution. V. Hermosillo volunteered to join this task force.
- c. "Aging Switchgear: condition assessment and lifecycle management" by A. Nanning.
 - This topic now has a lead: A. Nanning from Omicron. A small group was formed to work on outline, approach, and structure. Currently they are requesting direction from the group on who the audience should be. P. Di Lillo gave an example of how health indexes are usually incorporated into planning vs having a "midnight hour" emergency. Currently the task force is still seeking volunteers for contribution.

The secretary confirmed a workspace was set up for Aging Switchgear and that two other spaces were being request. Members of TI will receive an invitation from iMeetCentral. Noting that the taskforces are seeking contributors, the chair requested for members to go back to their individual SC groups and see if any experts would be available to volunteer for the three task forces.

10. Open Discussion:

- a. Develop a "call for experts" system to participate in Task Forces. T. Irwin affirmed that participation in T&I task forces does not require SA or Switchgear Committee membership and in-person attendance. X. Zhou, T. Johnson, and P. Faund volunteered to bring these topics to their organizations.
- b. Any new topics that T&I should discuss:
 - Technical user study – P. Leufkens presented a summary PPT that him and D. Johnson have been working on as a technical team of experts on several issues affecting users in T&D and to help manufacturers for product planning.
 - No other topics were raised.

11. Updates from relevant organizations:

- a. A3 active working groups were presented. Overview of UAB - the 'Voice' of utilities at Cigre. UAB consists of Cigre members employed by utilities.
- b. 2020 highlights were shared and 2021 activities were summarized.
- c. There is a new CIGRE A3 website <https://a3.cigre.org/>
- d. A3 created LinkedIn account for new announcements, events, publications, collecting feedback, etc: <https://www.linkedin.com/company/cigre-sc-a3>

12. Future meetings

- Fall 2021: Peppermill Resort, Reno, NV - October 10 - 14, 2021

13. Adjourn

April 19: Meeting adjourned at 5:38 PM. April 23: Meeting adjourned 11:04AM.

Teams Meeting Invite:

Nenad Uzelac is inviting you to a scheduled Teams meeting.

Topic: IEEE T&I subcommittee meeting

Time: April 19, 2021 03:45 PM Central Time (US and Canada)

Join Teams Meeting

https://urldefense.proofpoint.com/v2/url?u=https-3A_teams.microsoft.com_l_meetup-2Djoin_19-253ameeting-5FNzAyZWU0YjctOTJjZi00MzdmLWI4NzEtYjl1NjM2MzE3ZmFi-2540thread.v2_0-3Fcontext-3D-257b-2522Tid-2522-253a-25223f944c04-2D0f59-2D41d8-2Da423-2D716a63f07edd-2522-252c-2522Oid-2522-253a-25225b6e6eb9-2D7a5b-2D4248-2D9428-2Dfb1eebd885b0-2522-257d&d=DwMFaQ&c=h2Fu29X6B8vuaRkwP4jdQg&r=G6gjUsOO9pFXyq-hYwo_JzQ5nRL9fGdAE0bpVivlCs&m=OtXfNERttg37RyT9-NoKDB1D2nOcp_HNWbytPCd2xzl&s=AwfGutuqW89UrmhOCzLQTeJyVPfTVocsrho5M7iYvo&e=

Topic: Part 2: IEEE T&I subcommittee meeting

Time: April 23, 2021 10:00 AM Central Time (US and Canada)

Join Teams Meeting

https://teams.microsoft.com/l/meetup-join/19%3ameeting_MDczNDc5OGYtYjc1OS00ZjNlLWI0MmYtYWUyZmFjMjRkNTli%40thread.v2/0?context=%7b%22Tid%22%3a%2257368c21-b8cf-42cf-bd0b-43ecd4bc62ae%22%2c%22Oid%22%3a%22d54c2b3e-1042-4586-b098-04056280c7e0%22%7d

Attendance April 19th , 2021:

Role	Last Name	First Name	Company
Chair	Uzelac	Nenad	G&W Electric
Secretary	Lizardo	Alex	Cargill
Member	Byron	Eldridge	Schneider
Member	Cochran	Sterlin	Oak & Shield LLC
Member	Darko	Kennedy	G&W Electric
Member	Johnson	Dave	Consultant
Member	Kaminski	John	Siemens
Member	Leufkens	Paul	Power Projects Leufkens
Member	Livshitz	Albert	CE Power
Member	Mizener	Jeff	Siemens Industry
Member	Riley	Caryn	Georgia Tech/ NEETRAC
Member	Shinde	Sushil	Hitachi – ABB Power Grids
Member	Worthington	Charles	Hubbell Power Systems
Guest	Chhabra	Mohit	S&C Electric Company
Guest	Christian	Michael	ABB
Guest	Culhane	Michael	Eaton
Guest	Di Lillo	Pat	ConEd
Guest	Dullni	Edgar	Retired
Guest	Ekpoudom	Chris	Southern States
Guest	Frazier	Curtiss	Ameren
Guest	Harley	Jack	FirstPower Group
Guest	Hermosillo	Victor	GE Grid Solutions
Guest	Houston	James	Southern Company
Guest	Hurst	Bill	GE Grid Solutions
Guest	Irwin	Todd	GE Grid Solutions
Guest	Jain	Rahul	S&C Electric Company
Guest	Milnikel	Henning	Siemens
Guest	Nenning	Andreas	Omicron
Guest	Peterson	Mark	Xcel Energy
Guest	Reid	Laura	Hubbell Power Systems
Guest	Schiffbauer	Dan	Toshiba
Guest	Trichon	Francois	Schneider Electric
Guest	Trost	Karla	G&W Electric
Guest	Waldron,	Mark	National Grid UK
Guest	Whitney	Michael	S&C Electric Company
Guest	York,	Rich	Mitsubishi Electric
Guest	Yu,	Li	Eaton Corporation
Guest	Zhou	Xin	Eaton
Guest	Zia,	Danish	UL

Attendance April 23rd, 2021:

Role	Last Name	First Name	Company
Chair	Uzelac	Nenad	G&W Electric
Secretary	Lizardo	Alex	Cargill
Member	Byron	Eldridge	Schneider
Member	Cochran	Sterlin	Oak & Shield LLC
Member	Darko	Kennedy	G&W Electric
Member	Johnson	Dave	Consultant
Member	Kaminski	John	Siemens
Member	Leufkens	Paul	Power Projects Leufkens
Member	Livshitz	Albert	CE Power
Member	Mizener	Jeff	Siemens Industry
Guest	Chhabra	Mohit	S&C Electric Company
Guest	Christian	Michael	ABB
Guest	Dullni	Edgar	Retired
Guest	Found	Paul	BC Hydro
Guest	Gohil	Dave	AZZ Switchgear Systems
Guest	Henning	Milnikel	Siemens
Guest	Hermosillo	Victor	GE Grid Solutions
Guest	Irwin	Todd	GE Grid Solutions
Guest	Jain	Rahul	S&C Electric Company
Guest	Johnson	Travis	Xcel Energy
Guest	Nenning	Andreas	Omicron
Guest	Ramasetu	Vaidy	G&W Electric
Guest	Ringham	Grant	BC Hydro
Guest	Rohr	Richard	Powell Electrical Systems
Guest	Schiffbauer	Dan	Toshiba
Guest	Trost	Karla	G&W Electric
Guest	Zhang	Will	Hitachi
Guest	Zhou	Xin	Eaton



IEEE T&I Subcommittee Meeting



Image credit: ipopba | Getty Images

Nenad Uzelac (Chair)
Alex Lizardo (Secretary)



April 19, 2020





Netiquette

- Introduction though Chat
- Mute your microphone if not speaking
- Use video if presented
- “Raise your hand” to enter discussion



Agenda

- | | | |
|-----|--|-----------------|
| 1. | Call to Order | <i>Nenad U.</i> |
| 2. | Virtual meeting etiquette | Alex L. |
| 3. | Introduction of Guests (virtual) | Alex L. |
| 4. | Attendance (virtual) | Alex L. |
| 5. | Approval of the Agenda | Alex L. |
| 6. | Patent slides | |
| 7. | Approval of Minutes from Fall 2020 Meeting | |
| 8. | Chairman's report: | Nenad U. |
| | a. TI Scope review | |
| | b. TI subcommittee new membership | |
| 9. | Task forces: | |
| | a. "Testing for Power Frequency Over-Voltages $\geq 200\%$ open gap" | <i>Mohit</i> |
| | b. "Aging Switchgear: condition assessment and lifecycle management" | Andreas |
| | c. "T&D switchgear special applications" | Sushil |
| 10. | Open discussion | |
| | a. T&D technical user study | Paul & Dave |
| | b. Develop a "call for experts" system to participate in Task Forces | Nenad |
| | c. Any new topics that T&I should discuss | All |
| 11. | Updates from relevant organizations: | |
| | a. CIGRE A3 update | All |
| 12. | Future meetings | |
| 13. | Meeting adjourns | Nenad U. |

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 IEEE

- Cause an 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 WG Chair

Other guidelines for IEEE WG 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 ... do formally object.

.....
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**

Approval of Minutes

Technology and Innovation Subcommittee



IEEE Switchgear Fall 2019 standards meeting
 Location: Calamarian Resort, San Diego, CA
 Date: October 7th, 2019
 Room: Macaw
 Time: 3:45PM to 5:30PM
 Chair: Nenad Uzelac with meeting facilitated by Karla Trost in his absence
 Minutes: Karla Trost & Alex Lizardo

Meeting Minutes

1. **Call to order**
The meeting was called to order at 3:45PM.
2. **Introductions and Circulation of the subcommittee sign-in sheet.**
Sign-in sheets were circulated, and introductions were made.
Karla agreed to facilitate the meeting in Nenad's absence and Alex Lizardo volunteered to write notes.
3. **Attendance**
There were 49 guests in attendance.
4. **Approval of the agenda**
The agenda was elucidated by the facilitator and accepted without changes.
5. **Meeting minutes approval.**
The meeting minutes from the April 29th, 2019 meeting were showed. No objections or changes.
6. **Chairman report:**
 - **TI Subcommittee scope review.** The facilitator shared a presentation prepared by the chair which summarized and reiterated important points.
 - **TI Subcommittee membership and structure.** The facilitator shared the subcommittee nominations so far and emphasized to those in attendance should contact their SC chairs if they want to be nominated.
 - IWSO: Ted Burse, Carl Schneider, Jeff Mizener
 - HVCB: Dave Johnson, Paul Leuffens
 - SA: Alex Lizardo, Eldridge Byron
 - Working for nominations from RODE, HVS and HVF
 - See attached presentation

Fall 2019 TI Subcommittee Meeting Minutes – F19TI

page 1



7. Task Force reports

- a. **TF1: Review IEEE 1547 standard's impact on switchgear standards:**
 - Task Force chair Paul Leuffens was absent. In advance of the meeting he summarized the findings in the presentation "TF IEEE 1547 San Diego Oct 2019" attached below. Mohit Chhabra gave a quick background on the presentation and Paul's activity in brief
 - Presentation File:



- The discussion became focused on the increases in maximum voltage in C84.1 and the position paper that the switchgear committee submitted. Todd Irwin updated the group about a general message received from C84.1. Todd finalized by saying we will have to keep an eye out on this standard and that this WG directly impacts switchgear. He believes the switchgear committee now has enough people signed up so that we are not caught off guard in the future. A question was asked if we believe this problem will happen again and Todd clarified that while they are not pursuing this topic in the current revision, any new revision always makes it a possibility, which is why we must keep actively involved in this WG.
- Albert Livshitz brought up that A3/A2 working group was created to discuss increased voltages. He will send Karla the information for her to include in the minutes.

8. New Proposals

Carry over of last T&I meeting agreed to be prepared before Fall 2019 meeting:

- 1) Issue of aging equipment (diagnostics, end of life)
 - a. Albert presented the attached proposal:



The facilitator brought up the need to confirm the scope as a SC – do we feel it is too broad and do we have the right people working on it? Below is the input received from attendees:

- George Becker brought up there is ongoing work being done by C37.122.9. Albert clarified that he was planning to implement Nenad's comments which were to include the pre-existing and ongoing efforts by other groups (B3.43 Qigre group for example).

Fall 2019 TI Subcommittee Meeting Minutes – F19TI

page 2

IEEE Switchgear T&I sub-committee

- **Facilitates** and **conducts** research related to Switchgear, Circuit breakers and Fuses that are covered under IEEE switchgear standards. The need for innovations arises because of the changing business environment and technology offerings.
- **Develops** technical reports and makes recommendations for further advancement of IEEE switchgear standards.
- **Coordinates** with other technical committees, groups, societies, and associations as required.

IEEE Switchgear T&I sub-committee

- Will not develop standards
- Will cover the projects that are of interest to more than one switchgear subcommittee
- Anyone can write and submit a project proposal
- Subcommittee members will decide which projects to take.
- Initial members are chosen based on nominations, after will follow IEEE attendance rules.

T&I Membership

LVSD:

- Ted Burse
- Carl Schneider
- Jeff Mizener

HVCB:

- Dave Johnson
- Paul Leufkens
- vacant

RODE:

- Kennedy Darko
- Anil Dhawan
- Caryn Riley

SA:

- Alex Lizardo
- Eldridge Byron
- Albert Livshitz

HVF:

- Sterlin Cochran
- Charles Worthington
- Jim Wenzel

HVS:

- John Kaminski
- Phillip Corriveau
- vacant



Task Force reports



Task Forces

- 1) “Testing for power frequency over-voltages >200% open gap” (**paper**) **Lead: Mohit**
- 2) “Issue of aging equipment (diagnostics, end of life)” **Lead Andreas** (**tech. report**)
- 3) “T&D equipment for special applications” **Lead: Sushil** (**technical report**)



1) 200% open-gap testing

(part 1 of influence of renewables on switchgear equipment)

Scope of Work and deliverables:

1. Introduction
2. Define scope of switchgear to be covered in the White Paper.
3. Define extended duration of time for open gaps to be covered in the White Paper.
4. Identify applications where an open gap may be energized on both sides for extended durations.
5. Identify factors stressing open gaps when exposed to power frequency over-voltages.
6. Conduct user surveys to determine testing practices for open gaps exposed to $\geq 200\%$ of rated voltage for extended durations.
7. Develop recommendations for standardization of testing practices for open gaps exposed to $\geq 200\%$ of rated voltage for extended durations.

Goal: Write a technical paper draft before Spring 2021 meeting





Mohit to present the paper draft



2) Special applications

1. Arc furnace switching,
2. Gen synch application with HV circuit breakers in the absence of generator circuit breaker
3. Circuit breakers used in HVDC station on the AC side for filter banks
4. Power factor testing of CB in the field (this test is not done part of routine production)
5. Influence of renewables on HV circuit breakers in terms of harmonics, SC rating, X/R ratios, overvoltage
6. Electronics which is integrated into switchgear such as electronics used for fiber optic current sensors, electronics used with motor operating drives
7. Impact of HV disconnect switch transients on HV circuit breaker



Content (finish by fall 2021)

- Introduction
- Overview/Description of different special applications
- What are the current challenges?
- Review of existing IEC/IEEE standards
- Literature/Publication review on these application challenges
- Application recommendations
- Conclusion



3) Asset management / EOL

Scope of Work and deliverables:

1. Define scope of equipment to be covered by the Technical Report. Propose to include all equipment in scope of IEEE C37 Main Committee;
2. Identify the factors and stresses impacting the premature of equipment failure or equipment aging process;
3. Identify technical and financial feasibility to install on-line condition monitoring on different models type of T&D Switchgear
4. Identify and evaluate the present-day techniques to pre-detect potential failure and mitigate the aging of T&D Switchgear including:
 - a. Periodic maintenance and testing;
 - b. On-line condition monitoring and diagnostics;
 - c. Identify manufacturer design deficiency and life cycle management of the potential design failure equipment;
 - d. Reconditioning and upgrades using new manufacture' supplied components and materials;
 - e. Retrofit of the existing T&D switchgear with new sensing and condition diagnostic equipment;
 - f. Retrofill the aging components of T&D switchgear using pre-qualified modular assemblies;
5. Identify the right quantity of spare parts and recycling of stock,
6. Conduct users survey to evaluate the practices of the T&D switchgear lifecycle management;
7. Consolidate a list of equipment had failed due to manufacturer design, lack of maintenance, aging or climate change;
8. Digital Substation and self-diagnosing equipment as applied to aging T&D switchgear
9. Develop recommendations for standardization of the lifecycle management of T&D switchgear

Spring
2021

