

T&I Meeting Minutes

October 19th, 2022 – Burlington, VT



Chair: Alex Cochran (Lizardo)
Secretary : Caryn Riley
Meeting: Hilton Burlington Lake Champlain, Burlington, VT (Green Mountain B)
Time: Oct 19th, 2022 8AM – 9:45AM (Eastern Daylight Saving Time)

Meeting Minutes

1. Call to order

The meeting was opened at 08:00 am and called to order at 08:03 am EDT.

2. Introductions of Guests

Sign-up sheet was completed.

3. Attendance

9 Members, 22 Guests

4. Approval of the agenda

IEEE TI Fall 2022 Agenda.pdf
The agenda was approved by consensus.

5. Patent Slides

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

6. Meeting minutes approval

S22TImiRev0.pdf
Minutes were amended. Motion to accept, accepted by consensus. Amended minutes will be submitted for posting.

7. Chairman's report

- a. [TI Scope review](#)
- b. [Introduction of officer rotation, A. Cochran now chair, C. Riley has accepted secretary role.](#)

8. Task forces:

- a. [Aging Switchgear: condition assessment and lifecycle management \(A. Nenning\)](#)
 - Three portions of the document – Aging section 60% complete, Condition Assessment section – on schedule, Lifecycle Management of aging assets – under development
 - Yesterday task force met on site and conducted a brain storming session about the survey questions, plan to do the survey in the first quarter 2023.

- Goal to have the document for review by the subcommittee for Fall 2023 meeting
 - Task Force has 20 members, but always seeking more experts.
 - Utility members are requested to provide contacts to send the survey. Survey will take approximately 30 – 40 minutes to complete. CEATI contact on the task force to provide way to deliver the survey. Goal is to have an online link to send the survey out. Utility user group at PES Switchgear, M. Skidmore, chair, will be contacted to distribute the survey link.
 - Discussion followed.
 - Are members seeing increased asset management activities? Yes, being asked to do asset management of older GIS equipment;
 - Is lifecycle management based on installation environment, time in service, manufacturer expected life, maintenance practices? This is the most difficult task of our industry especially with the recent supply chain issues corrupting the ability to replace aging equipment.
 - There is a potential request to “standardize” nameplate information for the utility industry. May be submitted as a proposal for T&I once origin of this standardization plan is known.
- b. Testing for Power Frequency Over-Voltage \geq 200% open gap (M. Chhabra)
- Presentation slides will be included in the minutes. Reviewed the scope that is the focus of the white paper. Five contributors are actively assisting with topics of the white paper. TF Chair welcomes additional contributors. Refer to slide for areas where support is needed.
 - Discussion of 4.2.5 in the outline: Suggestion that this area may require involvement of the manufacturers; Agree that construction is critical for determining of the ability to survive extended time at 200%; need to have a single test for all devices to prove efficacy
 - Sent a utility user group questions, but did not get a response. TF member will follow up with the utility user group chair.
 - Goal is to complete document before the Spring 2023 Switchgear meeting.
 - Discussion about what to consider – specifically focused on issues of partial discharge across the open gap and the corresponding switchgear components; also why would another test be required besides the existing 1 min dry/10 s wet withstand tests; Shared experience with an issue has been seen on a 38 kV system with degradation of insulation not with the vacuum bottles, at this system voltage level 200% is above the voltage class of the device; should an accelerated life test be added to show performance for the 200% condition?
- c. T&D switchgear special applications (A. Cochran)
- Seeking a volunteer to lead this task force as current leader has not been able to move the work forward (new position within his organization).
 - Slides presented from Fall 2021 web meeting of topics and general outline of what would be covered for each topic
 - M. Christian volunteered to lead the Task Force. Would like all historical information on the progress.

9. Open discussion

- a. Discuss “call for experts” to participate in renewables Task Forces (N. Uzelac, past SC chair)
 - Still a challenge in getting experts from outside the Switchgear committee
 - Identified several ways to get new experts for contacts – most successful was Condition Assessment TF chair using LinkedIn
 - IEEE Future Directions newsletter was brought up and information supplied to investigate possible use
- b. IEEE IGET liaison. – N. Uzelac
 - Presentation will be included with the minutes.
 - A. Cochran will contact J. Follum about access to the October 28 meeting from 1-2 pm and if meeting sign in information can be shared with this subcommittee; She will distribute the link to all attendees if approved.
- c. Any new topics that T&I should discuss?
 - N. Uzelac/D. Schiffbauer – topic was brought to HVCB, but HVCB subcommittee voted it down as it was too focused on a specific technology for the subcommittee and they believe it fit within T&I scope, Request from HVCB for T&I to create a task force to generate a technical report/white paper on high voltage ac vacuum interrupters or update the content of IEEE PES TR64 (2018) suggestion to broaden scope to similar scope as Cigre 589 (2014); request that the original requester to complete a T&I project proposal form to initiate the project;
 - Chair wants to bring to ADSCOM how do we proceed with update of previous PES TR64 report that was done under ADSCOM and current request to HVCB; will bring proposal to them once completed between meetings so time isn't lost

10. Updates from relevant organizations:

CIGRE Paris & CIGRE A3 update (N. Uzelac) – slides included in the minutes. Trend of joint working groups between committees; had a meeting between IEEE PES and CIGRE to discuss working out copyright issues between organizations and collaboration for future conferences and working groups; Next meeting in Paris in 2 years, it's scheduled between the Olympics and ParaOlympics; CIGRE US National Committee presenting Grid of the Future Conference in Chicago, November 7-10, 2022.

11. Future meetings

- a. Spring 2023 (April 16 – 20), Sheraton Sand Key, Clearwater Beach, FL
- b. Fall 2023 (October 08 – 13), Catamaran Resort, San Diego, CA

12. Adjourn

Motion to adjourn meeting A. Dhawan, second C. Schneider. Meeting adjourned at 09:44 EDT.

T&I meeting
starting
@8AM



IEEE T&I Subcommittee Meeting



Alex Cochran(Chair)
Caryn Riley(Secretary)



Agenda

- | | | |
|-----|---|----------|
| 1. | Call to Order | Alex C. |
| 2. | In-person meeting etiquette | Alex C. |
| 3. | Introduction of Guests | Alex C. |
| 4. | Attendance | Alex C. |
| 5. | Approval of the Agenda | Alex C. |
| 6. | Patent slides | Alex C. |
| 7. | Approval of Minutes from Spring 2022 Meeting | Nenad U. |
| 8. | Chairman's report: | Nenad U. |
| | a. TI Scope review | |
| | b. Officer Rotation. Seeking volunteers for Secretary position. | |
| 9. | Task forces: | |
| | a. "Testing for Power Frequency Over-Voltages $\geq 200\%$ open gap" | Mohit |
| | b. "Aging Switchgear: condition assessment and lifecycle management" | Andreas |
| | c. "T&D switchgear special applications" | Sushil |
| 10. | Open discussion | |
| | a. Discuss "call for experts" to participate in renewables Task Forces | Nenad |
| | b. IEEE IGET liaison | Nenad |
| | c. Any new topics that T&I should discuss | All |
| 11. | Updates from relevant organizations: | |
| | a. CIGRE Paris & CIGRE A3 update | Nenad |
| 12. | Future meetings | |
| | a. Spring 2023 (April 16 – 20), Sheraton Sand Key, Clearwater Beach, FL | |
| | b. Fall 2023 (October 08 – 13), Catamaran Resort, San Diego, CA | |
| 13. | Meeting adjourns | Alex C. |

Call for Patents

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

Call for Patents

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

Call for Patents

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>

Call for Patents

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

T&I Meeting Minutes

April 13th, 2022 – Orlando, FL



Chair: Nenad Uzelac
 Secretary: Alex Cochran (Lizardo) is on sick leave – Substitute: Andreas Nenning
 Meeting: Orlando, FL; Signia by Hilton Orlando Bonnet Creek, Room Citrus
 Time: April 13th, 08.00 am

Meeting Minutes

1. Call to order
The meeting was opened at 08:00 and called to order at 08:03 EST
2. In-person meeting etiquette
Chair showed slides
3. Introductions of Guests
Rooster was filled out
4. Attendance
See roster
5. Approval of the agenda
IEEE TI Spring 2022 Ag.pdf
The agenda was elucidated by the chair. Motion to accept. Jeff Mizener and Caryn Riley approved
6. Patent Slides
IEEE patent slides were shared with the attendees with no comments from the group.
7. Meeting minutes approval
F21TImRev0.pdf
The agenda was elucidated by the chair. Motion to accept, Darko Kennedy approved
8. Chairman's report
 - a. [T&I officer rotation in Fall 2022. Alex Lizardo will become chair. Looking for T&I secretary](#)
9. Task forces:
 - a. [Testing for Power Frequency Over-Voltage >= 200% open gap \(Mohit\)](#)
Scope of the TF: it is not about out-of-phase switching? Albert: There are clearly defined standards for out-of-phase switching. RHODE should deal with any potential missing parts there. For instance reclosers are used for out-of-phase switching.

Overvoltage stresses (200% for a long period of time) on the interrupting media on various mediums should be included. G&W can help with vacuum and solid material. Goal is to define a test which needs to be done to validate that the breaker can withstand this stress. For instance, do a long term (24h) overvoltage withstand test.
Mohit will share the scope to make sure everybody can agree on it.

- b. [Aging Switchgear: condition assessment and lifecycle management \(Andreas\)](#)
Need to add extra time for the IEEE review process. Nenad has experience with other Technical Reports. The document will be send out to IEEE community and around 6 weeks to review.
Than you have to plan around 2 month to work that in.

10. Open discussion
 - a. [Follow up on "call for experts" system to participate in Task Forces. Doug explained that they will work on a solution for that.](#)
 - b. [Any new topics that T&I should discuss? No requests raised](#)
11. Updates from relevant organizations:
Cigre A3 update
12. Future meetings

Burlington, VT, October 2022
13. Adjourn
Meeting adjourned at 09:49 EST

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) “Aging Switchgear: condition assessment and lifecycle management” **Lead Andreas** (**tech. report**)
- 3) “T&D switchgear special applications”
Lead: Sushil (**technical report**)

TF Slides

Testing for Power Frequency Over- Voltages of $\geq 200\%$ of Line-Neutral Voltage Across an Open Gap

Mohit Chhabra

October 2022



Testing for Power Frequency Over-Voltages of $\geq 200\%$ of Rated Voltage Across an Open Gap

Agenda

1. Status of white paper
2. Next steps

Testing for Power Frequency Over-Voltages of $\geq 200\%$ of Rated Voltage Across an Open Gap

Status of white paper

Table of Contents	Status
1. Executive Summary	Not started
2. Introduction	Done
3. Literature Survey	In progress
4. Scope of Switchgear	
4.1 Insulating Medium	
4.1.1 Gas	In progress
4.1.2 Liquid	In progress
4.1.3 Solid Dielectric	Not started
4.2 Type of Isolating Device	
4.2.1 Indoor and Outdoor Disconnectors	In progress
4.2.2 Switch Disconnectors / Load Break Switches	In progress
4.2.3 Contactors	In progress
4.2.4 Reclosers	Not started
4.2.5 Interrupters	Not started
4.3 Voltage Ratings	In progress
4.4 Temperature	Not started
5. User Surveys	In progress
6. Recommendations	Not started



Testing for Power Frequency Over-Voltages of $\geq 200\%$ of Rated Voltage Across an Open Gap

Questions posed to utilities

Can you provide any specifications (or partial details) or preferences you may be using to qualify new circuit breakers and switches regarding their ability to withstand $\geq 200\%$ of rated voltage in the scenario that the breaker or switch experiences voltage on both sides when open for an extended periods of time?

Can you provide any specifications (or partial details) or preferences you may using regarding the use of solid insulation across the open gap for circuit breakers and switches?



Testing for Power Frequency Over-Voltages of $\geq 200\%$ of Rated Voltage Across an Open Gap

Next steps

1. Continue looking for contributors
2. Resend the survey to utilities

Call for Chair – Slides from Fall 2021

3) 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

Open Discussion

- 1) “Call for experts” to participate in renewables Task Forces
- 2) IEEE IGET liaison
- 3) *Any new topics that T&I should discuss*

iGET Update





- **Intelligent Grid & Emerging Technologies Coordinating Committee (iGET)**

Objectives



- Ensure that all key emerging technologies are considered within an appropriate PES technical committee
- Foster solutions to issues related to emerging technologies by informing experts within PES
- Support collaboration among PES technical committees by providing a forum for technologies influencing multiple areas

- **Scope**

- **All aspects of the intelligent grid and related emerging technologies within PES**

- Electric Machinery
- Energy Development & Power Generation
- Insulated Conductors
- Power System Analysis, Computing and Economics
- Energy Storage
- Power System Communications
- Power System Relaying
- Smart Grid
- Substations
- Switchgear
- Transformers
- Transmission & Distribution
- Power Systems Instrumentation and Measurement
- Cybersecurity
- Power System Resilience

Activities



- Develop webinars, white papers, etc. to foster awareness of:
 - Emerging technologies
 - Trends in the development of intelligent grids
 - Related issues that require solutions
- iGET does not address these issues directly
- Rather, we coordinate with relevant technical committees to ensure that solutions are identified and standards are developed

Upcoming Webinar



Emerging Standard: IEEE P2418.5 Blockchain for Energy

- Presenters: Claudio Lima and Umit Cali, Chair and Vice-Chair of PAR 2418.5 WG
- Content:
 - Overview of Blockchain technology and its use in the field of Energy
 - Energy transition issues, key technologies, use cases, initiatives, recent advances, and standards
- To foster coordination, iGET welcomes members of other committees to join – contact our chair at james.follum@pnnl.gov
- October 28, 1:00-2:00 Eastern Time

- **Liaisons**

- **Maintaining an efficient exchange of information on activities and related areas of mutual interest**
- Liaisons are appointed by iGET with the approval of the other group
- Liaisons are expected to be active participants in the group they are coordinating with
- Roles:
 - Coordinate which group takes ownership of emerging technologies identified by iGET
 - Report to other groups on iGET activities
 - Communicate needs for technical expertise through the liaison network

Officers



- Chair: Jim Follum, PNNL, james.follum@pnnl.gov
- Vice-Chair: Theo Laughner, Lifescale Analytics
- Secretary: Daniel Molzahn, Georgia Institute of Technology
- TCPC: Jovanio Santos, Thymos Energia

Updates from
CIGRE Paris & A3 “T&D Equipment”

A3

A3 TRANSMISSION&DISTRIBUTION EQUIPMENT

- Innovative design and technologies for changing network conditions, like HVDC and MVDC and off shore equipment. Need for higher ratings, higher reliability, faster, smaller and smarter equipment.
- Focus on environment and climate change . Deployment of lower carbon footprint equipment, like SF6 alternatives. More resilient equipment capable of withstanding flooding, high winds, extreme temperatures, ice storms, forest fires.
- Embedding intelligence into T&D equipment, high accuracy sensors, digital equipment with built in IoT, AI, machine learning.
- Reliability assessment and lifecycle management of ageing equipment. Monitoring and diagnostics, Condition assessment, determining End of Life, Digital Twin concept.



SC A3 - Transmission and Distribution Equipment

Scope of work:

The scope of SC A3 covers the whole life cycle of AC and DC T&D Equipment. This includes theory, development, design, performance, testing, installation, operation and maintenance of all switching devices, current limited fuses, surge arrestors, capacitors, busbars, instrument transformers and other equipment not covered under other study committees.

Principal areas of interest:

- 1) Innovative design and technologies for changing network conditions (e.g. DC circuit breakers, higher ratings, faster, smaller, smarter)
- 2) Focus on Environment and sustainability (e.g. lower carbon footprint equipment with Alternative gases)
- 3) Incorporation of intelligence into T&D equipment (e.g. controlled switching)
- 4) Impact of inverter-based technologies on T&D equipment
- 5) Advanced, high accuracy sensors, monitoring and diagnostics of T&D equipment
- 6) New and improving testing techniques
- 7) Reliability assessment and lifecycle management of ageing equipment.
- 8) More resilient equipment for harsh conditions, (e.g. flooding, strong winds, ice storms, off-shore)
- 9) Digital twins, machine learning, virtual and augmented reality

Main areas of attention:

SC A3 provides the information on new technologies, improved specifications, reliability, and lifecycle management of transmission and distribution equipment. This scope is well suited to the various technical needs of utilities that require technical and sustainable solutions for emerging problems and challenges in changing network conditions.

SC A3 increases its educational and tutorial activities on all relevant subjects not only within the CIGRE community but also to IEEE, IEC, and many related international conferences and exhibitions.

Topics of Working Groups

WG A3.39 Application and field experience with Metal Oxide Surge Arresters

WG A3.40 Technical Requirements and Testing Recommendations for MV DC switching equipment at distribution levels

- WG A3.41 Interrupting and switching performance with SF6 free switching equipment
- WG A3.42 Failure analysis and risk mitigation for recent incidents of AIS instrument transformers
- WG A3.43 Tools for lifecycle management of T&D switchgear based on data from condition monitoring systems
- WG A3/A2/A1/B1.44
Consequence of High Voltage Equipment operating exceeding highest system voltages
- WG A3.45 Methods for identification of frequency response characteristic of voltage measurement systems
- WG A3.46 Generator Circuit-Breakers: review of application requirements, practices, in-service experience and future trends
- WG A3/B3.60 User guide for non-SF6 gases and gas mixtures in Substations
- WG A3.47 Lifetime Management of Medium Voltage Indoor Switchgear

Future events:

- 2021 CIGRE Symposium, June 1-4th, Ljubljana Slovenia
- 2021 CIGRE Session August, Paris France
- 2021 CIGRE Colloquium, November, New Dehli, India
- 2022 CIGRE Session, August, Paris France
- 2023 CIGR Colloquium, June, Moscow
- 2023 CIGRE Colloquium, October, USA

The publications of the last 10 years are as follows:

- TB 817 Shunt capacitor switching in distribution and transmission systems
- TB 816 Substation equipment overstress management
- TB 757 Guidelines and best practices for the commissioning and operation of controlled switching projects
- TB 737 Non-intrusive methods for condition assessment of distribution and transmission switchgear
- TB 725 Ageing High Voltage substation equipment and possible mitigation technique
- TB 716 System conditions for and probability of Out-of-Phase
- TB 696 MO varistors and surge arresters for emerging system conditions
- TB 693 Experience with equipment for Series / Shunt Compensation
- TB 683 Technical requirements of state-of-the-art HVDC switching equipment
- TB 624 Influence of Shunt capacitor bank on CB fault interruption Duties
- TB 602 Tools for simulation of the internal arc effects in HV & MV switchgear
- TB 589 Vacuum Switchgears at Transmission voltages
- TB 570 Switching Phenomena for EHV and UHV equipment
- TB 544 Metal oxide (MO) surge Arresters - Stresses and Test Procedures
- TB 514 Reliability of high voltage equipment - Part 6: Best practices
- TB 513 Reliability of high voltage equipment - part 5: Gas Insulated switchgear
- TB 512 Reliability of high voltage equipment - part 4: Instrument Transformers
- TB 511 Reliability of high voltage equipment - part 3: DS & Earthing switches
- TB 510 Reliability of high voltage equipment - part 2: SF6 Circuit Breakers
- TB 509 Reliability of high voltage equipment - part 1: General Matters
- TB 497 Applications and Feasibility of Fault Current limiters in power systems
- TB 456 Background of technical specifications for substation equipment > 800 kV
- TB 455 Application of Composite insulators to high voltage apparatus
- TB 408 Line fault phenomena and their implications for 3-phase SLF/LLF clearing

All of the above TBs are available for download from www.e-cigre.org

Contact:

- Chairman: Nenad Uzelac - nenad.uzelac@cigre.org
- Secretary: Frank Richter - frank.richter@50hertz.com

Study Committee A3**1. Highlights**

- CIGRE 100th anniversary 2021 virtually
- Ljubljana, Slovenia - November 21-24, 2021
- Keep the work done only by remote meetings: Strategic Working group, SC Meetings

2. Working Groups in 2021:

2.1. New WGs

- JWG B3/A3.60: User guide for non-SF6 gases and gas mixtures in Substations
- A3.47: Lifetime Management of Medium Voltage Indoor Switchgear

2.2. WGs Disbanded

- Two working groups finished their work: A3.31 (Electra Paper), A3.36 (TB830)

2.3. Total number of active, WGs, JWGs

- 8 active WGs and one JWG under A3 lead, 5 JWG participation under lead of other SCs

2.4. Number of WG meetings held by electronic means (video or phone conferences):

- Due to the Pandemic the Working Group work was only done by remote meetings. (Last face-to face meetings took place in the beginning of 2020!!)

3. Publications

3.1. Publications during 2021 of Electra papers - excluding the executive summary of a TB), Reference papers, Technical brochures, CSE papers, Future Connections.

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- 3.1.1. Electra Paper of A3.31
- 3.1.2. Technical Brochure TB830 of A3.36

3.2. Publication plan for the coming year

- We expect 2 TB's (A3.41 and A3.39).

3.3. CSE Papers are planned and will be chosen out of the CIGRE Papers

3.4. Green Books progress

- Support the Green book activities of C1 on Asset Management
- Support the Green book activities of B4: chapter about HVDC CBs (draft submitted in April 2021)
- Second edition of A3 green book under preparation

3.5. Reference papers progress

- We plan to organise a reference paper on alternatives gases in conjunction with B3 and D1.

4. Tutorials and workshops in 2021

4.1. 2021:

Paris 2021: State of the art of DC circuit breakers in T&D (in conjunction with B4) (2021)

Webinar 03/2021: Shunt reactor switching: Theory and practice (2021)

Paris 2021 A3/B3/D1 Workshop: The impact of Sf6 free alternatives in T&D substations and its switchgear switching equipment

Ljubljana 2021: Trends and Challenges in T&D Equipment

4.2. Planned in coming years if any, place of event if appropriate or internet event.

August 2022, Paris: tutorial about switching ij vacuum B4,

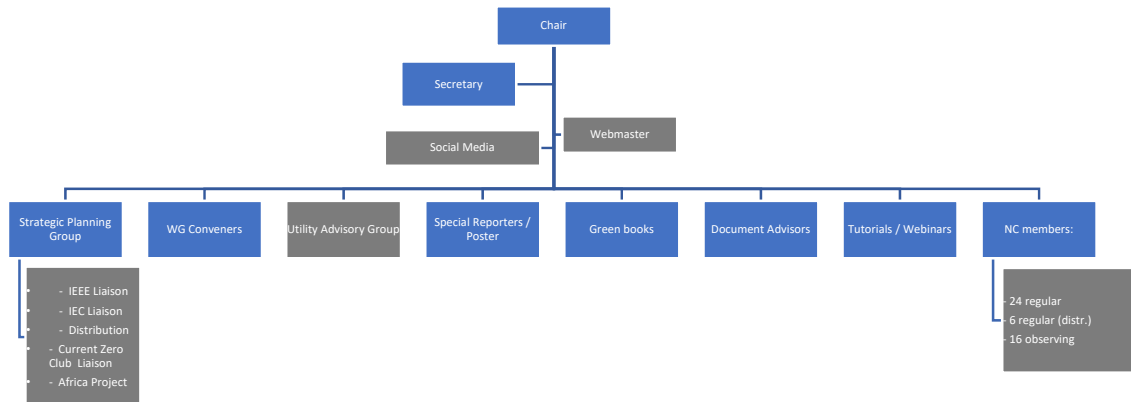
August 2022 Paris: workshop of SF6 Alternatives with B3

Offer of Current zero club to present topics under the frame of SC A3

4.3. On a tutorial day, one topic = one tutorial

5. Strategic Plan (2018-2028), SC Structure and Action Plan: status (to be reviewed, updated, re-written or still valid)

The structure of the SC was adapted 2021 and works now.



A webmaster was established, which also organises the social media contents currently. Fierst meetings of the Utility advisory board took place..

6. Planned SC meetings (in 2022 and next)

2022: Paris

2023 UK (under discussion)

2024 Paris

Invitation from US and Russia

7. Participation to Regional Meetings, colloquia and symposia:

7.1. In 2021 (passed)

7.2. In 2021 and beyond (scheduled)

June 2021: Ljubljana

November 2021: India (need to reschedule)

2023 UK

2023 United states

2025 Russia

8. Liaisons and Relations with other organisations

8.1. Relations with IEEE

The Chair held contacts to IEEE.

8.2. Relations with CIRED

Even that the SC A3 chair is deeply involved in CIRED activities. The contacts were strengthen, because a CIRED member is now member of SC A3 (Uwe Kaltenborn)

8.3. Relations with IEC

We have got a liaison with SC 17A (switching devices) and TC 38 (instrument transformers)

9. Specific actions for the recruitment of young experts, Place of Women in the SC

-

10. SC website: date of last update of KMS within SC and WGs

New SC A3 web site was updated; A LinkedIn profile was established, all active working groups work with KMS, there is a regular weekly update of the A3 related pages

11. Miscellaneous

The work continued rapidly. There were take place more frequent meetings of the working groups, but the meetings were limited to 2-3 hours. There were weekly online meetings between chair, webmaster and secretary.

Role	First Name	Last Name	Company
Chair	Alex	Cochran	Unaffiliated
Secretary	Caryn	Riley	Georgia Tech/NEETRAC
Member	Kennedy	Darko	G&W Electric Co.
Member	Anil	Dhawan	Allegis Group
Member	John	Kaminski	Siemens
Member	Albert	Livshitz	Qualus
Member	Jeff	Mizener	Siemens Industry, Inc.
Member	Carl	Schneider	Schneider Electric
Past Chair	Nenad	Uzelac	G&W Electric Co.
Member	Charles	Worthington	Hubbell Power Systems
Guest	Brian	Alexander	S&C Electric Co.
Guest	Koustubh	Ashtekar	JST Power
Guest	George	Becker	POWER Engineers Inc.
Guest	Kelsey	Bush	ABB
Guest	Mohit	Chhabra	S&C Electric Co.
Guest	Michael	Christian	ABB
Guest	Frank	DeCesaro	DeCesaro Consulting Services
Guest	Brian	Gerzeny	Powell Industries, Inc
Guest	Douglas	Hill	S&C Electric Co.
Guest	Rahul	Jain	S&C Electric Co.
Guest	John	Kapitula	ABB
Guest	Andreas	Nenning	OMICRON electronics GmbH
Guest	Larry	Putman	Powell Industries, Inc
Guest	Leonel	Santos	Schneider Electric
Guest	Daniel	Schiffbauer	Toshiba International Corporation
Guest	Kirk	Smith	Retired
Guest	Francois	Soulard	Hydro-Quebec
Guest	Francois	Trichon	Schneider Electric
Guest	Dan	Wolfe	Mitsubishi Electric Power Products Inc.
Guest	Li	Yu	Eaton
Guest	Xin	Zhou	Eaton