cigre
For power system expertise

CALL FOR PAPERS

CIGRE SESSION 48

23-28 August 2020
PARIS / FRANCE

Receipt of synopses at Central Office: 28TH JUNE 2019 *

Notification of acceptance: 15TH OCTOBER 2019

Receipt of full Papers at Central Office: 14TH FEBRUARY 2020

** Please contact your National Committee to know by which date they need to receive your synopsis for a prior screening.*

Within the framework of these **preferential subjects,** CIGRE encourages the submission of papers representing all aspects of the electric power system, including, but not limited to: Generation, Transmission, Distribution, Storage and End Use.

www.cigre.org

There is no individual presentation of Papers during Group Discussion Meetings.

Special Reports give the essence of Papers with questions for the audience.

Authors will have the opportunity to present their Paper during **Poster Sessions.**

If your Paper is accepted, then you must attend both meetings.

> > > > See full information **page 4**

A1 - ROTATING ELECTRICAL MACHINES

PS 1 / GENERATION MIX OF THE FUTURE

> Effect and risk of an increasing renewable power mix on existing legacy generators, generator auxiliaries, and motors of renewable energy and variable load demand.
> Improvement in designs and maintenance practices to comply with new and future grid requirements.
> Evolution and trends in new machines for renewable generation.

PS 2 / ASSET MANAGEMENT OF ELECTRICAL MACHINES

> Experience with refurbishment, replacement, design improvements, power up-rating, and efficiency improvement of aged generators and motors.
> Optimised condition monitoring, diagnosis, prognosis, and maintenance practices to improve reliability and extend operational life.
> Operational and project experience: installations, failure analysis; robotic inspections; recovery options; cost and time reduction initiatives; and effects of torsional electromechanical oscillations for synchronous compensators, wind turbine generators, turbo-generators, hydro-generators, and motors.

PS 3 / LATEST DEVELOPMENTS

> Designs, specifications, materials, manufacturing, maintenance, performance, and efficiency improvement of electrical machines.
> Condition monitoring techniques and equipment.

A2 - POWER TRANSFORMERS & REACTORS

PS 1 / TRANSFORMER TECHNOLOGIES TO ENABLE INTEGRATION OF DISTRIBUTED RENEWABLE ENERGY RESOURCES

> Application, specification, design, and construction.
> Effect of harmonics, including interharmonics and supraharmonics.
> Effect of extreme operating environments, especially offshore and also subsea.

PS 2 / ADVANCES IN DIELECTRIC DESIGN AND TESTING

> Specification of dielectric design requirements, especially for new and unusual applications.
> New and advanced dielectric design concepts and techniques.
> Challenges in dielectric testing and how to overcome them.

PS 3 / IMPROVING RELIABILITY FOR TRANSFORMERS

> Long-term reliability studies and surveys for transformers.
> Improving reliability through specification, design, and construction.
> Improving reliability through operation, maintenance, refurbishment, and repair.

A3 - TRANSMISSION & DISTRIBUTION EQUIPMENT

PS 1 / FUTURE DEVELOPMENTS OF TRANSMISSION AND DISTRIBUTION EQUIPMENT

> Medium Voltage DC circuit breakers.
> Measures to improve reliability.
> Developments of equipment with reduced environmental impact.
> SF6 alternatives for switching and isolation.

PS 2 / LIFETIME MANAGEMENT OF TRANSMISSION & DISTRIBUTION EQUIPMENT

> Diagnosis and prognosis / monitoring of equipment.
> Influence of environmental and operating conditions.
> Experience and countermeasures for overstresses and overloads.

PS 3 / IMPACT OF DISTRIBUTED RENEWABLE GENERATION AND STORAGE ON TRANSMISSION AND DISTRIBUTION EQUIPMENT

> New and emerging technologies for switching devices and other equipment.
> Incorporation of intelligence into the equipment.
> Impacts of distributed renewable energy sources and energy storage on equipment requirements.

B1 - INSULATED CABLES

PS 1 / CABLES FOR FUTURE POWER SYSTEMS

> Innovative cables and systems.
> Prospective impacts on cable life-cycle from use and implementation of Big Data and Industry 4.0.
> New functionalities expected from cable systems.

PS 2 / RECENT EXPERIENCES WITH EXISTING CABLE SYSTEMS

> Design, manufacturing, installation techniques and operation.
> Advances in testing, including failure location, and relevant experience.
> Lessons learnt from permitting, consent and implementation.

PS 3 / ENVIRONMENTAL CHALLENGES, ASSET MANAGEMENT, AND RESILIENCE OF CABLE SYSTEMS

> Environmental challenges in current, planned, and future cable systems.
> Quality, monitoring, condition assessment, diagnostic testing, upgrading methodologies, and relevant management.
> Safety considerations, cyber and physical security and Internet of Things, including case studies.

B2 - OVERHEAD LINES

PS 1 / CONDITION BASED MAINTENANCE FOR INCREASED SUSTAINABILITY

> Monitoring and modelling.
> Health index, remaining life, and degradation mechanisms.
> Risk assessment.

PS 2 / ENHANCING OVERHEAD LINE PERFORMANCE

> Innovative designs and materials; compaction; AC to DC conversion; voltage upgrade; ampacity uprating; losses optimisation; etc.
> Current carrying capacity.
> Earthing, lightning performance.

PS 3 / RESOURCES AND DESIGN CONSIDERATIONS

> Design with respect to construction; maintenance; lifetime and restoration; live line working; ergonomics; skills for installation and maintenance; robotics.
> Design and refurbishment for a changing environment.

B3 - SUBSTATIONS & ELECTRICAL INSTALLATIONS

PS 1 / DESIGN AND TECHNOLOGY

> Impact on design and installation of Distributed Renewable Energy Resources, Energy Storage Systems, Electric Vehicle Charging, etc.
> Mitigating environmental; health and safety; and security impacts.
> Rapid deployment and cost effective solutions for electrification of developing communities.

PS 2 / OPTIMISED SUBSTATION MANAGEMENT

> Best use of assets by optimising their life-time.
> Service continuity for maintenance, refurbishment. and replacement.
> Evolution of skills and managing competency.

PS 3 / INTEGRATION OF INTELLIGENCE

> Applications of new technologies, e.g. Internet of Things, Virtual Reality, Augmented Reality.
> Challenges and expectations for digital substations.

B4 - DC SYSTEMS & POWER ELECTRONICS

PS 1 / HVDC SYSTEMS AND THEIR APPLICATIONS

> Planning and implementation of new HVDC projects including need, justification, design, integration of renewables, environmental assessment, and economic assessment.
> Application of new technologies including cyber security and advanced controls to address emerging network issues, DC grid, multi-terminal HVDC, hybrid HVDC systems and HVDC circuit breakers.
> Refurbishment and upgrade of existing HVDC systems, service and operating experience of converter stations including offshore converters, and implications for converter equipment resulting from the conversion of AC circuits to DC circuits.

PS 2 / DC AND POWER ELECTRONICS FOR DISTRIBUTION SYSTEMS

> DC applications in distribution systems.
> Power Electronics applied in distribution projects, including economics and reliability.
> New concepts and designs of equipment.

PS 3 / FACTS

> Planning and implementation of new FACTS projects including need, justification, for integration of renewables, environmental assessment, and economic assessment.
> Application of new technologies in FACTS and other Power Electronic equipment, including interfacing generation and storage to the network.
> Refurbishment and upgrade of existing FACTS and other Power Electronic systems; service and operating experience.

B5 - PROTECTION & AUTOMATION

PS 1 / HUMAN ASPECTS IN PROTECTION, AUTOMATION AND CONTROL SYSTEMS (PACS)

> Causes, types, stages of occurrence, and consequences of human errors.
> Impact of PACS complexity and degree of functional integration on human errors.
> Prevention of human errors including training; work authorisation and peer reviews; procedures; application templates and standardisation; and best practices for working with sub-contractors and third parties.

PS 2 / COMMUNICATIONS NETWORKS IN PROTECTION, AUTOMATION AND CONTROL SYSTEMS (PACS) : EXPERIENCE AND CHALLENGES

> Management of redundancy in communications networks for applications and Intelligent Electronic Devices.
> Data Segregation, including use of virtual networks for PACS applications.
> Architecture of PACS communication network, including management of communication constraints.

C1 - POWER SYSTEM DEVELOPMENT & ECONOMICS

PS 1 / POWER SYSTEM RESILIENCE PLANNING

> Evaluating, improving, and measuring power system resilience in system planning, economic assessment and asset management, given increasing threats from human and natural hazards, including climate change.

PS 2 / ENERGY SECTOR SYNERGIES FOR DECARBONISING EFFICIENTLY

> Planning approaches addressing energy sector synergies across power, gas, transport, heating/cooling, and new energy carriers, in order to optimise overall decarbonisation efficiency whilst supporting local development.
> How do these planning approaches include aspects of energy conversion and storage, technical and economic sector interfaces?

PS 3 / DISTRIBUTED ENERGY RESOURCES IN TRANSMISSION PLANNING

> Tools, techniques, and data used in transmission system planning and investment decisions to evaluate and enable high levels of renewables, storage, and customer flexibility at all voltage levels.
> Holistic approaches that combine technical assessments, incentives, and reliability impacts on customers.

C2 - POWER SYSTEM OPERATION & CONTROL

PS 1 / CAPABILITIES REQUIRED FOR FUTURE SYSTEM OPERATION

> Operator training.
> Decision support tools including new methodologies.
> Wide Area Monitoring and Control.

PS 2 / SYSTEM OPERATION INTERFACES: IMPROVING OBSERVABILITY AND CONTROLLABILITY

> TSO-TSO interface/cooperation/data exchange.
> TSO-DSO interaction/cooperation/data exchange.

JOINT PS C2 AND C6

PS 3 / SYSTEM OPERATION CHALLENGES WITH INCREASING USE OF DISTRIBUTED ENERGY RESOURCES

> Enhancing flexibility, reliability, and resilience.
> Providing grid services through aggregators.
> Aggregator interaction.

C3 - POWER SYSTEM ENVIRONMENTALPERFORMANCE

PS 1 / SUSTAINABLE DEVELOPMENT GOALS (SDGs) OF THE UN

> How do companies integrate the SDGs in their business strategy to contribute to their achievement ?
> What are the main challenges to do so?
> In what way do companies benefit of integrating SDGs in their business strategies?

PS 2 / ENVIRONMENTAL IMPACT OF ENERGY TRANSITION

> Effects of raw materials becoming scarce.
> Which methods are used for measuring these impacts, regarding the whole supply chain.
> How to deal with the negative impacts of energy transition, e.g. effects of solar farms on biodiversity.

PS3 / RELATION OF WILDLIFE AND ELECTRICAL INFRASTRUCTURE

> How to prevent damages or outages for generation, transmission, and distribution equipment from birds, rodents, or other species.
> Which methods are used and which data are needed to determine mortality.
> Which methods for mitigation are used.

C4 - POWER SYSTEM TECHNICAL PERFORMANCE

PS 1 / IMPROVING POWER SYSTEM TECHNICAL PERFORMANCE THROUGH THE USE OF ADVANCED METHODS, MODELS AND TOOLS

> The analysis of widespread dynamic security issues including [intentional] electromagnetic interference, weather, and geomagnetically induced currents.
> The assessment of frequency stability, system strength, or power quality using Big Data analytics.
> Development of emerging metrics and tools for quantifying power system reliability, resiliency, and flexibility.

PS 2 / MODELLING OF THE FUTURE GRID BASED ON LESSONS LEARNED FROM SYSTEM EVENTS

> Experience gained from Smart Grid projects.
> High penetration levels of inverter-based devices.
> Deployment of energy storage systems.

PS 3 / METHODS, MODELS, AND TECHNIQUES FOR EVALUATING LIGHTNING, POWER QUALITY, AND INSULATION CO-ORDINATION TO ENHANCE THE PERFORMANCE OF THE EVOLVING GRID

> UHV AC and/or DC systems.
> Renewable generation, inverter-oriented power systems, and traction loads.
> Harmful interactions between power system components.

C5 - ELECTRICITY MARKETS & REGULATION

PS 1 / THE CHANGING NATURE OF MARKETS AND ANCILLARY REQUIREMENTS

> Market adaptations to handle the value shift between energy and services.
> Markets and services to address inertia and resilience.
> Role of markets with respect to aggregation and the provision of network services.
> Pricing approaches for emerging technologies and impacts of those approaches.

PS 2 / CHANGING ROLE OF REGULATORS AND STANDARDS

> Role of regulators in the changing markets.
> Evolving policy, standards, and guidelines to address issues affecting markets.
> Regulatory policies on transmission and distribution – too little or too much.

PS 3 / MARKET DESIGNS FOR CO-ORDINATION OF GENERATION AND NETWORK INVESTMENTS

> Markets and regulations to promote co-ordinated investments.
> Customer-driven market changes – the transition from centralised to distributed planning.
> Impacts of the changing nature of customers on investments and markets.
> The impact of peer-to-peer trading on the provision of market services.

C6 - ACTIVE DISTRIBUTION SYSTEMS AND DISTRIBUTED ENERGY RESOURCES

PS 1 / ADVANCED DISTRIBUTION SYSTEM DESIGN INCORPORATING DISTRIBUTED ENERGY RESOURCES

> Configuring demand response and intelligent loads for customer empowerment.
> Exploiting local energy storage possibilities and managing uncertainties.
> Enabling multi-energy systems using intelligent inverters and controls.

PS 2 / ENABLING TECHNOLOGIES AND SOLUTIONS FOR DISTRIBUTION SYSTEMS

> Management and aggregation platforms for Distributed Energy Resources.
> Individual microgrid, multiple microgrid, and virtual power plant design and control.
> Rural electrification and off-grid distribution systems.

JOINT PS C2 AND C6

PS 3 / SYSTEM OPERATION CHALLENGES WITH INCREASING DISTRIBUTED ENERGY RESOURCES

> Enhancing flexibility, reliability, and resilience.
> Providing grid services through aggregators.
> Aggregator interaction.

D1 - MATERIALS AND EMERGING TEST TECHNIQUES

PS 1 / TESTING, MONITORING AND DIAGNOSTICS

> Experience and insight from monitoring systems.
> Reliability of test equipment and systems for testing, monitoring, and diagnostics.
> Data handling, analytics, and advanced condition assessment.

PS 2 / FUNCTIONAL PROPERTIES AND DEGRADATION OF INSULATION MATERIALS

> New stresses, e.g. power electronics, load cycling, higher temperatures, and compact applications.
> Materials with lower environmental footprint, during production, operation, and disposal.
> Characterisation methods for validating functional properties.

PS 3 / INSULATION SYSTEMS OF ADVANCED COMPONENTS

> Materials under high stresses, e.g. field stress, flux, electric current, and frequency.
> Experience and requirements for new test procedures and standards.
> Development of new materials, e.g. 3D printing; lamination; casting; and additive or subtractive manufacturing.

D2 - INFORMATION SYSTEMS & TELECOMMUNICATION

PS 1 / THE IMPACT OF EMERGING INFORMATION AND COMMUNICATION TECHNOLOGIES ON ELECTRIC POWER UTILITIES

> The potential of Machine Learning and Artificial Intelligence in improving operations.
> Enhancing asset and lifecycle management using the Internet of Things, Big Data, and Analytics.
> The role of Blockchain in facilitating efficiency of market operations.

PS 2 / NEW CYBERSECURITY CHALLENGES IN THE CHANGING ELECTRICITY INDUSTRY

> Cybersecurity challenges in the use of the Internet of Things, Big Data, and Cloud-based platforms.
> Cybersecurity challenges related to Distributed Energy Resources and interconnection of new flexibility providers.
> Identification of cybersecurity threats using Big Data analysis and Machine Learning.

PS 3 / INCREASING OPERATIONAL EFFICIENCY USING PACKET SWITCHED COMMUNICATION TECHNOLOGIES

> Challenges in the migration to packet switched networks.
> Supporting the changing electricity industry with the use of existing and new communication technologies.
> Supporting time critical operational services with time distribution and synchronisation.

ACRONYMS

3D	Three dimensions
AC	Alternative Current
DC	Direct Current
DSO	Distribution System Operator
FACTS	Flexible AC transmission systems
HV	High voltage
HVDC	High voltage direct current
PACS	Protection, Automation & Control Systems
SDG	Sustainable Development Goals
SF6	Sulfur hexafluoride
TSO	Transmission System Operator
UN	United Nations

WHY PREFERENTIAL SUBJECTS?

At CIGRE Sessions Authors do not present their papers during Discussion Group Meetings.
They have this opportunity during specific meetings – The Poster Sessions – for which full detailed information is made available after the selection process.
The delegates read the papers in advance and they discuss them around a set of questions given in a **Special Report** which incorporates the gist of the papers.
To discuss the papers in depth, Session papers must therefore address a strictly limited list of topics, referred to as "Preferential Subjects" and selected by each Study Committee of CIGRE. The "Preferential Subjects" are the main part of this "Call for Papers".

HOW ARE PAPERS SELECTED?

The papers are selected on the basis of synopses.
They are first screened by National Committees (where applicable), who are entitled to put forward a set number of Papers.
Then the Study Committee Chairpersons, who are in charge of the running of the discussions, will select the proposals received, under the coordination of the Technical Committee Chairperson.
Authors will be informed of the results.
Full papers are considered to be accepted so authors do not have to expect any additional notification of acceptance. However, a paper may still be turned down even once written out in full, if considered of insufficient quality. Study Committee Chairpersons may also ask authors to make changes or adjustments to their papers. In both cases, authors will be duly informed.

WHO CAN PROPOSE A PAPER?

The main author (assuming there is more than one) must be an individual member or must be collective member staff.
Co-authors are not required to be CIGRE members.
Co-authors may be from different countries; in this case the Paper is identified as an "International paper".
A paper must focus on one preferential subject and only one.
A separate synopsis must be drawn up for each paper proposal.
The synopsis – 500 words minimum – must closely reflect the various points to be developed in the paper.
When sending the synopsis, the name and address of the main author – and more importantly the email address which will be used for notification of the selection results – the Study Committee reference and Preferential Subject addressed must be clearly specified.
Template: Authors will make use of the sample pages for lay-out of synopses; these are available on the CIGRE website, page "2020 Session".

WHERE ARE SYNOPSES TO BE DIRECTED?

If the main author is from a country with a CIGRE NC:
The synopsis must be sent to the National Committee involved. (Contact details are available on the CIGRE website; see "Links / National Committees" from the homepage).
Any synopsis sent directly to the Central Office will be returned to the sender.
For International Papers, the proposal must be sent to the National Committee of the main Author only.
If the main author is from a country where there is no National Committee: the synopsis must be sent in electronic format (PDF preferably) to the CIGRE Central Office, to the following address: *Sylvie.bourneuf@cigre.org*
If the proposed paper is written on behalf of a Study Committee (SC Allotment): the synopsis is sent directly to the Study Committee Chairperson, who will transfer it to the Central Office.

DEADLINES FOR RECEPTION OF THE SYNOPSES

- Synopses must be received at the Central Office BY 28TH JUNE 2019 AT THE LATEST. Past this date they will not be accepted.
- National Committees are required to send all paper synopses to the Central Office BY 28TH JUNE 2019 AT THE LATEST, which implies that National Committees will have received these synopses earlier.
- HENCE AUTHORS must contact their National Committee who will let them know by which date they need to receive the synopses (allowing time for screening and meeting the Central Office deadlines).
- AUTHORS FROM COUNTRIES where there is no National Committee will be sending their synopsis directly to the Central Office. THE STRICT DEADLINE IS 28TH JUNE 2019.
- MAIN AUTHORS WILL BE NOTIFIED OF THE SELECTION RESULTS BY 15TH OCTOBER 2019.
- DEADLINE FOR RECEIPT OF THE FULL PAPERS AT THE CENTRAL OFFICE IS 14TH FEBRUARY 2020.

ACKNOWLEDGEMENT OF RECEPTION

Authors with no National Committee who send their synopsis directly to Cigre Central Office will receive an acknowledgement.
If not received within 2 weeks, they must then contact Cigre again to make sure their proposal is duly taken into consideration.

All information on the 2020 Session can be found on the CIGRE website:

https://www.cigre.org/GB/events/cigre-session-2020

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