

All times are in the EST - Eastern Standard Time (Toronto - Canada)

SCHEDULE-AT-A-GLANCE

Time		Tuesday, October 20, 2020					
08:00	08:10	Word of Welcome Mike Bartel, Chair CIGRE Canada					
08:10	08:45	Keynote speech – Utility of The Future Mark Poweska, President and CEO of Hydro One					
09:00		Virtual Expo Hall Open					
09:00	10:15	Session 1	Paper ID	A1	Session 2	Paper ID	A2
			324			268	
			326			274	
			356			298	
372	315						
10:45	12:00	Session 3	Paper ID	A2	Session 4	Paper ID	A3
			344			269	
			346	287			
			281	296			
325	299						
12:30	13:45	Session 5	Paper ID	A3	Session 6	Paper ID	B2
			305			279	
			320			304	
			323			341	
342	263						
14:15	15:30	Session 7	Paper ID	B3	Session 8	Paper ID	B4
			285			379	
			289			275	
			311			286	
343	314						
16:00	17:15	Session 9	Paper ID	B4	Session 10	Paper ID	B5
			321			272	
			333			283	
			355			284	
369	294						
17:15		Virtual Expo Hall Close					
17:45	19:00	Session 11	Paper ID	B5	Session 12	Paper ID	C6
			302			354	
			309	360			
			258	362			
310	373						

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SCHEDULE-AT-A-GLANCE

Time		Wednesday, October 21, 2020					
08:00	09:15	Women in Engineering (WIE) Panel — Utility of the Future – Embracing Change <i>Ayesha Sabouba, Director, Transmission Engineering, Hydro One</i> <i>Angela Driver, Director Engineering, Manitoba Hydro</i> <i>Anne Langmaid, Director of Operations Western Region, Wood</i> Moderator: <i>Robyn Koropatnick, VP, Teshmont Consultants</i>					
09:30		Virtual Expo Hall Open					
09:30	10:45	Session 13	Paper ID	C4	Session 14	Paper ID	
			295			357	C4
			301			336	C5
			313			358	D2
347	370						
11:15	12:45	Session 15	Paper ID	C6	Session 16	Paper ID	
			256			259	C2
			300			278	
			329			282	
			332			291	
303	270	C6					
13:30	13:45	CEO Panel Introduction Francis Bradley, President and CEO, Canadian Electricity Association (CEA)					
13:45	14:30	CEO panel – Utility of The Future <i>Faisal Kazi, President & CEO, Siemens Canada</i> <i>Mark Poweska, President and CEO of Hydro One</i> <i>David Murray, Chief Innovation Officer of Hydro-Québec & President of Hydro-Québec Production</i> <i>Jay Grewal, President and CEO, Manitoba Hydro</i> <i>Annette Verschuren, President and CEO, NRStor</i> Moderator: <i>Francis Bradley, President and CEO, Canadian Electricity Association (CEA)</i>					
15:15	16:30	Session 17	Paper ID	C6	Session 18	Paper ID	
			375			257	D2
			377			308	
			288	319			
322	D1	352					
16:30		Virtual Expo Hall Close					
16:45	17:30	Award Presentation of the Best Papers and Closing Session Award of the Best Student Paper – Award of the Best NGN Paper <i>Closing Remarks</i>					
17:45	19:00	OPTIONAL NGN VIRTUAL RECEPTION					

TECHNICAL SESSIONS

Tuesday, October 20, 2020

SESSION 1 Rotating Electrical Machines (A1) Session chair: Emanuel Petrache

- (09:00 – 09:15) **CIGRE-324**
📄 **The Use of Absolute Limits for PD Measurements on Stator Windings**
M. Lachance, Omicron Electronics. (Canada)
- (09:15 – 09:30) **CIGRE-326**
📄 **Analysis of Sub Synchronous Resonant Modes in Series Compensated Networks using Multiple Frequency Scans**
D. Rathnayaka Weerakoon, U. Annakkage, C. Karawita, University of Manitoba (Canada)
- (09:30 – 09:45) **CIGRE-356**
📄 **The future of Electrical Signature Analysis (ESA) for machine protection**
K. Moghadam, C. Glodek, GE (Canada)
- (09:45 – 10:00) **CIGRE-372**
📄 **Endwinding Vibration Monitoring of Air-Cooled Turbine Generators – The Case Study Continues**
J. Letal, M. Sasic, Iris Power (Canada)
J. Eyles, Portlands Energy Center (Canada)

SESSION 2 Power Transformers and Reactors (A2) Session chair: Behdad Biglar

- (09:00 – 09:15) **CIGRE-268**
📄 **Power Transformer Bushings – Inspection, Testing and Refurbishment.**
K. Callery, Hydro One (Canada)
- (09:15 – 09:30) **CIGRE-274**
📄 **Overpressure Test of an Arc Resistant Power Transformer**
J-B. Dastous, Hydro-Quebec (Canada)
S. Brodeur, Hitachi ABB Power Grids (Canada)
- (09:30 – 09:45) **CIGRE-298**
📄 **Investigation of Wind Farm Padmount Transformer Through Transient Studies**
E. Karimi, A. Carver, D. Kell, E. Veilleux, M. Daryabak, Hatch (Canada)
- (09:45 – 10:00) **CIGRE-315**
📄 **Be Prepared for the Unexpected: Design to Increase Personal Safety, Reduce Fire and Explosion Risk, and Mitigate Environmental Impact**
E. G. Hennig, Siemens Energy (Canada)
E. Schweiger, Siemens Energy (Germany)
M. A. Stoessl, Siemens Energy (Austria)
D. Calitz, Siemens Energy (USA)

SESSION 3 Power Transformers and Reactors (A2) Session chair: Hemant Barot

- (10:45 – 11:00) **CIGRE-344**
📄 **A Finite Element Analysis Approach for Calculating Forces acting on Station Post Insulators, 'A' Frame Bus Assemblies and at Corners of Rigid Bus Due to High Short Circuit Currents and Extreme Wind**
A. Khan, Hydro One (Canada)
- (11:15 – 11:30) **CIGRE-346**
📄 **Advanced Power Transformer Diagnostics – Detection of Core Ground Issues**
A. Naderian, P. Pattabi, J. Mohammadi, Metsco Energy Solutions (Canada)
- (11:30 – 11:45) **CIGRE-281**
📄 **Alternative Network Development– Need for Flexible Solutions for Operation and Planning of Distribution and Transmission Grids**
M. Lundberg, Lund University (Sweden)
E. Hillberg, RISE Research Institutes of Sweden (Sweden)
- (11:45 – 12:00) **CIGRE-325**
📄 **Energy Consumption Estimation Through Artificial Intelligence**
A. L. Paolini, G. Serrano, Edenor S.A. (Argentina)

SESSION 4 Transmission and Distribution Equipment (A3) Session chair: Donna Jablonsky

- (10:45 – 11:00) **CIGRE-269**
📄 **Another Look at the Use of Mobile Unit Substations in Customer Delivery Systems**
G. A. Hamoud, Hydro One (Canada)
- (11:15 – 11:30) **CIGRE-287**
📄 **Transformer Limited Fault TRV's field measurements used to validate EMTP transformer models and comparison with TRV calculations based on existing standards (IEEE Std C37.06.1™-2017 and IEC 62271-100)**
Y. Fillion, M. Grisé, E. Portales, Hydro-Québec (Canada)
- (11:30 – 11:45) **CIGRE-296**
📄 **What it takes to design, manufacture and operate transformers under arctic temperature conditions**
T. Schneider, Siemens Energy (Austria)
J. Malde, M&I Materials (USA)
- (11:45 – 12:00) **CIGRE-299**
📄 **Manitoba Hydro, Estella Substation MVROT Pilot Project for the Energy Efficiency and Reduction of Losses in Electrical Power Distribution Grids – "The MVROT Project"**
A. Lemez, D. Lemez, Energo Group Canada (Canada)

SESSION 5 Transmission and Distribution Equipment (A3)
Session chair: Behdad Biglar

- (12:30 – 12:45) **CIGRE-305**
🕒 **Live Line Working Tool and Framing Design Innovation**
T. Carreira, K-Line Insulators (Canada)
- (12:45 – 13:00) **CIGRE-320**
🕒 **CIGRE JWG A3.43 progress report**
N. Gariboldi, Qualitrol (Switzerland)
- (13:00 – 13:15) **CIGRE-323**
🕒 **Permanent Overload Operation of the Hydro-Québec – New England Multiterminal HVDC Interconnection: Simulation Study and Live System Testing**
S. Badawi, A. O. Barry, D. Galibois, Hydro-Quebec (Canada)
- (13:15 – 13:30) **CIGRE-342**
🕒 **A step towards Circuit-Breaker Diagnostics Interoperability**
R. Pater, S. Poirier, R. Doche, J.Poirier, D. Ouellet, M. Germain, Hydro-Quebec (Canada)

SESSION 6 Overhead Lines (B2)
Session chair: Karen Callery

- (12:30 – 12:45) **CIGRE-279**
🕒 **Electrical Tests on Fire Retardant Contaminated Cap and Pin Insulators**
C. Bonilla, Powertech Labs (Canada)
- (12:45 – 13:00) **CIGRE-304**
🕒 **Distribution grid resilience - results of non-linear analysis**
C. Henderson, Valard Construction (Canada)
- (13:00 – 13:15) **CIGRE-341**
🕒 **Recommended Practice for Designing Insulation to Withstand Ice and Snow on Overhead Transmission lines in British Columbia**
M. Lu, N. R. Tavana, S. Cherukupalli, C. Singh, D. Chakrabarti, L. Erven, BC Hydro (Canada)
- Power Systems Technical Performance (C3)**
- (13:15 – 13:30) **CIGRE-263**
🕒 **Emergency Generators for Resilient Response to Natural Disasters**
A. Nassif, ATCO (Canada)

SESSION 7 Substations and Electrical Installations (B3)
Session chair: Paul Ankrett

- (14:15 – 14:30) **CIGRE-285**
🕒 **Remote Access of Intelligent Electronic Devices and Automatic DR Collection at Centralised Control Centre: A Novel Experience**
R K Arora, P. K. Srivastava, M. Kumar, P. Kumar, V. Kumar, PowerGrid (India)
- (14:30 – 14:45) **CIGRE-289**
🕒 **A New Generation of Integrated Assembly Smart Substation**
X. Song, W. Yan, Z. Jin, X. Lu, W. Guo, B. Dai, X. Zhao, Y. Xiao, J. Wu, Q. He, NR Electric (China)
- (14:45 – 15:00) **CIGRE-311**
🕒 **Rapid Ground Fault Detection on Compensated Grounded Systems: Design, and Testing**
H. Bayat, T. Bains, A. Zamani, GE (Canada)
M. Webster, J. Rorabaugh, A. Torres, Southern California Edison (USA)
- (15:00 – 15:15) **CIGRE-343**
🕒 **An Analysis of Mechanical Effects of Short Circuit on Strain Bus using Finite Element Approach and Validation by Modeling an Actual Strain Bus Subjected to Real Short Circuit Tests by Comparing Computed Results with Measured Quantities**
A. Khan, Hydro One (Canada)

SESSION 8 Active Distribution Systems and Distributed Energy Resources (C6)
Session chair: Pei Wang

- (14:15 – 14:30) **CIGRE-379**
🕒 **Microgrids – A Solution to Climate Change**
H. Sanchez-Reategui, Alectra Utilities (Canada)
M. Dang, McMaster University (Canada)
- HVDC and Power Electronics (B4)**
- (14:30 – 14:45) **CIGRE-275**
🕒 **Increasing Dispatchability of a PV Power Plant through Modular Multilevel Converter Based Embedded Battery Energy Storage (MMC-EBES)**
N. Herath, S. Filizadeh, University of Manitoba (Canada)
V. Pathirana, Hatch (Canada)
- (14:45 – 15:00) **CIGRE-286**
🕒 **A Method for Modeling and Testing Modular Multilevel Converters and Their Controls in Large Power System Simulation Studies**
J. Rupasinghe, S. Filizadeh, University of Manitoba (Canada)
D. Muthumuni, Manitoba Hydro International (Canada)
- (15:00 – 15:15) **CIGRE-314**
🕒 **Dynamic Equivalents for RTDS Applications**
Humud Said, ATCO (Canada)
Peter Kuffel, HVdcOne (Canada)

SESSION 9 DC Systems and Electrical Installations (B4)
Session chair: Pei Wang

- (16:00 – 16:15) **CIGRE-321**
🕒 **Safety in HVDC Converter Stations**
Y. Solovyev, L. Arevalo
Hitachi ABB Power Grids (Sweden)
- (16:15 – 16:30) **CIGRE-333**
🕒 **A Review of DC Fault Blocking Converters for HVDC Transmission Systems**
M. N. Sakib, S. Azad, M. Kazerani
University of Waterloo (Canada)
- (16:30 – 16:45) **CIGRE-355**
🕒 **Comparison of Dynamic Characteristics of Virtual Synchronous Machine Control Algorithms**
T. Thilekha, S. Filizadeh, U. Annakkage, University of Manitoba (Canada)
C. Karawita, TransGrid Solutions (Canada)
- (16:45 – 17:00) **CIGRE-369**
🕒 **Fast Restoration Algorithm of a Hybrid MMC-Based HVDC Grid**
Mohan Du, Sahar Azad
University of Waterloo (Canada)

SESSION 10 Protection and Automation (B5)
Session chair: Suma Jothibasu

- (16:00 – 16:15) **CIGRE-272**
🕒 **An Adaptive Fast Load Shedding Scheme for Enhancing Reliability and Stability of an Expanded Liquefied Natural Gas Plant – Lessons Learned**
H. (Barry) Xu, J. Gao, GE (Canada)
B. Bosley, J. Garcia, Kiewit (Canada)
T. Clark, Dominion Energy (USA)
- (16:15 – 16:30) **CIGRE-283**
🕒 **Challenges During Integration of Substations for Establishment of National Transmission Asset Management Centre (NTAMC) by POWERGRID – A case Study**
R.K Arora, P. K. Srivastava, S. Kumar, N. Singh, R. Garimella, PowerGrid (India)
- (16:30 – 16:45) **CIGRE-284**
🕒 **Communication Architecture for Automatic Acquisition of Disturbance Records at Control Centre**
R K Arora, P. K. Srivastava, S. Kumar, M. Kumar, J. G. Jose, PowerGrid (India)
- (16:45 – 17:00) **CIGRE-294**
🕒 **A Review of Existing Protection Schemes of Microgrids with Inverter-Based Distributed Energy Resources**
X. Zhang, S. Azad, University of Waterloo (Canada)


SESSION 11 Protection & Automation (B5)
Session chair: Pankaj Sharma

- (17:45 – 18:00) **CIGRE-302**
🕒 **IEC 61850-Based FLISR Testing: A Comparative Study using RTDS**
Benjamin Kregel, ComEd (USA)
C. Chandrabalan, A. Momeni, F. Katiraei, Quanta Technology (Canada)
F. Rahmatian, NuGrid Power (Canada)
- (18:00 – 18:15) **CIGRE-309**
🕒 **Design, Integration, and Testing of an Adaptive Protection System for Microgrids**
Y. Yin, H. Bayat, A. Zamani, GE Grid Automation (Canada)
Y. Fu, Mississippi State University (USA)
- Power System Operation and Control (C2)**
- (18:15 – 18:30) **CIGRE-258**
🕒 **A Frequency Response-Based Renewable Resource Hosting Capacity Method for Isolated Grids**
A. Nassif, ATCO (Canada)
- (18:30 – 18:45) **CIGRE-310**
🕒 **A Comprehensive Analysis to Create and Operate a Temporary Power System Island - A Real Case Study**
S. Shimu, I. Rahimi, C. Wang, V. Kulatilake, A. Schneider, AltaLink (Canada)


SESSION 12 Active Distribution Systems and Distributed Energy Resources (C6)
Session chair: John Penaranda


- (17:45 – 18:00) **CIGRE-354**
🕒 **Diesel Generator Sizing for Remote Power Systems with Consideration of Renewable Energy**
S. R.D. Sumanik, J. Zrum, M. Ross, Yukon College (Canada)
- (18:00 – 18:15) **CIGRE-360**
🕒 **Energy Storage as a Solution for Increasing Feeder Hosting Capacity - Concepts and Analysis Methods**
J. Peppanen, A. Maitra, G. Singh, EPRI (USA)
J. Patel, Hydro One (Canada)
- (18:15 – 18:30) **CIGRE-362**
🕒 **Innovative Solutions and Approaches Taken by North American Utilities in Leveraging Benefits of DERs and Grid Modernization Technologies**
S. Chuangpishit, F. Katiraei, R. Masiello, Quanta Technology (Canada)
- (18:30 – 18:45) **CIGRE-373**
🕒 **Comparison of Unidirectional and Bidirectional Charging Optimization Using a Composite EV Load Model**
Patrick Bampanga, Atul Manmohan, William Chisholm, University of Toronto (Canada)

SESSION 13 Power System Technical Performance (C4)
Session chair: Eduardo Alvarado


CIGRE-295
(09:30 – 09:45)  **Active and Reactive Power Priority Imposed by Current Limit Logic in Inverter-based Generators**
F. Fang, M. Rahmatian, K. Chilukuri,
PSC North America (Canada)

CIGRE-301
(09:45 – 10:00)  **Stability Analysis of Inverter-Based Systems with Virtual Inertia Control**
S. Peiris, S. Filizadeh, University of Manitoba (Canada)
B. Jayasekara, L. Kothalawala, D. Muthumuni,
Manitoba Hydro International (Canada)


CIGRE-313
(10:00 – 10:15)  **The Probabilistic Modeling of Common-Cause Failures and Failure Bunching in a Transmission System Reliability Model**
R. Hasan, M. Viele, W. Winters, Con Edison (USA)
D. Allen, The Risk Research Group (USA)

CIGRE-347
(10:15 – 10:30)  **Probability of Transmission Equipment Contingencies in Ontario Power System**
D. Chayka, J. Ge, Hydro One (Canada)
A. Cole, Hydro One (Canada)
P. Rebellon, Ontario Independent Electricity System Operator (Canada)

SESSION 14 Power System Technical Performance (C4)
Session chair: Timothy Mackay


CIGRE-357
(09:30 – 09:45)  **On Verification of Load Models for Frequency Response Using PMU data**
S. Fung, H. Zareipour, D. Westwick,
University of Calgary (Canada)
P.-k. Keung, S. Ahmed,
Alberta Electricity System Operator (Canada)

Electricity Markets and Regulations (C5)

CIGRE-336
(09:45 – 10:00)  **Challenges of Payment Security Mechanism in the Power Sector and its Solution Through Smart Contracts**
S. K. Jain, P. K. Agarwal, P. Khandelwal,
Power System Operation Corporation (India)


Information Systems and Telecommunications (D2)


CIGRE-358
(10:00 – 10:15)  **Cybersecurity Tool Integration Challenges with IEDs in Digital Power Systems**
S. Casavant, BBA (Canada)


CIGRE-370
(10:15 – 10:30)  **Segregating a Flat Network for Increased Reliability and Security**
P. Haughey, BBA (Canada)

SESSION 15 Active Distribution Systems and Distributed Energy Resources (C6)
Session chair: Kankar Bhattacharya

CIGRE-256
(11:15 – 11:30)  **DERMS, Federated Architecture for DER, And the Enabling Standards**
G. Gray, EPRI (USA)


CIGRE-300
(11:30 – 11:45)  **GLOW: A Novel Co-simulation Framework for Integrated Distribution Network Planning and Data Analysis Using GridLAB-D**
Y. Ye, B. Yang, P. Chongfuangprinya, Hitachi America R&D (USA)


CIGRE-303
(11:45 – 12:00)  **Utilizing Community Storage for Virtual Power Plants**
Z. Wassenberg, M. Calabro, Burns & McDonnell (USA)


CIGRE-329
(12:00 – 12:15)  **Energy Storage as a Tool for Enhanced Reliability: Framework Development and Lessons Learned**
G. Singh, J. Peppanen, A. Maitra, EPRI (USA)
J. Patel, Hydro One (Canada)

CIGRE-332
(12:15 – 12:30)  **Optimized Integration of Large-Scale Energy Storage into Microgrids for Military Installations**
A. Maitra, A. Cortes, S. Jothibasu, G. Singh, EPRI (USA)

SESSION 16 Power System Operation and Control (C2)
Session chair: Suma Jothibasu


CIGRE-259
(11:15 – 11:30)  **A Reactive Power Compensation Scheme Using Distribution STATCOMs to Manage Voltage in Rural Systems**
A. Nassif, D. Teshome, ATCO (Canada)

CIGRE-278
(11:30 – 11:45)  **Event-Triggered Dynamic State Estimation in Power Systems Using a Data-Selective Set Membership Filter**
R. Boragolla, P. Yahampath, U. Annakkage,
University of Manitoba (Canada)

CIGRE-282
(11:45 – 12:00)  **Hybrid Circulating Current Control of a Modular Multilevel Converter for Primary Frequency Response Support**
J. Lapsley, S. Filizadeh, University of Manitoba (Canada)
X. Shi, RTDS Technologies (Canada)

CIGRE-291
(12:00 – 12:15)  **Comprehensive Studies on Controller Tuning for PSS2B and PSS4B: Challenges, and Straightforward Tuning Approach**
S. Maleki, D. Kell, M. Daryabak, E. Karimi, S. Hussain,
A. Carver, Hatch (Canada)


Active Distribution Systems and Distributed Energy Resources (C6)

CIGRE-270
(12:15 – 12:30)  **Distributed Energy Resources Planning Portal - A Key requirement from PUC to Have DER Information Accessible to Public**
S. Seshadri, I. Lumb, Terawe Corporation (USA)

Wednesday, October 21, 2020


SESSION 17 Active Distribution Systems and Distributed Energy Resources (C6)


Session chair: Hemant Barot

CIGRE-375
(15:15 – 15:30)  **Control Interaction of Two PV Power Plants with Volt -Var Control**
S. Mohan, R. K Varma,
University of Western Ontario (Canada)


CIGRE-377
(15:30 – 15:45)  **Utility Energy Savings by Novel Smart Inverter Control of PV Systems, BESS and EV Charging Stations as STATCOMs**
R. Varma, University of Western Ontario (Canada)

Materials and Emerging Test Techniques (D1)


CIGRE-288
(15:45 – 16:00)  **Altitude Corrections for External Insulation Design: IEC Standards and Engineering Applications**
L. Arevalo, Hitachi ABB Power Grids (Sweden)


CIGRE-322
(16:00 – 16:15)  **Determination of AC Test Currents for Thermo-Electric Laboratory Stresses at Gas-Insulated HVDC Systems**
M. Hallas, Technical University of Darmstadt (Germany)
K. Juhre, Siemens (Germany)
M. Kosse, Siemens (Germany)
M. Secklehner, Baur GmbH (Austria)

SESSION 18 Information Systems and Telecommunications (D2)
Session chair: Timothy Mackay

CIGRE-257
(15:15 – 15:30)  **Towards an Asset Health Capability**
G. Gray, EPRI (USA)

CIGRE-308
(15:30 – 15:45)  **Transmission Products and Systems for Utilities of the Future – IoT Connected, Digital Twin Based, Intelligent**
D. Helbig, P. Singh, E. G. Hennig, Siemens Energy (Germany)
KTH Royal Institute of Technology (Sweden)

CIGRE-319
(15:45 – 16:00)  **Communications Modeling: A New Approach to Intrusion Detection, Performance and Diagnostics**
S. McCreery, E. Carvalheira, A. Klien,
Omicron Electronics (Canada)

CIGRE-352
(16:00 – 16:15)  **Improving Field Operations and Safety with Wearable Technology**
Z. Wassenberg, Burns & McDonnell (USA)
A. Vitt, Manitoba Hydro (Canada)