IEC TC 38 WG 47 – Evolution of Instrument transformer requirements for the future market: link and exchanges with the IT4PQ Research Project

Paolo Mazza

IEC TC 38 WG 47 Convenor

19NRM05 IT4PQ Final Workshop

INRIM, Torino (Italy), 2023-06-22

General Information about IEC TC 38 WG 47

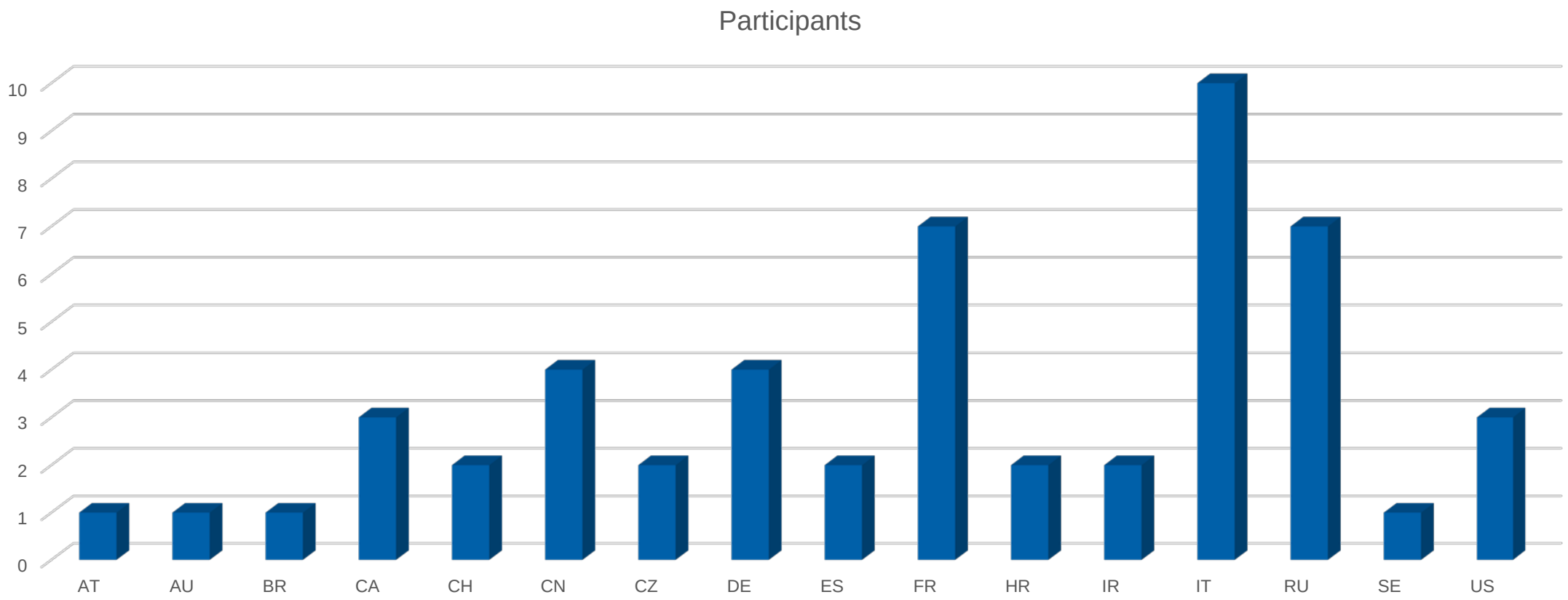
Title: **Evolution of Instrument transformer requirements for the modern market**

Scope: To prepare the evolution of the requirements contained in TC38 standards to take into account the technological evolution of devices traditionally connected to instrument transformers (meters, protective relays, etc.) as well as the new needs associated to emerging new applications (e.g.: power quality measurement, power meters, synchrophasors, etc.)

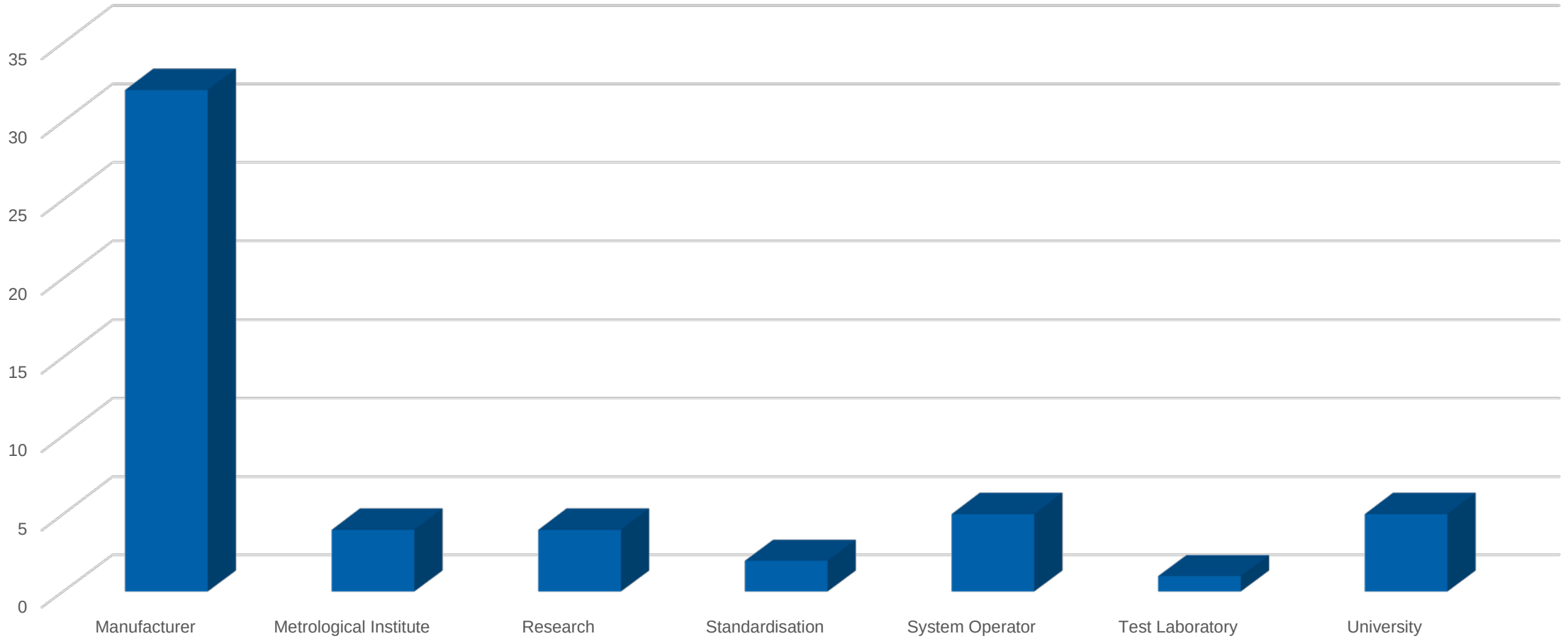
Composition

- Convenor : Paolo Mazza
- 5 Task Forces (TF) (Influence Quantities, PMUs, Power Quality, Questionnaire, Travelling Waves)
- 52 WG members, 28 active in TFs

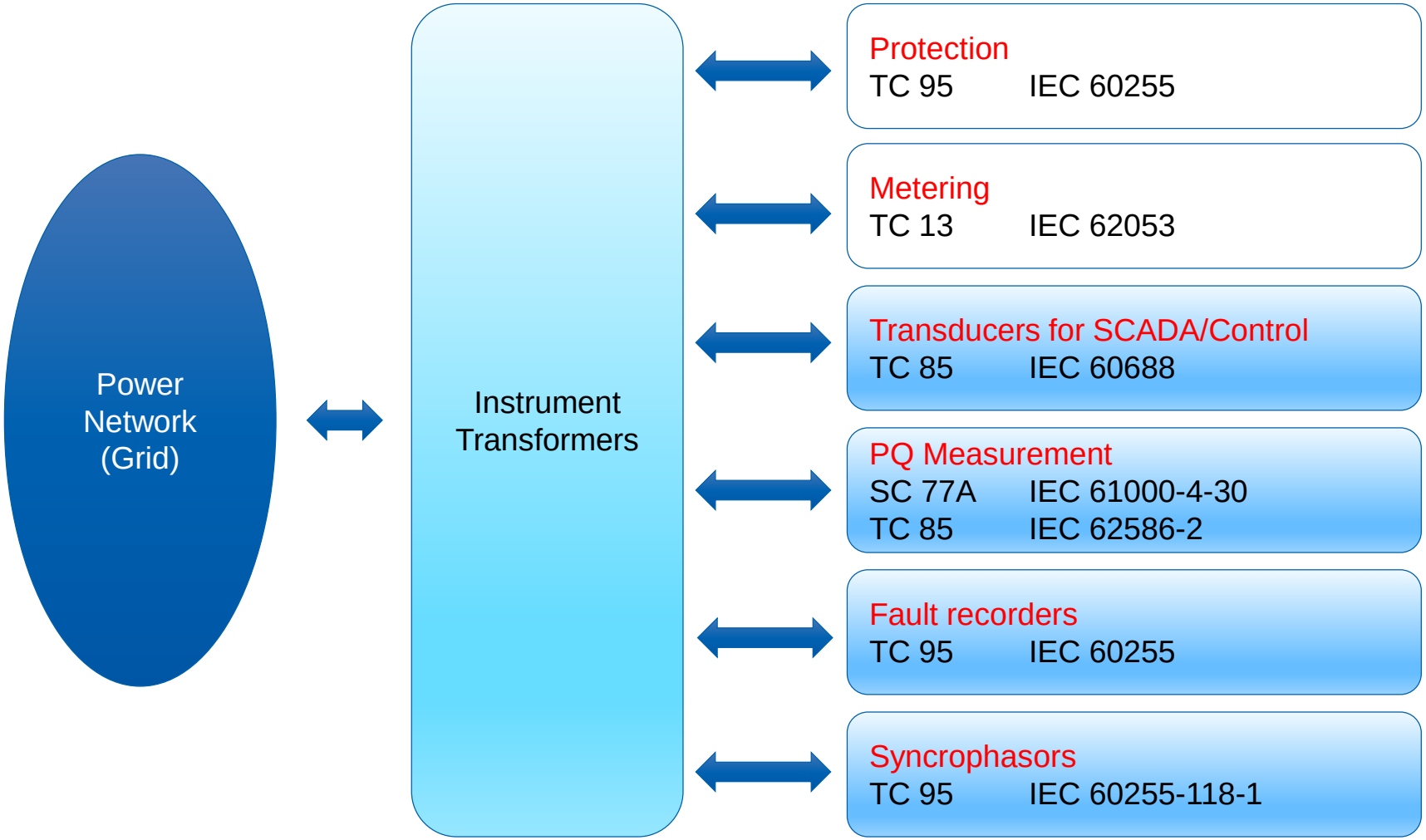
IEC TC 38 WG 47 Composition – by NC



IEC TC 38 WG 47 Composition – by kind of Participants



Instrument transformers and new applications



Documents under development

Reference	Title	Last circulated version	Next steps	Target Date of publication
PWI 38-10	Recommendations to TC38 concerning Evolutions of Instrument Transformer Standards for applications using Travelling Waves	38/695/DC 2022-02-04	DC2 08/23	End 2024
PWI 38-11	The Use of Instrument Transformers for Phasor Measurement Units application	38/696/DC 2022-02-04	DC2 08/23	End 2024
-	Instrument Transformer Ratings – A Questionnaire	-	DC1 01/24	End 2024
-	Instrument Transformers Behaviour in the Presence of Multiple Simultaneous Influence Factors	-	DC1 12/23	End 2024
-	The Use of Instrument Transformers for Power Quality Measurement	-	DC1 12/23	End 2024

Documents under development

IEC TC 38 WG 47 reports its activity periodically to IEC TC 38 Chair Advisory Group, to the whole TC 38 by issuing Documents for Comments, Technical Reports and Technical Specifications and, finally, to IEC TC 38 Plenary Meetings, where strategic decisions for the TC are taken.

It was therefore strategic to ensure a permanent link between IT4PQ project and IEC TC 38 WG 47 with periodic reporting.

Detailed overviews of IT4PQ project structure and results have been therefore presented at least once per year during relevant plenary meetings of WG 47.

Finally, WG 47 advised IEC TC 38 Officers in the preparation of the workshops associated to IEC TC 38 plenary meeting, ensuring the presentation to the whole TC and to the Instrument Transformers' Community of the whole project and of some important results achieved in the project.

Overall presentations of the whole project and of its results discussed during IEC and CENELEC TC 38 plenary meetings and the associated workshops

N.	Presenter	Title	Date and Place
1	G. Crotti	Measurement Methods and Procedures for Assessing Accuracy of Instrument Transformers for Power Quality Measurements EURAMET EMPIR project 19NRM05 Kick-off meeting report	2020/09/30 IEC TC 38 Chair Advisory Group Meeting
2	G. Crotti	Methods and procedures to assess the behavior of Instrument Transformer for Power Quality measurement	2021/09/20-21 IEC TC 38 plenary meeting workshop Webconference
3	L. Peretto	Performance Evaluation of LPIT under Multiple Influence Quantities	2021/09/20-21 IEC TC 38 plenary meeting workshop Webconference
4	G. Crotti	Methods and procedures to assess the behavior of Instrument Transformer for Power Quality measurement	2021/09/24 IEC TC 38 plenary meeting Webconference
5	G. Crotti	Measurement methods and test procedures for assessing accuracy of ITs for PQ measurement EURAMET EMPIR 19NRM05: Overview	2021/10/08 CENELEC TC 38 plenary meeting Webconference
6	G. Crotti	19NRM05 IT4PQ Measurement methods and test procedures for assessing accuracy of ITs for PQ measurement	2022/06/27 IEC TC 38 Chair Advisory Group Meeting Webconference
7	P. S. Letizia G. Crotti	Assessing accuracy of instrument transformers in PQ measurements Output and Results from the IT4PQ research projects	2023/10/04 IEC TC 38 plenary meeting workshop Bucharest (RO)

Overall presentations of the whole project and of its results discussed during IEC TC 38 WG 47 meetings

N.	Ref. Author	Title	Date and Place
1	G. Crotti	Measurement Methods and Procedures for Assessing Accuracy of Instrument Transformers for Power Quality Measurements - EMPIR 19NRM05 project Overview and first activities	2021/06/21 Webconference
2	G. Crotti	19NRM05 IT4PQ Measurement methods and test procedures for assessing accuracy of ITs for PQ measurement. Project overview	2022/11/17 Milano (IT)
3	G. Crotti	The IT4PQ project: from triggers to project outputs	2023/06/22 Torino (IT)

Detailed technical presentations about specific aspects discussed during IEC TC 38 WG 47 meetings (1)

N.	Ref. Author	Title	Date and Place
1	M. Luiso et alii	IT for PQ – conceptual measurement setup - Measurement of Synchrophasors with Stand Alone Merging Units: a Preliminary Study	2021/06/21 Webconference
2	L. Peretto	IT Accuracy vs. Influence Quantities	2021/06/21 Webconference
3	M. Luiso	Example of IT performance indexes as a function of the considered PQ parameters	2022/11/17 Milano (IT)
4	Y. Chen	Reference measuring systems and experimental results related to CT/LPCT characterisation under PQ phenomena	2022/11/17 Milano (IT)
5	P. S. Letizia	Development and Experimentation of Traceable Characterization Methods for Voltage Transformers for PQ Applications	2022/11/17 Milano (IT)
6	B. Ayhan	A three-phase measurement setup for simultaneous testing of combined instrument transformers and sensors	2022/11/17 Milano (IT)
7	F. Munoz	Approach for an industrial wideband comparator for ITs	2022/11/17 Milano (IT)
8	A. Mingotti	A Simplified Method to Characterize Low-Power Current Transformers	2022/11/17 Milano (IT)
9	P. S. Letizia	Simplified Procedures for Inductive VTs wideband characterization	2022/11/17 Milano (IT)
10	M. Agazar	Testing Voltage Transformers in Presence of Combined Temperature and Vibrations	2022/11/17 Milano (IT)

Detailed technical presentations about specific aspects discussed during IEC TC 38 WG 47 meetings (2)

N.	Ref. Author	Title	Date and Place
11	Y. Chen	Reference measuring systems and experimental results related to the evaluation of Influence factors on CTs and LPCTs	2022/11/17 Milano (IT)
12	R. Stiegler	Impact of temperature and burden on the frequency dependent transfer ratio of resin cast MV voltage instrument transformers	2022/11/17 Milano (IT)
13	A. Mingotti	The Effect of Influence Quantities on the Accuracy of Rogowski Coils	2022/11/17 Milano (IT)
14	H. Çayci	Combined ITs and Sensors: How reliable are they for PQ measurements?	2022/11/17 Milano (IT)
15	P. Mazza	IEC TC 38 WG 47 – Evolution of instrument transformer requirements for the future market: link and exchanges with the IT4PQ Research Project	2023/06/22 Torino (IT)
16	M. Luiso	Definition of framework test conditions and metrics	2023/06/22 Torino (IT)
17	E. Mohns	Reference system for the assessment of current transformer's PQ performances	2023/06/22 Torino (IT)
18	P. S. Letizia	Inductive VTs: a comparative analysis of performances under PQ disturbance	2023/06/22 Torino (IT)
19	A. Mingotti	Simplified and low-cost characterization of medium-voltage low-power voltage transformers in the power quality frequency range	2023/06/22 Torino (IT)
20	F. Munoz	A simplified procedure based on a wideband comparator for the calibration of CTs for PQ.	2023/06/22 Torino (IT)

Detailed technical presentations about specific aspects discussed during IEC TC 38 WG 47 meetings (3)

N.	Ref. Author	Title	Date and Place
21	M. Luiso	Simplified test procedures for frequency characterization of inductive VTs	2023/06/22 Torino (IT)
22	A. Nalli	IT4PQ: wideband testing of LPITs	2023/06/22 Torino (IT)
23	D. Istrate	Inductive VTs: effect of temperature and vibrations	2023/06/22 Torino (IT)
24	P. S. Letizia	Impact of adjacent phases and proximity on wideband LPVT and VT performance	2023/06/22 Torino (IT)
25	A. Mingotti	LPCTs: effect of influence quantities on the accuracy of Rogowski Coils and simplified testing.	2023/06/22 Torino (IT)

Thank you

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