



European Joint Research Project on
“Metrology for Smart Energy Management
in Electric Railway Systems”

FINAL ONLINE WORKSHOP

“METROLOGY AND MEASUREMENTS FOR AN EFFICIENT ELECTRIC RAILWAY SYSTEM”

JANUARY 28, 2021

9:30 am – 4:00 pm

The Workshop will be chaired by

Donato Carillo, General Secretary of the Collegio Ingegneri Ferroviari Italiani (CIFI)

Domenico Giordano, Istituto Nazionale di Ricerca Metrologica (INRiM), Coordinator of the European Joint Research Project MyRailS on "Metrology for Smart Energy Management in Electric Railway Systems"

PROGRAMME

WELCOME - 9:30-9:50

Introduction by the chairmen [10']

The Italian National Metrology Institute (INRiM) and its contribution to the research on electric transport [10']

Pietro Asinari, INRiM's Scientific Director and Full Professor at Politecnico di Torino

SESSION I - 9:50-10:50

Metrology for the Energy Measurement Function (EMF)

- ***Calibration of energy measurement function under AC distorted waveforms [25'+5' Q&A]***

Jorge Rovira, Fundacion para el Fomento de la Innovacion Industrial (FFII)

Daniela Istrate, Laboratoire National de Métrologie et d'Essais (LNE)

- ***The set-up for the calibration of the energy measurement function for DC railway system [15']***

Davide Signorino, Politecnico di Torino, Istituto Nazionale di Ricerca Metrologica (INRiM)

TIME TO DEBATE

How can the EN 50463 standard be improved? What about legal metrology for energy measurement functions in Europe? [15']

BREAK - 10:50-11:00



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SESSION II - 11:00-12:30

Power quality (PQ) in AC and DC railway systems

Power quality in AC railway systems

- **The PQ measurements in the AC Bologna substation [10'+5' Q&A]**
Peter Davis, National Physical Laboratory (NPL), UK
- **PQ analysis in AC railway system [10'+5' Q&A]**
Yljon Seferi, University of Strathclyde, UK
- **Harmonic power [10'+5' Q&A]**
Andrea Mariscotti, ASTM, Switzerland, Università di Genova, Italy

Power quality in DC railway and metro systems

- **Arc events at pantograph: a reliable way to detect them [20']**
Domenico Giordano, Istituto Nazionale di Ricerca Metrologica (INRiM), Italy
- **An overview of the power quality in DC railway and metro systems [10']**
Daniele Gallo, Università della Campania “Luigi Vanvitelli”, Italy

TIME TO DEBATE

The continuous monitoring of the power quality parameters thanks to trains in commercial services by means of upgraded energy meters [15'].

LUNCH BREAK - 12:30-14:00

SESSION III - 14:00–16:00

Where we find the energy to save? The braking energy and the Eco-driving

- **Energy saved by eco-driving in the Metro de Madrid and Bologna-Rimini railway line: test cases [15'+5' Q&A]**
Paloma Cucala García, Universidad Pontificia Comillas, Spain
- **Accurate measurement of power dissipated by braking rheostats [15'+5' Q&A]**
Domenico Giordano, Istituto Nazionale di Ricerca Metrologica (INRiM), Italy
- **The dissipated braking energy in railway and metro systems [15'+5' Q&A]**
Antonio Delle Femine, Università della Campania “Luigi Vanvitelli”, Italy
- **How to recover the braking energy: a case study [15'+5' Q&A]**
Giuseppe Graber, Hitachi Rail Italy
- **Design of an energy recovering system in the substation: a methodology starting from on-board measured data [15'+5' Q&A]**
Daniele Gallo, Università della Campania “Luigi Vanvitelli”, Italy

TIME TO DEBATE

The IEC–CENELEC priority in the standardisation on non-conventional DC substations. Future research activities [20'].