CABLE DYNAMICS LABORATORY

Experimental tests for
the evaluation of the dynamic properties
of cables, dampers, spacers

The knowledge of the cable and damping devices mechanical properties allows to correctly estimate, through numerical models, the overhead transmission line dynamic response to the wind excitation. In particular, conductor self-damping together with damper dynamic stiffness and spacer-damper stiffness and damping properties are evaluated through laboratory tests and are used in the numerical models both to assess the conductor + damping devices dynamic performance and to optimise the damping devices design. The laboratory allows both customized tests and standard tests carried out according to the main International Standards.

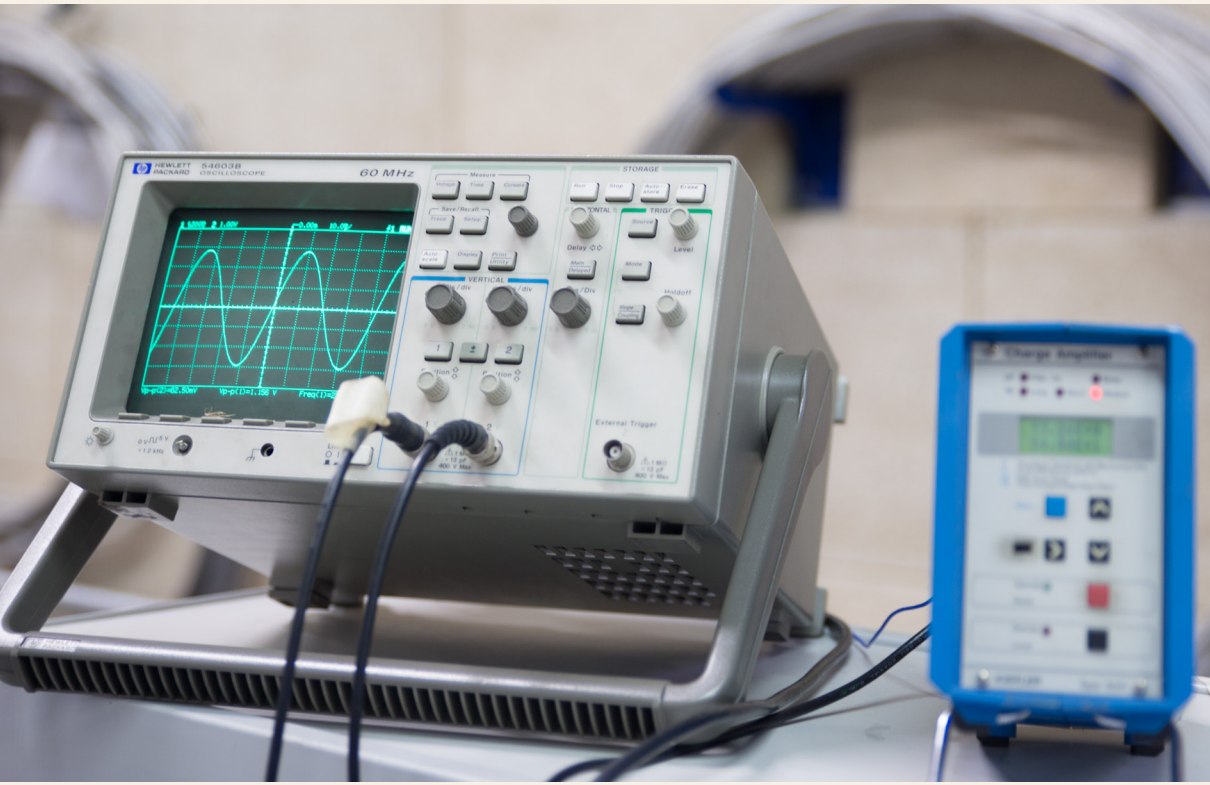
INSTRUMENTS & FACILITIES

50m long laboratory span
Programmable Logic Control (PLC)
Gearing Watson electro-dynamical shaker + amplifier (V617/DSA4-8k)
Unholtz&Dickie electro-dynamical shaker + amplifier (SA15-S452)
B&K 1050 controller
Electromechanical actuator UNIMEC TP7010 MBD with electrical motor 7.5kW 750rpm (conductor tensile load control)
N. 5 current suppliers TDK Lambda GEN25-400-3P400 (50kW total power) (conductor heating thermal tests)
Load cell U10M/250kN + HBM Scout 55 (conductor tensile load measurement)
Kistler 30 kN piezoelectric load cells
Piezo-accelerometers B&K 4508 with power amplifiers PCB 480E09
Strain gauges and conditioning modules
Laser transducers and other displacement transducers
Temperature sensors
Various sizes hydraulic actuators and load cells + MTS Flex Test Digital Controllers

CERTIFICATIONS

Test “Stockbridge Type Dampers Dynamic Characterisation” (ISO9001:2008 certification)
Test “Stockbridge Type Dampers Effectiveness Test” (ISO9001:2008 certification)

ACTIVITIES	
CABLE SELF-DAMPING TEST	Decay Method
	Power Method
	Inverse Standing Wave Ratio
SPACER-DAMPERS DYNAMIC CHARACTERIZATION	Stiffness and damping properties
	Stiffness and damping properties at high and low temperature
	Aeolian vibrations and subspan oscillations fatigue tests
	Simulated short circuit test
	Slip test
STOCKBRIDGE DAMPERS DYNAMIC PERFORMANCES	Damper characteristic curve (Mechanical impedance/Dynamic stiffness with Imposed constant speed or constant displacement)
	Damper effectiveness test
CABLE + SUSPENSION CLAMP FATIGUE TEST HIGH TEMPERATURE CONDUCTORS THERMAL TESTS	Linear coefficient of thermal expansion
	Sag curve/knee-point temperature



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