Grid code compliance (GCC) verification services

Item no. 557.220 – 557.224

Securing plant control characteristics for reliable grid code compliance.

Description

Compliance with grid connection requirements is crucial for a stable grid supply. In many countries, the measurement of the plant controller is also a prerequisite for project certification and is therefore decisive for the successful implementation of solar power plants.

The type and scope of the so-called Site Acceptance Tests (SAT) differ from market to market and often depend on the plant size (installed capacity) and voltage level. With the Grid Code Compliance (GCC) Engineering Services we offer customized services for the verification of power plant control from standardized functional tests to project-specific compliance test procedures and compliance test reports. Market-specific and contractual agreements between grid operator and connected party (owner) can be taken into account on a project-specific basis.

Overview

In principle, the verification can be either standardized or project-specific. If the grid operator defines specific requirements for compliance tests, the verification must be carried out project-specific in accordance with the specified framework conditions.

	Assessment		**Documentation**		
	Qualitative	Quantitative	Standard	Project-specific	Raw data (.txt)
Functional test					
557.220 Standard test protocol	✓	–	✓	–	–
Standard verification					
557.221 Standard test procedure, system-related	–	–	✓	–	–
557.222 Standard test report, system-related	–	✓	✓	–	✓
Project-specific verification					
557.223 Compliance test procedure, project-specific	–	–	–	✓	–
557.224 Compliance test report, project-specific	–	✓	–	✓	✓

Additional notes

- **Qualitative assessment**: Testing whether setpoints can generally be reached and maintained.
- **Quantitative assessment**: Determination of control characteristics such as steady-state error, rise time, settling time and overshoot (only project-specific if required).
- **Standard**: Test protocol/test procedure according to meteocontrol's own standard in reliance to Network code (NC) requirements for generators (RfG)/EU regulation 2016/631.
- **Project-specific**: Test procedure according to country- and/or project-specific requirements.
- **Setpoint command method**: Only the setpoint command methods required by the grid operator are tested.
- **Measurement raw data**: Provision of measurement raw data with an interval of 200 ms in format .txt
- **Revisions**: Revisions are charged on the basis of hourly rates.

Site acceptance tests (SAT)

- Testing according to drafted test procedure (standard/project-specific) is not included in the scope of delivery, but can be offered on an hourly rate basis.

Active power	• Active power decrease at overfrequency (LFSM-O) • Active power controllability
Reactive power	• Reactive power capability (only project-specific if required) • Voltage control Q (V droop) • Reactive power control Q_{var} • Power factor control cos ϕ_{var} • Characteristic curve Q (P) • Characteristic curve Q (U)
Behavior in the events of technical faults	• Communication failure at an interface for setpoint value transmission • Communication failure at an interface for correction value transmission • Communication failure at an interface for actual value transmission

Standard verification (557.221, 557.222)

	Setpoint steps	Step size	Control range [1)]
Active power decrease at overfrequency (LFSM-O)	8	not fixed	50.0 … 51.5 Hz
Active power controllability	10	10 % P/P_{max}	0 … 100 % P/P_{max}
Voltage control Q (V droop)	16	0.01 V/V_c	0.95 … 1.05 V/V_c
Reactive power control Q_{var}	18	5 % Q/P_{max}	-30 … 30 % Q/P_{max}
Power factor control cos ϕ_{var}	15	0.01	-0.95 … 0.95
Characteristic curve Q (P)	10	10 % P/P_{max}	-33 … 0 % Q/P_{max}
Characteristic curve Q (V)	18	0.01 V/V_c	-33 … 33 % Q/P_{max}

[1)] Negative reactive power values (Q/cos ϕ) correspond to a reactive power absorption from the grid (underexcited operating mode, voltage decreasing), positive reactive power values (Q/cos ϕ) correspond to a reactive power injection into the grid (overexcited operating mode, voltage increasing).