About

Provide general information regarding the described test objective.

Test objective name	TransitionIslandedMODE
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Short description	The test is an adaptation of the Erigrid 2.0 test case #10 "Evaluation of secure transition from grid-connected to islanded operation: Uninterruptible Power Supply"
Present use / development status	V1.0

Scope and goal

What is the test objective, i.e. what is the purpose of carrying out the test? Try to formulate the objective within one of the following three categories:

1. *Characterization: a measure is given without specific requirements for passing the test. Examples: understanding the behaviour of a system, developing a mathematical model of a component.*
2. *Validation: a requirement and abstract measure is provided, but the results are subject to interpretation, i.e. passing a test depends on a qualitative evaluation by an expert or user of the system. These tests seek to answer the question are we building the right system? Example: Is the mathematical model good enough?*
3. *Verification: acceptance of a test result depends on the direct evaluation against fixed and formalized assessment criteria. These criteria can be formulated as quantitative measures with a set/range of acceptable values of these measures, i.e. quantitative tests. These tests seek to answer the question are we building the system right? Example: Testing whether a component conforms to a standard.*
4. *Optimization: optimization is the selection of a best element (regarding a defined criterion) from some set of available alternatives. These tests seek to answer the question on how to build the right system? Example: Sizing of a component*

Test objective	☐ characterization ☐ validation ☒ verification ☐ optimization
Description incl. justification	The test case is used to assess the transition of a microgrid (MG) from grid-connected to islanded operation state when critical frequency conditions arise in the connected LowVoltage (LV) grid. With respect to the initial formulation of the Erigrid 2.0 test case #10, this test is focused on the behaviour of the grid-forming inverter in the MG during the transition to islanded mode, neglecting the analyses on the

	protection equipment (not modelled in the benchmark grid). The test is performed for two critical frequency conditions, with the LV grid frequency reaching the upper value of 50.5 Hz and the lower value of 49.5 Hz..
System configuration *To which system configuration does this test apply?*	JRA1-EO-ST
Use case *To which use case does this test apply?*	n/a

Identification of test components

This section provides information about the system under test, object under investigation and function under investigation.

System Under Test *Which subset of the entire system configuration needs to be simulated to achieve the test objective?*	The entire system, with particular focus on the microgrid after its disconnection from the LV network.
Object Under Investigation *Which are the components of the System Under Test that are to be characterized or validated?*	• Microgrid • Grid-Forming Inverter
Function Under Investigation *which of the system behavior defined in the use case is to be characterized, validated or verified?*	Capability of the grid-forming inverter to set up and maintain the nominal frequency in the microgrid after its disconnection from the LV network

Test criteria

This section provides information about the criteria to evaluate the test results.

Objective Function / Target Metrics *Optimization studies: Define the objective function (OF), which specifies how the measured parameters are used to evaluate the optimization target. **Refer to OF and***	• Frequency in the microgrid • Active and reactive power exchanged by the microgrid inverter • Voltage at the inverter terminals

KPI description forms (separate forms). *Other studies: Define the target metrics, which specifies how the measured parameters are used to evaluate the test objective in terms of KPIs.* **If available, refer to KPI description forms** *(separate forms).*	
Acceptable test result *Applicable for validation and verification test cases.* *Define quality attributes for assessing an acceptable test result. For validation tests an abstract measure to enable a qualitative assessment is stated. For verification tests, the acceptance threshold (worst case for passing the test) is stated.*	Microgrid frequency is set to its nominal value within few seconds after the disconnection of the microgrid and does not exhibit relevant variations after that