Host Utilities

SESSION PARTNER

ADD LOGO OR DELETE IF NO PARTNER

ORGANIZER

ISGF India Smart Grid Forum

Supporting Ministries

# India SMART UTILITY Week 2025

## Session : Name of the Session

## PRESENTATION TOPIC


***Presented By***

***Dr. Miguel Martinez, Principal Engineer GCC, UL Solution***

# Why grid codes are required

With the increasing amount of decentralized power generating units and systems, the number of active and influencing factors in the grid to stabilize or destabilize the voltage and frequency increases and has to follow specific rules to obtain a safe and stable operation and power supply worldwide.

# What the grid codes state

Grid codes are technical specifications that define the parameters a facility connected to a public electric grid must meet. These requirements enhance the safety, security and economically proper functioning of the electric system, covering aspects such as voltage regulation, power factor limits and response to system faults.

# Where the grid codes apply

- Each country applies its own grid code, and each power system utility adopts its own local rules.
- Europe has worked on grid code harmonization in Entso-E since the blackout events (Italy 2003) and regional islanding (Netherlands 2006).
- The result was the NetCode “Requirements for Generators (EU) 2016/631” published by the Entso-E, defining the general requirements for Power Generating Units, Systems and their components connected to the European transmission grid.

# Grid code requirements and conformity evaluation method

**Grid Code Requirements**

Due the different issues, electrical grid requirement are defined by each EU country based on RfG.

- Applicability definitions are different per each country.
- Exhaustive requirements based on range of values are set up in each country.
- Non exhaustive requirements are defined in different ways in each EU country.

**Conformity evaluation**

Conformity evaluation method are defined in the RfG according to EU regulations.

- Each country defines the authority that needs to develop the conformity assessment method.
- Rules shall be published and approved at national level.
- At the issuance of the regulation, there was no harmonized conformity evaluation method in place at the EU level, only country by country.

# Conformity evaluation method

**DSO or TSO method**

Evaluation is performed at power plant level based in simulations performed by each DSO or TSO.

Methodology is approved by each DSO and TSO.

No third-party accredited company is requested to perform this activity.

This method is applicable for all EU countries.

**Testing of generators**

Testing shall be performed at power generating unit (PGU).

Testing shall be performed by an accredited laboratory for the specific grid code requirements by EU accreditation body.

**Testing and certification of generators**

Testing and certification shall be performed at power generating unit (PGU).

Testing and certification shall be performed by one accredited laboratory/certification body for the specific grid code requirements by EU accreditation body.

**Certification of power generating systems (PGS)**

Certification based on simulations and PGU certification shall be done at the PGS level.

Certification shall be performed by one accredited certification body for the specific grid code requirements by EU accreditation body.

# New Developments

## Storage generating modules

RfG shall be applicable to storage systems.

Some EU member countries as Germany and Italy, already include these requirements.

These requirements shall be implemented in all EU member countries that don´t include yet.

## V2G modules

Bidirectional EV chargers shall comply with the RfG.

Compliance could be mandatory at the system level too.

## Grid forming requirements

Grid forming requirements compliance will be mandatory.

Each country is working on these requirements.

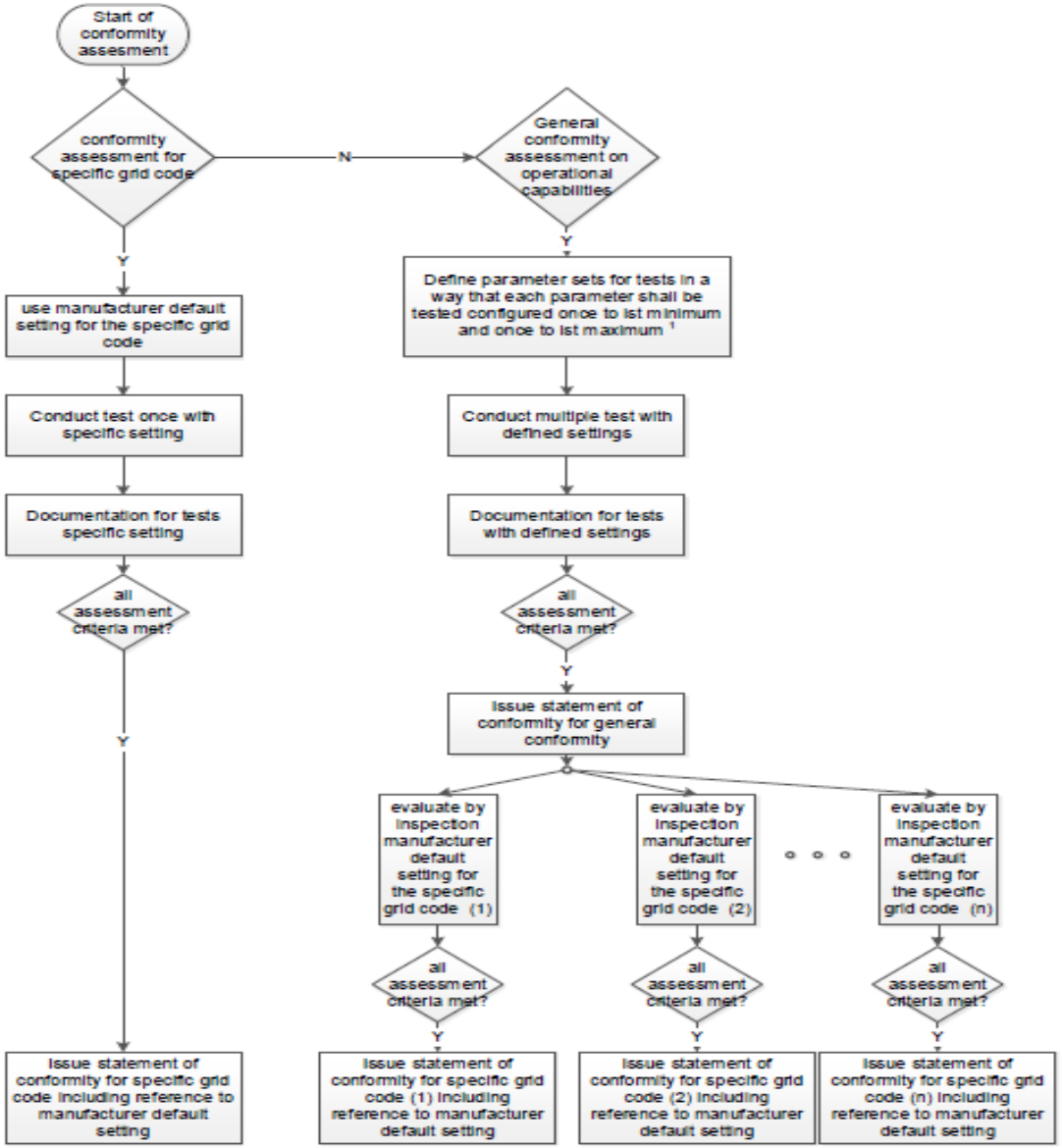
There is not consensus at EU member country level.

# KEY TAKEAWAYS / RECOMMENDATIONS

## Conformity evaluation scheme EN 50549-10

This standard offers 2 options for the conformity evaluation:

- Conformity evaluation based on default settings for each country.
- Conformity evaluation based on operational capabilities.



Host Utilities

TATA

TATA POWER

BSES

BSES Rajdhani Power Limited

BSES

BSES Yamuna Power Limited

NPCL

NOIDA POWER COMPANY LIMITED

SESSION PARTNER

ADD LOGO OR DELETE IF NO PARTNER

ORGANIZER

ISGF

India Smart Grid Forum

Supporting Ministries

सत्यमेव जयते
MINISTRY OF POWER
GOVERNMENT OF INDIA

सत्यमेव जयते
MINISTRY OF NEW AND RENEWABLE ENERGY
GOVERNMENT OF INDIA

सत्यमेव जयते
DEPARTMENT OF SCIENCE & TECHNOLOGY

सत्यमेव जयते
NITI Aayog

सत्यमेव जयते
MINISTRY OF POWER
GOVERNMENT OF INDIA
CENTRAL ELECTRICITY AUTHORITY

# India SMART UTILITY Week 2025

# *THANK YOU*

For discussions/suggestions/queries email: isuw@isuw.in

www.isuw.in

Links/References (If any)