

Smart Grid International Research Facility Network

ISGAN – Annex 5

ISGAN (International Smart Grid Action Network) is an initiative of the Clean Energy Ministerial and is an IEA Technology Collaboration Program. The vision of ISGAN is to accelerate progress on key aspects of smart grid policy, technology, and related standards through voluntary participation by governments.

SIRFN Description

The Smart Grids International Research Facility Network (SIRFN) is a network of smart grid testing facilities in countries participating in the ISGAN.

SIRFN coordinates joint testing-related activities relevant to “smart” electricity grids. SIRFN’s collaborative testing and evaluation capabilities are meant to be leveraged by the international community to enable improved design, implementation, and testing of smart grids and their functionality, including the reliable integration of clean energy technologies.

SIRFN’s Focus Areas bring together technical experts to consider the current state, identify issues for test facilities to collaborate on resolving, identify potential SIRFN users, and recommend and implement SIRFN activities to overcome obstacles.

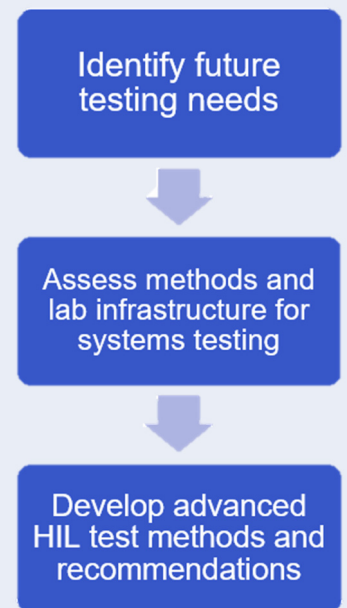
SIRFN – Technical Task 5: Advanced Laboratory Testing Methods - ALTM

The testing of Smart Grids infrastructure and their functionalities is of paramount importance to ensure a smooth transition from the conventional centralized power system operation to a future highly complex and distributed operation paradigm. Conventional testing methods do not reflect the impact of the novel components into the system behavior.

In this task, the use of novel advanced laboratory testing methods which consider the effects of the tested devices into the wider system are analyzed and developed, i.e. real time simulation and in particular Power Hardware-in-the-Loop (PHIL) and Controller Hardware-in-the-Loop (CHIL). By means of these prior methods (PHIL and CHIL) potential added value to topics in the field of electrical systems and power electronic component research is targeted. Moreover, valuable input to the future testing procedures within international standards for electric power systems for the low/middle voltage range (IEC, UL, EN, etc. standards) is expected and recommendations for novel advanced testing methods in the laboratory environment such as remote HIL techniques are elaborated.

Activities of the “Advanced Laboratory Testing Methods” Task

- Identification of current laboratory limitations and future needs.
- Development of new testing methods and recommendations methods in light of identified limitations and opportunities presented through the transition.
- Identification of real-world application to demonstrate the feasibility and capability of developed methods.
- Development of systems level laboratory testing methods.
- Enhancement of current testing methods, exchange of good practices and knowledge base through collaborative activities.



Current Work Programme

This task deals with following topics to [enhance the testing of Smart Grid infrastructures and their functionalities](#):

- Evaluate and identify the state-of-the-art testing methods in standardized testing of integrated energy systems.
- Assessment and implementation of new testing methods (such as geographically distributed HIL) to evaluate and demonstrate new power system components and controls.
- Evaluate current testing methods for multi-vector systems (Power to X) and environmental testing in the loop, in which the impact of the different energy vectors and environmental conditions will be assessed from a systems perspective.
- Identify needs to further develop flexible testing methods such as scalability.
- Develop recommendations on future testing techniques.
- Collaborative activities among test infrastructures.
- Application of advanced methodologies within the network.

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