

CIGRE Study committee B5

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG B5.92

NAME OF THE CONVENOR

Borges de Oliveira Denise (BRAZIL)

TITLE

Anti-Islanding Protection for Distributed Generation: Challenges, Systemic Impact and Recommendations

THE WG APPLIES TO DISTRIBUTION NETWORKS: YES

ENERGY TRANSITION

- 4 / Sustainability and Climate Change
- 5 / Grids and Flexibility
- 6 / Solar PV and Wind

POTENTIAL BENEFIT OF WG WORK

- 2 / potential interest from a wide range of stakeholders
- 3 / likely to contribute to new or revised industry standards
- 4 / state-of-the-art or innovative solutions or directions
- 5 / Guide or survey on techniques, or updates on past work or brochures

STRATEGIC DIRECTION

- 1 / The electrical power system of the future reinforcing the End-to-End nature of CIGRE: respond to speed of changes in the industry by preparing and disseminating state-of-the-art technological advances
- 2 / Making the best use of the existing systems

SUSTAINABLE DEVELOPMENT GOAL

- 7 / Affordable and clean energy
- 9 / Industry, innovation and infrastructure

BACKGROUND :

Anti-islanding protection is an important feature in power systems, particularly in the context of distributed generation such as solar or wind power plants. It is designed to prevent an islanding situation, where a portion of the power grid continues to operate in isolation from the rest of the grid. This protection is implemented with local relays relying among other things on Over/Undervoltage, Over/Underfrequency, vector shift or state comparison principles, typically.

While islanded operation of a part of the network can be beneficial in some scenarios (e.g., providing backup power to local consumers or supporting the stability of the transmission system), it poses serious safety risks and operational challenges in the context of power system evolution experienced over the last years.

Maloperation of anti-islanding protection can jeopardize the stability of the transmission system if many generation units are tripped falsely. Some anti-islanding protections might be more prone to maloperate than others especially in low-load or low-generation scenarios or when the electricity system is changing to more converter-dominated system. Additionally, the complexity of protection schemes, potential impacts on system performance, and evolving regulatory standards complicate implementation. Integration with smart grids and communication systems further adds difficulty, while balancing cost-effectiveness with safety and reliability remains a key concern.

PURPOSE / OBJECTIVE / BENEFIT OF THIS WORK :

The goal of this working group is to provide recommendations regarding implementation of anti-islanding protections in line with their role in modern power systems. Historically, this type of protection was developed and introduced in a context where the number of decentralized productions connected to the grid was rather limited. For the reasons mentioned in the background section, the time has come to review and update its fundamentals.

SCOPE :

The scope of WG B5.92 includes the following elements related to anti-islanding protection:

- Definition and roles of the anti-islanding protection
- Description of protection principles implemented to detect islanded condition
 - local protection
 - distributed protection
- Current practice regarding implementation schemes across various voltage levels
- Case studies covering both successful and unwanted operation of anti-islanding protection, with a clear description of underlying risks and potential consequences
- General considerations over regulatory requirements and standards
- Evaluation of adequation of the performance of the different protection types and the requirements for the different use cases
- Conceptual and technological challenges, especially in the context of grid-following and grid-forming facilities provided by IBR based generation
- Technical recommendations for implementation and solutions

Out of Scope:

The most typical regulatory considerations will be discussed, but since they are country-dependent, it would be impossible to give an exhaustive overview.

Remarks:

- Include liaison member with SC B4 and C6 to clarify the role of anti-islanding protections in modern power systems and the expected performances (dependability, security, action time ...).
- Include DSO representative as regular member

DELIVERABLES AND EVENTS

Deliverables Types

Annual progress and activity report to Study Committee
Electra report
Technical Brochure and Executive Summary in Electra
Tutorial

Time schedule

Q2	2026	Recruit Members
Q3	2026	Develop final work plan
Q4	2029	Draft TB for Study Committee Review
Q1	2030	Final TB & other deliverables

APPROVAL BY TECHNICAL COUNCIL CHAIRMAN:

Rannveig S. J. Loken
March 18th, 2026