



European Research Infrastructure supporting Smart Grid Systems Technology Development, Validation and Roll Out

TRANSNATIONAL ACCESS PROVISION

RESEARCH INFRASTRUCTURE DESCRIPTION AND TRANSNATIONAL ACCESS CONDITIONS

DELFT UNIVERSITY OF TECHNOLOGY



Grant Agreement No:	654113
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Project Duration:	54 month

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1 Research Infrastructure

Name of Infrastructure/Installation	Real Time Digital Simulator Lab (RTDS)
Location	TU Delft- Delft, The Netherlands
Web Site	http://www.tudelft.nl/en/

2 Description of the Research Infrastructure

The RTDS installation at TU Delft consists of 8 racks with 10 PB5 and 36 3PC cards, capable of simulating grids in 2 μ s and 50 μ s step size. Additionally the racks have analog/digital I/O, remote I/O, two GTNetx2, and one GTSync card. The RTDS Simulator allows to test protection and controls in real time, where an hour in the real world equals an hour in the simulator. Utilizing modular custom computing hardware and software, simulations performed encompass results from DC up to electromagnetic transients. Inherently, these results include information regarding the system load flow and transient stability, as well as that of harmonics and faster disturbances.



3 Services offered by the Research Infrastructure

The major applications of the RTDS includes:

- Equipment can be thoroughly test-driven and customized.
- New power system network designs or upgrades can be evaluated and accurately tested.
- Black box real-world equipment (e.g. closed-source controllers) can be tested and integrated in larger test scenarios without having a model.
- Interoperability of multi-vendor installation can be validated.
- Models and real implementations (products) of components can be compared.
- Closed-loop testing of protective relays and control systems.
- Studying general AC system operation including behaviour of generation and transmission systems.
- Investigating dynamic power system equipment interaction.
- Studying interaction between integrated AC/DC systems.
- Integration and operation of distributed generation and renewables.
- Investigation and testing of SMART Grid initiatives including wide area protection and control.
- Testing of control system of converter based equipment.



4 Brief description of the organization managing the Research Infrastructure

Technische Universiteit Delft (TU Delft), is the largest and oldest Dutch public technological university, located in Delft, Netherlands. It has eight faculties and numerous research institutes. It hosts over 19,000 students (undergraduate and postgraduate), more than 3,300 scientists, and more than 2,200 support and management staff.

The RTDS facility is within the **Intelligent Electrical Power Grid (IEPG)** group of the **Electrical Sustainable Energy (ESE)** department.

The field of the Intelligent Electrical Power Grids research program covers the generation, transmission and distribution of electrical energy, and a characteristic is the system-oriented approach. Our research program covers the three different time scales for which power systems are usually studied: transient, dynamic and steady state behaviour of power systems. The area of this research program is concerned with the technical, economical and societal performance of the electricity supply system. Theoretical and technological limits of current and future power systems and components are investigated taking into account the changing operating environment, e.g. the large-scale introduction of renewable and distributed energy sources and the application of new and sustainable technologies.

5 Transnational Access conditions offered by TU Delft



The conditions of the Transnational Access offered by TU Delft are:

- Half of the rack must stay free for our other projects.
- Maximum 6 people are allowed.
- Guests have to sign a hospitality declaration for the stay at TU Delft.

Reimbursement of expenses:

Travel expenses for Transnational Access (TA) are paid by the EU H2020 project ERIGrid. Dedicated project budget is reserved for the hosting institution to cover travel and staying expenses for TA guests. Travel and stay is expected to be based on the most economical options.

6 Contact details for Research Infrastructure

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