RTDS Technologies **NEWS**

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WHAT'S NEW: APRIL 2020

- Updates on COVID-19 and 2020 events
- Exciting new models and features
- Special protection system testing with the RTDS® Simulator

2020 EVENT UPDATE

WEBINAR: PRACTICAL USE OF REAL-TIME SIMULATION FOR DE-RISKING HVDC INTEGRATION // REGISTER NOW
Thursday, April 16 at 9:00 AM CST

Learn about real-time simulation from the safety of your home! We are excited to announce this joint webinar with **Great Britain's National HVDC Centre**, which will explain the principles of real-time simulation, outline international experience on hardware-in-the-loop testing for de-risking the integration of power system technologies, and highlight practical considerations using the case study of an HVDC scheme with multi-terminal design.

CHANGES TO UPCOMING EVENT SCHEDULE

Some of our favourite events have been rescheduled, but we'll still be attending later this year. In the meantime, if you have questions or would like a product demo, reach out to our digital conference booth at **MARKETING@RTDS.COM**.

- **IEEE PES T&D:** *October 12 – 16, 2020, Chicago, USA*
- **Microgrid Knowledge:** *November 18 – 20, 2020, Philadelphia, USA*
- **SEERC:** *November 24 – 27, 2020, Vienna, Austria*

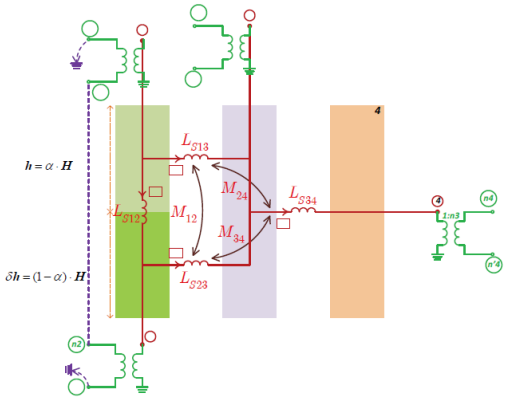
SAVE THE DATE: 2020 EUROPEAN USER'S GROUP MEETING
September 23-25, 2020
Nuremberg, Germany

Watch our website for more information and abstract submission!

A NOTE ON RTDS TECHNOLOGIES AND COVID-19

As the RTDS Technologies staff works from home to keep our community safe, we're still fully equipped to support you when you need us. Our R&D department, maintenance program, and simulation support services remain fully operational during this time. We hope our global community is staying home and staying safe.

EXCITING NEW MODELS AND FEATURES TO CHECK OUT IN RSCAD®



FAULTED TRANSFORMER MODEL

Our new faulted transformer model is based on a terminal duality equivalent. Common engineering challenges are addressed by replacing the popular star equivalent circuit with an equivalent based on terminal duality principles. The new model is a more realistic and practically accurate representation of a transformer's magnetic circuit, including the representation of real physical leakages. It allows for a more accurate prediction of the magnetic inrush current, as well as full representation of the mutual coupling between branches, allowing for better model performance at the terminals. Under asymmetrical conditions, the model allows for the accurate evaluation of short circuit reactance by decomposing the leakage flux into axial and transverse components. The new model is a game-changer in representing the transient behaviour of transformers and enabling the comprehensive closed-loop testing of transformer protection.

SMALL TIMESTEP TO SUBSTEP CONVERSION TOOL

Our new Small Timestep to Substep conversion tool allows users to migrate cases that were developed in small timestep subnetworks to the new Substep environment. Substep has several advantages for power electronic simulation, including no hard limit on the quantity of resistive switches, the option to avoid fictitious losses at higher switching frequencies without decoupling VSCs from the rest of the network, and more nodes allowed per subnetwork.

FREQUENCY SCAN COMPONENT

Our new frequency scan component provides an analytical, offline impedance scan of the simulated network. A new button in the Draft module allows the user to invoke a frequency scan (DC - 1 MHz) prior to running the simulation. This executes a partial compile and computes the system impedance seen from the scanning point over the specified frequency range. Built-in frequency scanning allows the RTDS Simulator to conveniently aid in identifying and reporting system resonance conditions.

TESTING A SPECIAL PROTECTION SCHEME FOR BELGIUM/UK HVDC LINK

The Nemo HVDC Link, a subsea cable interconnecting Belgium and the United Kingdom and facilitating the transfer of up to 1000 MW, was constructed and tested in late 2018.

However, energization was delayed until a special protection scheme (SPS) was put in place. Schweitzer Engineering Laboratories (SEL) engineered a sophisticated system to ensure system stability in the event of abnormal conditions along the corridor. The ten finished SPS panels included protective relays, real-time automation controllers, communication networking devices, and logic control. The system leveraged IEC 61850 GOOSE messaging for substation-to-substation communication.

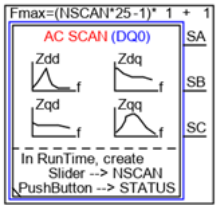
The RTDS Simulator was used for hardware-in-the-loop testing of the SPS prior to installation on site. A model of the Belgian utility's power system, including the HVDC link and a software model of the utility's existing protection and SCADA system, was built in RSCAD and validated based on available data. It was then physically interfaced to the SPS panels to perform HIL testing, which validated the co-operation of the SPS and existing SCADA system as well as the operation time of the SPS for critical cases.

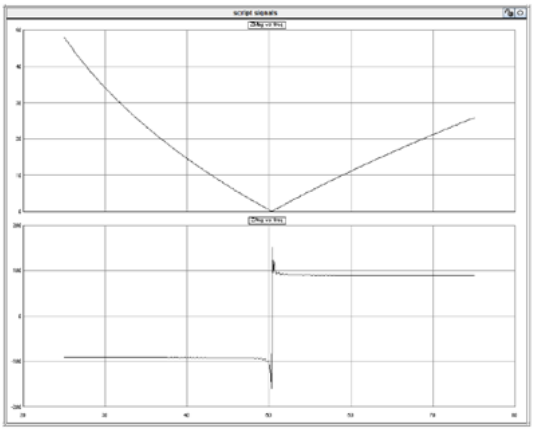
LEARN MORE ON THE SEL WEBSITE.

COMMISSIONING AND TRAINING AT BRNO UNIVERSITY OF TECHNOLOGY IN CZECH REPUBLIC

HARMONIC SCAN CAPABILITY

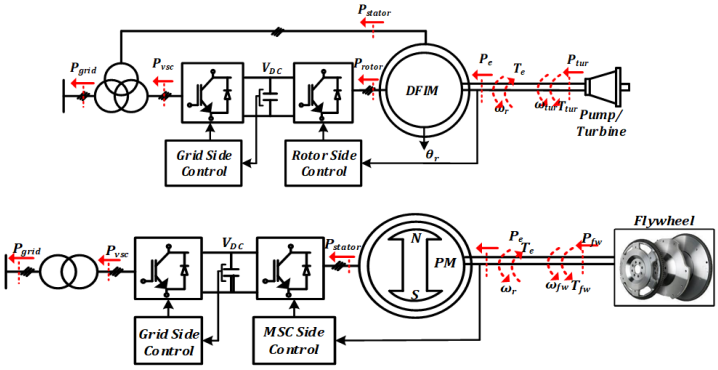
Our new harmonic scan capability provides a white noise injection into the network during the simulation. Harmonic waveforms of a frequency range specified by the user (up to 9 kHz) are superposed and applied to the system. The impedance response of the system in the frequency domain is then calculated by the component. A module for conveniently creating Bode plots and determining eigenvalue-based Nyquist stability criterion for the system is currently under development.





SAMPLE CASES FOR FLYWHEEL AND PUMPED STORAGE

RSCAD now features fully documented flywheel and pumped hydro storage sample cases, which provide a launch point for users looking to explore mechanical energy storage applications. The pumped hydro storage case is based on a variable speed doubly-fed induction machine system, with the machine, converters, and PWM firing pulse generation modelled in the Substep environment. The flywheel case models an additional mass added to the rotor of a permanent magnetic synchronous machine, and includes a back-to-back converter and firing pulse generator in the Substep environment. Both cases have average value model (AVM) versions, which reduce the quantity of simulation hardware required to run the case. The new cases can be found in the Samples directory.



CLICK HERE TO LOG IN TO THE RTDS CLIENT AREA WHERE YOU CAN ACCESS THE FULL RSCAD RELEASE NOTES.

*If you have an idea for a new feature, please send it to **FEEDBACK@RTDS.COM**. We want to hear from you!*

STAY IN-THE-LOOP WITH RTDS ONLINE: