

# RTDS NEWS

June 2000



## Siemens and RTDS Technologies – Successful Cooperation

Siemens is presently the largest single user of the RTDS® Simulator. In total, they have twenty racks of RTDS equipment installed in the simulation labs of Erlangen, Germany. Their first installation was a two-rack system put in place in 1993, one of the first in the world.

Using the initial installation, Siemens took time to evaluate and validate the RTDS Simulator before proceeding to expand the system. In 1995-96, they began the systematic transition from their traditional analogue simulator to the fully digital system. The process has been gradual and there have been many cooperative efforts between Siemens and RTDS Technologies along the way.

In their work, Siemens uses the RTDS Simulator to test a variety of control and protection equipment, using a wide range of Simulator configurations. Tests have been carried out on controllers for SVC, HVDC, Grid Master Power Controllers (GMPC) and TCSC.

In many cases, the RTDS Simulator was also used to perform the Factory System Tests (detailed tests of an installation's integrated control and protection systems, requiring a vast amount of digital and analogue I/O exchange).

Detailed protection system tests have also been conducted using various customer specific configurations. The protection systems under test have ranged from production relays to newly developed TCSC protection systems.

For all of these studies, Siemens is able to take advantage of the shorter set-up times and greater operating flexibility provided by the fully digital system.

Before RTDS Technologies developed the Improved Firing Algorithm (IFA), Siemens became expert at interfacing the fully digital RTDS with analogue valves. The technique was used successfully for the testing of both SVC and HVDC systems. In one case,

Siemens even provided a customer with an RTDS-analogue valve hybrid system as part of an HVDC project.

However since the development of the IFA, Siemens has moved to fully digital simulations with most new FACTS projects. The IFA was first used for an SVC project and most recently for a TCSC installation. For HVDC, GTO and IGBT applications, the hybrid scheme is still in use. However, it is also planned to use the new 3PC valve group component, with IFA and internal faults, for fully digital, real time, simulation tests on future HVDC projects.

Through the work already conducted, Siemens have confirmed that the IFA has allowed the RTDS Simulator to simulate the function of a thyristor valve with accuracy equal to that of an analogue valve model. This kind of practical feedback has proven invaluable to RTDS Technologies in evaluating the result of R&D and in guiding future efforts.

The cooperation between Siemens and RTDS Technologies has also provided the push for, and occasionally the sponsoring of, new component development. Such components include the induction machine, enhanced SVC, enhanced TCSC, components to assist with the interfacing of analogue valve groups, etc.

Siemens input and cooperation is very welcome at RTDS Technologies as it has benefited all RTDS users and served to improve the system in many respects.

### **Stay Tuned**

*Currently at RTDS Technologies we are developing software that will provide automatic conversion from transient stability (PSS/E format) to PSCAD Draft graphical format. The software is currently being tested as work on the KEPS system progresses and is intended for release later this year.*

### **KEPS Update**

KEPS Stage III, the final stage, will be delivered in September 2000. The system's final 26 rack, 3PC-WIF based configuration is now in operation at RTDS Technologies. This is certainly the most powerful real time simulator ever configured.

The system has more than twice the number of racks previously installed in any single RTDS Simulator, with the synchronization (global bus) signal being passed via fiber optic cable.

### **New DIO Card**

The Digital Input Output (DIO) Card was developed mainly to allow optical isolation of digital signals within the confines of the Portable RTDS Simulator. The card is rack mounted, unlike most of the other newly developed I/O cards which are rail mounted. Digital signals connect to the DIO from the processor cards via two digital ports found in the rear. The isolated signals (32 input and 32 output) are connected to external equipment using 2mm banana plugs located on the front faceplate.

The DIO can be added to any RTDS Simulator rack that has an empty slot available. The only requirement is an isolated power supply for the external side of the card. Therefore, it is easy to use the DIO to upgrade a system where additional isolated digital channels are required.

### **Upcoming Events**

#### ***Electricity – The New Millennium***

*Exhibition June 18-21, 2000 in Montreal, Canada.*

#### ***IEEE/PES Summer Meeting***

*Hospitality Suite July 16-20, 2000 in Seattle, USA*

#### ***Cigré 2000***

*Exhibition August 26 to September 1, 2000 in Paris, France.*

#### ***CEPSI 2000***

*Exhibition October 23-27, 2000 in Manila, Philippines.*