⫴RTDS Technologies

TECHNICAL PUBLICATIONS

If you would like further information on any of these technical publications please email rtds@rtds.com.

PROTECTION SYSTEM TESTING

Real Time Requirements and Closed-Loop Testing of Wide Area Protection and Control Schemes
Presented at XII Symposium of Specialists in Electric Operational and Expansion Planning, Brazil, 2014, May 18 – 21, 2014, pages 1-7

Utilizing RTDS Simulation Scenarios for PHASOR System Performance Testing at Southern California Edison
Western Protective Relaying Conference, Spokane, WA, 2013.

RTDS Simulation and Testing of a Remedial Action Scheme at Southern California Edison
Western Protective Relaying Conference, Spokane, WA, 2013.

Real Time Digital Simulation for Control Schemes Using Phasor Measurement Units
Presented at XII Symposium of Specialists in Electric Operational and Expansion Planning, Brazil, 2012, May 2012, pages 1 – 9

Using a New Faulted Synchronous Machine Model for Hardware-In-Loop Testing of a Generator Protection Relay
Presented at Southern African Power Systems Protection Conference, Johannesburg, South Africa, 14-16 November 2012

Certification of Protection Relay Models for Eskom Using Real Time Digital Simulation
Presented at Southern African Power Systems Protection Conference, Johannesburg, South Africa, 14-16 November 2012

Experiences with Detailed Hardware-In-Loop Testing of Protection Relays and Settings Within Eskom
Presented at Southern African Power Systems Protection Conference, Johannesburg, South Africa, 14-16 November 2012

Integration of RTDS with EPG Synchrophasor Applications for Visualization and Analysis of Simulation Scenarios at Southern California Edison
North American Power Symposium (NAPS), Champaign, IL, September 2012, pages 1 – 5

Protection Performance Testing in IEC 61850 Based Systems
10th IET International Conference on Developments in Power System Protection (DPSP 2010), Manchester, March 2010, pages 1 - 5

Protection Testing of a 100% Stator Ground Fault Using A Phase Domain Synchronous Machine Model in Real Time
10th IET International Conference on Developments in Power System Protection (DPSP 2010), Manchester, March 2010, pages 1-5

R e a l   t i m e   d i g i t a l   s i m u l a t i o n   f o r   t h e   p o w e r   i n d u s t r y

Testing Methodology for LOM Protection Performance Assessment
10th IET International Conference on Developments in Power System Protection (DPSP 2010), Manchester, March 2010, pages 1-5

Using a Real Time Digital Simulator to Affect the Quality of IEC 61850 GOOSE and Sampled Value Data
10th IET International Conference on Developments in Power System Protection (DPSP 2010), Manchester, March 2010, pages 1-5

Implementation of a Ship-Wide Area Differential Protection Scheme
IEEE Transactions on Industry Applications, November 2008, pages 1864 - 1871

Impact of Fault Current Limiters on Existing Protection Schemes
CIGRE WG A3.16, Electra, No 236, February 2008, pp. 31 - 41

Impact of Waveform Distorting Fault Current Limiters on Previously Installed Overcurrent Relays
IEEE Transactions on Power Delivery, Volume 23, Issue 3, July 2008, pp. 1310 - 1318

A Dynamic Modelling Environment for the Evaluation of Wide Area Protection Systems
Presented at 43rd International Universities Power Engineering Conference (UPEC '08), Padova Italy, September 2008

Real Time Power System Simulation using RTDS and NI PXI
North American Power Symposium (NAPS), Calgary, Canada, September 28th to 30th, 2008

Secondary Arc Extinction and Detection Real and Simulated
IET 9th International Conference on Developments in Power System Protection, 2008. DPSP 2008

Using a Multi-Threaded Time-Step to Model a Multi-Function Relay in a Real Time Digital Simulator
IET 9th International Conference on Developments in Power System Protection, 2008. DPSP 2008,Glasgow, 17 - 20 March 2008, pages 162 - 167

Impact of Waveform Distorting Fault Current Limiters on Previously Installed Overcurrent Relays
IEEE Transactions on Power Delivery, Volume 23, Issue 3, July 2008, pp. 1310-1318.

Comparative Assessment of Differential Relay Model Performance with Hardware Equipment
Grand Challenges in Modeling & Simulation, Summer Simulation Conference (SummerSim), June 16-19, 2008 Edinburgh, Scotland

Designing and Testing Protective Overcurrent Relay Using Real Time Digital Simulation
Grand Challenges in Modeling & Simulation, Summer Simulation Conference (SummerSim), June 16-19, 2008 Edinburgh, Scotland

Modeling and Validation of an Overcurrent Relay Using LabVIEW and RTDS
Grand Challenges in Modeling & Simulation, Summer Simulation Conference (SummerSim), June 16-19, 2008 Edinburgh, Scotland

In System Emulation of a New Current Differential Back-up Protection Relay
DPSP 2008. IET 9th International Conference on Developments in Power System Protection, 2008. Publication Year: 2008 , Page(s): 400 – 405

Large Scale Power System Simulation and PMU testing using a Real Time Digital Simulator

Presented at IPEC 2007, Singapore, December 2007

Performance Comparison of Distance Protection Schemes for Shunt-FACTS Compensated Transmission Lines
IEEE Transactions on Power Delivery,Issue Date: Oct. 2007, Volume: 22 Issue:4, On page(s): 2116 – 2125

Backup Transmission Line Protection for Ground Faults and Power Swing Detection Using Synchrophasors
Proceedings of the 34th Annual Western Protective Relay Conference, October 2007, Spokane, WA.

Hardware-in-the-Loop Simulation of Distance Relay Using RTDS
2007 Summer Simulation Multiconference (SummerSim'07), Jul 14, 2007 - Jul 19, 2007, San Diego, CA United States

Real Time Simulation Testing Using IEC61850
Presented at IPST 2007, Lyon France, June 2007, Session 26 Paper No. 177

Real Time Simulation of Internal Faults in Synchronous Machines
Presented at IPST 2007, Lyon France, June 2007, Session 24 Paper No. 90

Performance Analysis of the ROCOF and Vector Shift Methods Using a Dynamic Protection Modelling Approach
Proc. 15th International Conference on Power System Protection, Bled Slovenia, September 2006, pp. 139-144

Validation of Out-of-Step Protection With a Real Time Digital Simulator
Western Protective Relay Conference 2006, Spokane, Washington, October 17 – 19, 2006

Impact of Shunt- FACTS on Distance Protection of Transmission Lines
Power Systems Conference: Advanced Metering, Protection, Control, Communication, and Distributed Resources, 2006. PS '06

Protective Relay Synchrophasor Measurements During Fault Conditions
Presented at Power Systems Conference: Advanced Metering, Protection, Control, Communication, and Distributed Resources, Clemson USA, March 2006, pp. 83 – 95

Hardware Implementation of a Ship-Wide Area Differential Protection Scheme
Presented at WMSCI 2005, Orlando USA, July 2005, Paper No. S762HI

Performance of Distance Relays on Shunt- FACTS Compensated Transmission Lines
IEEE Transactions on Power Delivery, Volume: 20, Issue: 3, Publication Year: 2005, Page(s): 1837 – 1845

A Generic Real-Time Computer Simulation Model for Superconducting Fault Current Limiters and its Application in System Protection Studies
Applied Superconductivity, IEEE Transactions on, Volume: 15, Issue: 2 , Part: 2
Publication Year: 2005 , Page(s): 2090 - 2093

Real Time Digital Simulation for Control and Protection System Testing
In Proc. PESC 2004, Aachen Germany, June 2004, pp. 329-335

Protective Relay Testing for Relays installed in the Vicinity of Active Power System Components
Presented at the Power System Protection and Automation Conference, New Delhi India, November 2004

Modelling an Impedance Relay using a Real Time Digital Simulator
  In Proc. 8th Annual Conference on Developments in Power System Protection DPSP 2004,
  Amsterdam Netherlands, pp. 665-668

***Simulation Studies of OLTC Transformer AVC Relays Operating in Series using a RTDS,
Real Time Digital Simulator***
  In Proc. 8th Annual Conference on Developments in Power System Protection DPSP 2004,
  Amsterdam Netherlands, pp. 619-622

Testing a Protection System using the RTDS Batch Mode Facility
  In Proc. IPST 2001, Rio de Janeiro Brazil, June 2001, pp. 447-452

Testing Line Current Differential Relays using Real-Time Digital Simulators
  In Proc. IEEE T&D Conference & Exposition 2001, Atlanta USA, November 2001,
  Vol. 1 pp. 516-521

Dynamic Simulations challenge Protection Performance
  In Proc. WPRC 2003, Spokane USA, October 2003, Paper No. 8

HVDC Control and Protection Testing using the RTDS Simulator
  In Proc. 4th International HVDC Transmission Operating Conference,
  Yichang PRC,   September 2001, Paper No. 17 pp. 101-106

A New Algorithm for Digital Low-Impedance Protection of Busbars
  In Proc. IEE/PES Summer Meeting 2001, Vancouver Canada, July 2001, Vol. 1 pp. 97-102

***Implementation of Dynamic Distance Relay Scheme Evaluation Testing Guidelines using
Analogue and Real Time Digital Simulators***
  In Proc. DPSP 2001, Amsterdam Netherlands, April 2001, pp. 213-217

***Simulation of a differential current protection scheme involving multiple Current
Transformers***
  In Proc. ICDS '99, Vasteras Sweden,   May 1999, Poster Session

***Improved Current Transformer Model Based on the Jiles/Atherton Theory of Ferromagnetic
Materials***
  In Proc. ICDS '99, Vasteras Sweden,   May 1999, Session III

A Novel Series Capacitor Bank Protection Scheme Validity Tests
  In Proc. ICDS '99, Vasteras Sweden,   May 1999, Session I

Using a Real-Time Digital Simulator to Test a Circuit Breaker Synchronizer Device
  In Proc. ICDS '99, Vasteras Sweden, May 1999, Session I

Batch Mode Operating Software for Relay Test Applications of the RTDS™ Simulator
  In Proc. EMPD '98, Singapore, March 1998, pp. 356-361

Evaluation and Testing of Line Protection for Series-Compensated Transmission Lines
  In Proc. the 1997 Sixth International Conference on Developments in Power System
  Protection, Nottingham UK, March 1997, pp. 155-158

Comparisons of Relay Transient Test Results Using Various Testing Technologies
  In Proc. ICDS '97, Montreal Canada, May 1997, pp. 57-62

Testing of Integrated Multifunction Protection Systems on the Real-Time Digital Simulator
  In Proc. ICDS '97, Montreal Canada, May 1997, pp. 177-182

Using a Real Time Digital Simulator to Develop an Accurate Model of a Digital Relay

In Proc. ICDS '95, College Station Texas USA, April 1995, pp. 173-178

Testing of the Beckwith Electric M-0430 Multifunction Protection Relay Using Real Time Digital Simulator (RTDS)
In Proc. ICDS '95, College Station Texas USA, April 1995, pp. 49-54

On Site Relay Testing for a Series Compensation Upgrade
Presented at IEEE-PES Summer Meeting, Vancouver British Columbia, Canada, July 1993

A Real Time Digital Simulator for Testing Relays
IEEE Transactions on Power Delivery, Jan. 1992, Vol. 7, No.1, pp. 207 - 213
** IEEE PSRC 1993 PRIZE PAPER **

New Requirements Aiming at the Reusability of Real Time Digital Simulations of Control and Protection System - FURNAS Experience

CONTROL SYSTEM TESTING

Real Time Requirements and Closed-Loop Testing of Wide Area Protection and Control Schemes
Presented at XII Symposium of Specialists in Electric Operational and Expansion Planning, Brazil, May 2014, pages 1-7

Utilizing RTDS Simulation Scenarios for PHASOR System Performance Testing at Southern California Edison
Western Protective Relaying Conference, Spokane, WA, 2013.

RTDS Simulation and Testing of a Remedial Action Scheme at Southern California Edison
Western Protective Relaying Conference, Spokane, WA, 2013.

Co-simulation of an FPGA-based Electromagnetic Transient Model and a Small Time-Step Model in the RTDS Real-Time Digital Simulator
GCMS 2012 at SummerSim '12, Genoa, Italy, July 2012

Real Time Digital Simulation of Wide Area Protection and Control Schemes Using Phasor Measurement Units
Presented at XII Symposium of Specialists in Electric Operational and Expansion Planning, Brazil, May 2012, pages 1-9

Advanced Control Methods and Strategies for Oncor Electric Delivery Renner SVC
IEEE/PES Power Systems Conference and Exposition (PSCE), 2011, Phoenix, March 20 -23, 2011, pages 1-9

Testing the Smarts in the Smart T&D Grid
IEEE/PES Power Systems Conference and Exposition (PSCE), 2011, Phoenix, March 20 -23, 2011, pages 1-8

Design and Development of a Static VAR Compensator for Load Compensation Using Real-Time Digital Simulator and Hardware Simulation
2007 Large Engineering Systems Conference on Power Engineering

Real Time Digital Simulation for Control and Protection System Testing
In Proc. PESC 2004, Aachen Germany, June 2004, pp. 329-335

FURNAS Strategy Regarding Real-Time Tests: A Practical Case – Campos Static VAr Compensator
In Proc. WMSCI 2005, Orlando USA, July 2005, Paper No. S300VW

Control System Improvement and Behaviour Assessment
In Proc. SEPOPE 2002, Brasilia Brazil, May 2002

HVDC Control and Protection Testing using the RTDS Simulator
In Proc. 4th International HVDC Transmission Operating Conference, Yichang PRC,   September 2001, Paper No. 17 pp. 101-106

Using an External Controller with the Real-Time Digital Simulator
In Proc. ICDS '99, Vasteras Sweden,   May 1999, Session IV

Cahora Bassa GMPC Testing using a Real Time Digital Simulator
In Proc. ICDS '97, Montreal Canada, May 1997, pp. 251-256

Application of Real Time Digital Simulation for Commissioning Automatic   Voltage Regulators for Synchronous Condensers
 In Proc. ICDS '97, Montreal Canada, May 1997, pp. 211-216

Model Development of an Actual HVdc Control for the RTDS Simulator
 Late Submissions to ICDS '97, Montreal Canada, May 1997; not included in Conference Proceedings (contact RTDS Technologies for copies)

Control System Modelling using the Real Time Digital Simulator
 In Proc. ICDS '97, Montreal Canada, May 1997, pp. 197-202

HVDC Simulation and Control Testing using a Real Time Digital Simulator (RTDS)
 In Proc. ICDS '95, College Station Texas USA, April 1995, pp. 213-218

Validation of a Fully Digital Real-Time Electromagnetic Transients Simulator for HVDC System & Controls Studies
 In Proc. Athens Powertech (APT'93), Athens Greece, September 1993,   Vol. 2, pp. 751-759

Closed Loop Testing of a Joint VAR Controller Using a Digital Real-Time Simulator
 IEEE Transactions on Power Systems, Aug 91, Vol. 6, No. 3, pp. 1140-1146

New Requirements Aiming at the Reusability of Real Time Digital Simulations of Control and Protection System - FURNAS Experience

HVDC STUDIES

RTDS Environment Development of Ultra-High-Voltage Power System
IEEE Power Engineering Society General Meeting, 2007

HVDC Control and Protection Testing using the RTDS Simulator
In Proc. 4th International HVDC Transmission Operating Conference,
Yichang PRC,   September 2001, Paper No. 17 pp. 101-106

Chandrapur – Padghe HVDC Schemes Coordination Study
In Proc. ICDS '99, Vasteras Sweden,   May 1999, Session I

Validating the Real Time Digital Simulator for HVDC Dynamic Performance Studies
In Proc. ICDS '97, Montreal Canada, May 1997, pp. 245-250

Model Development of an Actual HVdc Control for the RTDS Simulator
Late Submissions to ICDS '97, Montreal Canada, May 1997; not included in Conference
Proceedings (contact RTDS Technologies for copies)

Expanding an Analogue HVDC Simulator's Modelling Capability using a Real Time Digital Simulator (RTDS)
In Proc. ICDS '95, College Station Texas USA, April 1995, pp. 199-204

HVDC Simulation and Control Testing using a Real Time Digital Simulator (RTDS)
In Proc. ICDS '95, College Station Texas USA, April 1995, pp. 213-218

Validation of a Fully Digital Real-Time Electromagnetic Transients Simulator for HVDC System & Controls Studies
In Proc. Athens Powertech (APT'93), Athens Greece, September 1993,   Vol. 2, pp. 751-759

Enhanced Performance of a Conventional HVDC analogue Simulator with a Real-Time Digital Simulator
In Proc. Power Systems Computation Conference (PSCC11), Avignon France, August 1993.
Vol. 1pp. 663-669

FACTS STUDIES

RTDS Implementation of STATCOM for Power System Stability Improvement
  Presented at Saudi Arabia Smart Grid Conference, Jeddah, Saudi Arabia, December 2012

Advanced Control Methods and Strategies for Oncor Electric Delivery Renner SVC
  IEEE/PES Power Systems Conference and Exposition (PSCE), 2011, Phoenix, March 20 -23, 2011, pages 1-9

Performance Comparison of Distance Protection Schemes for Shunt-FACTS Compensated Transmission Lines
  IEEE Transactions on Power Delivery,Issue Date: Oct. 2007, Volume: 22 Issue:4, On page(s): 2116 – 2125

Design and Development of a Static VAR Compensator for Load Compensation Using Real-Time Digital Simulator and Hardware Simulation
  2007 Large Engineering Systems Conference on Power Engineering

Impact of Shunt- FACTS on Distance Protection of Transmission Lines
  Power Systems Conference: Advanced Metering, Protection, Control, Communication, and Distributed Resources, 2006. PS '06

Performance of Distance Relays on Shunt- FACTS Compensated Transmission Lines
  IEEE Transactions on Power Delivery, Volume: 20, Issue: 3, Publication Year: 2005, Page(s): 1837 - 1845

FURNAS Strategy Regarding Real-Time Tests: A Practical Case – Campos Static VAr Compensator
  In Proc. WMSCI 2005, Orlando USA, July 2005, Paper No. S300VW

FURNAS TCSC – An Example Using Different Simulation Tools for Performance Analysis
  In Proc. IPST 2001, Rio de Janeiro Brazil, June 2001, pp. 675-680

SVC for Resonance Control in NamPower Electrical Power System
  In Proc. IEE/PES Summer Meeting 2001, Vancouver Canada, July 2001, Vol. 1 pp. 860-865

Advanced Fully Digital TCSC Real-Time Simulation
  In Proc. CEPSI 2000, Manila Philippines, October 2000

Advanced Fully Digital TCSC Real-Time Simulation in Comparison with Computer Studies and On-Site Testing
  In Proc. ICDS '99, Vasteras Sweden, May 1999, Session VIII

A Novel Series Capacitor Bank Protection Scheme Validity Tests
  In Proc. ICDS '99, Vasteras Sweden, May 1999, Session I

Evaluation and Testing of Line Protection for Series-Compensated Transmission Lines
  In Proc. the 1997 Sixth International Conference on Developments in Power System Protection, Nottingham UK, March 1997, pp. 155-158

Advanced SVC Testing using a Real Time Digital Simulator
  In Proc. ICDS '97, Montreal Canada, May 1997, pp. 265-270

Advanced Hybrid Testing in FACTS Environment using a Real Time Digital Simulator
  Late Submissions to ICDS '97, Montreal Canada, May 1997; not included in Conference Proceedings (contact RTDS Technologies for copies)

Real time digital simulation for the power industry

Application of Real Time Digital Simulation for Commissioning Automatic   Voltage Regulators for Synchronous Condensers
  In Proc. ICDS '97, Montreal Canada, May 1997, pp. 211-216

On-Site Transient Testing for a Series Compensation Upgrade
  In Proc. ICDS '95, College Station Texas USA, April 1995, pp. 335-340

On Site Relay Testing for a Series Compensation Upgrade
  Presented at IEEE-PES Summer Meeting, Vancouver British Columbia, Canada, July 1993

GENERAL POWER SYSTEM SIMULATION

Power Hardware-in-the-Loop Testing of a YBCO Coated Conductor Fault Current Limiting Module
  IEEE Trans. on Applied Superconductivity, Special Issue from the Applied Superconductivity Conference, Chicago, August 17-22, 2008.

Wide Band Equivalent For Real Time Digital Simulators
  Presented at WMSCI 2007, Orlando USA, July 2008, Paper No. S013BM

Voltage Sensitivity to Capacitor Switching on an Existing Fixed Speed Induction Generator Wind Farm
  Presented at IEEE Power Engineering Society General Meeting, June 24-28, 2007. pp. 1-4.

Real-Time Digital Time-Varying Harmonic Modeling and Simulation Techniques: IEEE Task Force on Harmonics Modeling and Simulation
  IEEE Trans. on Power Delivery, Volume 22, Issue 2, April 2007, pp. 1218-1227.

Development of a Training Simulator for Power System Operation
  Presented at WMSCI 2006, Orlando USA, Paper No. S154GT

UMEC Transformer Model for the Real Time Digital Simulator
  In Proc. IPST 2005, Montreal Canada, June 2005, Paper No. IPST05-077-25a

A Real-time Platform for Teaching Power System Control Design
  International Conference on Power Systems Transients, IPST 2005

Recent Developments in Digital Real Time Simulation for Power Systems
  In Proc. WMSCI 2005, Orlando USA, July 2005, Paper No. S762HI

Real Time Simulation for Advanced Time-Varying Harmonic Analysis
  In Proc. IEEE Power Engineering Society General Meeting, 12-16 June 2005, pages 2250-2252, volume 3

A Generic Real-Time Computer Simulation Model for Superconducting Fault Current Limiters and Its Application in System Protection Studies
  IEEE Trans. Applied Superconductivity, Volume 15, Issue 2, Part 2, June 2005, pages 2090-2093.

The FURNAS' Experience on Real Time Simulation
  Presented at IX SEPOPE, Rio de Janeiro Brazil, May 2004

Complexity in Power Systems and Consequences for Real-Time Computing
  In Proc. PSCE 2004, New York USA, October 2004, Paper No. PSCE2004-000711

An Efficient Saturation Algorithm for Real Time Synchronous Machine Models using Flux Linkages as State Variables
  In Proc. Electrimacs 2002, Montreal Canada, June 2002

New Simulation Tools for Power Systems
  In Proc. IEEE T&D Conference & Exposition 2001, Atlanta USA, November 2001,
  Vol. 1 pp. 91-96

Comparison of Transient Stability Analysis and Large-Scale Real Time Digital Simulation
  In Proc. IEEE Porto PowerTech '2001, Porto Portugal, Sept. 2001, EMT-175

Development and Testing of a Large Scale Digital Power System Simulator at KEPCO

In Proc. IPST2001, Rio de Janeiro Brazil, June 2001, pp. 704-709

Computer and Real-Time Simulation of Large Power Systems
In Proc. CEPSI 2000, Manila Philippines, October 2000

Power System Analysis Using the Real Time Digital Simulator
In Proc. ICEE2K, Kitakyushu Japan, July 2000

Overview & Comparison of Power System Analysis and Study Tools
In Proc. IERE Workshop, Taejon Korea, September 1999, pp. 63-69

Comparison of IEEE Benchmark for Computer Simulation of Subsynchronous Resonance
In Proc. ICDS '99, Vasteras Sweden,   May 1999, Poster Session

Overview of the Development and Installation of KEPCO Enhanced Power System Simulator
In Proc. ICDS '99, Vasteras Sweden,   May 1999, Session VII

The Implementation of the Cholesky Factorization Routine in the RTDS Real Time Network Solution
In Proc. ICDS '99, Vasteras Sweden,   May 1999, Session III

Development of Real-Time Simulation Technology - Summary of Experiences and Results
In Proc. ICDS '99, Vasteras Sweden,   May 1999

RTDS - A Fully Digital Power System Simulator Operating in Real Time
In Proc. ICDS '95, College Station Texas USA, April 1995, pp. 19-24

Fully Digital Real-Time Electromagnetic Transients Simulator
In Proc. IERE International Electric Research Exchange, Workshop on   New Issues in   Power System Simulation, Caen France, March 1992, pp. 218-228

SMART GRID & DISTRIBUTED GENERATION

Real Time Requirements and Closed-Loop Testing of Wide Area Protection and Control Schemes
Presented at XII Symposium of Specialists in Electric Operational and Expansion Planning, Brazil, 2014, May 18 – 21, 2014, pages 1-7

A PHIL Facility for Microgrids
International Journal of Distributed Energy Resources, Technology & Science Publishers, ISSN 1614-7138 01/2013; Vol. 9(No. 1):89-104, January – March 2013

FPGA Model of a High-frequency Power Electronic Converter in an RTDS Power System Co-simulation
IEEE Electric Ship Technologies Symposium (ESTS), 2013, Arlington, VA, USA, April 2013, pages 71-75

Automatic Distributed Voltage Control Algorithm in Smart Grids Applications
Published in IEEE Transactions on Smart Grid. Volume 4, Issue 2, June 2013.

Real Time Digital Simulation for Control Schemes Using Phasor Measurement Units
Presented at XII Symposium of Specialists in Electric Operational and Expansion Planning, Brazil, 2012, May 2012, pages 1 – 9

Integration of RTDS with EPG Synchrophasor Applications for Visualization and Analysis of Simulation Scenarios at Southern California Edison
North American Power Symposium (NAPS), Champaign, IL, Sept. 2012, pages 1-5

Laboratory Experiences with Power-Hardware-in-the-Loop Simulation for Distributed Energy Resources
Presented at 3rd IEEE PES Innovative Smart Grid Technologies (ISGT) Conference. Berlin, Germany, October 17, 2012.

Power System Stability Enhancement Through Wide Area Measurements
Presented at Saudi Arabia Smart Grid Conference, Jeddah, Saudi Arabia, December 2012

Testing the Smarts in the Smart T&D Grid
IEEE/PES Power Systems Conference and Exposition (PSCE), 2011, Phoenix, March 20 -23, 2011, pages 1-8

Protection Performance Testing in IEC 61850 Based Systems
10th IET International Conference on Developments in Power System Protection (DPSP 2010), Manchester, March 2010, pages 1-5

Using a Real Time Digital Simulator to Affect the Quality of IEC 61850 GOOSE and Sampled Value Data
10th IET International Conference on Developments in Power System Protection (DPSP 2010), Manchester, March 2010, pages 1-5

PV-Wind-Fuel Cell-Electrolyzer Micro-grid Modeling and Control in Real Time Digital Simulator
Presented at ICCEP 2009, Capri, Italy, June 2009

A Dynamic Modelling Environment for the Evaluation of Wide Area Protection Systems
Presented at 43rd International Universities Power Engineering Conference (UPEC '08), Padova Italy, September 2008

A Study on Stability Enhancement of Distributed Generators

Real time digital simulation for the power industry

Presented at 2008 IEEE Power Engineering Society General Meeting, Pittsburgh USA, July 2008

Performance of Induction Generator Protection During Distributed Network Disturbances
Proc. IET 9th International Conference on Developments in Power System Protection, Glasgow UK, March 2008, Vol. 1, pp. 529-534

Large Scale Power System Simulation and PMU testing using a Real Time Digital Simulator
Presented at IPEC 2007, Singapore, December 2007

Voltage Source Converter Modeled in RTDS – Experiences and Comparison with Field Results
Presented at IPST 2007, Lyon France, June 2007, Session 24 Paper No. 76

Real Time Simulation Testing Using IEC61850
Presented at IPST 2007, Lyon France, June 2007, Session 26 Paper No. 177

The CAPS-SNL Power System Security Testbed
Presented at Third International Conference on Critical Infrastructures, Alexandria USA, Sept 2006

Development of a Unified Design, Test, and Research Platform for Wind Energy Systems Based on Hardware-in-the-Loop Real-Time Simulation
IEEE Transactions on Industrial Electronics, Volume 53, Issue 4, June 2006, pages 1144-1151.

A Real-Time Controller Concept Demonstration for Distributed Generation Interconnection
In Proc. IEEE Power Engineering Society General Meeting, Montreal, QC, Canada, June 2006.

Protective Relay Synchrophasor Measurements During Fault Conditions
Presented at Power Systems Conference: Advanced Metering, Protection, Control, Communication, and Distributed Resources, Clemson USA, March 2006, pp. 83 – 95

Development of a Unified Design Test and Research Platform for Wind Energy Systems Based on Hardware-in-the-Loop Real-Time Simulation
IEEE 35th Annual Power Electronics Specialists Conference, 2004. PESC 04

POWER ELECTRONICS

FPGA model of a High-frequency Power Electronic Converter in an RTDS Power System Co-simulation
R. Meka, M. Sloderbeck, Md. O. Faruque, J. Langston, M. Steurer, L. S. DeBrunner.
Proceedings of the IEEE Electric Ship Technologies Symposium (ESTS 13), Arlington, VA 22-24, 2013

RTDS Implementation of STATCOM for Power System Stability Improvement
Presented at Saudi Arabia Smart Grid Conference, Jeddah, Saudi Arabia, December 2012

Co-simulation of an FPGA-based Electromagnetic Transient Model and a Small Time-Step Model in the RTDS Real-Time Digital Simulator
GCMS 2012 at SummerSim '12, Genoa, Italy, July 2012

Backup Transmission Line Protection for Ground Faults and Power Swing Detection Using Synchrophasors

Study of Power Loss of Small Time-Step VSC Model in RTDS
In Proc. Of the IEEE PES General Meeting, June 24-28, 2007 in Tampa, Florida, USA (submission no. 07GM1261)

Hardware-in-the-Loop Investigation of Rotor Heating in a 5 MW HTS Propulsion Motor
IEEE Trans. on Applied Superconductivity, Volume 17, Issue 2, Part 2, June 2007, pp. 1595-1598

Voltage Source Converter Modeled in RTDS – Experiences and Comparison with Field Results
Presented at IPST 2007, Lyon France, June 2007, Session 24 Paper No. 76

PEBB based High-Power Hardware-In-Loop Simulation Facility for Electric Power Systems
In Proc. IEEE Power Engineering Society General Meeting, Montreal, QC, Canada, June 2006

Use of RTDS Real-Time Simulator for Dynamomoter Control in Electrical Machine Testing.
In Proc. SCI 2004, Orlando USA, July 2004, Paper No. S874EP

Small Time-Step (<2μSec) VSC Machine Drives for the Real Time Digital Simulator
In Proc. Electrimacs 2005, Hammamet Tunisia, April 2005, Paper No. 210

Small Time-Step (<2μSec) VSC Model for the Real Time Digital Simulator
In Proc. IPST 2005, Montreal Canada, June 2005, Paper No. IPST05-168-25c

The Real Time Digital Simulation of a Single Phase Voltage Source Converter and its Application
In Proc. IPST 2003, New Orleans USA, October 2003, Paper No. 13-2

MARINE SYSTEMS

FPGA model of a High-frequency Power Electronic Converter in an RTDS Power System Co-simulation
Proceedings of the IEEE Electric Ship Technologies Symposium (ESTS 13), Arlington, VA 22-24, 2013

Adaptive Transfer Function Estimation of a Notional High-Temperature Superconducting Propulsion Motor
Accepted for publication in IEEE Transactions on Industrial Applications, accepted January 2008.

Controls for Minimizing Ship Power System Frequency Fluctuations
In Proc. ASNE Controls & Automation Symposium, Biloxi, MS, December 10-11, 2007

A Co-Simulation Approach for Real-Time Transient Analysis of Electro-Thermal System Interactions on Board of Future All-Electric Ships
In Proc. Of the 2007 Summer Computer Simulation Conference, July 15-18 2007, San Diego, CA

Characterization of the Transient Behaviour of an AC/DC Conversion System for a Notional All-Electric Ship Simulation Using Sequential Experimental Design Methodology
In Proc. Of the 2007 Summer Computer Simulation Conference, July 15-18 2007, San Diego, CA

Applying Controller and Power Hardware-in-the-Loop Simulation in Designing and Prototyping Apparatuses for Future All Electric Ship
Proc. Of 2007 IEEE Electric Ship Technologies Symposium, May 22-23, Arlington, USA

Investigating the Impact of Pulsed Power Charging Demands on Shipboard Power Quality
Proc. Of 2007 IEEE Electric Ship Technologies Symposium, May 22-23, Arlington, USA

Sequential Experimental Design Based Modeling of a Notional All-Electric Ship AC/DC Conversion System for Sensitivity and Uncertainty Analysis
Proc. Of 2007 IEEE Electric Ship Technologies Symposium, May 22-23, Arlington, USA.

Crashback Simulations of a Notional Destroyer-Class All-Electric Ship
Presented at the ASNE Advanced Naval Propulsion Symposium 2006, Arlington, VA, October 30-31, 2006.

Demonstrating the Power Hardware-in-the-Loop through Simulations of a Notional Destroyer-Class All-Electric Ship System during Crashback
Presented at the ASNE Advanced Naval Propulsion Symposium 2006, Arlington, VA, October 30-31, 2006

Augmenting E-Ship Power System Evaluation and Converter Controller Design by Means of Real-Time Hardware-in-Loop Simulation
Proc. Of 2005 IEEE Electric Ship Technologies Symposium, July 25-27, Philadelphia, USA, pp.171-175.

Hardware Implementation of a Ship-Wide Area Differential Protection Scheme
Presented at WMSCI 2005, Orlando USA, July 2005, Paper No. S762HI

Progress and Challenges in Real Time Hardware-in-the-Loop Simulations of Integrated Ship Power Systems
In Proc. IEEE Power Engineering Society General Meeting, 12-16 June 2005, pages 534-537, vol. 1.

Large-Scale Simulation of Naval Power Systems for Design Optimization
Electric Machine Technology Symposium 2004, Philadelphia USA, January 2004

POWER HARDWARE-IN-THE-LOOP (PHIL)

A PHIL Facility for Microgrids
International Journal of Distributed Energy Resources, Technology & Science Publishers, ISSN 1614-7138 01/2013; Vol. 9(No. 1):89-104, January – March 2013

Comparison of Multiple Power Amplification types for Power Hardware-in-the-Loop Applications
Complexity in Engineering (COMPENG), 2012, Aachen, Germany, June 2012, pages 1-6

Laboratory Experiences with Power-Hardware-in-the-Loop Simulation for Distributed Energy Resources
Presented at 3rd IEEE PES Innovative Smart Grid Technologies (ISGT) Conference. Berlin, Germany, October 17, 2012.

Design, Development and Operation of a PHIL Environment for Distributed Energy Resources
IEEE   IECON   2012,   Montreal,   Canada,   October   2012

Improve the Stability and the Accuracy of Power Hardware-in-the-Loop Simulation by Selecting Appropriate Interface Algorithms
Industry Applications, IEEE Transactions on, Volume: 44, Issue: 4, Publication Year: 2008, Page(s): 1286 – 1294

Accuracy Evaluation in Power Hardware-in-the-Loop (PHIL) Simulation
In Proc. Of the 2007 Summer Computer Simulation Conference, July 15-18, 2007. San Diego, CA

Hardware-in-the-Loop Investigation of Rotor Heating in a 5 MW HTS Propulsion Motor
IEEE Trans. On Applied Superconductivity, Vol. 17, Issue 2, Part 2, June 2007, pp. 1595-1598

Applying Controller and Power Hardware-in-the-Loop Simulation in Designing and Prototyping Apparatuses for Future All Electric Ship
Electric Ship Technologies Symposium, 2007. ESTS '07. IEEE, Publication Year: 2007, Page(s): 443 – 448

Demonstrating the Power Hardware-in-the-Loop through Simulations of a Notional Destroyer-Class All-Electric Ship System during Crashback
Presented at the ASNE Advanced Naval Propulsion Symposium 2006, Arlington, VA, October 30 - 31, 2006

Development of a Unified Design, Test, and Research Platform for Wind Energy Systems Based on Hardware-in-the-Loop Real-Time Simulation
IEEE Transactions on Industrial Electronics, Volume 53, Issue 4, June 2006, pages 1144-1151.

Augmenting E-Ship Power System Evaluation and Converter Controller Design by Means of Real-Time Hardware-in-Loop Simulation
Proc. Of 2005 IEEE Electric Ship Technologies Symposium, July 25-27, Philadelphia, USA, pp.171-175.

Testing a 5 MW High-Temperature Superconducting Propulsion Motor
Proc. Of 2005 IEEE Electric Ship Technologies Symposium, July 25-27, Philadelphia, USA, pp. 171-175.

Progress and Challenges in Real Time Hardware-in-the-Loop Simulations of Integrated Ship Power Systems

In Proc. IEEE Power Engineering Society General Meeting, 12-16 June 2005, pages 534-537, vol. 1.

Real Time Digital Simulations Augmenting the Development of Functional Reconfiguration of PEBB and Universal Controller
Presented at the 24th American Control Conference (ACC) in Portland, OR, USA, June 8-10, 2005.

Experimental Determination of Dynamic Parameters for a Superconducting Machine
IEEE Transaction on Applied Superconductivity, Vol. 15, No. 2, June 2005. Pages: 2154 – 2157.

A Novel Approach to Power Quality Assessment: Real Time Hardware-in-the-Loop Test Bed
IEEE Trans. PD, Volume 20, Issue 2, Part 1, April 2005, pp. 1200-1201.