



Faculty of Electrical Engineering,
University of Žilina, Slovak Republic



PROGRAM

of the 10th International Conference

ELEKTRO 2014

Hotel Diplomat, Rajcke Teplice, Slovak Republic, May 19 –20, 2014



International Scientific Committee

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WUILPART, M., UM Mons, Belgium

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BRIDA, P.
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PIRNIKOVA, S.
PROKROSOVA, K.
RAFAJDUS, P.
ROCH, M.
STRAPACOVA, T.

PROGRAM

Monday 19 May 2014

08:00 – 09:30 Registration

09:45 – 10:00 Opening Ceremony – the City Hall

10:00 – 12:15 Invited Lectures– the City Hall

Teletraffic models beyond Erlang

Michael D. Logothetis and Ioannis D. Moscholios,

University of Patras and University of Peloponnese, Greece

Novel Trends in Numerical Modelling of Multiphysics Problems in Electromagnetics

Ivo Dolezel et al., University of West Bohemia, Czech Republic

Photonic crystals for optoelectronics

Dusan Pudis, University of Zilina, Slovak Republic

Power Electronics as Key Factor in Generation, Transmission, and Usage of Electric Energy

Helmut Weiss, Montan universitaet Leoben, Austria

12:30 – 13:30 Lunch

14:00 – 15:20 Sessions

15:20 – 15:40 Coffee Break

15:40 – 17:00 Sessions

17:00 – 18:00 Poster Section

18:00 – 19:00 IEEE/IAS/IES Meeting, Congress room

19:30 – Conference Gala Dinner

Tuesday 20 May 2014

08:00 – 09:00 Registration

09:00 – 10:20 Sessions

10:20 – 10:40 Coffee Break

10:40 – 12:00 Sessions

12:00 – 13:00 Poster Section

13:00 – 13:15 Closing ceremony, Congress room

13:15 – 13:45 Lunch

MONDAY 19 MAY 2014

SESSIONS AND POSTER SECTION

TA1 Information and Communication Technologies and Services

14:00 – 15:20 Lobby Bar, ground floor

chairman: Logothetis M., co-chairman: Brida P.

Petr Chlumsky, Jiri Vodrazka

Delay Analysis of Data Transmission System with Channel Coding

Boris I. Shakhtarin, Alexander A. Makarov, Yana A. Kupriyanova

Measurer of the Random Radiopulse with Free-Form Envelope and Unknown Time-and-Frequency and Power Parameters

Tamas Berczes, Adam Horvath

A Finite-Source Queuing Model for Spectrum Renting in Mobile Cellular Networks

Juraj Machaj, Peter Brida, Jozef Benikovsky

Using GSM Signals for Fingerprint-based Indoor Positioning System

TA2 Mechatronics and Electronics

14:00 – 15:20 VIP room, third floor

chairman: Yaskiv V., co-chairman: Drgona P.

Michal Frivaldsky, Pavol Spanik, Peter Drgona, Ondrej Hock

Influence of Transformer Core Geometry on the Qualitative Indexes of front-end Converters

Pavol Spanik, Michal Frivaldsky, Andrej Kanovsky

Life-time of the Electrolytic Capacitors in Power Applications

Vojtech Blahník, Zdenek Peroutka, Jakub Talla, Ivan Matuljak

Controlled Single-phase Current Source with LCL Filter

Frantisek Duchon, Michal Tolgyessy, Lubos Chovanec, Peter Paszto, Andrej Babinec, Pavol Gardian

RGB-D Mapfor Robot Navigation

TA3 Power Electrical Systems

14:00 – 15:20 Congress room

chairman: Cacciato M., co-chairman: Spanik P.

Volodymyr Yaskiv, Anna Yaskiv, Alexander Abramovitz

Performance Evaluation of MagAmp Regulated Isolated AC-DC Converter with High PF

Juraj Koscelnik, Michal Prazenica, Michal Frivaldsky, Stefan Ondirko

Design and Simulation of Multi-element Resonant LCTL C Converter with HF Transformer

Marek Valco, Peter Sindler, Jozef Sedo, Jozef Kuchta

Inverter Output Voltage under Different Type of Loads

Juraj Koscelnik, Michal Frivaldsky, Michal Prazenica, Roman Mazgut

A review of Multi-elements Resonant Converters Topologies

TA5 Trends in Theoretical and Applied Electrical Engineering

14:00 – 15:20 Winter Garden, ground floor

chairman: Annaroi M. De Paor, co-chairman: Capova K.

Davidson Clare M., De Paor M. Annaroi, Lowery M. Madeleine

Using the Root Locus Method to Analyze Pathological Oscillations in Neurological Diseases

J. Misek, M. Gala, B. Babusiak

Capacitive Electrocardiography Measurement with Indirect Skin Contact

Libor Hargas, DusanKoniar, Miroslav Hrianka, Peter Durdik, Peter Banovcin

Integration of LabVIEW-Based Virtual Instruments to Modern Respirology Diagnostics

Libor Hargas, Dusan Koniar, Miroslav Hrianka, Anna Simonova, Durdik Peter, Peter Banovcin

Adjusting and Conditioning of High Speed Video Sequences for Diagnostic Purposes in Medicine

TA1 Information and Communication Technologies and Services

15:40 – 17:00 Lobby bar, ground floor

chairman: Mullerova J., co-chairman: Hudec R.

Josef Horalek, Jan Matyska, Vladimir Sobeslav, Petr Suba

Energy Efficiency Measurements of Data Center Systems

Stefan Badura, Milan Fratrik, Ondrej Skvarek, Martin Klimo

Bimodal Vowel Recognition Using Fuzzy Logic Networks – Naive Approach

Peter Sykora, Patrik Kamencay, Martina Zachariasova, Robert Hudec

Hand Gesture Recognition Based on Depth Map

Lubomir Scholtz, Dusan Korcek, Libor Ladanyi, Jarmila Mullerova

Tunable Thin Film Filters for the Next Generation PON Stage 2 (NG-PON2)

TA2 Mechatronics and Electronics

15:40 – 17:00 VIP room, third floor

chairman: Yaskiv V., co-chairman: Frivaldsky M.

Pavol Spanik, Michal Frivaldsky, Peter Drgona

Optimization Procedure for Selection of Active Components of DC-DC Converter's Thermal Simulation Model

Gaetano Pecoraro, Mario Cacciato, Giuseppe Scarcella, Giacomo Scelba

Design of Sine Wave Filters for Motor Drives Based on Genetic Algorithms

Bohumil Skala, Vladimir Kindl, Roman Pechanek, Jan Sobra

Problems with the Drive of the Coal-Conveyor

Bohumil Skala, Vaclav Kus, Roman Pechanek

Problems Concerning the Overloading of the Wastewater Pump Drive

E. Zaitseva, M. Kvassay, V. Levashenko, J. Kostolny

Reliability Analysis of Logic Network by Logical Differential Calculus

TA3 Power Electrical Systems

15:40 – 17:00 Congress room

chairman: Novak M., co-chairman: Brandt M.

Jozef Jurcik, Miroslav Gutten, Daniel Korenciak, Pawel Zukowski, Tomasz N. Koltunowicz, Konrad Kierczynski, Jan Subocz, Marek Szrot
Analysis of AC Conductivity in Wet Oil Impregnated Insulating Paper

Milan Sebok, Jozef Jurcik, Miroslav Gutten, Pawel Zukowski, Tomasz N. Koltunowicz, Konrad Kierczynski, Jan Subocz, Marek Szrot
Moisture Level Content Analysis in Oil Impregnated Pressboard used in Power Transformers

Miroslav Novak, Miloslav Kosek
Unbalanced Magnetic Pull Induced by the Uneven Rotor Magnetization of Permanent Magnet Synchronous Motor

Richard Janura, Jozef Jurcik, Miroslav Gutten, Daniel Korenciak
Analysis of Distribution Transformer Insulation Using Domain Method

TA5 Trends in Theoretical and Applied Electrical Engineering

15:40 – 17:00 Winter Garden, ground floor

chairman: Dolezel I., co-chairman: Smetana M.

Jozefa Cervenova, Lukas Hajro
One Possibility of Signal Processing

Hynek Bachraty, Katarina Bachrata
On Modeling Blood Flow in Microfluidic Devices

Mariana Usakova, Elemir Usak, Vladimir Jancarik
Magnetic Properties of Ni Ferrites Substituted by Divalent Zn, Cu and Co Ions

Maciej Oziemblowski, Tomasz Drozd, Igor P.Kurytnik, Lukasz Bobak
Effect of Pulsed Electric Field Strength and Number of Pulses on Fatty Acid Profile of Liquid Whole Egg

Milan Stork
Sinusoidal and Square Wave Voltage Controlled Oscillators

Poster Section

17:00 – 18:00 Reception, ground floor

Martin Matula, Jozef Dubovan, Miroslav Markovic

Sensors Utilization for Weighing Applications of Vehicles in Motion

Oleg V. Chernoyarov, Sai Si Thu Min, Alexandra V. Salnikova, M. Kuba

Detection and Estimation of Abrupt Changes in Gaussian Random Processes with Unknown Parameters

Martin Vestenicky, Martin Vaculik, Katarina Kotianova, Peter Vestenicky, Tomas Mravec

Simplified Algorithm for Antenna Array Radiation Pattern Calculation in MATLAB Environment

Libor Ladanyi, Lubomir Scholtz, Jarmila Mullerova

Numerical Investigation of Soliton Propagation and Interaction in Optical Fibers Using Finite Difference Schema

Miroslav Markovic, Michaela Solanska, Milan Dado

Reservation of Network Resources Depending on the Type of Transmitted Services

Vladimir Sedlak, Daniela Durackova, Tomas Kovacic

Investigation of an Impact of Room Acoustics on Performance of Ideal Binary Mask

Jozef Papan, Pavel Segec, Peter Paluch

Multicast in IP Fast Reroute

Igor Belai, Mikulas Huba

Adaptive DO-FPI Controller for the First-order Plant

Lorand Szabo, Mircea Ruba, Daniel Fodorean, Pavol Rafajdus, Peter Dubravka

Direct Instantaneous Torque Controlled Modular Switched Reluctance Motor Designed for Automotive Applications

Pavel Brandstetter, Ondrej Skuta, Tomas Verner

Implementation of Vector Control with Rotor Time Constant Adaptation for Induction Motor Drive

Ondrej Hock, Peter Drgona, Marek Paskala

Simulation Model of Adjustable Arm using Denavit-Hartenberg Parameters

Peter Cubon, Jozef Sedo, Roman Radvan, JanStancek, Pavol Spanik

Calculation of Demand of Electric Power of Small Electric Vehicle using Matlab GUI

Roman Mazgut, Pavol Spanik, Juraj Koscelnik, Peter Sindler

The Measurement of Balance by the Accelerometer and Gyroscope

Tomas Fedor, Jan Vittek, Peter Sindler

Influence of Variable Moment of Inertia in Robot Servo Motor Control

Lubomir Ostrica, Jozef Jurcik

Detection of Faults Gasoline Injection System for new OBD Systems

David Lindr, Pavel Rydlo, Petr Jirasko

Simplified Inverse Control Method for Two-Mass Servomechanism Vibration Suppression

Miroslav Dulik, Libor Ladanyi

Surface Detection and Recognition using Infrared Light

Jan Sobra, Vladimir Kindl, Bohumil Skala

Determination of the Force Caused by Broken Rotor Bar and Static Eccentricity in an Induction Machine

Petr Bernat, Petr Kacor

Utilisation of Stray Electromagnetic Field for No-contact Operational Diagnostic of Asynchronous Machine

Roman Pechanek

Evaluation of Different Approaches of Mathematical Modelling of Thermal Phenomena Applied to Induction Motors

Vladimir Kindl, Tomas Kavalir, Roman Pechanek, Bohumil Skala, Jan Sobra

Key Construction Aspects of Resonant Wireless Low Power Transfer System

Milan Diko, Pavol Rafajdus, Pavol Makys, Peter Dubravka, Lorand Szabo, Mircea Ruba

A Novel Design Conception of Switched Reluctance Motor for Electrical Vehicles

Zelmíra Ferkova

Two-Phase Induction Motor- a Comparison of the Modeling in ANSYS Maxwell 2D and 3D

Martin Brandt, Adrian Peniak

The Failure of Power Transformer 110/23 kV Identification

Vladimir Chudacik, Ladislav Janousek, Tatiana Strapacova, Milan Smetana

Impact of Selected Defect Parameters on 3D Eddy Current Testing Response Signals

Jindrich Jansa, Karel Slobodnik, Pavel Karban, Ivo Dolezel

Cross-Correlation as a New Evaluation Tool in Pulsed Eddy Current Defectoscopy

Jan Kacerovsky, Frantisek Mach, Nikolayev Denys, Pavel Karban, Ivo Dolezel

Estimation of Charges and Critical Velocity of Plastic Particles in Triboelectric Separator

Marek Lis, Marcjan Nowak, Marek Patro, Andrzej Rusek

A General Form of the Mathematical Model for the Analysis of the Transient States of Complex Electro-Mechanical System with Distributed Parameters

Marek Lis, Marcjan Nowak, Marek Patro, Andrzej Rusek

A Mathematical Model of Single-Mass Electromechanical System Taking into Account the Temperature Effect on System Parameters on the Example of Mill Stand

Adriana Savin, Dagmar Faktorová, Mária Pápežová, Rozina Steigmann

Electromagnetic nondestructive evaluation using metamaterials sensor

IEEE/IAS/IES Meeting

18:00 - 19:00 Congress room

TUESDAY 20 MAY 2014

SESSIONS AND POSTER SECTION

TA 3 Power Electrical Systems

09:00 – 10:20 Congress room

chairman: Vojenciak M., co-chairman: Hoger M.

Dominik Szabó, Michal Regula, Roman Bodnar, Juraj Altus

Control of a SVC for Power Factor Correction

Michal Vojenciak, Bertrand Dutoit, Daniele Colangelo

Indirect Cooling of Superconducting Fault Current Limiter

Roman Bodnar, Alena Otcenasova, Michal Regula, Dominik Szabo

Measurement of Power Quality in Low-voltage Network

Daniel Hropko, Marek Hoger, Marek Roch, Juraj Altus

Reactive Power Optimization of Generators by using Particle Swarm Algorithm

TA 4 Control and Information Systems in Transport and Industry

9:00 – 10:20 Lobby Bar, ground floor

chairman: Janota A., co-chairman: Spalek J., Hrbcek J.

Axel Ruf, Emil Matejka, Ivan Sekaj

Train Control System Without Interlocking. A New Paradigm in Railway Control?

Petr Simonik, Tomas Mrovec, Jiri Takac

Principles and Techniques for Analysis of Automotive Communication Lines and Buses

Peter Nagy, Karol Rastocny

Analysis of the Operator's Error Influence on the Safety of the Controlled Process

Michal Gregor, Juraj Spalek

Curiosity-driven Exploration in Reinforcement Learning

TA 5 Trends in Theoretical and Applied Electrical Engineering

09:00 – 10:20 Winter garden, ground floor

chairman: Stork M., co-chairman: Cap I.

Lukas Koudela

Numerical Calculation and Experimental Verification of Forces during Regulation of Permanent Magnet

Milan Smetana, Klara Capova, Tatiana Strapacova

Evaluation of Biomaterial Stress-Corrosion Cracks by Magnetic Sensors

Ladislav Janousek, Rebican Mihal, Milan Smetana, Tatiana Strapacova, Anton Duca

Advanced Procedure for Non-destructive Diagnosis of Real Cracks from Eddy Current Testing Signals

Renata Tothova, Iveta Jancigova, Ivan Cimrak

Energy Contributions of Different Elastic Moduli in Mesh-Based Modeling of Deformable Objects

TA 6 Materials and Technologies for Electrical Engineering

09:00 – 10:20 VIP room, third floor

chairman: Pudis D., co-chairman: Gomory F.

Peter Hockicko, Jozef Kudelcik, Francisco Munoz, Laura Munoz-Senovilla

Electrical Properties of LiPO₃ Glasses

Milan Fratrik, Martin Klimo, Peter Jancovic

Determining the Switching Properties of the Minimum Function from a Single VI Characteristic

Fedor Gomory, Milos Mosat, Jan Souc

Superconducting Fault Current Limiter Operating in Liquid Nitrogen

Jozef Kudelcik, Lukas Varacka

Pressure Effects on Breakdown in Transformer Oil ITO 100

TA2 Mechatronics and Electronics

10:40 – 12:00 VIP room, third floor

chairman: Cacciato M., co-chairman: Spanik P.

Bohdan Borowik, Igor P. Kurytnik

Microcontrollers Diagnostic System for Performance Evaluation of Stirling Engine

Marek Lazor, Marek Stulrajter

Novel Method for Field Oriented Control of BLDC Motor with Smooth Produced Torque

Tatiana Mudrakova, Milan Zalman, Martin Jarcuska

LMPM Position Control with 4D Bi-Harmonic Master Slave Generator

Petr Simonik, Tomas Mrovec, Jiri Takac

Actuators for Regulation Weight and Air Pressure for Modern Turbodiesel Engines

TA 3 Power Electrical Systems

10:40 – 12:00 Congress room

chairman: Brandstetter P., co-chairman: Pacha M.

Martin Vlasak

Reduction of Exciting Current of Induction Machine During Connection to Electrical Grid

Matej Pacha, Jiri Stepanek

Modelling of Parallel Operation of AC Traction Motors Considering Adhesion and Tilting

Peter Butko, Tomas Fedor, Jan Vittek

Comparison of Energy Consumption for Position Controlled SMPM using Various Energy Near-optimal Control Techniques

Tomas Laskody, Michal Prazenica, Slavomir Kascak

Space Vector PWM for Two-Phase Two-Leg Matrix Converter

TA 4 Control and Information Systems in Transport and Industry

10:40 – 12:00 Lobby Bar, ground floor

chairman: Mikulski J., co-chairman: Franekova M., Holeccko P.

Jan Durech, Maria Franekova, Peter Holeccko, Emilia Bubenikova

Security Analysis of Cryptographic Constructions Used within Communications in Modern Transportation Systems on the Base of Modeling

Marian Hrubos, Ales Janota

Fusion of Sensory Data Obtained by Different Equipment Integrated in the Mobile Measurement Platform

Jan Durech, Marian Hrubos, Maria Franekova, Ales Janota

Implementation of Data from the Mobile Measurement Platform to VANET Application

Peter Vestenicky, Tomas Mravec, Martin Vestenicky

Mathematical Modelling of Single-Bit Passive RFID Marker Localization Methods

TA 5 Trends in Theoretical and Applied Electrical Engineering

10:40 – 12:00 Winter garden, ground floor

chairman: Karban P., co-chairman: Janousek L.

Iveta Jancigova, Renata Tothova

Scalability of Forces in Mesh-Based Models of Elastic Objects

Stefan Borik, Ivo Cap, Branko Babubsiak

Analysis of Nonsymmetrical Arterial Branching using Electromechanical Analogies

Stefan Borik, Ivona Malikova, Johannes Miersch, Daniel Laqua, Sebastian Ley, Peter Husar

Light Source Driver, Photodiode and Impedance Sensing in Plethysmographic Measurements

Branko Babubsiak, Michal Gala, Stefan Borik

Hardware Design of ECG Data Logger

Poster Section

12:00 – 13:00 Reception, ground floor

Oleg V. Chernoyarov, Alexandra V. Salnikova, Boris I. Shakhtarin, Artem E. Rozanov
Threshold Characteristics of the Appearance Time Estimate of the Random Radio Pulse with Free-form Envelope and Inaccuracy Unknown Duration

Vasilios Zarikas, Theofilos Chrisikos, K. E. Anagnostou, Stavros Kotsopoulos, P. Avlakitotis, C. Liolios, T. Latsos, G. Peratzakis, A. Lygdis, D. Antoniou, Asimakis Lykoargiotis

Telemetry Analysis and Wireless Data Communications for a Measuring Station

Slavomir Matuska, Robert Hudec, Miroslav Bencko, Patrik Kamencay, Martina Zachariasova

A Novel System for Automatic Detection and Classification of Animal

Andrej Tkac, Vladimir Wieser

Channel Estimation Using Measurement of Channel Impulse Response

Michal Srnec, Peter Paluch

Towards the Autonomic Network Management and Context Base Routing

Jana Sajgalikova, Milan Dado

Numerical Modeling of Degradation Mechanisms in Single Mode Optical Fibre Using Finite Difference Method

Malgorzata Cupriak, Slawomir Jasinski, Malgorzata Kaliczynska

Integrated IT System for Safety of Large Objects

Pavel Drabek, Martin Pittermann, Miroslav Los, Bedrich Bednar

Traction Drive With Medium-Frequency Transformer - Control Strategy Based on NULL Vectors

Jozef Hrbcek, Vojtech Simak

Controller Design for Nonlinear Stochastic System with Time Delay and Constraints

Anna Kondelova, Jozef Cuntala

Time Models of Dynamic and Static Reconfiguration in FPGAs

Martin Kysela

Data Logger of Tram's Control Signals

Igor Miklosik, Juraj Spalek

Acquisition of Meteorological and Operational Data for the Tunnel Simulator

Jerzy Mikulski

Katowice as a City with an Intelligent Traffic Management System

Lubomir Pekar, Maria Gustafikova, Zuzana Lobotkova

Accident Analysis, Related to the Train Movement in a Track Section in ZSR Conditions

Karol Rastocny, Lubomir Pekar

Analysis of the Causes of Hazards Associated with the Train Movement in Track Section

Vojtech Simak, Dusan Nemec, Jozef Hrbcek

Linear Control of Naturally Unstable System Using PID Regulator

Juraj Zdansky, Karol Rastocny

Influence of Redundancy on Safety Integrity of SRCS with Safety PLC

Miroslav Dulik, Stanislav Jurecka

Measuring Capacitance of Various Types of Structures

Robert Hudec, Miroslav Benco, Slavomir Matuska, Patrik Kamencay, Martina Zachariasova

Utilization of Electro-Conductive Blended Ag/PA Textile Rayon Yarns as Data and Power Wires in an Intelligent Textile Structures

Daniel Kacik, Peter Tatar, Ivan Martinec

Measurement of PDMS Refractive Index by Low-Coherence Interferometry

M. Sarlinova, E. Halasova, P. Palcek, R. Seewald

Fracture Properties of Bone Cements

Lubos Suslik, Dusan Pudis, Peter Gaso, Daniel Jandura, Ivana Lettrichova, Sofia Berezina, Rainer Nolte, Pavol Hronec, Jaroslav Kovac, Peter Schaaf

PDMS Membranes with Surface 2D PhC for Far-Field Pattern Modification of LED

Frantisek Mach, Ivan Novy, Pavel Karban, Ivo Dolezel

Shape Optimization of Electromagnetic Actuators

Ivona Malikova, Ladislav Janousek

Non-Thermal Effects of Low-Frequency Electromagnetic Field on Biological Cells

Maria Papezova, Dagmar Faktorova

Localization of Epileptic Graphoelements

Roman Radil, Jan Barabas, Patrik Kamencay

Innovative Possibility of Small Metal Biomarker Detection Implanted into a Human Bone

Sarlinova M. Halasova E., Palcek P., Seewald R.

Fracture Properties of the Bone Cements

Andrea Stubendekova, Milan Smetana, Ladislav Janousek:

Non-destructive Testing of Artificial Knee Joint by Eddy Current Method

Jakub Manas, Petr Bilik

The Analyser of the Impact of Renewable Electricity Resources on the Flicker in the Distribution System

Martin Galad, Pavol Spanik

Design of Photovoltaic Solar Cell Model for Stand-alone Renewable System

Daniel R. Weisz, Felix A. Himmelstoss

LED Converter with Limited Duty Cycle

Matus Novak, Richard Kravec, Martin Kanalik, Zsolt Conka, Michal Kolcun

UPFC Influence to Transient Stability of Power System

Michal Bahernik, Marek Hoger, Peter Bracinek, Klemen Dezelak

Model of Photovoltaic Power Plant with Constant Resistive Load

Michal Regula, Roman Bodnar, Alena Otcenasova, Dominik Szabo

Monitoring of Voltage Quality in a Future Grid

Stanislav Misak, Lukas Prokop, Petr Bilik

Power Quality Analysis in Off-grid Power System

Vaclav Kusy, Martin Pittermann, Jiri Fort

Control Algorithms of Additional Converter for Reducing the Impact of Voltage Sags to Typical Electric Drive

Tomas Laskody, Slavomir Kascak, Michal Prazenica

Space Vector PWM for Two-Phase Four-Leg Matrix Converter

Vladimir Vavrus, Branislav Dobrucky

Three Phase AC Cable Over-Voltages Analysis for Ultra-Deep Wells Supplying

13:00 – 13:15 Closing ceremony, Congress room