

2nd International Conference on Nuclear Power  
Plants: Structures, Risk and Decommissioning

# NUPP 2018

11 - 12 June 2018

Jurys Inn, Croydon

London, UK

## Programme

Sponsored By



# ABOUT NUPP 2018

Many countries are currently constructing or are in the planning/designing stage of building nuclear power plants. This is primarily to move away from the depleting fossil fuel and in an attempt to combat climate change. However, design construction and operation of these structures poses particular challenge with respect to handling radioactive material. The conference aims to bring together researchers, practitioners to address the structural analysis design, risk analysis and decommissioning technologies employed in the nuclear power plant. This will involve advanced analysis both for strength and load model in order to establish safety level. Probabilities and risk analysis form the basis for the safety of Nuclear Power Plant, the analysis dictate the chances for the reactor in failing in incidents of natural or external incidents. Removal and closure of a plant is also pivotal to the face of Nuclear Energy, in giving confidence to the public. This conference presents the perfect opportunity for you, as it aims to provide an ideal platform for industry leading researchers, technology developers, industrial players and supply chain partners to converge.

NUPP 2018 provides the perfect opportunity for you to do so, as it aims to provide an ideal platform for industry leading researchers, technology developers, industrial players and supply chain partners to converge. Bringing the pioneers together the conference aims to promote the methodologies, exchange of ideas and the way forward to commercialisation.

## Organising Committee

Professor Purnendu Das, ASRANet Ltd, UK

Professor Nawal Prinja, Wood Group (Nuclear), UK

**Prof Ashraf Ayoub**, City University London, UK

**Dr Alfredo Camara**, City University London, UK

**Prof Francesco D'Auria**, University of Pisa, Italy

**Prof Bijan Dutta**, Homi Bhabha National Institute, India

**Prof Yasin Fahjan**, Gebze Technical University, Turkey

**Prof Damien Feron**, Commissariat à l'énergie atomique et aux énergies alternatives, France

**Prof Werner Fuchs**, University of Stuttgart, Germany

**Dr Kelum Gamage**, University of Glasgow

**Dr Luis Ibarra**, University of Utah, USA

**Dr Giorgio Locatelli**, University of Leeds, UK

**Prof Kamran Nikbin**, Imperial College London, UK

**Prof Chris Pearce**, University of Glasgow, UK

**Prof Nawal Prinja**, Wood Group (Nuclear) UK

**Prof Chul-Hwa Song**, Korea Atomic Energy Research Institute

**Dr Konstantinos Daniel Tsavdaridis**, University of Leeds, UK

**Dr Robert Wang**, Engineering Analysis Services (EASL), UK

FULL REGISTRATION      £400

STUDENT REGISTRATION   £200

## CONTACT

ASRANet Ltd

5 ST VINCENT PLACE

G1 2DH

E: [INFO@ASRANet.co.uk](mailto:INFO@ASRANet.co.uk)

T: +44 (0) 141 275 4801



# DAY ONE: MONDAY 11TH JUNE

08:30-08:55 DELEGATE REGISTRATION

08:55-09:00 WELCOME ADDRESS: **PURNENDU DAS**, ASRANET LTD, UK

09:00-09:40 THE ROLE OF NUCLEAR AND R&D IN A BALANCED ENERGY MIX

**KEYNOTE: FIONA RAYMENT** NATIONAL NUCLEAR LABORATORY, UK

## SESSION 1: CHAIR—NAWAL PRINJA

09:40-10:20 THERMAL HYDRAULICS IN NUCLEAR ENGINEERING

**KEYNOTE: HECTOR IACOVIDES**, UNIVERSITY OF MANCHESTER, UK

10:20-11:00 DO WE HAVE ENOUGH DATA? ROBUST APPROACHES FOR DEALING WITH ALEATORY AND EPISTEMIC UNCERTAINTY

**KEYNOTE: EDOARDO PATELLI**, UNIVERSITY OF LIVERPOOL, UK

11:00-11:30 **BREAK**

11:30-11:50 CORROSION AND DECOMMISSIONING

**INVITED: DAMIEN FERON**, CEA, FRANCE

11:50-12:10 LOCAL APPROACHES TO CLEAVAGE FRACTURE—BENEFITS AND CHALLENGES

**INVITED: ANDREY JIVKOV**, UNIVERSITY OF MANCHESTER, UK

12:10-12:30 A CONFINEMENT-DEPENDENT LOAD-INDUCED THERMAL STRAIN CONSTITUTIVE MODEL FOR CONCRETE

**INVITED: PARTHASARATHI MANDAL**, UNIVERSITY OF MANCHESTER, UK

12:30-14:30

## **LUNCH**

## SESSION 2: CHAIR—ASHRAF AYOUB

14:30-14:50 DEVELOPMENT OF A SCINTILLATOR BASED CODED-APERTURE MIXED FIELD IMAGINE SYSTEM FOR NUCLEAR DECOMMISSIONING APPLICATIONS

**INVITED: KELUM A. A. GAMAGE**, UNIVERSITY OF GLASGOW, UK

14:50-15:10 EVALUATION OF REINFORCED CONCRETE CRACKING AND POST-CRACKING FOR NEW BUILD NUCLEAR BUILDINGS UNDER DESIGN AND BEYOND DESIGN LEVEL SEISMIC INPUT MOTIONS

**DAN GHIOCEL**, GHIOCEL PREDICTIVE TECHNOLOGIES, USA

15:10-15:30 SEISMIC SSI ANALYSIS METHODOLOGY BASED ON THE INTEGRATED ACS SASSI-ANSYS FE MODELING

**MIKE SAREMI**, WOOD GROUP PLC, UK

15:30-15:50 MONITORING OF THE JULES HOROWITZ REACTOR PRE-STRESSED CONCRETE CONTAINMENT VESSEL

**ERIC PHILIP**, CEA, FRANCE

15:50-16:20

## **BREAK**

## SESSION 3: CHAIR—DAMIEN FERON

16:20-16:50 IMPACT OF AGR GAS COMPOSITION ON WEAR OF THE TIE-BAR / GUIDE TUBE COMPONENTS

**HUGUES RENONDEAU**, ESR TECHNOLOGY

16:50-17:10 AN ASSESSMENT OF THE SEISMIC PERFORMANCE OF NUCLEAR REACTOR POWER BUILDINGS RESTING ON EMBEDDED FOUNDATIONS OF LARGE PLANE SIZE

**MARIANA TOMASIN**, POLITECNICO DI MILANO, ITALY

17:10-17:30 UNCERTAINTY IN DIGITAL REACTOR DESIGN

**SILVIA TOLO**, UNIVERSITY OF LIVERPOOL, UK

17:30-17:50 LIMITATION OF THE RANDOM VIBRATION THEORY APPROACH FOR SEISMIC SOIL-STRUCTURE INTERACTION (SSI) ANALYSIS

**DAN GHIOCEL**, GHIOCEL PREDICTIVE TECHNOLOGIES, USA

19:00 **CONFERENCE DINNER**

# DAY TWO: TUESDAY 12TH JUNE

## SESSION 4: CHAIR—PURNENDU DAS

09:00-09:20 VERIFICATION OF NEUTRON SOURCE SPECTRUM DEFINITION WITH DIFFUSION LENGTH AND FERMI AGE

**JAKUB LULEY**, SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA, SLOVAKIA

09:20-09:40 LIFE EVALUATION OF CRACK-TYPE FOR STRENGTH WELD

**LIU PAN**, CHINA NUCLEAR POWER ENGINEERING CO., CHINA

09:40-10:00 THE EFFECTIVENESS OF FIBRE REINFORCED CEMENTITIOUS MATRICES FOR STRENGTHENING OF RC BEAMS AT ELEVATED TEMPERATURES

**ASHRAF AYOUB**, CITY UNIVERSITY OF LONDON, UK

10:00-10:20 MODELLING OF IN-LINE TUBE BANKS INSIDE AGR BOILERS

**JAMES BLACKALL**, UNIVERSITY OF MANCHESTER, UK

10:20-10:50 **BREAK**

## SESSION 6: CHAIR—EDOARDO PATELLI

10:50-11:10 MODELLING OF PARTIALLY-BONDED STEEL-CONCRETE SANDWICHED MEMBERS

**ASHRAF AYOUB**, CITY UNIVERSITY OF LONDON, UK

11:10-11:30 ASCE 4-16 STANDARD-BASED PROBABILISTIC SOIL-STRUCTURE INTERACTION (SSI) ANALYSIS FOR SEISMIC DESIGN-BASIS AND FRAGILITY ANALYSIS

**DAN GHIOCEL**, GHIOCEL PREDICTIVE TECHNOLOGIES, USA

11:30-11:50 SEISMIC SOIL-STRUCTURE INTERACTION (SSI) EFFECTS FOR DEEPLY EMBEDDED NUCLEAR ISLANDS SURROUNDED BY BACK-FILL SOIL

**DAN GHIOCEL**, GHIOCEL PREDICTIVE TECHNOLOGIES, USA

11:50-12:10 DEVELOPING DEMO DESIGN CRITERIA

**MIKE GORLEY**, UKAEA, UK

12:10-12:30 A VENTED LOW PRESSURE CONTAINMENT FOR THE HIGH TEMPERATURE GAS-COOLED REACTOR

**XIN WANG**, UNIVERSITY OF TSINGHUA, CHINA

12:30-14:30 **LUNCH**

## SESSION 8: CHAIR—DAN GHIOCEL

14:30-14:50 OPTIMIZATION OF THE OPERATION PROCESS AT THE DIFFUSION LENGTH AND FERMI AGE MEASUREMENT FACILITY

**VLADIMIR NECAS**, SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA, SLOVAKIA

14:50-15:10 EFFICIENT COMPUTATIONAL STRUCTURAL RELIABILITY ANALYSIS OF CONCRETE CONTAINMENTS

**JONATHAN SADEGHI**, UNIVERSITY OF LIVERPOOL, UK

15:10-15:30 RADIOLOGICAL CHARACTERISATION OF BURIED RADIOACTIVE WASTES: INTEGRATED RADIATION IMAGING AND SURFACE PENETRATING RADAR APPROACH

**IKECHUKWU UKAEGBU**, LANCASTER UNIVERSITY, UK

## SESSION 5: CHAIR—PARTHA MANDAL

DECOMMISSIONING COSTING CODE BASED ON THE ISDC—THE INTERNATIONAL STANDARD DECOMMISSIONING COST FORMAT

**VLADIMIR DANISKA**, VUJE TRNAVA, SLOVAKIA

RING COMPRESSION TESTS ON UN-IRRADIATED ZIRCALOY-4 CLADDING CONSIDERING FUEL PELLETS

**LUIS IBARRA**, UNIVERSITY OF UTAH, USA

ON THE EFFECTIVE FUEL TEMPERATURE OF VVER-440 FUELS

**BRANISLAV VRBAN**, SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA, SLOVAKIA

AXIAL FLOW-INDUCED VIBRATION IN CANTILEVERED RODS: AND EXPERIMENTAL BENCHMARK STUDY FOR NUCLEAR REACTOR APPLICATIONS

**ANDREA CIONCOLINI**, UNIVERSITY OF MANCHESTER, UK

## SESSION 7: CHAIR—ANDREY JIVKOV

NUMERICAL ANALYSIS AND EXPERIMENTAL STUDY ON THE IN-PLANE CYCLIC BEHAVIOUR OF SHEAR-CRITICAL STEEL-PLATE COMPOSITE WALLS WITH BOUNDARY ELEMENTS

**CHANG-CHING CHANG**, NATIONAL CENTER FOR RESEARCH ON EARTH-QUAKE ENGINEERING, NATIONAL APPLIED RESEARCH LABORATORIES, TAIWAN

SELECTION OF MODERATOR MATERIALS TO INCREASE THE WORTH OF REACTIVITY CONTROL MECHANISMS IN FAST REACTORS

**STEFAN CERBA**, SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA, SLOVAKIA

LONG-TERM SAFETY OF THE DEEP GEOLOGICAL REPOSITORY AS A PARTIAL TASK OF THE END PART OF NUCLEAR FUEL CYCLE

**DOROTA FLAMIKOVA**, SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA, SLOVAKIA

THE POTENTIAL DROP TECHNIQUE FOR CONTINUOUS MONITORING IN HIGH TEMPERATURE COMPONENTS

**ADAM WOJCIK**, UNIVERSITY COLLEGE LONDON, UK

DEVELOPMENTS IN THE BACK-END OF THE OPEN FUEL CYCLE IN SLOVAKIA

**DANA BARATOVA**, SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA, SLOVAKIA

## SESSION 9: CHAIR—MIKE SAREMI

EFFICIENCY ESTIMATION OF NAITL DETECTOR FOR THE PURPOSE OF MANGANESE SULPHATE BATH EXPERIMENT

**FILIP OSUSKY**, SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA, SLOVAKIA

A PROBABILISTIC RISK ASSESSMENT FOR SNF TRANSPORTATION CASKS AFTER LONG-TERM STORAGE

**LUIS IBARRA**, UNIVERSITY OF UTAH, USA

SEISMIC QUALIFICATION APPROACH FOR C&I SAFETY CONTROL CABINETS AND EQUIPMENT

**GORO SUZUKI**, HITACHI LTD, JAPAN

**CONFERENCE CLOSES**



## KEYNOTE SPEAKERS

**Dr Fiona Rayment**OBE is the Executive Director of NIRO, a division of the UK National Nuclear Laboratory that is charged with providing strategic nuclear advice to Her Majesty's Government. She has more than 25 years of nuclear industry experience working primarily within operations and strategic planning roles across a number of different nuclear sites, both in the UK and internationally. Rayment is a chartered chemist and engineer with a PhD in chemistry from University of Strathclyde, Glasgow and is a fellow of the Royal Society of Chemistry and of the UK Nuclear Institute. She has an MBA from Manchester Business School. Rayment recently received an OBE in the 2017 Queen's birthday honours for her services to Nuclear innovation and research.

Rayment's other roles across the sector include being on the board of the UK Nuclear Institute, and the American Nuclear Society. She is a member of the UK Research Councils Fusion Advisory Panel, Office of Nuclear Regulation Independent Advisory Panel and Idaho National Laboratory's Nuclear Science and Technology Advisory Committee. Rayment is the chair of the UK's Nuclear Skills Strategy Group, the strategic body that oversees UK nuclear sector skills requirements, and chairs the Nuclear Energy Agency's NI 2050 advisory panel.

**Professor Hector Iacovides**, graduated from University College London (Mechanical Engineering). He then joined the Thermo and Fluids Division of the Mechanical Engineering Department at UMIST as a post-graduate student, first obtaining an MSc Degree in Thermodynamics and Fluid Mechanics and then going on to complete a PhD project in Computational and Experimental Heat and Fluid Flow. He then joined the staff in the Thermo and Fluids Division of the Mechanical Engineering Department at UMIST, first as a post-doctoral researcher and subsequently as a member of academic staff. Currently he is a Professor of Convective Heat Transfer at the School of Mechanical, Aerospace and Civil Engineering.

In June 2006, Prof. Iacovides shared the Award for Scientific Contribution from The Heat Transfer Society of Japan, with his MACE colleague Dr T. J. Craft and Prof K Suga of Osaka Prefecture University.

**Dr Edoardo Patelli** is a Senior Lecturer in Uncertainty and Computational modelling, at the Institute for Risk and Uncertainty, University of Liverpool and a honorary member of the National Tsing Hua University, Taiwan. In addition, he is the co-investigator and co-director of the EPSRC-ESRC Centre for Doctoral Training in "Quantification and Management of Risk & Uncertainty in Complex Systems & Environments" and Chair of the Technical Committee on Simulation for Safety and Reliability Analysis (ESRA - European Safety and Reliability Association).

Dr Patelli is leading an interdisciplinary research group focused on developing and apply efficient and robust tools for Risk, Safety and Uncertainty Quantification across different sectors able to deal with scarce data and vague information. Dr Patelli has published more than 200 peer-reviewed publications in International journals and in Proceedings of International Conferences and 4 book chapters. I am a guest-editor on International journals and also organised multi-disciplinary international conferences in risk and vulnerability and probabilistic analyses.

# Sponsorship & Exhibition Space

## Sponsorship

**Cost**        £1500 + VAT

### Package Includes:

- 2 Free Delegate Registration
- Company Logo in the Conference Programme
- Company Logo in the Book of Abstracts
- Company advert in the Book of Abstract (A4 Size)
- Advert in the Conference Proceedings (USB)

## Exhibition

**Cost**        £1200 + VAT

### Package Includes:

- 1 Free Delegate Registration
- 1 Display table (1800 x 1200 mm) in Breakout Area
- Display material: Published material, Structural component
- Display Banners

## Sponsorship Package + Exhibition Package

**Cost**        £2100 + VAT

- 2 Free Delegate Registrations
- 1 Display Table (1800 x 1200 mm) in Breakout Area
- Display Material: Published Material, Structural Component
- Display Banners
- Company Logo in the Conference Programme
- Company Logo & Advert in the Book of Abstracts (A4 Size)
- Advert in the Conference Proceedings (USB)



## CONFERENCE VENUE

**JURY'S INN HOTEL**  
**WELLESLEY ROAD**  
**CROYDON, LONDON**



GUESTS VISITING LONDON FOR BUSINESS OR PLEASURE, THE JURY'S INN CROYDON HOTEL IS PERFECT FOR THOSE NOT WISHING TO BE IN THE HUSTLE AND BUSTLE OF BUSY LONDON, BUT STILL CLOSE BY. THE HOTEL PROPERTY OFFERS LOW PRICED HOTEL ROOMS AT A CENTRAL LOCATION WITH THE WHITGIFT SHOPPING CENTRE OVER THE ROAD AND EAST CROYDON STATION A SHORT 3-4 MINUTE WALK AWAY. FOR THOSE WANTING TO GO INTO CENTRAL LONDON FOR A LEISURE DAY, OR FOR BUSINESS, EAST CROYDON STATION IS A SHORT 17 MINUTE TRAIN RIDE TO LONDON VICTORIA OR LONDON BRIDGE. HOWEVER, THERE IS PLENTY TO DISCOVER IN CROYDON WITH VARIOUS HERITAGE SITES TO EXPLORE. THE QUEEN'S GARDENS ARE AN EASY 6 MINUTE WALK AND SHIRLEY PARK GOLF COURSE IS A 7 MINUTE DRIVE AWAY.

## CONFERENCE DINNER VENUE

THE CONFERENCE DINNER WILL BE HELD AT 7PM IN THE JURYS INN, THE SAME LOCATION AS THE CONFERENCE. WE WELCOME ALL DELEGATES TO ATTEND FOR AN EVENING OF GOOD FOOD AND A GREAT NETWORKING OPPORTUNITY.

