



PRELIMINARY PROGRAMME

Salamanca, 22-26 October 2006

Sunday 22

09:00 – 19:00 Golf Tournament
20:00 – 21:00 Welcome Reception

Monday 23

09:00 – 10:30 **OPENING SESSION I**

Chairwoman: M^a Teresa Estevan - Chairwoman / Consejo de Seguridad Nuclear
Co-Chairman: Frank Deconinck - President / European Nuclear society

- Yury A. Sokolov – Deputy Director General / International Atomic Energy Agency
- Luis Echávarri – Director General / NEA/OECD
- Kunihisa Soda – Commissioner / Japan Nuclear Safety Commission.
- TBD – US NRC

10:30 – 11:00 Break

11:00 – 13:00 **OPENING SESSION II : Future Trends in Nuclear Fuel**

Chairman: José L. González - President / ENUSA
Co-Chairwoman: M^a Teresa Dominguez - President / Spanish Nuclear Society

- Jack Fuller – Chief Operating Officer / GNF
- Anton Badenkov – Vice-President / TVEL Corporation
- Claude Jaouen – Executive Vice-President / Framatome ANP
- Aris Candris – Senior Vice-President / Westinghouse.
- Yuhong Ren – Vice Chief Engineer/ CJFN.
- Sadaaki Abeta – Acting General Manager / MHI.

13:00 – 14:30 Cocktail

TECHNICAL SESSION I : Security of Supply

14:30h – 16:30 **Chairman:** Ali Etemad – Vattenfall Bränsle AB – Sweden.
Co-Chairman: tbd

- **The diverse aspects of security of supply.**
James Malone (Exelon – USA).
- **Another perspective of security of supply.**
Geoff Varley (NAC-UK).
- **Addressing the Supply Security of the Nuclear Fuel Cycle: A U.S. Merchant Generator Risk Acceptance Perspective.**
Robert P. Jordan & Phillip A. Benavides (Constellation Energy – USA).



- **Increased flexibility and security of fuel assembly supplies with AREVA.**
Florence Guyot (AREVA - France), Bernd Beuerlein (AREVA NP – Germany), Nancy Carr (AREVA NP – USA) and Franz-Josef Sievers (AREVA-ANF – Germany).
- **GNF Security of Supply Chain... Business Continuity.**
Emily Martin-Beard, Bob Crate (GNF-USA).
- **Alternate uranium sources in Germany.**
Udo Rieger (Vattenfall Europe - Germany).

16:30 – 17:00 Break

TECHNICAL SESSION II : High Burnup

17:00 – 19:00 **Chairman:** Sadaaki Abeta – MHI – Japan.
Co-Chairman: Carlo Vitanza – NEA/OECD – Italy.

- **EDF PWR FUELS, Operating experience and high burn-up performance.**
Jean-Juc Provost and Michel Debes (EDF Generation-France).
- **Roadmap of Criteria Rationalization and R&D fore Future High Duty Usage of Fuel.**
Naoto SEKIMURA (The University of Tokyo-Japan).
- **Specific Heat and Density of High Burn-up Fuel.**
S. K. Yagnik (EPRI-USA), J.A. Turnbull (Consultant-UK).
- **TVO's Measurement Campaign for GE14 Lead Use Assemblies: Pursuing Higher Burnup.**
Kari Ranta-Puska (TVO- Finland), Juan J. Serna (ENUSA-Spain), Robert Rand and Mark Dubecky (GNF-USA).
- **Development Program of J-Alloy, High Corrosion-Resistant Alloy for PWR Fuel Cladding Tube.**
Hayato TAKABATAKE (The Kansai Electric Power Co., Inc - Japan), Saadaaki Abeta (Mitsubishi Heavy Industries, Ltd.-Japan), Tamotsu Murata (Nuclear Fuel Industries, Ltd.-Japan).
- **Cladding Optimization for Enhanced Performance Margins.**
R. Kesterson, L. Hallstadius, K. Yueh, H. Shah, J. Foster, D. Colburn (Westinghouse Electric Company-USA), P. Tolonen (ENUSA-Spain).

20:30 – 21:30 Concert

Tuesday 24

TECHNICAL SESSION III : Fuel Manufacturing

08:30 – 10:30 **Chairman:** Michel Debes – EDF – France.
Co-Chairman: tbd

- **Development of DUPIC Fuel Fabrication Technology by Using High Burn-up Spent PWR Fuel.**
Jung Won Lee, W.K. Kim, J.W. Lee, G.I. Park and M.S. Yang (Korea Atomic Energy Research Institute – Korea).



- **MELOX high throughput MOX manufacturing plant: 10 years of experience and progress.**
Marc ARSLAN (AREVA NC, Recycling Business Unit, MELOX – France).
- **Manufacturing Experience of LWR Fuels in India.**
R.N. Jayaraj (Nuclear Fuel Complex, Department of Atomic Energy - India).
- **Lean Six Sigma in ENUSA Factory: Quality and Efficiency.**
Javier Montes (ENUSA-Spain).
- **Fabrication of density homogenized (U,Gd) O₂ pellet by improving wet hydrogen.**
PENG Haiqing, YANG Wei, XIONG Deming & WEI Tao (Yibin Nuclear Fuel Element Plant – China).
- **Improved fuel performance by enhanced UO₂ pellet fabrication and inspection methods.**
S. Borell, H. Widegren (Westinghouse Electric – Sweden), H. Shah (Westinghouse Electric – USA).

TECHNICAL SESSION IV : *Methods & Models I*

In parallel with TS III **Chairman:** Peter Urban – AREVA NP – Germany.
Co-Chairman: Toyoshi Fuketa – JAPAN ATOMIC ENERGY AGENCY - Japan.

- **Nuclear Fuel Research Activities of the Consejo de Seguridad Nuclear.**
J. M. Conde, C. Alejano, J. M. Rey (Consejo de Seguridad Nuclear – Spain)
- **New Developments in Fuel Performance Modelling.**
B. Sutharshan, S. Sidener, M. Conner, P. Rubiolo (Westinghouse Electric Company – USA)
- **A Methodology for Calculating and a Process for Mitigating Channel Distortion & Cell Friction (Part I) & (Part II).**
Atul A. Karve, Gerard A. Potts, Robert A. Rand, Gerry M. Latter, and Mark A. Dubecky (GE/GNF – USA)
- **Advanced Thermal Hydraulic core and fuel assembly design with state-of-the-art subchannel codes.**
F. Burtak, J. Heinecke, M. Glück, K. Kühnel, J. Kronenberg, T. Kollmann (AREVA NP – Germany).
- **Evolution of the thermophysical properties of the UO₂ fuel as a function of burn-up.**
D. Staicu , V.V. Rondinella , T. Wiss , D. Papaioannou (European Commission, Joint Research Centre - Institute for Transuranium Elements – Germany), M. Kinoshita , A. Sasahara , T. Sonoda , S. Kitajima (Nuclear Energy Systems Department, Komae Research Laboratory - Central Research Institute of Electric Power Industry – Japan), D. Baron (EDF/DRD/MMC Renardiere – France), D. Laux (Université Montpellier – France) .
- **EDF experience feedback and Research & Development contributions to the update of the fuel performance code CYRANO3 to challenge the high burnup licensing requirements.**
B. Therache, P. Thevenin (EDF-Septen, EDF-R&D – France).

10:30 – 11:00 **Break**



11:00 – 13:00 POSTER SESSION I

Chairman: José G^a Aycart – GNII – Spain.
Co-Chairman: Georgij Krivoshein - IGNALINA NPP – Lithuania

High Burnup

- **PIE of High Burnup BNFL SBR MOX Fuel.**
M.A. Barker (NEXIA Solutions Ltd.- UK), E.C. Matthews, K. Stephenson (British Nuclear Group Ltd. – UK), Y. Parmar (NOK-Switzerland) and S. Bremier (European Commission JRC. – Germany).
- **Development of experimental technique for simulation of radial cracking of high burnup fuel cladding tubes.**
Kan Sakamoto, Masafumi Nakatsuka (GNF – Japan).
- **FUMEX-II Results of High Burnup Performance Code INFRA.**
Yong Sik Yang, Chan Bock Lee, Dae Ho Kim, Young Min Kim, Sun Ki Kim, Je Geon Bang. (Korea Atomic Energy Research Institute – Korea).

Fuel Manufacturing

- **Zirconium Matrix Alloys for High Uranium Content Dispersion Type Fuel.**
A.M. Savchenko, I.I. Konovalov, A.V. Vatulin, A.V. Laushkin, S.A. Ershov, S.V. Maranchak, Y.V. Konovalov, E.K. Malamanova (A.A. Bochvar Institute of Inorganic Materials (VNIINM) – Russia).
- **Relationship between Release Behavior of Cesium and Sintered Pellet Density in DUPIC Fuel Fabrication with High Burn-up Spent PWR Fuel.**
Geun IL Park, D.Y. Lee, Jung Won Lee, J.W. Lee, M.S. Yang (Korea Atomic Energy Research Institute – Korea).
- **AREVA MOX Fuel Fabrication Development Incentives.**
Dominique FAVET (AREVA NC, Recycling BU – MELOX – France).
- **The RAJ-II Next Generation BWR Fuel Bundle Shipping Container**
Andy Langston (Global Nuclear Fuel – USA).

Methods & Models I

- **ALCYONE: the PLEIADES fuel performance code dedicated to multidimensional PWR studies.**
G. Thouvenin, J.M. Ricaud, D. Plancq (Commissariat à l'Energie Atomique – France), P. Thévenin (Electricité de France – France).
- **1 D Neutronic model in the Frequency Domain and its coupling to the Stability Code LAPUR.**
J.L. Muñoz-Cobo, C. García, A. Escrivá (Polytechnic University of Valencia – Spain), José Melara (Iberdrola Ingeniería y Construcción – Spain).
- **Quantification of fission gases in high burnup fuel with Laser Ablation ICP-MS.**
Matthias I. Horvath, Andrei Izmer, Niko Kivel, Renato Restani (Laboratory for Materials Behavior, Nuclear Energy and Safety, Paul Scherrer Institute – Switzerland), Marcel Guillong (Institute for Isotope Geology, Mineralogic Elements – Switzerland), Detlef Günther (Laboratory for Inorganic Chemistry, Trace Elements and Microanalysis Group – Switzerland).



- **Analysis of FRAPCON-3 models related to high burnup fuel.**
María Teresa del Barrio, Isabel Vallejo, Luis Enrique Herranz (CIEMAT-Spain).
- **Consistent modelling of threshold conditions for beginning of HBS formation in high burnup UO₂.**
V.V. Likhanskii, V.G. Zborovskii (SRC of Russia TRINITI- Institute for Innovation and Fusion Research – Russia).
- **Modeling Fission Gas Effects on High Burnup Fuel Behavior during RIA.**
Wenfeng Liu and Mujid S. Kazimi (Center for Advanced Nuclear Energy Systems – USA).
- **Characterization test and analysis of LWR fuel assembly mechanical behaviour.**
Hyung-Kyu Kim, Kyung-Ho Yoon, Kang-Hee Lee, Young-Ho Lee (Korea Atomic Energy Research Institute – Korea).
- **A simple model for the enhanced cladding corrosion under severe duty operation in PWRs.**
M. Quecedo, A. Sanchez, J. Andres (ENUSA Industrias Avanzadas, S.A. – Spain)
- **Calculation with MCNP of reactivity and power distribution of ATRIUM-10XP design and comparison with isotopics obtained with MONTEBURNS, MCNP-ACAB and CASMO4.**
P.Ortego , C. Töre (SEA, Ingeniería y Análisis de Blindajes S.L.- Spain), A. Crespo (IBERINCO – Spain), P. Mata , L. García Delgado (IBERDROLA Generación – Spain), O. Cabellos , N. García-Herranz , J. Sanz (Universidad Politécnica de Madrid, Instituto de Fusión Nuclear - Spain), J. Sanz (Universidad Nacional de Educación a Distancia – Spain).
- **Improvements in the fission gas release module of the fuel behaviour code FUROM.**
Katalin KULACSY (Hungarian Academy of Sciences – Hungaria)
- **3D FEM based Fuel Rod Simulator.**
M. Dostál, M. Valach, J. Zymák (NRI ŘEŽ plc - Czech Republic), R. Svoboda (ČEZ a.s., NPP Temelín - Czech Republic).
- **Porosity and gaseous swelling effects on fuel rod behaviour during class 2 power ramp transient.**
J. Julien, R. Masson (EDF-R&D – France). B. Michel (Commissariat à l’Energie Atomique – Fance).

Fuel Performance

- **Experimental Verification of Water Chemistry Influence on AOA.**
Nuria Doncel (ENUSA Industrias Avanzadas, S.A.- Spain), Genis Rubio (Asociación Nuclear Ascó-Vandellós II A.I.E – Spain), Manuel Novo (CCNN Almaraz-Trillo – Spain).
- **Fretting Wear Examination on the GuardianTM. Fuel for OPR1000 Plants.**
HK Kim, JS Yoo, JI Kim, YK Jang, KT Kim (Korea Nuclear Fuel Co., LTD.- Korea).
- **Ultrasonic Fuel Cleaning System (UFCS).**
Pedro Alvarez and Humberto Marta (ENUSA-ENWESA A.I.E. – Spain).



Fuel Cycle Strategies and Core Management

- **Development of Nuclear Material Measurement System for Advanced Conditioning Process of Spent PWR Fuel**
Ho-Dong Kim, Tae-Hoon Lee, Won-Il Ko, Eun-Ha Kwon (Korea Atomic Energy Research Institute – Korea), Sang-Yoon Lee, Michael C. Miller (Los Alamos National Laboratory – USA).
- **V1 NPP Bohunice fuel management strategy during pre-decommissioning project.**
Consolación Montalvo (Iberdrola Ingeniería y Construcción – Spain), Peter Hlbocký (Slovenské Elektrárne – Slovakia)
- **Analysis Of Crda in a High Burnup Fuel Core for Cofrentes NPP With Retran-3d.**
Andrés J. Gómez, Pablo J. García, Consolación Montalvo, Ignacio Collazo (IBERDROLA INGENIERÍA Y CONSTRUCCIÓN – Spain).

Spent Fuel Management

- **Methodology to evaluate limiting cladding temperatures during dry storage of spent fuel elements.**
K. L. Nissen, W. Goll (Areva NP GmbH – Germany), Y. Parmar, J. Afonso (NOK – Germany).
- **Cladding Tube Deformation Test for Stress Reorientation of Hydrides.**
Adil M. Alam, Christian Hellwig (Paul Scherrer Institute – Switzerland).

LOCA & RIA Issues

- **Study of fuel rod criteria for LOCA condition in the light of recent experimental data.**
Sonnenburg, H.G. (Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH – Germany).
- **Development of Expert System for Failed Fuel Diagnosis under WWER Operation Conditions.**
V. Likhanskii, I. Evdokimov, A. Sorokin, A. Khromov, V. Kanukova (State Research Center of Russian Federation – Russia).
- **Probabilistic Assessment of Fuel Pin Integrity Subjected to Severe Accident.**
B.K.Dutta and H.S.Kushwaha (Bhabha Atomic Research Centre – India).
- **Mechanical Property Evaluation of High burn-up Nuclear Fuel Cladding by Ring Tensile Test.**
Sunki Kim, Jegeon Bang, Daeho Kim, Youngmin Kim, Yongsik Yang, Chanbock Lee (Korea Atomic Energy Research Institute – Korea).
- **New Insight on Volatile Fission Products (I and Cs) release from high burnup UO2 fuel under LOCA type conditions.**
Y. Pontillon, G. Ducros, P.P. Malgouyres, J. Noirot, C. Gonner, A (Commissariat à l'Energie Atomique – France), A. Harrer, F.A. Andreo (EDF/SEPTEN – France), Dutheillet (EDF R&D – France), M. Kissane (Institut de Radioprotection et de Sûreté Nucléaire DPAM/SEMIC – France).



- **Substantiation of WWER fuel safety in Design Basis Accidents. Experimental Support.**

P.V. Fedotov, A.A. Goncharov, A.V. Kumachev, A.V. Medvedev, O.A. Nechaeva*, V.V. Novikov, A.V. Salatov (FSUE A.A. Bochvar VNIINM – Russia).

Advance in Fuel Design

- **Areva NP New UO₂ Fuel Development and Qualification for LWR Applications.**
C. Delafoy & al (AREVA NP – France).
- **Pellet Continuity as Perspective Fuel Properties.**
I.I.Loktev, A.A.Enin, S.A.Bujmov (JSC “NCCP” – Russia)
- **Fuel engineering contributions to improve the competitiveness of Argentine Nuclear Power Plants.**
L. Alvarez, J. Casario, J. Valesi (Comisión Nal. de Energía Atómica - Argentina)

13:00 – 14:30 Lunch

TECHNICAL SESSION V : Fuel Performance

14:30 – 16:30 **Chairman:** Robert Brown – GNF – USA.
Co-Chairman: tbd

- **Systematic Approach to PWR Fuel Performance Improvement.**
Sumit Ray (Westinghouse Electric Corporation – USA).
- **Nuclear Fuel Performance: Trends, Remedies and Challenges.**
M.W. Kennard, I. Frankl, R.L. Klein (Stoller Nuclear Fuel Division of NAC International – USA).
- **Fuel Evaluations under zinc injection in Ascó I-II and Vandellós II NPP.**
Genís Rubio, José Luis Gago (Asociación Nuclear Ascó-Vandellós II A.I.E. – Spain), Alicia Sánchez, Nuria Doncel (ENUSA – Spain).
- **GNF 10x10 Fuel- Pursuing Performance and Reliability.**
John Schardt (GNF – USA).
- **Investigation of the high burnup rim structure in the PWR fuel.**
Yuji KOSAKA (Nuclear Development Corporation – Japan), Nobuyuki FUKUDA (Mitsubishi Heavy Industries, Ltd – Japan), Toshikazu SENDO (The Kansai Electric Power Co. Inc – Japan)
- **Performance of alloy M5 cladding and structure at burnups beyond the current licensing limit in US reactors.**
Isaac Mensah (AREVA NP Inc – USA), Jean-Paul Mardon (AREVA NP – France).

16:30 – 17:00 Break



TECHNICAL SESSION VI : Fuel Cycle Strategies and Core Management

17:00 – 19:00 **Chairman:** **David Powell** – WESTINGHOUSE – UK.
Co-Chairman: **Imre Nemes** – PAKS NPP - Hungary.

- **EDF's perspectives on Fuel performance and fuel cycle management.**
Michel DEBES (EDF - Nuclear Fuel Division – France).
- **Technico-economic comparison of long-term nuclear fuel cycle management scenarios: application to the French context.**
A. Le Dars (CEA – France).
- **Latest update on fuel and core design experiences in Cofrentes NPP.**
M.T. López Carbonell, A. Galicia Saavedra (IBERDROLA Generación – Spain).
- **Simplicity, flexibility and margins – The first core of Olkiluoto 3.**
R. Boehm, E. Riedl, G. Schmidlein, P. Pulkus (AREVA NP GmbH – France), S. Latokartano (Teollisuuden Voima Oy (TVO) – Finland)
- **The N-StreamingSM Concept for Optimizing BWR Fuel Cycle Designs.**
Mehdi Asgari and Dave J. Kropaczek (Global Nuclear Fuel – Americas – USA).

19:00 – 20:00 **Spanish Food Testing**

Wednesday 25

TECHNICAL SESSION VII : Spent Fuel Management

08:30 – 10:30 **Chairman:** **Kari Ranta Puska** – TVO – Finland.
Co-Chairman: **José Antonio Gago** – ENRESA – Spain.

- **EUROFAB: A success story for MOX in the USA.**
Jean-Pierre BARITEAU, Marc DALMIER (AREVA NC, Recycling Business Unit – France), Arvid JENSEN (Duke- Cogema-Stone and Webster – USA), Mike MC MAHON, Jeff TUCKER (AREVA NP – USA), Patrick JACOT, Laurent BLACHET (TN International – USA), Tracy SAVILLE (DUKE POWER – USA).
- **Delayed Hydride Cracking Susceptibility of Spent Fuel Rods at RT.**
Young S. Kim, Sang B. Ahn and Yong M. Cheong (Korea Atomic Energy Research Institute – Korea).
- **Spanish R&D program on spent fuel dry storage.**
José Manuel Alonso (ENUSA – Spain), José Manuel Conde (CSN – Spain), José Antonio Gago (ENRESA – Spain), Pedro González (ENDESA – Spain), Manuel Novo (CNAT – Spain), Luis Enrique Herranz (CIEMAT – Spain)
- **Acceleration of defects identification of VVER-440 fuel at the wet interim spent fuel storage facility at Npp se-ebo.**
M. Mikloš, V. Slugeň, V. Kršjak (Slovak University of Technology Bratislava – Slovakia), M. Božik (Slovenské Elektrárne, plc. – Slovakia).
- **Specific surface area: key factor in the dissolution process for the spent fuel storage.**
E. Iglesias, J. Quiñones, J.M. Cobo, S. Pérez, A. Martínez Esparza (ENRESA – Spain).



- **Statistically Based Methodology for Fuel Rod TM Design and Spent Fuel Storage.**
G. A. Potts, R. A. Rand (GNF – USA), N. Doncel (ENUSA - Spain).

TECHNICAL SESSION VIII : Methods & Models II

In parallel with TS VII **Chairman:** **Pedro Mata** – IBERDROLA – Spain
Co-Chairman: TBD

- **Challenges for High Burnup Fuel Rod Designs.**
R. Fawcett, M. Kiernan, C. Patterson, R. Rand, R. Stachowski (GNF – USA), M. Quecedo (ENUSA – Spain).
- **Cladding Mechanical Assessment and Application in Modelling.**
Anna-Maria Alvarez, Koji Kitano, Rikard Källström and Gunnar Wikmark (Studsvik Nuclear – Sweden), V. Ioan Arimescu (Areva NP Inc – USA), David Schrire (Vattenfall Fuel - Sweden).
- **Simulation study of irradiation induced restructuring of high burnup fuel - The new cross-over project (NXO) to study rim-structure formation.**
M. Kinoshita (JAEA/CRIEPI - Japan), H. Y. Geng, Y. Chen, Y. Kaneta (University of Tokyo – Japan), M. Iwasawa, T. Ohnuma (CRIEPI – Japan), S. Matsumura, K. Yasunaga, K. Yasuda (Kyushu University – Japan).
- **EDF independent validation of a new fuel assembly design proposed by a supplier : a method to improve safety and competitiveness.**
N. Baillon, A. Maurice (EDF Septen - France)
- **Recalculation of a PWR Load Ramp with the coupled 3 DC Code System R/P/C.**
K. Kühnel, K. Richter (AREVA, Framatome ANP GmbH – Germany)
- **3D Assessments of the Cracked UO₂ Pellets Behaviour.**
Armando C. Marino & Gustavo L. Demarco (Comisión Nacional de Energía Atómica – CNEA – Argentina).

10:30 – 11:00 **Break**

11:00 – 13:00 **POSTER SESSION II**

Chairman: **Lars Hallstadius** – WESTINGHOUSE - Sweden.
Co-Chairman: **Frantisek Pazdera** - NUCLEAR RESEARCH INSTITUTE. – Czech Republic.

High Burnup

- **High Burnup Fuel (Pellet Burnup 80 GWd/t) Behavior- Fission gas release, Pellet swelling, Micro-structure.**
Jin KAMIMURA, Koichi OHIRA, Kazutoshi OKUBO, Noboru ITAGAKI (Nuclear Fuel Industries, Ltd – Japan), Akira TAKAGI (Tokyo Electric Power Company – Japan).
 - **High burnup UO₂ fuel morphology: recent transmission electron microscopy observations.**
T. Wiss, H. Thiele, I.L.F. Ray, V.V. Rondinella (European Commission, Joint Research Centre, Institute for Transuranium Elements – Germany), T. Sonoda, M. Kinoshita (Central Research Institute of Electric Power Industry, CRIEPI – Japan).
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Fuel Manufacturing

- **Lean Six Sigma.**
John Porter (Global Nuclear Fuel – USA).
- **The Traveller: A Short History of the Design, Testing, Licensing, and Implementation of the New PWR Fuel Shipping Package Design.**
Norman A. Kent (Westinghouse Electric Company, LLC – USA), Pilar Pérez-Millán (ENUSA Industrias Avanzadas, S.A. – Spain).
- **AREVA NP Fuel Manufacturing invests for the future to ensure security of supply to its customers.**
Alain Lacoste, Christian Delevallée, Jean-François Marrot (AREVA, FBFC-France) and Hans-Uwe Siebert (AREVA NP – France)
- **Are there specificities to an international transport compared to a domestic transport of radioactive material?.**
Pascal Chollet (AREVA NC- France), Anne Presta (AREVA, Cezus - France).
- **Zirconium product manufacturing within AREVA: A key element for the nuclear fuel supply chain.**
Jean-Pierre Gros, Romain Doublet (AREVA NP – France).

Methods & Models I

- **Fuel Modelling at Extended Burnup: IAEA Coordinated Research Project FUMEX-II.**
J Killeen, V Inozemtsev (IAEA – Australia), J A Turnbull (Independent Consultant – Australia).
- **Analysis of Abnormal Operating Occurrences for Sta. Maria de Garoña with TRACG.**
J. C. Manchobas (Nuclenor – Spain), J. Haces (ENUSA Industrias Avanzadas, S.A.- Spain), J. Garcia (General Electric – Spain).
- **TANOXOS : an analytical irradiation program aiming at understanding the behaviour of various doped UO₂ fuels.**
L. CAILLOT, J. NOIROT, Y. PONTILLON, S. VALIN (Fuel studies department (DEC), CEA – Cadarache – France).
- **CFD SIMULATION OF A BWR FUEL ASSEMBLY AND COMPARISON WITH TRACJ.**
Ferrando, R. Miró, S. Chiva, G. VerdúE AND RELAP5. (Universitat Jaume I – Spain).
- **Development of Fuel Analysis Methods at Global Nuclear Fuel.**
Scott Palmtag, Dave Knott, and Dave Kropaczek (Global Nuclear Fuel (GNF)- USA).
- **The benefits of the FUMEX-II project for extending the verification of the TRANSURANUS code.**
P. Van Uffelen, A. Schubert, C. Györi, J. van de Laar (European Commission, DG Joint Research Centre, Institute for Transuranium Elements, Karlsruhe – Germany), D. Elenkov (Institute for Nuclear Research and Nuclear Energy, Sofia – Germany).
- **Recent modelling features in the COPERNIC3 AREVA NP fuel rod performance code.**
Ch. Garnier, P. Mailhé F. (AREVA NP – Lyon – France), Sontheimer, H. Landskron, D. Deuble (AREVA NP GmbH - Erlangen – Germany), Arimescu, M. Billaux (AREVA NP – Richland – USA).



- **Utilization of SIMTAB Methodology in Translating the Kinetics. Parameters from SIMULATE-3 to RELAP5/PARCS for REA 3D-Dynamic Analysis in Trillo NPP.**
R. Miró, F. Maggini, O. Roselló, G. Verdú (Chemical and Nuclear Engineering Department – Spain), T. Barrachina (Applied Mathematics Department Polytechnic University of Valencia – Spain), A. Gómez (Iberdrola Ingeniería y Consultoría – Spain), J. C. Martínez-Murillo (CC. NN. Almaraz-Trillo – Spain).
- **CYRANO3 : the industrial PLEIADES fuel performance code for EDF PWR studies.**
P. Thévenin, R. Masson (EDF R&D – France), B. Petitprez (EDF SEPTEN – France), D. Plancq (Commissariat à l’Energie Atomique – France).
- **Analytical and experimental studies of fretting-corrosion and vibrations of fuel assemblies of a VVER-1000 water cooled and water moderated power reactor**
Dr. Yu.N.Drozdov (IMASH Machine Study Institute named after A.A.Blagonravov of the Russian Academy of Sciences, Moscow – Russia), Dr. Al.A.Tutnov, Dr. A.A.Tutnov, Dr.E.E.Alexeyev (Kurchatov Institute Russian Research Centre, Moscow – Russia), V.V.Makarov, A.V.Afanasyev (FSUE OKB “Gidropress”- Russia).
- **Research of the spent nuclear fuel thermal characteristics in RRC Kurchatov Institute.**
Mikhail Baryshnikov (Russian Research Center “Kurchatov Institute” – Russia).
- **A Mechanistic Fission Gas Release Model implemented in the TRANSURANUS Fuel Behaviour Code and applied on FUMEX-II Benchmarking Cases.**
L.A. Nordström, P. Blair, Ch. Hellwig (Paul Scherrer Institut (PSI - Switzerland)

Fuel Performance

- **Effect of Mechanical Properties of Spacer Grid Springs on the Fretting Wear of a Nuclear Fuel Rod.**
Young-Ho Lee, Hyung-Kyu Kim (Korea Atomic Energy Research Institute – Korea).
- **Characterisation of Magnetic Crud on KKL Fuel rods.**
Guido Ledergerber, Wilfried Kaufmann (Kernkraftwerk Leibstadt AG – Switzerland), K.-A. Magnusson (Westinghouse Electric Sweden – Sweden), Didier Gavillet, Sousse Abolhassani (Paul Scherrer Institut – Switzerland).
- **Experience On Fuel Inspection System.**
José R. Fernández (Tecnatom - Spain), Juan J. Serna (Enusa Industrias avanzadas, S.A. – Spain).
- **Operation-to-PIE data juxtaposition of the Zaporozhye NPP, - WWER-1000 FA-E0325 fuel rods, and comparative calculations of WWER and PWR type fuel rods.**
G. Passage, S. Stefanova (Institute for Nuclear Research and Nuclear Energy –BAS – Bulgaria). A.S. Scheglov, V.N. Proselkov (All-Russian Research Center "Kurchatov Institute" – Russian Federation).
- **Fuel Channel Dimensional Surveillance Equipment-Measuring Bow, Bulge, Twist and Length of BWR Fuel Channels.**
Per Collin, Jan Möller, Andreas Fristedt-Ablad (Westinghouse Electric-Sweden).
- **Results of Post-Irradiation Examinations (PIE) of E110 Claddings and Alloy Upgrading for VVER.**
V.V. Novikov, V.A. Markelov, V.F. Kon'kov, A.V. Tselishchev, A.A. Balashov (FSUE A.A. Bochvar VNIINM – Russia).



- **Performance of Weapons-Grade Plutonium in Mixed Oxide Nuclear Fuel.**
Donald Spellman, Larry Ott, and Robert Morris (Oak Ridge National Laboratory - USA)

Fuel Cycle Strategies and Core Management

- **The Fuel Management Strategy for the End-Of-Plant cycles of Zorita NPP.**
Luis Rebollo Medrano, Julio Blanco Zurro (UNION FENOSA GENERACION, S.A – Spain).
- **Deterministic BWR core design.**
Randolph Höglund (VTT Technical Research Centre of Finland – Finland), Mikael Solala (Teollisuuden Voima Oy – Finland).

Spent Fuel Management

- **Long Time Storage of Failed Fuel Rods.**
John Klintberg, Jan-Olov Nygren, Per Collin, Andreas Fristedt-Ablad (Westinghouse Electric-Sweden).

LOCA & RIA Issues

- **Experimental Database of E110 Cladding Oxidised in Hydrogen Rich Steam.**
E. Perez-Feró, P. Windberg, Z. Hózer, M. Horváth, I. Nagy, A. Pintér-Csordás, E. Szabó, K. Kulacsy (Hungarian Academy of Sciences KFKI Atomic Energy Research Institute – Hungaria), Cs. Györi (European Commission, Joint Research Centre, Institute for Transuranium Elements – Germany).
- **Failure Behavior of the Zirconium Cladding after the Loss of the Coolant Accident (LOCA).**
Jun Hwan Kim, Myoung Ho Lee, Byoung Kwon Choi and Yong Hwan Jeong (Korea Atomic Energy Research Institute – Korea).
- **High power ramps in the OSIRIS reactor**
S. MARTIN, F. CHAMIOT, G. THELLIER, S. LOUBIERE (Commissariat à l'Energie Atomique – France).
- **Fuel Cladding Corrosion Protection Through Watercare.**
John Schardt (Global Nuclear Fuel – USA), Tom Caine (GE Nuclear – USA).
- **Fuel behaviour under off-normal conditions.**
Hiroshi Ono, Akira Mototani, Nobuaki Abe, Yutaka Takeuchi (Toshiba Corporation, Power system Company – Japan).

Advance in Fuel Design

- **Out-of-pile Tests under LOCA Conditions for J-Alloy, High Corrosion-Resistant Alloy for PWR Fuel Cladding Tube.**
Toshiya KIDO (Nuclear Development Corporation – Japan), Seiichi Watanabe (Mitsubishi Heavy Industries, Ltd – Japan), Yoshihiro Tsuchiuchi (Nuclear Fuel Industries, Ltd. – Japan).



- **Basic Properties of Manufactured Cladding Tubes of J-Alloy, High corrosion-Resistant Alloy for PWR Fuel Cladding Tubes.**
Yoshihiro TSUCHIUCHI (Nuclear Fuel Industries, Ltd – Japan), Ryuji Wakamatsu (Zirco Products Co., Ltd. – Japan), Takeshi Isobe (Mitsubishi Materials Corporation – Japan), Seiichi Watanabe (Mitsubishi Heavy Industries, Ltd. – Japan).

13:00 – 14:30 Lunch

TECHNICAL SESSION IX : LOCA & RIA Issues

14:30 – 16:30 **Chairman:** Jose M. Conde – CONSEJO DE SEGURIDAD NUCLEAR – Spain.
Co-Chairman: Nadien Hollasky – ASSOCIATION VINÇOTTE NUCLEAR – Belgium.

- **IRSN R&D Studies on High Burnup Fuel Behaviour under RIA and LOCA Conditions.**
J. Papin, M. Petit, C. Grandjean (Institut de Radioprotection et de Sûreté Nucléaire – France)
- **Behaviour of High Burnup PWR Fuels during Simulated Reactivity-Initiated Accident Conditions.**
Toyoshi FUKETA and Tomoyuki SUGIYAMA (Japan Atomic Energy Agency - Japan).
- **The U.S. Nuclear Regulatory Commission's Research On Fuel Behavior under Accident Conditions.**
Ralph O. Meyer (U.S. Nuclear Regulatory Commission – USA).
- **Core and fuel aspects in licensing LOCA safety analysis and reload safety evaluation for Belgian NPPs.**
Jinzhaoh Zhang and Jean Paul Dalleur (Suez-Tractebel Engineering – Belgium).
- **Experimental simulation of a control rod withdrawal error in a cold critical BWR.**
Joakim K.-H. Karlsson (Studsvik Nuclear– Sweden), Gunnar Rönnerberg (OKG AB – Sweden), David Schrire (Vattenfall Bränsle AB – Sweden), Magnus Limbäck (Westinghouse Electric Sweden AB – Sweden).
- **Modelling the IFA-650.3 Halden LOCA Test Coupling the TRACE and FALCON Codes.**
Hannu Wallin, Yacine Aounallah, Antonino Romano, and Martin A. Zimmermann (Laboratory for Reactor Physics and Systems Behaviour – Switzerland).

16:30 – 17:00 Break



TECHNICAL SESSION X : *Advance in Fuel Design*

17:00 – 19:00 **Chairman:** **Patrick Blanpain** – AREVA NP – France.
Co-Chairman: **Didier Haas** - ITU Karlsruhe – Germany.

- **Westinghouse BWR fuel - recent experiences and developments.**
Sture Helmersson, Magnus Limbäck, Hakan Söderberg (Westinghouse Electric Sweden AB – Sweden).
- **Improved Zr Alloys for High Burnup BWR Fuel.**
"Shinji Ishimoto, Yoshinori Etoh (NFD – Japan), Toshio Matsumoto (GNF – Japan), Dan Lutz (GNF – USA), Akira Takagi (TEPCO – Japan).
- **A family of upgraded fuel assemblies for PWR.**
Denis Gottuso (AREVA NP Inc – USA), Jean-Noel Canat, Pierre Mollard (AREVA NP – France).
- **EFG Fuel Designs and Experience in EDF Reactors.**
David Chapin, William Rabenstein (Westinghouse – USA), Miguel Aulló, Alberto Cerracín (ENUSA – Spain), Göran Boman (Westinghouse – Sweden).
- **Mixed Uranium-Transition Metal Carbides for Advanced Reactor Applications.**
Samim Anghaie (University of Florida – USA).
- **Capillary Impregnation Technology for Novel Types of Fuels.**
A.M. Savchenko, I.I. Konovalov, A.V. Vatulin, S.A. Ershov, S.V. Maranchak, Z.N. Petrova, G. Kulakov (A.A. Bochvar Institute of Inorganic Materials (VNIINM) – Russia).

21:00 – 23:00 **Conference Dinner**

Thursday 26

09:00 – 14:30 **TECHNICAL VISIT**