

# The Antenna

NEWSLETTER FROM A.N.T. INTERNATIONAL No.56 2023



## A.N.T. INTERNATIONAL SEMINARS

A.N.T. International is very grateful to Iberdrola in Spain and Electric Power Research Institute, EPRI, in Charlotte, NC, that kindly hosted the nuclear fuel (ZIRAT) and coolant chemistry/structural material degradation (LCC) Seminars. We also want to thank all the 110+ customer participants from 27 different organisations and 11 countries for coming to the seminars.

We are very happy that there is a significant increase in number of participants, organisations and number of participating countries compared to last year. It is clear that there is an increase in education need in the nuclear area due to the renewed interest for nuclear power.

The Seminars are valuable for all engineers with different backgrounds from engineers with little experience to experts in their fields.

Our Seminars in the US and in Spain were very well appreciated by our customers. The overall opinion on the different Seminars was 4.4 ranked on a scale from 1 (bad) to 5 (excellent) which is a small improvement compared to last year Seminars where the overall opinion on the different Seminars ranged from 4.3 to 4.4.



# LCC18 SEMINAR

THE LCC18 SEMINAR PRESENTATIONS WERE GIVEN BY:



Dr. Jiaxin Chen



Mr. Francois Cattant



Dr. Audrius Jasiulevicius

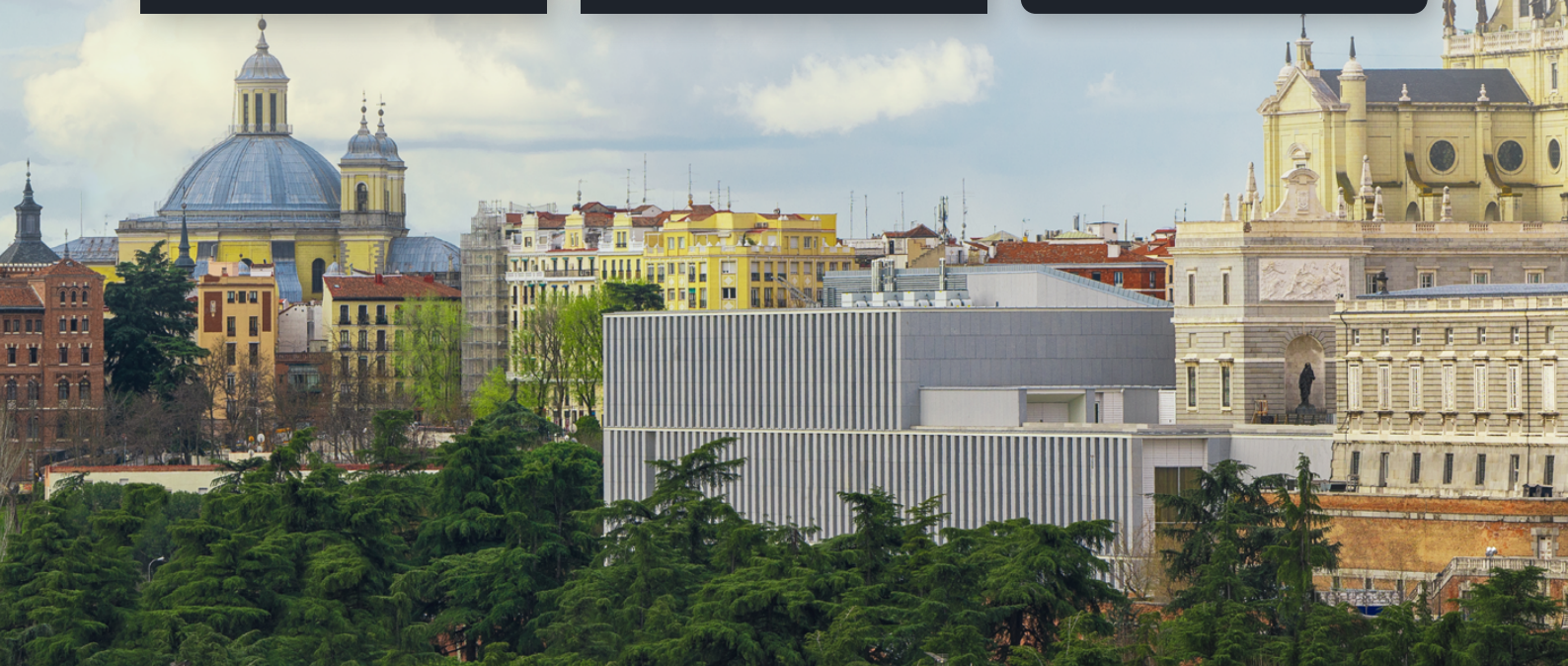


Mr. Igor Škorvaga



Ms. Michaela Joanidisova

*Please click on the  
photos to get more  
information about  
the Experts*





# LCC18 FEEDBACK



*“This was my first LCC Seminar and I was very impressed.  
It was very informative and have learned a lot.  
Networking was great too.”*

**NATHAN LEE**

Engineer - Nuclear Chemistry, Materials,  
Chemistry and Corrosion  
ROLLS-ROYCE

*“The seminar was interesting  
and very good.”*

**MAJA PRESKAR**

Chemical Technology Engineer  
NEK

*“Overall very good seminar.  
Would recommend to others!”*

**ALEKSI KEMPPAINEN**

Chemist  
TVO

*“Good conference. Thank you! ”*

**JAMIE CULSHAW**

Nuclear Safety Inspector  
ONR

# ZIRAT27 SEMINARS

THE ZIRAT27 SEMINAR PRESENTATIONS WERE GIVEN BY:

*Please click on the photos  
to get more information  
about the Experts*



# ZIRAT27 FEEDBACK



*"I always enjoy ZIRAT and find it worthwhile."*

**STEVE SPARKS**  
Nuclear Fuel Engineer 4  
NUSCALE

*"Excellent ZIRAT seminar, as always."*

**JOSÉ MANUEL DEY NAVARRO**  
IBERDROLA

*"Well organized seminar with knowledgeable presenters and good opportunities to consult experts with specific queries"*

**SIMONE SMITH**  
Fuel Engineer  
EDF ENERGY



# PHOTO GALLERY



Excellent Iberdrola Conference Facilities where the ZIRAT27 and LCC18 seminars were held.



Introduction of the LCC18 and ZIRAT27 Seminars in Madrid by Dr. Alberto Concejal Bermejo of Iberdrola. The middle of the screen in the photo shows the participating organisations in the LCC18 and ZIRAT27 Seminars.



Dr. Martin Steinbrück presenting "Accident Tolerant Fuel" at the ZIRAT27 Seminar in Madrid.



Dr. Zoltán Hózer presenting "VVER Fuel" at the ZIRAT27 Seminar in Madrid.





Dr. Zoltán Hózer at the ZIRAT27 Seminar in Madrid



Dr. Jiaxin Chen presenting “Coolant-side corrosion of reactor materials in LWRs and deposition of radioactive species” at the LCC18 Seminar in Madrid.



Mr. Francois Cattant presenting “PWRs operation and maintenance - Feedwater plant and other secondary components – Mechanical components” at the LCC18 Seminar in Madrid.



Mr. Matt Eyre presenting “Interim Dry Storage” at the ZIRAT27 Seminar in Charlotte, NC, US



All participants and lecturers at the ZIRAT Seminars at the EPRI conference centre in Charlotte, NC, US.



All participants and lecturers at the LCC and ZIRAT Seminars at the Iberdrola conference centre in Madrid.  
Dr. Alberto Concejal Bermejo of Iberdrola is in the middle at the front of the photo.



# THE MOST RECENT A.N.T. INTERNATIONAL EXPERTS

I am very happy to announce five new Experts: Mr. David Schrire, Mr. Sten Lundberg, Mr Milton Rubenich, Mr Fernando Roumiguere and Prof. Kastriot Spahiu. With these additional Experts, A.N.T. International has now access to 38 world class Experts that can provide various services to you.



**MR. DAVID SCHRIRE**

**Mr. David Schrire** has degrees in Nuclear Engineering from Queen Mary College, London and Purdue University, Indiana. He has worked in the area of fuel performance since 1983, both at Studsvik Nuclear and at ABB Atom (now Westinghouse Sweden) and from 2004 to 2022 at Vattenfall Nuclear Fuel where he was a Senior Specialist in Fuel Performance. He has extensive experience in planning, leading and evaluating in-pile and out-of-pile testing and post-irradiation examination of fuel and core materials, with numerous publications in the area.

While at Studsvik he initiated the ROPE-I and ROPE-II international projects to study the behaviour of high burnup LWR fuel rods operating with a high internal pressure, and later the Studsvik Cladding Integrity Project (SCIP), an international programme to study cladding failure by different mechanisms. At ABB Atom, where he was the head of the fuel inspection and performance group, he led a programme to evaluate the consequences of cladding hydriding. At Vattenfall Nuclear Fuel he was responsible for planning and evaluating the introduction of new fuel designs and materials in the Forsmark and Ringhals reactors, as well as for fuel performance topics including analysis of fuel and fuel structural component failures.

He has been actively involved in international fuel behaviour research programmes including the JAEA ALPS I and II safety tests in Japan and the EPRI Fuel Reliability Programme.



**MR. STEN R. LUNDBERG**

**Mr. Sten R. Lundberg** has more than 45 years of experience in the nuclear industry, the last 27 years as a consultant in the core and fuel area, primarily for BWRs. Before that, he spent more than 17 years with different utilities in the reload group (Sydkraft, Sweden), code development and testing group (-Studsvik, now SSP, Sweden), and in the nuclear operation group (Leibstadt NPP, Switzerland). At Leibstadt, he held the position of head of the nuclear operation group for seven years.

He is presently working as a consultant in the area of competence mentioned above. His customers are Vattenfall (KKB&KKK) in Germany, BKW/AXPO (KK Mühleberg and KK Leibstadt) in Switzerland, Forsmark/Ringhals NPP (Sweden), and several other organizations and utilities worldwide (Toden software, ENSI, PSI, S Levy etc.). His expertise is in the core area with an emphasis on the reactor physics/Thermal hydraulics of the nuclear operation of BWR plants. In his consulting work, he was chiefly involved in BWR fuel and cores' design and various steady-state and transient analyses of the nuclear operation. These analyses are a combination of the neutronics and the thermal-hydraulic disciplines. Also, topics such as fuel failure analyses and fuel performance has been part of his work.

He has also dealt with core design issues for PWRs. He has also written codes (fortran) simulating the decay heat in reactors and nuclear fuel, xenon and samarium transients based on time/power input and a large number of help codes to analyze calculated results. He has a license to run the older CMS package containing the 2D CASMO-4E and the 3D SIMULATE-3/-3K codes.





**Mr. Milton Norberto Rubenich** has a MSc degree in Nuclear Engineering (1976) and BSc in Chemistry (1972). In 1975 he joined Eletronuclear, the Brazilian company responsible for design, commissioning and operation of NPPs in Brazil. He did On-the-job training at KWU/SIEMENS covering different areas of chemistry and process chemistry, four years and two months and participated in all phases of the project Angra 2, including:

- Conceptual and detailed design
- Commissioning and trial operation of Angra2 and support to the operation of the plant.

Milton Rubenich has extensive experience in:

- The design (conceptual and detailed) of water treatment systems for NPPs, chemistry of the different circuits, commissioning and trial operation, including operation of demineralized plants,
- Outage activities, especially SGs tube sheet lancing and gamma scanning of internal surfaces of the primary circuit (source term determination) and,
- Analysis of chemical and radiochemical and dose rate data of NPPs, including licensing issues relate to discharge of liquid wastes.

He has also extensive experience with procurement and follow up activities for water treatment plants and surface protection. Milton Rubenich worked as a chemist at Eletronuclear, Brazil, from 1975 to 2015 and some of his career highlights covered:

- Demineralized Water Supply – Angra Site
- Secured Closed Cooling Water Circuit and Conventional Cooled Water Circuits – Angra 2
- Zinc injection in the primary circuit of Angra 2 and Angra 1
- Forced oxidation of the primary circuit during refueling outages.
- Use of B-10 enriched boric acid in the primary circuit.
- Operational Concept of the Water-Steam Circuit, Angra 2.



**Mr. Fernando Roumiguère** is chemical engineer with post-graduation in nuclear engineering. He has thirty eight years of experience in the nuclear field covering activities in the areas of plant operation, plant project and plant service. He worked as senior engineer and project manager in the power plant chemistry department of the Siemens Nuclear Division, later AREVA NP GmbH. He has been certified as Company Senior Advisor in the area of Power Plant Chemistry in July, 2008.

He was also engaged as IAEA Consultant for chemistry issues in the preparation of the IAEA TECDOC 1668 – Management of Ageing of Steam Generators, 2011. The activities carried out along his early career include plant operation (6 years), and plant system basic and detail design and planning, plant project (6 years), were a relevant, valuable experience before starting the service and consulting activities. These include service and consulting activities in about 30 NPPs worldwide.



**PROF. KASTRIOT SPAHIU**

**Prof. Kastriot Spahiu** is adjunct professor at Chalmers University of Technology, supervising Ph.D. students carrying out research on spent fuel dissolution in groundwater. He was research coordinator for the experimental spent fuel programme and thermodynamic databases at SKB in the period 1995-2018. He co-authors the main reports of Safety Assessments SR-Can (2006) and SR-Site (2011), as well as the corresponding Process Reports and Data Reports. He was member of the SARG-group, reviewing LILW Safety Assessment at SKB.

He started working in the field of spent fuel disposal since 1979, during his Ph.D. studies at the RIT (Royal Institute of Technology), Stockholm. At that time the carbonate chemistry of aqueous actinide and lanthanide ions was poorly known and it increased considerably as a result of the work of the carbonate group at RIT under the leadership of Prof. Ingmar Grenthe, and financed by SKB. In the process Kastriot got a solid knowledge of solution thermodynamics, especially on activity coefficient estimations in electrolyte solutions. He was member of the review team of Np-Pu thermodynamic database in the period 1994-2001 and has maintained the interest in this field by being chair or member of the Executive Group of the NEA-TDB project,

which produces the high-quality reviews of thermodynamic data for actinides and important fission products used practically in all safety assessments. He has been adviser and reviewer of thermodynamic databases for other waste management organizations, such as ANDRA (France), NIRAS/ONDRAF (Belgium) and RWM (UK).

His introduction in the field of spent fuel dissolution coincided with his start at SKB in 1995 and a few years later the first tests of spent fuel leaching in the presence of hydrogen produced by the anoxic corrosion of iron were undertaken at Studsvik. Since then Kastriot has devoted most of his time investigating the various aspects of the radiolytically promoted spent fuel dissolution and the inhibiting effect of the anoxic iron corrosion products such as  $H_2$  and Fe(II). Such investigations resulted in the decrease of the dissolution rates of spent fuel under the reducing repository conditions by several orders of magnitude, which has a very large impact in the safety assessment of a spent fuel repository.

Kastriot has been member of the Research Council of ANDRA (France) and of the International Scientific Advisory board of PRECCI, CEA (France), member of the Research Advisory Committee of OPG and NWMO (Canada) and reviewer and adviser of the NIRAS/ONDRAF spent fuel programme. He has been experimental work package leader in EC projects concerning fuel dissolution, such as SFS (2001-2004), NF-PRO (2004-2007) and MICADO (2007-2010).

During his 44-year work in the field of spent fuel repository research, he co-authors 4 books, more than 90 refereed papers and more than 30 technical reports. He was assigned the task to write a State of the Knowledge report for spent fuel by the EURAD EC project in 2021. He has given invited lectures in several conferences, including MRS Actinides 2008, Migration 2009 and 2017, ANUP 2010, Atalante 2012, Actinides 2013, Goldschmidt 2016 and MRS SBNWM 2016.

Through A.N.T. International independent World Class Network of 38 Experts we can provide unique knowledge and experience in the nuclear field.

**READ MORE ABOUT  
OUR EXPERTS »**





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## CONTACT

For more information and/or an offer, welcome  
to contact us at [sales@antinternational.com](mailto:sales@antinternational.com)

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information [www.antinternational.com](http://www.antinternational.com)