

The Antenna

NEWSLETTER FROM A.N.T. INTERNATIONAL No.63 2025

REMINDER OF UPCOMING ZIRAT AND LCC SEMINARS. MAY 5-7, 2026



Don't miss your chance to join the Annual ZIRAT30 Fuel and LCC21 Coolant Chemistry/Corrosion & Structural Material Degradation Seminars - the premier events for cutting-edge industry insights. We are delighted that Iberdrola (Spain) will generously host this year's seminars in Madrid, May 5-7, 2026. This is a unique opportunity for ZIRAT30 and LCC21 members to connect, learn, and exchange experience with leading experts from around the world.

Please be advised that the last day to register for the ZIRAT30 and LCC21 Seminars is 21 April 2026.

If you are not yet a ZIRAT/LCC member but would like to participate or learn more about the programmes, please contact me at mikaela.rudling@antinternational.com.

We would be happy to help you join and secure your place at the seminars.

ZIRAT AND LCC SEMINARS IN 2026

These Seminars deliver exceptional value for engineers of all backgrounds, from newcomers seeking a solid foundation to experienced specialists looking to deepen their expertise.

Last year's seminars gathered over 90 participants from 28 organisations across 12 countries, with excellent feedback: an average score of 4.5 out of 5.



ZIRAT30 PRESENTATION AGENDA

The following presentations will be given at the ZIRAT30 seminar:

PIERRE BARBERIS – ZIRCONIUM COMPONENTS: PROCESSING AND MICROSTRUCTURE

ZOLTAN HOZER – VVER/PWR FUEL BEHAVIOUR DURING NORMAL OPERATION IN A NUCLEAR REACTOR

PETER RUDLING – DELAYED HYDRIDE CRACKING DURING INTERIM DRY STORAGE OF SPENT NUCLEAR FUEL

DAVID SCHRIRE – TITLE OF PRESENTATION TO BE PROVIDED

MARTIN STEINBRÜCK – PROMISING ATF CLADDING CONCEPTS: OVERVIEW AND UPDATE 2024/2025

NICOLAS WAECKEL AND PETER RUDLING – PELLET CLADDING INTERACTION (PCI) AND PELLET CLADDING MECHANICAL INTERACTION (PCMI)

JINZHAO ZHANG – TITLE OF PRESENTATION TO BE PROVIDED

ZIRAT30 – Fuel & Zirconium Alloys

Celebrating its 30th year, ZIRAT provides an annual global review of zirconium technology, helping members understand alloy behaviour, evaluate material performance, and exchange insights in an independent expert forum.

LCC21 PRESENTATION AGENDA

The following presentations will be given
at the LCC21 seminar:

JIAXIN CHEN: – CORROSION PRODUCT FORMATION, RELEASE,
TRANSPORTATION AND DESPOSITION IN PWR PRIMARY CIRCUITS:

PIERRE GUILLERMIER – SILICA CONTENT CURRENT GUIDANCES (AND
THEIR GENESIS), SILICA MANAGEMENT IN PRIMARY WATER COOLANT

JIŘÍ RAPOUCH – EXPERIENCE WITH VVER WATER CHEMISTRY CONTROL

ARMIN ROTH – REVIEW OF MAJOR TOPICS IN CORROSION AND
ENVIRONMENTALLY ASSISTED CRACKING OF MATERIALS FOR
MECHANICAL COMPONENTS OF LIGHT WATER REACTORS
FROM THE PAST 40 YEARS

JUAN DE DIOS SANCHEZ ZAPATA – KEY EMERGING ISSUES AND RECENT
PROGRESS IN PWR/VVER, BWR AND NEW REACTORS - KEY RESULTS
FROM
THE 2025 NPC CONFERENCE IN KOREA

ARANCHA TIGERAS – COOLANT CHEMISTRY TOPIC
TO BE ANNOUNCED LATER

LCC21 – Coolant Chemistry & Structural Materials

Now in its 21st year, LCC advances understanding of reactor water chemistry to ensure safe, efficient operation and protect material integrity. It also guides plants in applying optimal PWR secondary-side chemistry and offers an independent platform for expert dialogue.

DEVELOPMENT OF SMALL MODULAR REACTORS, SMRS

A.N.T. International brings together one of the world's strongest networks of nuclear experts—professionals who helped shape today's global reactor fleet.

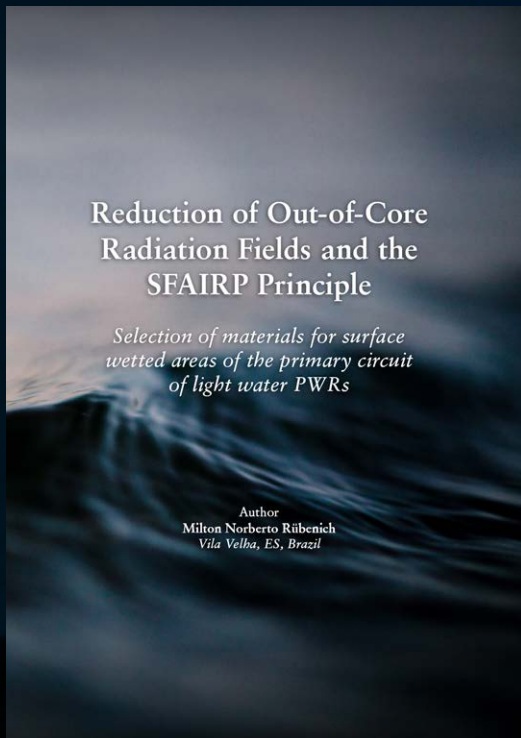
With unparalleled experience in fuel and structural material, coolant chemistry, and thermal-hydraulics, our specialists are uniquely positioned to support the next generation of reactors. Whether you are developing a new SMR concept or refining an existing design, A.N.T. International provides the deep technical insight and proven industry knowledge needed to accelerate development, reduce risk, and ensure long-term reliability.

From concept to deployment, our experts help you build SMRs on a foundation of decades of real-world nuclear experience.



NEW REPORT

Discover how smarter material choices in PWR primary circuits can reduce out-of-core radiation fields — aligned with the SFAIRP principle.



Principle delivers insights for practical solutions for one of the nuclear industry's biggest challenges: minimizing radiation exposure in pressurized water reactors (PWRs).

This report explains how the right choice of materials, chemistry control, and design decisions can significantly cut radiation fields caused by isotopes like Co-60, Co-58, and Sb-124. With real-world lessons from Siemens designed reactors located in Europe and Brazil, it shows how to apply the SFAIRP principle (So Far As Is Reasonably Practicable) to reduce dose rates, improve outage performance, and extend plant lifetimes.

Engineers, operators, and regulators will benefit from clear strategies, benchmark data, and the introduction of a new Ultimate ALARA Index (UAI) that links energy production with radiation safety.

Author Milton Norberto Rübenich, an ANT International expert with over 40 years in nuclear design and operations, brings unmatched experience and insight to this essential guide.

Please contact sales@antinternational.com to get more information and price of this report



A.N.T. INTERNATIONAL®

OUR MOST RECENT EXPERTS

I am very happy to announce two new experts: Dr. Armin Roth and Dr. Martin Steinbrück. With these additional Expert, A.N.T. International has now access to 46 world class Experts that can provide various services to you.

Armin Roth, born in 1959, received his engineering diploma (“Dipl.-Ing.”) in materials science from the Friedrich-Alexander-Universität of Erlangen-Nürnberg, Germany, in 1986. His major subject was corrosion & surface technology, supported by in-depth studies in general properties of materials and physical chemistry. For five years he worked as a research scientist at the Institute for “Corrosion and Surface Technology” of the same university. During this period, he performed a major governmentally funded research project on corrosion of Aluminium-Lithium alloys for aircraft structures. He received his PhD in corrosion engineering from the same university in 1991.

Since then, he has worked in the department of “Materials, Corrosion and Welding” for Siemens AG / Power Generation Group (KWU), followed by Siemens Nuclear Power GmbH, Framatome ANP GmbH, AREVA NP GmbH, AREVA GmbH, and most recently for Framatome GmbH.

From 1996 to 2003 he was section leader of the mechanical materials testing section within this department. Since 2003, he concentrates his expertise on the performance of technical and scientific engineering projects as well as on consultancy in direct contact with customers from plants and utilities.

Armin Roth has gained a broad experience in scientific investigations and interpretations as well as the application of scientific knowledge for the engineering assessment of mechanical components of nuclear power plants such as reactor pressure vessels of boiling water reactors (BWR) and pressurized water reactors (PWR) pipes, pumps and valves. In particular, he was consulting for various root cause analyses of failed parts, for projects of component replacement or refurbishment of the installed base of Siemens/KWU design plants, and for Framatome’s new build EPR projects of Olkiluoto 3, Flamanville 3, and Hinkley Point C.

His knowledge and experience comprise general corrosion, uniform and localised corrosion, environmentally assisted cracking (EAC) including stress corrosion cracking (SCC), irradiation assisted stress corrosion cracking (IASCC), strain-induced corrosion cracking (SICC), and corrosion fatigue (CF) respectively environmentally assisted fatigue (EAF), according to the more recently applied terminology. His main materials of concern are all kind of steels, i.e. carbon steel, low-alloy steel, stainless ferritic and ferritic-martensitic chromium steels, and austenitic stainless chromium-nickel steels. He has also basic knowledge in corrosion and EAC of Ni-alloys, Cu-alloys, Al-alloys, Ti-alloys. Moreover, he has worked with ageing mechanisms of metallic materials in general and has authored a catalogue of ageing mechanisms for mechanical components in nuclear power plants with light water reactors.

From a project perspective, he represented the company in several national and international projects and working groups. In particular, since 2000 he serves as a member of the board of directors of the International Cooperative Group on Environmentally Assisted Cracking (ICG-EAC), a non-profit organisation of experts registered in the USA. He was appointed chairman of this group in the period from 2019 to 2022. Furthermore, for more than 10 years he served as working group leader of the “low-alloy steel”-section of this scientific and engineering group.

He was awarded the level of Chief Advisor by Framatome GmbH and Fellow Expert by the Framatome Group. Furthermore, he received the title of Fellow by the EDF group.

His work is documented in the international public domain in more than 50 scientific publications at conferences and in scientific journals.

Since January 2025 he has entered the state of retirement.



MR. ARMIN ROTH

Dr. Martin Steinbrück studied chemistry at the Friedrich Schiller University of Jena and received his Ph.D. in 1990.

After working for two years in a microelectronics company, he joined the Karlsruhe Institute of Technology (formerly Forschungszentrum Karlsruhe FZK) in 1991. Since then, he has worked mainly in the fields of materials science and nuclear safety research. Dr. Steinbrück is head of the High-Temperature Materials Chemistry group at the Institute of Applied Materials. He is Principal Investigator of the QUENCH project dealing with the hydrogen source term and coolability during quenching of an overheated core in the framework of the KIT Nuclear Safety Program. He is particularly interested in materials behavior, oxidation, and nuclear component interactions at high temperatures. In recent years, Dr. Steinbrück has focused on accident tolerant fuel (ATF) cladding materials.



Dr. Steinbrück has published more than 170 papers cited in Scopus with an H-index of 38 (as of 09/2025). He is the organizer of the annual International QUENCH Workshop: <http://quench.forschung.kit.edu/index.php>

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