

The Antenna

NEWSLETTER FROM A.N.T. INTERNATIONAL No.40 2018



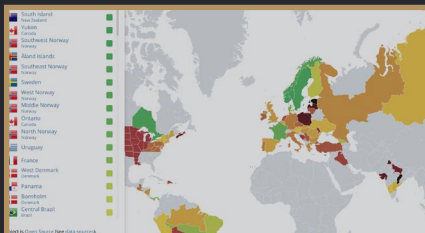
INFORMATION ABOUT NUCLEAR POWER



Why I changed my mind about nuclear power.

*by Michael Shellenberger,
TEDxBerlin*

[click here to watch](#)



Climate impact by area.
electricitymap.org

[click here to view](#)

ALL OF US WORKING IN THE NUCLEAR INDUSTRY have a responsibility to inform others about how safe and environmentally friendly nuclear energy is. If we all inform other people, I am sure we can make a difference. I found the film to the left (about 25 min. long) on YouTube which is really great. The lecturer, an environmentalist and pacifist describes the benefits of nuclear power compared to solar, wind, coal, oil and natural gas.

The following link www.electricitymap.org shows which energy sources are used in different countries and the CO₂ emission from each country. It is interesting to note that Germany, a country that claims to be so environmentally-friendly is actually one of the worst polluting countries in the western Europe. While France with a lot of nuclear power is one of the most environmentally-friendly in Europe, thanks to the nuclear power.

I would be most grateful if you could share both the film and the link to the website with your friends and ask them in turn to spread the message.

*Yours sincerely,
Peter Rudling*



A.N.T. INTERNATIONAL SEMINARS 2019 SCHEDULE

FEBRUARY 2019 Clearwater Beach, Florida, USA.

MONDAY 4	TUESDAY 5	WEDNESDAY 6	THURSDAY 7	FRIDAY 8
	ZIRAT23 Seminar, USA			

MARCH 2019 Palma de Mallorca, Spain.

MONDAY 4	TUESDAY 5	WEDNESDAY 6	THURSDAY 7	FRIDAY 8
		Structural Materials Degradation		
			Radiation Effects on Material Properties	
MONDAY 11	TUESDAY 12	WEDNESDAY 13	THURSDAY 14	FRIDAY 15
ZIRAT23 Seminar, Spain			PWR Reactor Design and Operation	
LCC14 Seminar, Spain			Zr Alloy Corrosion and Hydrogen Pickup Mechanisms	

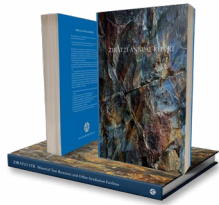


SEMINAR INFORMATION

ZIRAT23 Seminar

The ZIRAT Seminar is a part of the ZIRAT Programme, this Seminar is held every year in USA and Europe during February-March and is only available to current member organisations. Up to eight (8) employees per organisation can attend the ZIRAT Seminar.

[Read more about the ZIRAT Annual Programme](#)



LCC14 Seminar

The LCC Seminar is a part of the LCC Programme, this Seminar is held every year in Europe during March and is only available to current member organisations. Up to eight (8) employees per organisation can attend the LCC Seminar.

[Read more about the LCC Annual Programme](#)



Structural Material Degradation

(March 6-8, 2019 — Spain)

INFORMATION:

Structural materials degradation may be responsible for the loss of availability, high repair costs and safety related events. During the seminar, past experience of structural materials degradation is presented with the objective of providing materials/structural engineers the tools and knowledge to protect nuclear power plants against re-occurrence of similar degradations along with directions to avoid potential new materials failures.

LECTURERS:

[Mr. François Cattant](#) and [Dr. Ulf Ilg](#).

[Click here for more information](#)

Radiation Effects on Material Properties

(March 7-8, 2019 — Spain)

INFORMATION:

This course is directed at engineers, physicists and materials scientists with an interest in component behaviour in nuclear reactor cores. The primary aim is to give a practical understanding of how material properties are affected by irradiation and how this impacts the reactor operation and the useful life of a given component in the reactor. The course will provide reactor design engineers and reactor operations staff an appreciation for materials selection in reactor construction and also provide some of the tools needed to predict material property changes that occur over the life of the reactor. The focus will be on radiation effects on material properties; corrosion and other reactions with the coolant will not be addressed

LECTURER:

[Dr. Malcolm Griffiths](#).

[Click here for more information](#)

PWR Reactor Design and Operation

(March 14-15, 2019 — Spain)

INFORMATION:

This course provides an overview of all aspects of PWR plant and fuel design including normal operation, accident mitigation, the fuel reload analysis process, operating experience issues, and computer codes used for PWR analyses. The primary aim of the course is to give a practical understanding of PWR plant and fuel design and operation. This course is directed at engineers and engineering support personnel that support PWR plant operation, PWR fuel design, or any facet of PWR fuel analyses.

LECTURER:

[Mr. Kenneth Epperson.](#)

[Click here for more information](#)

Zr Alloy Corrosion and Hydrogen Pickup Mechanisms

(March 14-15, 2019 — Spain)

INFORMATION:

This course is directed at engineers, and materials scientists interested in fuel performance in general and specifically in Zr alloy corrosion and hydrogen pickup mechanisms and performance. The focus will be on explaining the very complicated corrosion and hydrogen pickup mechanisms in an understandable manner. Also, the various parameters impacting corrosion and hydrogen pickup will be covered as well as discuss specific in-reactor cases with abnormal corrosion and hydrogen pickup behaviours and the possible reasons behind the behaviours.

LECTURERS:

[Mr. Friedrich Garzarolli](#), [Dr. Clément Lemaignan](#)
and [Mr. Peter Rudling](#).

[Click here for more information](#)



ADDITIONAL INFORMATION

A.N.T. INTERNATIONAL ACADEMY – SEMINAR PRICES

3-DAY SEMINAR

No. of participants	1	2	3	4	5	6	7	8
Price p/p (EUR)	2 750	2 625	2 500	2 500	2 500	2 375	2 375	2 375
Total price (EUR)	2 750	5 250	7 500	10 000	12 500	14 250	16 625	19 000

2-DAY SEMINAR

No. of participants	1	2	3	4	5	6	7	8
Price p/p (EUR)	2 500	2 375	2 375	2 250	2 250	2 000	2 000	2 000
Total price (EUR)	2 500	4 750	7 125	9 000	11 250	12 000	14 000	16 000

1.5-DAY SEMINAR

No. of participants	1	2	3	4	5	6	7	8
Price p/p (EUR)	1 700	1 625	1 625	1 550	1 550	1 450	1 450	1 450
Total price (EUR)	1 700	3 250	4 875	6 200	7 750	8 700	10 150	11 600

Contact us for more information: seminar@antinternational.com or +46 (0)31-88 16 00

THE HOTELS

Clearwater Beach, Fl, USA – Palma de Mallorca, Spain



Sheraton Sand Key Resort

1160 Gulf Blvd., Clearwater Beach,
33767 Florida, USA
Phone: +1 727 595 1611
Fax: +1 727 593 6004
Website: [Sheraton Sand Key Resort](http://SheratonSandKeyResort.com)



Meliá Palma Marina (Former Meliá Palas Atenea)

Paseo Ingeniero Gabriel Roca, 29.
Palma de Mallorca, Spain.
Phone: +34 971 28 1400
Fax: +34 971 45 1989
Email: melia.palma.marina@melia.com
Website: [Meliá Palma Marina](http://MeliáPalmaMarina.com)

ANNUAL PROGRAMMES

Information about ANT International Annual Programmes related to fuel, various systems chemistry and corrosion and structural material degradation in LWRs (BWRs, PWRs, VVERs, CANDUs).

THE OVERALL OBJECTIVES OF THE THREE ANNUAL PROGRAMMES ARE:

To enable the customer to gain increased understanding of material and water chemistry behaviour related to successful core operation, meeting all water chemistry and material related challenges in the most efficient way and evaluations of options for the backend of the fuel cycle.



The objective is met through review and evaluation of the most recent published data, identification of the most important new information, and discussion of its significance with the long and broad experience of our experts. Included in the reviews are topics on:

- Zr alloy materials research and development, fabrication, component design and in-reactor performance, LOCA and RIA performance as well as interim dry storage.
- Various systems chemistry and corrosion issues and resolutions mainly in the primary and secondary side of PWRs/VVERs and primary side of BWRs.
- Structural material degradation in LWRs.

The deliverables in the three programmes are:

- Technical reports as searchable high-resolution PDF files in colour.
 - » The files can be copied to a company server, with full read access for everybody with access to the server.
 - » The contents from Reports in PDF-format can be printed.
 - » Also, the contents from the PDF files can be copied and pasted electronically into other documents, e.g. Word files.
 - » The programme member is free to use all figures and tables where A.N.T. International has the copyright both internally and externally.
- The authors will be available for consulting throughout the year. A few telephone or e-mail consultations requiring no additional work are provided at no additional cost to members.
- In two of the three programmes also Seminars are held in USA, in Europe in February-March and in China to present the report results by the authors.

REPORT AUTHORS & LECTURERS



Our experts have more than 600 years of cumulative experience working for fuel/reactor vendors and nuclear utilities such as Duke Energy, General Electric, AREVA NP GmbH, AREVA NP, Electricité de France (EDF), EnBW, Harwell Laboratory of the UKAEA, etc.

Of the 18 experts, 14 have a Ph.Ds. Their specialties cover a large spectrum of subjects. During their working careers they have held a large range of responsible positions: Manager of Fuel Channels Components Branch, Chief Technologist/Chemistry, Manager of Safety Analysis Engineering and Fuel Development, Manager of Materials Technology, Manager of the Corrosion Mitigation and Coatings Laboratory, Expert Consultant in corrosion and stress corrosion of materials, Head of the corrosion department of the Technical (R&D) Centre, International expert in charge of chemistry and corrosion in the corporate offices, Chief Physical Sciences, Engineering Fellow, Chief Technologist, Chemistry Manager.

[*Read more about our experts*](#)

OUR CUSTOMERS

The following organisations/companies are members of one or several of our three Annual Programmes.



NUCLEAR UTILITIES

- Amec Foster Wheeler
- Axpo
- BKW
- CEZ
- CNAT
- CNL
- Duke
- EDF UK
- Enresa
- EPZ
- Fortum
- Gösgen-Däniken
- Iberdrola
- Kansai
- Kyushu
- NA-SA
- NEK
- OKG
- TEPCO
- Tractebel
- TVO
- Vattenfall
- Xcel Energy



FUEL VENDOR REACTORS

- KNFC
- NFI



RESEARCH AND ENGINEERING ORGANISATIONS

- Bechtel
- CNPRI
- EPRI
- Rolls-Royce
- SNERDI
- Studsvik



NUCLEAR REGULATORY AGENCIES

- NRC
- ONR
- ENSI



Pictured above are: Ms. Qifeng Zeng, (Senior Engineer), Mr. Hui Lu (Engineer) and Mr. Yunqing Zhou (Director, Senior Engineer) from SNERDI.



Mr. Ilia Kniazev, System engineer, Primary coolant purification and treatment systems at Fennovoima.

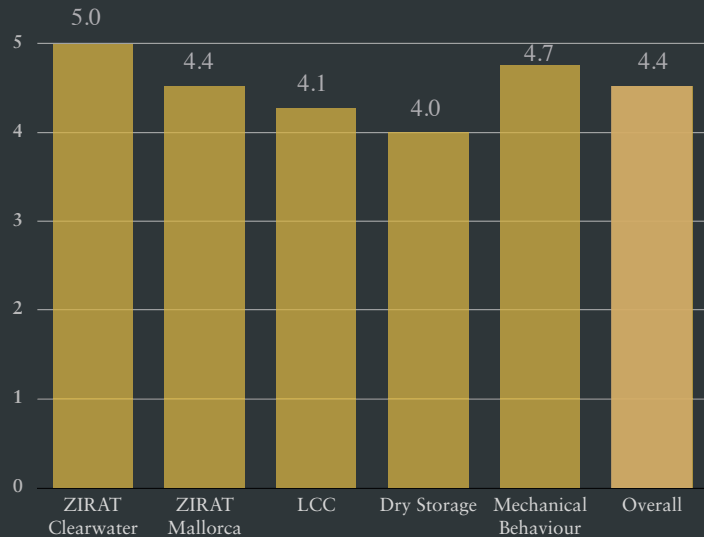
SEMINARS 2018

Over 80 attendees from 34 organisations, 12 countries in North America, Europe and Asia participated in the seminars and provided the following feedback.

What is your overall opinion?

A summary of the evaluation from the participants in the 2018 Seminars is provided in the table to the right.

The grade ranged from 1 (poor) to 5 (excellent). These values represent the average.



Ms. Rautio Satu
FORTUM



Mr. Theo van Bloois
EPZ



Mr. Andrew Sinclair
AMEC FOSTER WHEELER

"Again an excellent seminar with a lot of new, practical and useful information!"

MS. TINA KLASSEN
Specialist Nuclear Fuel Technology
Axpo Power AG

"Two days may have saved months of work"

DR. TODD ALLEN
INL and the University of Wisconsin

"I appreciated the level of knowledge of all presenters. It is clear A.N.T. International has a very experienced staff"

MR. BEN HOWELL
Lead Nuclear Engineer
Duke Energy

CONTACT US!

For more information and/or an offer welcome to contact us
at seminar@antinternational.com

Please also visit our website for the latest updated
information, www.antinternational.com



A.N.T. INTERNATIONAL®
www.antinternational.com

Advanced Nuclear Technology International
Spinnerivägen 1, Fack 5035, SE-448 50 Tollerød, Sweden. Phone: +46 (0)31-88 16 00.
info@antinternational.com www.antinternational.com