The Antenna

NEWSLETTER FROM ANT INTERNATIONAL No.20 2012

OUR EDUCATIONAL PROGRAMS – FOLLOW UP FROM THE ZIRAT & LCC SEMINARS

Continued improvements are appreciated by our customers!

The ZIRAT* and LCC* Seminars in the US and Malta, February–March 2012, got high rankings.

The annual ZIRAT Program is open to nuclear utilities and laboratories world-wide. The annual LCC Program is open to nuclear utilities, fuel vendors, research laboratories and regulatory agencies.

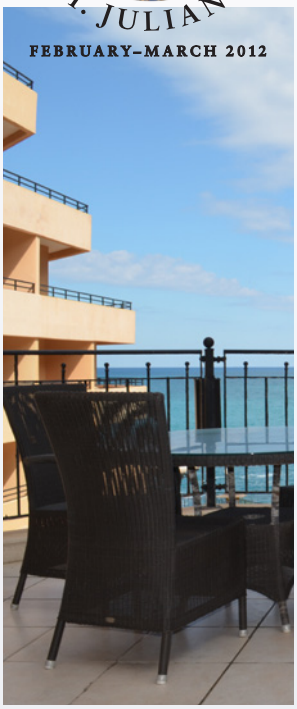
In 2012 one ZIRAT Seminar was held in Clearwater Beach, Florida and one in St. Julian's, Malta where a total of 49 participants representing 25 organisations took part in the Seminars.

In St. Julian's, Malta a total of 29 participants representing 16 organisations took part in the European LCC7 Seminar.

Read the ZIRAT16 evaluation

Read the LCC7 evaluation

See pictures



* The Annual Zirconium Alloy Technology (ZIRAT) Program is focused on fuel assembly material issues and open to nuclear utilities. The overall objective of the ZIRAT Program is to enable the nuclear utilities and laboratories to gain increased understanding of material behaviour related to successful core operation. Read more

The Annual LWR Chemistry and Component Integrity (LCC) Program is focused on reactor coolant and RCS material issues and open to nuclear utilities, fuel vendors, research laboratories and regulatory agencies. The overall objective of the LCC Program is to enable the LCC Member to gain increased understanding of reactor water chemistry related to a successful plant operation and continued integrity of Reactor Coolant System (RCS) materials while keeping radiation exposure low. Read more

"Everything you need to know about Control Rods"

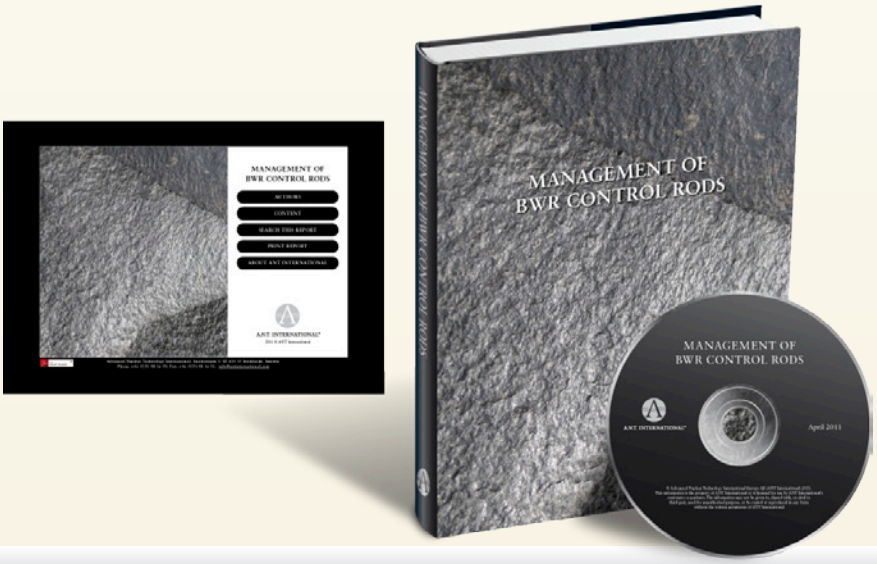
Manuel Albendea, Responsible for Core Monitoring and Control Rod Management, Nuclear Fuel Cycle Department, Iberdrola, Generación SAU, Spain.

The MBCR (Management of BWR Control Rods) is, as all reports by ANT International, an excellent handbook that offers a complete overview of all there is to know about control rods in BWR reactors. After a systematic, didactic and enjoyable introduction of the basic concepts, very useful for beginners or forgetful veterans like me, MBCR provides a complete and comprehensive compendium to the current state of the art knowledge in this field.

All the topics are presented clearly, from the BWR control rod designs and operation criteria to the rod material sensitization by effect of irradiation. The text also describes in detail the degradation and failure mechanisms and the radiochemical effluents behavior. MBCR is indispensable for expert engineers responsible for the control rod management so they can make optimum use of the rod in order to reduce the direct replacement and waste disposal costs, while ensuring an efficient and safety plant operation.

The high quality of the text is the result of great experience and knowledge of the authors, Dr. Kurt-Åke Magnusson and Mr. Klas Lundgren that have a lifetime of experience in the nuclear materials technology area. This handbook can be read cover to cover for those who seek to understand the BWR control rods in its entirety, and can also be used as a reference source to look up useful facts and information concerning specific areas.

Together with the hardcover book a CD with the book in a searchable pdf format is delivered. It is very useful in the e-book reader, and makes the book easy accessible.



The objective of this handbook, is to cover the basis for management of the control rods and provides guidance for those needing an introduction to the topic as well as an up to date review and bibliography. This information is of interest for people involved in control rod management and water chemistry surveillance as well as those who are relative newcomers to this field.

Read more

For further questions or an offer, please contact Peter Rudling; peter.rudling@antinternational.com

EXISTING REPORTS

Reports from ANT International that help resolve current Issues. By clicking on the links below you will be able to browse through many of the pages in these Reports that are both interesting and useful in your day to day work. If you would like more information and/or an offer, please contact Peter Rudling; peter.rudling@antinternational.com

BWR Fuel Channel Distortion ***Read more***

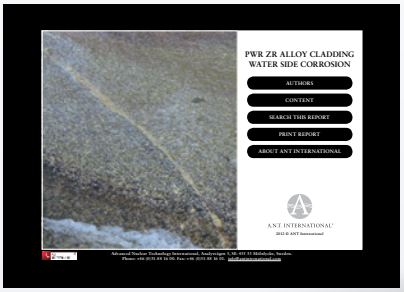
Effect of Zn in BWR and PWR/VVER on Activity Build-up, IGSCC and Fuel Performance ***Read more***

NEW REPORT

PWR Zr-Alloy Cladding Water Side Corrosion – PZAC

All fuel vendors are developing new PWR alloys to reduce corrosion and hydrogen pickup rates since these properties may limit burn-up. To be able to understand the PWR corrosion mechanism and the different parameters impacting the corrosion rate, ANT International has developed this Handbook that will become available in the summer 2012. The corrosion performance depends on several parameters such as:

- Temperature at the Zr alloy oxide/metal interface
- Exposure time
- Water chemistry, including impurities and CRUD deposition
- Fast neutron flux
- Zr-alloy chemistry and condition
- Existance of a hydride layer at the Zr alloy oxide/metal interface
- Irradiation induced dissolution of second phase particles (SPP)
- LiOH incorporation in the inner part of the oxide layer.
- Oxide thermal conductivity



Authors Friedrich and Mathias Garzarolli, editor Peter Rudling

Since these parameters are different for different PWR alloys being tested in-reactor, it is hard to compare the corrosion performance of these alloys under equivalent conditions to enable an organization to select the best material.

The Handbook also provides a computer code which allows an equivalent comparison of new alloys irradiated in different reactors at different conditions. The computer code may also assist in identifying the mechanism why the corrosion rate starts to accelerate under certain conditions.

For further questions and an offer, please contact Peter Rudling; peter.rudling@antinternational.com

LET OUR EXPERTS ASSIST YOU

Problem solving by world class experts

ANT International can provide expertise in the BWR/PWR plant chemistry and fuel design/manufacturing/performance areas. We have noticed that many of our customers would like to have some limited support (2–4 weeks) from experts and ANT International can provide such services. Dependent on the issue, we set up the perfect team of experts to resolve the issue. We have many years of experience of doing this type of work in the fuel area and we now offer the same services in the plant chemistry area.

Read more

ZIRAT17/LCC8 2013

These are the interesting topics in our next ZIRAT & LCC Programs. Make sure that your organization sign up for the next ZIRAT and LCC Program.

Welcome to contact us for an offer or if you have any questions.

Zr alloy/fuel technology information related to BWR/PWR/VVER/CANDU reactors

ZIRAT17 Annual Report, including recent information on:

- Fuel reliability and High Burnup Zr alloy and UO_2/MOX fuel Performance Issues
- Effect of manufacturing on Zr alloy, including CANDU pressure tubes, microstructure and in-reactor performance
- Review of Zr Alloy Irradiation growth and consequences
- Review of Zr Alloy BWR shadow corrosion/nodular corrosion mechanisms and most recent PWR/VVER/BWR corrosion and hydrogen pickup Zr alloy data
- Update on most recent fuel failures and secondary degradation in-reactor
- Update on dry storage issues

ZIRAT17 Special Topic Report on Performance of high strength nickel alloys used in BWR/VVER/PWR fuel assemblies

ZIRAT17 Special Topic Report on High burnup BWR/VVER/PWR fuel design issues

Plant chemistry/corrosion and structural material integrity issues in BWR/PWR/VVER/CANDU reactors

LCC8 Annual Report on Key Emerging Issues and Recent Progress Relating to Structural Materials Degradation and Plant Chemistry/Corrosion

LCC8 Special Topic Report on BWR Chemistry – Introduction into Chemistry in Nuclear Power Plants with Boiling Water Reactors, Volume II (first volume was provided in the LCC7 Program)

LCC8 Special Topic Report on PWR/VVER Primary Side Coolant Chemistry – Technical Basis and Recent Discussions, Volume II (first volume was provided in the LCC7 Program)

The Annual Zirconium Alloy Technology (ZIRAT) Program is focused on fuel assembly material issues.

Read more

The LWR Chemistry and Component Integrity (LCC) Program is an annual program, focused on reactor coolant and RCS material issues.

Read more

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