

INGSM-5

Fifth International Nuclear Graphite Specialists Meeting

Plas Tan-Y-Bwlch, Maentwrog, Gwynedd, United Kingdom
12th – 15th September, 2004

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Supported by The British Carbon Group

Programme

Sunday September 12th 2004

- 1200h onwards Delegates rooms available at Plas Tan-Y-Bwlch. Residents at The Oakeley Arms Hotel, The Old Rectory Hotel and The Estuary Lodge check-in.
- Self-service coffee/tea available in Plas Tan-Y-Bwlch lounge for ALL delegates and accompanying persons.*
- 1600 – 1900 **Conference Session 1:** Lecture Theatre (Stables) (*all sessions*)
- 1600 Welcome and General Introduction
 Dr. A.J. Wickham, Conference Chairman
- 1620 “Irradiation Performance of HTR-10 Fuel Matrix Graphite”
 Tang Chunhe^{}, Koshcheev Konstantin[#], Oleg G. Karlov⁺*
 ^{}INET, Tsinghua University, Beijing, China*
 [#]Federal State Unitary Enterprise “Institute of Nuclear Materials, Zarechny, Sverdlovsk Region, Russia
 ⁺ Russian Research Centre “Kurchatov Institute”, Moscow, Russia
- 1650 “Present Status of Research on Graphite, C/C Composites and Safety Demonstration Test in the HTTR Project”
 T.Shibata, J.Sumita, M.Ishihara, S.Hanawa, K.Sawa and T.Iyoku,
 Japan Atomic Energy Research Institute (JAERI)

- 1720 “The Design of the PBMR Core Structures”
Mark Mitchell, PBMR Co. (Pty) Ltd, South Africa
- 1750 “UK Regulatory Framework for Assessment of Graphite Core Safety Cases”
G. Heys, HSE Nuclear Safety Directorate, UK
- 1810 “Update on Progress with Graphite Codes and Standards”
T.D. Burchell, Oak Ridge National Laboratory, USA
- 1835 “German Standards for Carbon and Graphite”
Gerd Haag, Forschungszentrum Jülich, Germany
- 1900 – 2000 *Cash Bar available*
- 2000 **Welcome Reception:**
“Taste of Wales” Buffet
Dylan Cernyw – Telyn Fach Gymraeg (Traditional Welsh Harp)
- Hosts:*
- Dr. Mike Weighman, Deputy Chief Inspector of Nuclear Installations, Health and Safety Executive Nuclear Safety Directorate*
- Dr. Graham Fairhall, British Nuclear Fuels plc, NSTS*
- Cash Bar available to 2330h*

Monday September 13th 2004

- 0830 – 1030 **Conference Session 2**
Chairman: *Dr. T. Shibata, JAERI and IAEA Database Liaison Officer for Japan*
- 0830 “Environmental Effects on Fracture of Nuclear Graphites”
Brian McEnaney, Materials Research Centre, University of Bath, UK
- 0900 “Modelling of Fracture in Pseudo-Brittle Materials”
C. Lynch and G.B. Neighbour, University of Hull, UK
- 0930 “Reassessment of Fundamental Graphite Properties - Modulus, Strength and CTE”
Alan Steer and M. Bradford, British Energy, UK
- 1000 “A Study into the Key Factors Influencing the Design Life of a PBMR Side Reflector Block”
Mark Mitchell, PBMR Co. (Pty) Ltd., South Africa
- 1030 – 1045 *Coffee Break*

- 1045 – 1245 **Conference Session 3**
Chairman: *Mr. Mark Mitchell, PBMR Co (IAEA Database Sponsor)*
- 1045 “Monitoring Strategy for Operating Reactors”
James Reed and Tony Beynon, British Energy, UK
- 1115 [Title to be advised]
Matthew Brown, BNFL NSTS, Berkeley, Glos, UK
- the talk will cover the influence of sample size on property measurements and may also cover recent developments on DYM and UTS measurement techniques
- 1145 “On the Analysis of Graphite Irradiation Creep Data”
T.D. Burchell, Oak Ridge National Laboratory, USA
- 1215 “The Validity of the Use of Equivalent DIDO Nickel Dose”
Dennis Allen, British Nuclear Group, Berkeley, UK
- 1300 – 1400 *Lunch (Plas Tan-Y-Bwlch)*
- 1400 – 1530 **Conference Session 4**
Chairman: *Dr. Derek Buckthorpe, NNC Ltd*
- 1400-1440 Special Discussion: “Graphite Materials Programme for the VHTR System in Conjunction with Generation IV activities (towards the NGNP planned for construction in 2017 in the US)”
- 1440 “Pre-irradiation Characterisations of HTR Candidate Nuclear Graphites”
J.A. Vreeling and J.G. van der Laan, NRG Petten, The Netherlands
- 1505 “Irradiation testing of Graphites & Composites at Petten 2003-2009”
J.G. van der Laan, J.A. Vreeling et al., NRG Petten, The Netherlands
- 1530 – 1610 Group Photograph, followed by Tea Break
- 1610 – 1800 **Conference Session 5**
Chairman: *Prof. Chunhe Tang, INET China*
- 1610 “Can Nuclear Grade Graphites and Advanced Gas Reactor Fuel Components Be Made From Anthracite?”
Peter Pappano, Oak Ridge National Laboratory, USA
- 1635 [Title to be advised]
S. Blaine Grover, INL, USA
(presentation on gas reactor testing in ATR including the upcoming tests on fuel currently being prepared by Pete Pappano at ORNL)
- 1700 [Title to be advised]
Nassia Tzeleni, BNFL NSTS, Berkeley, Glos, UK

- the talk will provide an update on the INL irradiation experiment and describe the complementary thermal oxidation studies
- 1720 “Towards a Nuclear Graphite Purity Specification”
Shahed Fazluddin, PBMR Co. (Pty) Ltd
- 1740 “Characterisation of Isotropic Cokes”
Jean-Noel Rouzaud, ENS, Dept Geologie, Paris and B. Tahon, SGL Carbon
- 1800 – 1830 *Cash bar available*
- 1830 – 1930 Dinner (Plas Tan-Y-Bwlch)
- 1930 – 2130 **Conference Session 6: Workshop on Structural Code Comparison**
Chairman: *Dr. D.K.L. Tsang, University of Manchester School of Engineering, Nuclear Graphite Research Group*
- 1930 Introduction
Prof. Barry Marsden, University of Manchester School of Engineering, Head of Nuclear Graphite Research Group
- 1945 “The Development of a Nuclear Graphite Stress Analysis Code”
D.K.L. Tsang, B.J. Marsden and S.L.A. Fok, University of Manchester, UK
- 2000 “Benchmark 1 Analysis using the Serco Graphite UMAT”
Chris Jones, SERCO Assurance, UK
- 2015 “Benchmark with FEAT-COILU”
M. Rabbitt, British Energy Generation Ltd, UK
- 2030 “Stress Analysis for IG-110 Graphite with VIENUS Code”
T.Shibata, S.Hanawa, M.Ishihara, K.Sawa and T.Iyoku, Japan Atomic Energy Research Institute (JAERI)
- 2045 Contribution from PBMR Co.
Mark Mitchell, PBMR Co. (Pty) Ltd, South Africa
- 2100 Comparison of the Results
D.K.L. Tsang, University of Manchester
- 2115 Discussion: A Future Benchmark Exercise?
- 2130 - 2330 *Cash Bar available*

Tuesday September 14th 2004

- 0830 – 1030 **Conference Session 7**
Chairman: Dr. T.D. Burchell, ORNL and IAEA Database Liaison Officer for USA
- 0830 “Ion Irradiation Program and Effects of Ion Irradiations on the Electrical Resistivity of Carbon Fibers”
Tatsuo Oku, University of the Air, Japan; A. Kurumada, Y. Imamura, Ibaraki University, Japan; M. Ishihara, S. Baba, J. Aihara, JAERI, Japan; and T.D. Burchell, ORNL, USA
- 0900 “Oxidation Behaviour of Ion-Irradiated Nuclear Graphite”
Se-Hwan Chi, KAERI, Republic of Korea
- 0930 “Graphite Oxidation Behaviour and Test Methods”
P. Barth and B. Tahon, SGL Carbon
- 1000 - 1245 **Conference Session 8 (Themed Session: UMIST and The University of Manchester)**
Chairman: Prof. Barry Marsden, University of Manchester School of Engineering and Head of Nuclear Graphite Research Group
- 1000 Introduction
Barry Marsden, The University of Manchester, UK
- 1010 “UK Regulatory Graphite Research Requirements, An Overview”
G. Heys, HSE Nuclear Safety Directorate, UK
- 1030 – 1045 *Coffee*
- 1045 “Relationships between Microstructure and Properties in Nuclear Graphite”
J Marrow, L Babout and P Mummery, UMIST, UK
- 1110 “Crack Propagation in Nuclear Graphite”
A Hodgkins and J Marrow, UMIST, UK
- 1135 “Mechanics Continuum Damage Model for Nuclear Graphite”
S.L.A Fok and B J Marsden, University of Manchester, UK
- 1200 “Analysis and Experimental Studies of Dynamic Stress Waves Generated by Fast Fracture in Graphite Components”
S.L. A. Fok, J D Jackson, W. He, J R Wright and S.P. Yao, University of Manchester, UK
- 1225 “Modelling of Available Graphite Data”
E. Eason, Modelling and Computing Service LLC, USA, and G N Hall, University of Manchester, UK

- 1300 – 1400 *Lunch (Plas Tan-Y-Bwlch)*
- 1400 – 1445 **Conference Session 9**
Chairman: *Dr. Christfried Schlosser, SGL Carbon, Germany (IAEA Database Sponsor)*
- 1400 “Structural Approach to Graphite Properties Modelling”
Mark Bradford and Alan Steer, British Energy, UK
- 1420 First Principles Modelling of Diffusion in Graphite
I. Suarez-Martinez, A.A.El-Barbary, M.I. Heggie, The University of Sussex, UK
- 1450 Depart Plas Tan-Y-Bwlch for Social Evening. *Programme:*
- Llechwedd Slate Caverns (two underground tours)*
Historic Ffestiniog Steam Railway (Blaenau Ffestiniog to Portmadoc)
Dinner (Castell Deudraeth [main group] and elsewhere [overflow])
- Cash Bar available upon return until 2300h – Oakeley Arms Hotel only*

Wednesday September 15th 2004

- 0830 – 1030 **Conference Session 10**
Chairman: *M.Pierre Homerin, GrafTech Intl Inc. (IAEA Database Sponsor)*
- 0830 “The Oxidation of Nuclear Graphite Components: Separating Fact from Fiction for Decommissioning”
A.J. Wickham, Consultant; W. Ingamells and J. Buffery, UKAEA, UK
- 0900 “Graphite Waste Management”
Jean-Pierre Bonal, CEA Saclay, France (to be presented by J-C Robin)
- 0925 “Graphite Oxidation Tests at Cadarache”
Jean-Charles Robin, CEA Cadarache, France
- 0950 “Activity of the Four Main Radionuclides in the Graphite Sleeves of the St Laurent Silos – Measurements and Calculations”
Laurent Rahmani, EDF CIDEN, Villeurbane, France
- 1020 – 1035 *Coffee*

- 1035 – 1120 **Conference Session 11**
Chairman: *Dr. Gerd Haag, Forschungszentrum Jülich, Germany*
and IAEA Database Liaison Officer for FZJ, Germany
- 1035 “Data Handling in the Nuclear Data Section of the IAEA”
R.E.H. Clark, D. Humbert, O. Schwerer, IAEA Vienna
- 1100 [to be advised]
Odile Gelineau, Framatome-ANP, France
- 1120 – 1150 **Closing Session**
- Reflections, discussion, proposal for INGSIM-6 in 2005
- 1200h Option (1) Depart for BNFL Wylfa Nuclear Power Station Tour
(packed lunch provided) followed by direct coach to Manchester
Airport with connection for those returning to Plas Tan-Y-Bwlch –
airport arrival estimated 1930h so overnight stay should be considered
- Option (2) Sandwich Lunch at Plas Tan-Y- Bwlch followed by
direct departure to Manchester Airport or Train Stations *(minibus travel*
according to demand)
- Option (3) Optional Local Tour (Minibus) with Native Guide (for
over-stayers for IAEA Committee Meeting)