HTR 2004

September 22-24, 2004
Friendship Hotel, Beijing 100084, China

INET, Tsinghua University

2nd International Topical Meeting on HIGH TEMPERATURE REACTOR TECHNOLOGY

September 22-24, 2004
Friendship Hotel, Beijing 100084, CHINA

HTR 2004

Institute of Nuclear and New Energy Technology of Tsinghua University

Official Program

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HTR 2004
Beijing, CHINA, September 22-24, 2004

SCHEDULE OVERVIEW

Tuesday, September 21, 2004

13:00 – 19:00	Registration – Lobby of Building No.1
18:30 – 20:30	*Welcome Reception – Ju Xiu Yuan in Friendship Palace*

Wednesday, September 22, 2004

8: 00 – 16:00	Registration – Lobby of Building No.1			
8: 30 – 12:20	Plenary: National and International HTR Program, Economic – Function Hall in Building No.1			
12:20 – 13:30	*Lunch Break – Ya Shi Ting in Building No.1*			
	Room 101, Meeting Hall	Room 102, Meeting Hall	Room 104, Meeting Hall	Room 105, Meeting Hall
13:30 – 17:55	Session A, B: National and International HTR Program, Fuel and Fuel Cycle	Session C: Nuclear and Thermo-Hydraulic Analysis	Session D: Engineering Design and Application	Session E: Material and Components
18:30 – 20:30	*Banquet – Function Hall in Building No.1*			

Thursday, September 23, 2004

8:00 – 16:00	Registration – Lobby of Building No.1			
	Room 101, Meeting Hall	Room 102, Meeting Hall	Room 104, Meeting Hall	Room 105, Meeting Hall
8:30 – 12:05	Session B: Fuel and Fuel Cycle	Session C and H: Nuclear and Thermo-Hydraulic Analysis, New Experiments	Session F: Safety and License	Session E: Material and Components
12:20 – 13:30	*Lunch Break – Ju Fu Yuan Restaurant in Friendship Palace*			
	Room 101, Meeting Hall	Room 102, Meeting Hall	Room 104, Meeting Hall	Room 105, Meeting Hall
13:30 – 17:55	Session B: Fuel and Fuel Cycle	Session C: Nuclear and Thermo-Hydraulic Analysis	Session D and F: Engineering, Design, Application, Safety and License	

Friday, September 24, 2004

8: 00	Buses departure from Friendship Hotel to INET for technical tours
11:30	*Lunch (INET)*
12:15	Departure to the Great Wall

Technical Sessions

Wednesday, September 22, 2004

8:30 – 12:20	**Plenary: National and International HTR Program, Economic** *Function Hall, Building No. 1* **Session Chairs:** A. Kadak (MIT) and S. Yu (INET)			
8:30 – 9:30	**Welcome Speech:** **1. Director of INET,** Z. Zhang **2. Former DDG of IAEA,** J. Qing **3. Representative of HTR-TN,** D. Hittner			
9:30 – 9:50	**HTR-PM Project,** Y. Wang (CHNG)			
9:50 – 10:15	***#A04*** **PBMR Project Status and the Way Ahead,** D. Matzner (PBMR)			
10:15 – 10:40	***#A07*** **Present Status of HTTR Project,** N. Fujimoto, S. Fujikawa, H. Hayashi, T. Nakazawa, T. Iyoku and K. Kawasaki (JAERI)			
10:40 – 11:05	***#A02*** **The European programme of development of HTR/VHTR technology,** D. Hittner (Framatone)			
11:05 – 11:30	***#A01*** **VHTR: Very High Temperature Reactor: The French Atomic Energy Commission (CEA) R&D Program,** P. Billot, D. Barbier (CEA)			
11:30 – 11:55	***#A09*** **Overview of the DOE Advanced Gas Reactor Fuel Development and Qualification Program and Gas Reactor (NGNP) R&D,** M. Feltus (DOE)			
11:55 – 12:20	***#G02*** **From Field to Factory – Taking Advantage of Shop Manufacturing For the Pebble Bed Modular Reactor,** E. Wallace (PBMR), R. Matzie (Westinghouse), R. Heider (Sargent and Lundy), J. Maddalena (PBMR)			
12:20 – 13:30	***Lunch Break – Ya Shi Ting in Building No.1***			
13:30 – 17:55	**Session A, B: National and International HTR Program, Fuel and Fuel Cycle** *Room 101, Science Hall* **Session Chairs:** R. Matzie (Westinghouse) and D. Hittner (Framatome)	**Session C: Nuclear and Thermo-Hydraulic Analysis** *Room 102, Science Hall* **Session Chairs:** G. Greyvenstein (North West University) and N. Fujimoto (JAERI)	**Session D: Engineering Design and Application** *Room 104, Science Hall* **Session Chairs:** M. Fox (IST) and M. Fuetterer (JRC-IE)	**Session E: Material and Components** *Room 105, Science Hall* **Session Chairs:** J. Slabber (PBMR) and Y. Sun (INET)
13:30 – 13:55	***#A06*** **MIT Modular Pebble Bed Reactor (MPBR)** A. Kadak, R. Ballinger (MIT)	***#C01*** **Physical Designs and Calculations for the First Full Power Operation of the 10MW High Temperature Gas-cooled Reactor-Test Module (HTR-10)** X. Jing, Y. Yang (INET)	***#D01*** **Study on the Thermodynamic Cycle of HTR-10GT** Z. Huang, J. Wang, J. Li (INET)	***#E13*** **Studies on Mechanical Behaviour of Mod 9Cr-1Mo Steel – CEA R&D Program** M. Cabrillat, M. Reytier, M. Sauzay (CEA), V. Gaffard (Ecole des Mines de Paris), J. Seran, P. Billot (CEA), B. Riou (Framatome- ANP/ Novatome)

13:55 – 14:20	***#A08*** **A private investor's initiative in HTR technology in The Netherlands** B. Wiersma (Sunergy/Innoplan B.V.), A. Heek, F. Blom, S. Groot (NRG), B. Boer (Delft University of Technology), R. Pahladsingh (Sunergy/Innoplan B.V.)	***#C04*** **Dynamic Systems CFD Simulation Core For the Analysis of HTGR Power Plants** G. Greyvenstein (North West University), W. Landman (M-Tech Industrial)	***#D02*** **Concept of Pebble-Bed-Based HTGR with Fast Pebble Discharge System** J. Dong (INET)	***#E14*** **Application of a Leak Before Break Procedure to a HTGR Cross-Duct** M. Cabrillat, C. Krakowiak, Y. Lejeail (CEA)
14:20 – 14:45	***#A10*** **ANTARES: The HTR/VHTR project at Framatome ANP** Jean-Claude Gauthier, Gerd Brinkmann, Bernie Copsey, Michel Lecomte (Framatome ANP SAS)	***#C05*** **A Finite Volume-Based Network Method For The Prediction Of Heat, Mass And Momentum Transfer In A Pebble Bed Reactor** G. Greyvenstein, H. Antwerpen (North West University)	***#D05*** **Design Features of Gas Turbine Power Conversion System for HTR-10GTm** J. Wang, Z. Huang, S. Zhu, S. Yu (INET)	***#E16*** **Issues in Reactor Pressure Vessel materials** B. Riou, C. Escaravage, D. Hittner, D. Pierron (Framatone ANP)
14:45 – 15:10	***#H01*** **Overview of the CEA Program in High Temperature Helium Technology** L. Cachon, O. Gastaldi, F. Dechelette, A. Berjon (CEA)	***#C07*** **Validation Of A Transient Thermal-Fluid Systems CFD Model For A Packed Bed High Temperature Gas-Cooled Nuclear Reactor** PG Rousseau, CG du Toit and WA Landman (North-West University)	***#D15*** **Design of Chinese Modular High-Temperature Gas-cooled Reactor HTR-PM** Z. Zhang, Z. Wu, Y. Xu, Y. Sun, F. Li (INET)	***#E22*** **Fracture and Mechanical Behaviour of Nuclear Graphite** A. Hodgkins, J. Ali, L. Babout, T. Marrow, A. Fok, B. Marsden, P. Mummery (University of Manchester)
15:10 – 15:35	***#A05*** **Recent Progress Research and Prospect of HTR Application in Indonesia** Sukarsono, D. Herhady, Damunir, E. Susiantini, I. Suryawan (RC for Advanced Technology)	***#C17*** **The PBMR Steady State and Coupled Kinetics Core Thermal-Hydraulics Benchmark Test Problems** F. Reitsma, G. Strydom (PBMR)	***#D18*** **GTHTR300C for Hydrogen Cogeneration** K. Kunitomi, X. Yan, S. Shiozawa, N. Fujimoto (JAERI)	***#E23*** **The Use of X-Ray Microtomography to Determine the Relationships Between the Microstructure and Mechanical Behaviour of Nuclear Graphite** L. Babout, A. Hodgkins, J. Ali, L. Sun, T. Marrow, A. Fok, B. Marsden, P. Mummery (University of Manchester)
15:35 – 15:50	***Coffee Break***			
15:50 – 16:15	***#B08*** **Behaviour of Spent HTR Fuel Elements in Aquatic Phases of Repository Host Rock Formations** J. Fachinger (FZJ), M. Exter (NRG), B. Grambow (EMN)	***#C08*** **Thermal Hydraulic 3D Calculations of the High Temperature Gas Cooled Reactor Core** O.Cioni (CEA, France)	***#D08*** **Comparison of two Models for a Pebble Bed Modular Reactor Core coupled to a Brayton Cycle** A. Walter, A. Schulz, G. Lohnert (IKE)	***#E01*** **The Full Performance Test for the Pressure Relief Valves of HTR-10** X. Wu, J. Dong, R. Li (INET)
16:15 – 16:40	***#B09*** **Advanced Coated Particle Fuel Options** J. Kendall (Global Virtual LLC)	***#C13*** **Determination Of A HTGR Radioactive Material inventory** C. Bourdeloie, P. MARIMBEAU (CEA, France)	***#D12*** **The Impact of Design on the Decay Heat Removal Capabilities of a modular Pebble Bed HTR** N. Said, M. Buck, W. Bernnat and G. Lohnert (IKE)	***#E17*** **Theoretical Analysis on the Tribological Properties of Graphite** X. Sheng, S. Yu (INET)

16:40 – 17:05	***#B20*** **TIMCOAT: An Integrated Fuel Performance Model for Coated Particle Fuel** J. Wang, R. Ballinger (MIT)	***#C14*** **Analysis of the Turbine Deblading in A HTR with the CATHARE Code** M. Saez, N. Tauveron, T. Chataing, G. Geffraye, L. Briottet, N. Alborghetti (CEA)	***#D09*** **Evaluating the main power System of the PBMR Plant with Sensitivity and Monte Carlo Analysis** H. Linde (PBMR), P. Rousseau (North West University)	***#E27*** **The Effect of Softening on the Predicted Strength of Brittle Materials using a Continuum Damage Mechanics Failure Model** L. Shi, H. Li (INET), S. Fok, B. Marsden (University of Manchester), S. Yu (INET)
17:05 – 17:30	***#B21*** **A Fracture Mechanics based Coated Particle Fuel Failure Model** J. Wang, R. Ballinger (MIT)	***#C23*** **Comparison of Fuel Loading Pattern in HTR-PM** X. Jing, F. Li (INET)	***#D13*** **The Interim Fuel Storage Facility of the PBMR** W. Fuls (IST)	***#D04*** **Design and Small Scale Test of the Active Magnetic Bearing Control System for the HTR-10GT** L. Shi, L. Zhao, G. Yang, H. Gu, X. Diao
17:30 – 17:55	***#B12*** **Irradiation of High Temperature Reactor Fuel Pebbles at VHTR Conditions in the HFR Petten** M. Fütterer, H. Lohner, R. Conrad (JRC- Institute for Energy), K. Bakker, S. Groot, C. Sciolla (Nuclear Research and Consultancy Group Petten)	***#C24*** **Thermal- hydraulic Feasibility Analysis of the HTR-PM** Z. Gao, Y. Dong (INET)	***#D14*** **Advanced Modularity Design for the MIT Pebble Bed Reactor** M. Berte, A. Kadak (MIT)	***#E15*** **Metallic and Graphite Material for Out of Core and in Core Components of the VHTR, First Results of the CEA R&D Program** J. Seran, P. Billot, H. Burlet, R. Couturier, J. Robin (CEA), B. Riou (Framatome ANP)

Thursday, September 23, 2004

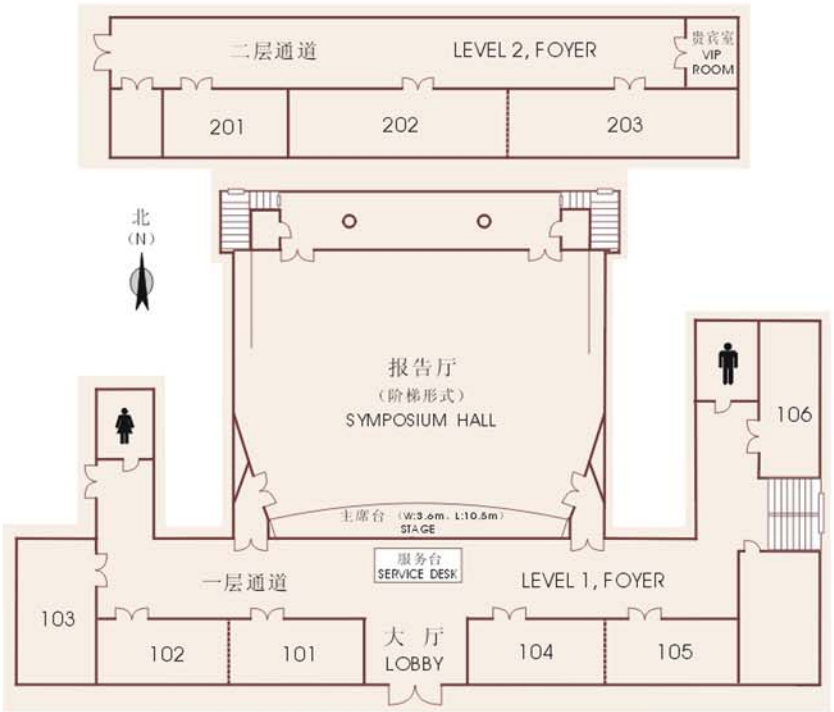
8:30 – 12:05	**Session B: Fuel and Fuel Cycle** *Room 101, Science Hall* **Session Chairs:** J. Kendall (Global Virtual LLC) and T. Abram (BNFL)	**Session C and H: Nuclear and Thermo-Hydraulic Analysis, New Experiments** *Room 102, Science Hall* **Session Chairs:** A. Heek (NRG), (TBD)	**Session F: Safety and License** *Room 104, Science Hall* **Session Chairs:** G. Lohnert (IKE) and S. Ball (ORNL)	**Session E: Material and Components** *Room 105, Science Hall* **Session Chairs:** A. Ougouag (INEEL) and X. Li (INET)
8:30 – 8:55	***#B01*** **HTR and VHTR Fuel Irradiation Program in the Material Testing Reactor OSIRIS** P. Guillermier (AREVA)	***#H02*** **PBMR Existing and Future R&D Test Facilities** D. Matzner (PBMR)	***#F03*** **On The Use Of Point Kinetics For High-Temperature Gas-Cooled Reactor Transient Analysis** M. Methnani (IAEA)	***#A03*** **Last results from HTR-E project** E. Breuil (Framatone ANP)
8:55 – 9:20	***#B03*** **The ATLAS HTR Fuel Simulation Code Objectives, Description and First Result,** M. Phelip, G. Degeneve, M. Pelletier, F. Michel (CEA), P. Guillermier (AREVA)	***#H05*** **Pebble Flow Experiments for Pebble Bed Reactors** A. Kadak, M. Bazantl, M. Aichele, T. Burka, J. Choi, R. Creighton, J. Eapen, D. Feng, C. Goff, L. Gronning, N. Hernandez, J. Hung, W. Kennedy, M. Savkina, D. Wang, J. Warburton (MIT)	***#F02*** **Thermal Response of a High Temperature Reactor during Passive Cooldown under Pressurized and Depressurized Conditions** H. Haque, W. Feltes, G. Brinkmann (Framatone)	***#E25*** **The Relationship between Strength and Modulus in Nuclear Graphite** B. Marsden, A. Fok, T. Marrow, and P. Mummery (University of Manchester)

9:20 – 9:45	***#B04*** **CEA and AREVA R&D on HTR Fuel Fabrication and Presentation of the GAIA Experimental Manufacture Line** F. Charollais, S. Fonquernie, C. Perrais, M. Perez (CEA), P. Guillermier (AREVA)	**#H06 Safety Demonstration Tests on HTR-10** S. HU, R. WANG, Z. GAO (INET)	***#F11*** **Radioactive waste arsing from HTR** J.Fachinger, J.M. Turner, A. Nuttall, C. Bourdeloie, G. Brinkmann, H. Bruecher, W. von Lensa (RCJ-ISR)	***#E26*** **Stress wave propagation after primary cracking in cylindrical specimens of brittle material** W. He, A. Fok, J. Jackson, J. Wright (University of Manchester)
9:45 – 10:10	***#B06*** **European Programme on High Temperature Reactor Fuel Technology** C. Perrais (CEA), J. Somers (JRC/ITU), M. Perez, F. Charollais (CEA), B. Acosta (JRC/IE), P. Obry (CEA), H. Nabielek, K. Vervondern (FZJ), M. Pelletier, F. Michel (CEA), K. Bakker (NRG), M. Fuetterer (JRC/IE), P. Guillermier (Framatome ANP), E. Toscano (JRC/ITU), H. Werner (FZJ), T. Abram (BNFL), H. Over (JRC/IE), P. Heyraud (CEA)	***#H07*** **Power operation commissioning tests of HTR-10** S. HU, R. WANG (INET)	***#F07*** **Advanced High-Temperature Reactor (AHTR) Loss of Forced Circulation Accidents** S. Ball, C. Forsberg (ORNL)	***#E06*** **The Use of Advanced Material in VHTR'S** S. Fazluddin, P. Smit, J. Slabber (PBMR)
10:10 – 10:25	***Coffee Break***			
10:25 – 10:50	***#B14*** **PBMR Nuclear Material Safeguards** J. Slabber (PBMR)	***#C30*** **Verification and Validation of the HTGR systems CFD code Flownex** G. Greyvenstein, J. Ravenswaay (North West University)	***#F09*** **Safety Classification and Defense in Depth for HTR's** A. Koster (PBMR)	***#E12*** **Results from EU 5th Framework HTR Projects HTR-M & HTR-M1** D. Buckthorpe (NNC Ltd Reactor Systems)
10:50 – 11:15	***#B15*** **Pebble Fuel Advantage** J. Slabber (PBMR)	***#C22*** **Coupling of Neutronics and Thermal-Hydraulics Codes for the Simulation of Transients of Pebble Bed HTR Reactors** T. Rademer, W. Bernnat, G. Lohnert (IKE)	***#F10*** **MCNP Simulations and Measurements for the Validation of the PBMR Burnup Measurement System at NECSA** Z. Karriem, W. Strydom, J. Venter (PBMR)	***#E09*** **The Use of Compact Heat Exchangers Technologies for the HTRs Recuperator Application per Proper Design** P. Franck (CEA)
11:15 – 11:40	***#B22*** **Design Optimization and analysis of Coated Particle Fuel Using Advanced Fuel Performance Modeling Techniques** J. Wang, R. Ballinger (MIT)	***#C18*** **Development and Validation of Metallic Fission Product Release Models and Codes at PBMR (I)** H. Merwe (PBMR)	***#F12*** **Air Ingress Benchmarking with Computational Fluid Dynamics Analysis** A. Kadak, T. Zhai (MIT)	***#E18*** **Overview of graphite treatment processes in High Temperature Reactors** F. Delage, C. Latge, P. Thouvenot (CEA)
11:40 – 12:05	***#B23*** **Silver Ion Implantation and Annealing in CVD Silicon BCarbide:The Effect of temperature on Silver Migration** H. Maclean, R. Ballinger (MIT)	***#C18*** **Development and Validation of Metallic Fission Product Release Models and Codes at PBMR (II)** H. Merwe (PBMR)	***#F13*** **Important Viewpoints Proposed For A Safety Approach Of HTGR Reactors In Europe** J. Pirson (TRACTEBEL Engineering Nuclear)	***#E28*** **An Experimental Study on the Porosity Networks in Nuclear Graphite** L. Sun (INET), A. Hodgkins, J. Marrow (Manchester Materials Science Centre), A. Fok, B. Marsden (University of Manchester)
12:20 – 13:30	***Lunch Break – JuFuYuan Restaurant in Friendship Palace***			

13:30 – 17:55	**Session B: Fuel and Fuel Cycle** *Room 101, Science Hall* **Session Chairs:** C. Tang (INET) and D. Greneche (AREVA)	**Session C: Nuclear and Thermo-Hydraulic Analysis** *Room 102, Science Hall* **Session Chairs:** P. Rousseau (North West University) and J. Kuijper (NRG)	**Session D and F: Engineering, Design, Application, Safety and License** *Room 104, Science Hall* **Session Chairs:** J. Wang (INET) and A. Koster (PBMR)	
13:30 – 13:55	***#B07*** **Microstructures of Silicon Carbide and Pyrocarbon Coatings for Fuel Particles for High Temperature Reactors (HTR)** D. Hélary, X. Bourrat (LCTS), O. Dugne, G. Maveyraud, M. Pérez (CEA), P. Guillermier (AREVA)	***#C02*** **Flow Field Analysis of the Hot gas chamber of the 10 MW High Temperature Reactor** J. Wang, Z. HUANG, H. BO, S. JIANG (INET)	**#D30 Discussion About Several Key Problems to Develop Helium Gas Turbo Compressor System of HTR- 10GT** L. Xu (703)	
13:55 – 14:20	***#B10*** **Current Capabilities Of The Fuel Performance Modeling Code Parfume** G. Miller, D. Petti, J. Maki, and D. Knudson (INEEL)	***#C03*** **Development and Validation of 3-D Multi-component Mixture Analysis Tool (GAMMA) for Air Ingress in HTGRs** H. Lim (KAERI), H. No (KAIST)	***#F06*** **Sensitivity Studies of Modular High Temperature Gas-cooled Reactor (MHTGR) Postulated Accidents** S. Ball (ORNL)	
14:20 – 14:45	***#B19*** **Novel Inert Matrix Fuel Kernels for Pu and Minor Actinide Incineration in High Temperature Reactors** J. Somers, A. Fernandez (JRC-ITE)	***#C21*** **HTR-N Reactor Physics and Fuel Cycle Studies** J. Kuijper, X. Raepsaet (JRC-Institute for Energy)	***#F08*** **PBMR Containment System Design and Evaluation** A.Koster (PBMR)	
14:45 – 15:10	***#B02*** **The AREVA HTR Fuel Cycle: An Analysis of Technical Issues and Potential Industrial Solutions** W. Szymczak (AREVA)	***#C09*** **The Framatome -ANP Very High-Temperature Reactor** G. Brinkmann (Framatome-ANP GmbH), B. Copsey (Framatome-ANP Inc), J. Gauthier, M. Lecomte (Framatome-ANP SAS)	***#F05*** **Dose Rate Effects of Ion-Irradiated Isotropic Nuclear Graphite** S. Chi, G. Kim, E. Kim, J. Chang (KAERI)	
15:10 – 15:35	***#B05*** **HTGR spent fuels processing: The CEA investigation program** M. Masson, S. Grandjean, J. Lacquement, J. Thieblemont (CEA)	***#C10*** **The COPERNIC/CYCLOP Computer Tool: Pre-conceptual Design of Generation 4 Nuclear Systems** D. Haubensack, C. Thévenot, P. Dumaz(CEA)	***#F01*** **Analysis of Reactivity Induced Accidents for HTR-10** K. Serhat, K. Ihsan (AEA)	
15:35 – 15:50	***Coffee Break***			

15:50 – 16:15	***#B13*** **Post-irradiation Testing of HTR-Fuel Elements Under Accident Conditions** E. Toscano (JRC- Karlsruhe)	***#C11*** **Analysis of HTR-10 First Criticality with Monte Carlo Code Tripoli-4.3** H. Chang (CEA, INET), X. Raepsaet, F. Damian, Y. Lee, O. Koberl (CEA), X. Jing, Y. Yang (INET)	***#D11*** **Design of Pebble Bed Reactors Using Genetic Algorithms** H. Gougar, A. Ougouag, W. Terry (INEEL)	
16:15 – 16:40	***#B25*** **Modular Helium Reactor Fuel Cycle Concepts and Sustainability** C. Ellis, A. Baxter, A. Shenoy (GA)	***#C12*** **Detailed Analysis of Pebble-Bed HTR PROTEUS Experiments with the Monte Carlo Code TRIPOLI4** O. Köberl (CEA), R. Seiler (Paul Scherrer Institute)		
16:40 – 17:05	***#B24*** **Thermo-mechanical Behavior of a TRISO-Coated Particle Under Normal Operation** Y. Kim, C. Lee, and J. Chang (KAERI)	***#C15*** **PBMR Fuel Sphere Source Terms** C. Stoker, F. Reitsma (PBMR)		
17:05 – 17:30	***#E19*** **Data for Computing Radiation Induced Damage in HTR Fuel Matrices** C. Wemple (INEEL)	***#C20*** **Analysis of Effectiveness of the PBMR Cavity Cooling System** M. Staden (PBMR)		

Hotel Map



会议楼一层、二层
会场示意图

MEETING HALL
LEVEL 1&2 — FLOOR PLAN

中国华能集团公司
CHINA HUANENG GROUP

Sponsor

Brief Introduction of China Huaneng Group

China Huaneng Group (CHNG), approved by the State Council, is a major state-owned enterprise taking power generation as its core business while building a diversified business portfolio. It is a state-authorized investment entity and a trail state-holding company.

The approved total registered capital of CHNG is RMB 20 billion Yuan. CHNG's business scope mainly covers the following areas: investment, construction, operation and management, generation and sales of electricity and heat of electric power projects; the related business such as finance, energy and transportation, information technology, renewable energy, environment protection and trade; overseas investment, financing, foreign trade, international cooperation, etc.

Over the past 20 years since its establishment in 1985, CHNG has made remarkable contributions to the national economy and to the reform and development of China's electric power generation capacity, which account for roughly 8.2% of the national total capacity.

With reference to national economic development plan, the state industry policies, and the market demand, CHNG has identified its development goal for the first 20 years of the new century. By the year of 2010, CHNG will increase its generation capacity up to 60GW, around 10% of the national total installation, and its sales revenue up to US$10 billion, so as to enter the World Top 500 Companies. By the year of 2020, the installed capacity will reach 120GW, which will account for 12% of the nation's total, and the sales revenue will reach US$20 billion, and CHNG will become a large enterprise group with international competitiveness and characterized by "solid capability, world-class management, serving the nation and embracing the world".

A "red" company that serves the socialism with Chinese characteristics, constantly strives for sustainable development of the national economy and upgrading the people's living standard;

A "green" company that is technology-oriented, environmentally conscious, and facilitating sustainable development of the society;

A "blue" company that adheres to keeping pace with the times, learning and innovating, embracing the world.