

PHYSOR 2010 Workshop on:
“Reactor Physics and Design of Next Build Reactors”

The Pebble Bed Modular Reactor
From V.S.O.P. (Very Superior Old Product) to Generation-IV candidate.

Grand Station Ballroom 3

Friday May 14, 2010, 8:15 AM - 4:45 PM

Organizer: Frederik Reitsma

Time:	Presenter	Title and Scope
08:15	Welcome	Welcome and self introduction
08:25	Frederik Reitsma (PBMR)	“Overview of the pebble bed reactor systems” <i>Introduction to pebble bed reactors, History (AVR, THTR, HTR Modul etc) and designs, Generation-IV characteristics, General layout and main components, Different applications and power conversion cycles, Current designs (HTR-10, PBMR, HTR-PM)</i>
08:50	Frederik Reitsma (PBMR)	“The Pebble Bed Modular Reactor (PBMR) design” <i>Fuel design, Reactor design and shutdown systems, MEDUL concept and equilibrium cycle models, Pebble flow lines and modelling, Typical characteristics (flux, power, load follow), PBMR400 and PBMR200 designs</i>
09:15	Christoph Pohl (FZJ)	“Status of the code System VSOP” <i>Introduction of the code system VSOP99 with description and actual status of the diffusion, spectral and thermo hydraulic code models. Aspects of the latest code version (VSOP99-09) and intended improvements for the future. Latest projects with VSOP.</i>
09:35	Presented: Kostadin Ivanov (PSU)	"Methodology for Selection Spectral Zones of PBMR" Ramatsemela Masango (PBMR)
10:00	<i>Tea Break (30 min)</i>	
10:30	Frederik Reitsma (PBMR)	“Safety principles and safety analysis of PBMR with selected results” <i>Fundamental safety principles and how they are satisfied, Source terms, Fission product transport, DBE and DBBE limiting cases and analysis.</i>
11:00	Kay Nuenighoff (FZJ)	“Transient analysis in pebble bed reactors with MGT” <i>Introduction to the coupled neutronic/thermohydraulic multigroup diffusion code MGT, chemistry feedback during air and water ingress accidents, differences between internal and external spectrum calculations, new ENDF-B-VII cross section library.</i>
11:30	Jim Kuijper (NRG)	“PANTHERMIX code system for PBMR steady-state and transient calculations: latest developments”
12:00	<i>Lunch (1 hour)</i>	
13:00	Abderrafi M Ougouag (INL)	“Systematic Error Control in Cross Section Preparation for Optically-thin HTR Applications”
13:30	Hans Gougar (INL)	“Application to Multi-scale Simulation and Optimization of Pebble Bed Reactors” <i>The PEBBED code was developed at INL for the calculations of High temperature Pebble-Bed Reactor. The diffusion-depletion-pebble-mixing algorithm of the original PEBBED code was enhanced by several improved models and coupling including THERMIX-KONVEK, improved COMBINE code, performing 1-D colorset calculations in ANISN to capture radial leakage effects and many more. The status of the code and results of various models will be compared and assessed.</i>
14:00	Ivor Clifford (PSU/ PBMR)	“The OpenFOAM Framework as a Tool for Pebble-Bed Multi-Physics Analysis”
14:30	Presented by: Frederik Reitsma (PBMR)	Status of the PBMR open source project VulaSHAKA for the development of a new multi- physics code system based on OpenFOAM solver and SALOME environment. Johannes Odendaal
14:50	K Ivanov (PSU)	"Sensitivity study on the energy group structure for HTR analysis”
15:10	Peter Mkhabela (PBMR / PSU)	"Optimization of coupled Multiphysics methodology for safety analysis of the Pebble Bed Reactor"
15:30	<i>Tea Break (30 min)</i>	
16:00	Frederik Reitsma (PBMR)	Demonstration of the PBMR Training Simulator
16:45	<i>Workshop Closure</i>	