OECD Nuclear Energy Agency
International Workshop on

Structural Materials for Innovative Nuclear Systems

Hosted by

Idaho National Laboratory, Idaho Falls, USA
7-10 October 2013

Programme

Monday, 7 October		
9.00	**Registration**	
Opening session		
9.30-9.45	Welcome address from INL	*Todd Allen*
9.45-10.00	Welcome address from NEA	*Stéphanie Cornet (on behalf of Thierry Dujardin)*
Session I ***Chair: James Marrow***		
10.00-10.30	***Invited talk*** Industrial perspectives on material choices for advanced nuclear systems	Martine Blat (EDF R&D)
10.30-11.00	**Coffee break**	
11.00-11.30	***Invited talk*** Use of user facilities for the R&D of innovative materials	Todd Allen (INL, USA)

	Overview on Programs	
11.30-11.55	The new EC FP7 MatISSE project: Materials Innovations for a Safe and Sustainable nuclear in Europe	Céline Cabet (CEA, France)
11.55-12.25	IAEA Coordinated Research Projects (CRP) supporting development of structural materials for innovative nuclear systems	Victor Inozemtsev (IAEA)
12.30-14.00:	**Lunch**	
Session II: Metal Alloys ***Chairs: David Gandy and Victor Inozemtsev***		
14.00-14.30	***Invited Talk***	
	Code qualification and material data needs for licensing	Davide Bernardi (ENEA, Italy)
14.30-14.55	Generation IV and Transmutation Materials (GETMAT) Project: First assessment of results	Concetta Fazio (KIT, Germany)
14.55-15.20	Materials for innovative Lead Alloy cooled Nuclear Systems-overview	Georg Müller (KIT, Germany)
15.20-15.45	Development of coatings for liquid Pb corrosion protection in next Generation IV future reactors	Alessandro Gessi (ENEA, Italy)
15.45-16.15	**Coffee break**	
16.15-16.40	The Influence of Neutron Irradiation on the Mechanical Properties of Structural Materials in LBE Environment	Erich STERGAR (SCK-CEN, Belgium)
16.40-17.05	Overview of 9Cr steels properties for structural application in Sodium Fast Reactors	Céline Cabet (CEA, France)
17.05-17.30	Stress Corrosion Cracking and Oxidation of Austenitic Stainless steel 316 in Supercritical Water Reactor	Alberto S Aez (CIEMAT, Spain)
17.30-18.00	**Discussion**	
19.00 (TBC)	**Conference Dinner**	
Tuesday, 8 October 2013		
8.30-15.00	**Registration**	
Session III: Metal Alloys ***Chairs: Concetta Fazio & Richard Wright***		
9.00-09.25	Nickel based alloys compatibility with fuel salts for molten salt reactor with thorium and uranium support	Olga Feinberg/Victor Ignatiev (Russia Federation)
9.25-9.50	Mechanical Properties of Ni-based superalloys in high temperature steam environments	Changheui Jang (KAIST, Rep. of Korea)
9.50-10.15	Novel Experiments to Characterize Creep-Fatigue Degradation in VHTR Alloys	Richard Wright (INL, USA)
10.15-10.45	**Coffee break**	

10.45-11.10	Fatigue and Creep Crack Propagation behaviour of Alloy 617 in the Annealed and Aged Conditions	Julian Benz (INL, USA)
11.10-11.35	Evaluation of In-Situ Tritium Transport Parameters for Type 316 Stainless Steel during Irradiation	Walter LUSCHER (PNNL, USA)
~~11.35-12.00~~	~~Microstructure Reconstruction for Phase Field Modeling of Irradiated Cladding~~	~~Bradley FROMM (INL, USA)~~
12.00-12.30	**Discussion**	
12.00-14:00	**Lunch**	
Session IV: Novel Pathways		
Chairs: Céline Cabet & Ji-Yeon Park		
14.00-14.25	Powder Metallurgy and Hot Isostatic Processing for Research for Structural and Pressure Retaining Applications within the Electric Power Industry	David Gandy (EPRI, USA)
14.25-14.50	Processing of a novel nanostructured ferritic steel via spark plasma sintering and investigation of its mechanical and microstructural characteristics	Indrajit CHARIT (Uni. Idaho, USA)
14.50-15.15	Development of swelling-resistant ODS and ferritic-martensitic alloys based on insights obtained using self-ion irradiation at a very high dpa rate	Frank Garner (DSL Extreme, USA)
15.15-15.30	**Discussion**	
15.30-16.00	**Coffee Break**	
Session 1 : Poster session on Metal Alloys & Novel Pathways		
Chair: Todd Allen & Lorenzo Malerba		
16.00-17.30	**Presentations on posters (3 mins each)**	
17.30-19.00	**Poster Session (+ drinks)**	
Wednesday, 9 October		
Session V: Ceramics and Ceramic Composites		
Chairs: Georg Müller + Hirotatsu Kishimoto		
9.00-9.25	Extra-Safe LWR Core with SiC/SiC Fuel Cladding by NITE Method	Akira Kohyama (Muroran Institute of Technology, Japan)
9.25-9.50	Fabrication and Properties of SiC Ceramics for the Application of LWR Fuel Cladding	Ji-Yeon Park (KAERI, Rep. of Korea)
9.50-10.15	Inhibition of Oxidation in Nuclear Graphite	Philip Winston (INL, USA)
10.15-10.45	**Coffee break**	
10.45-11.10	Effect of Neutron Irradiation on Select Mn+1AXn Phases	Darryl Tallman (SRNL, USA)

11.10-11.35	Helium Irradiated Ti_3AlC_2	Maulik PATEL (UTK, USA)
11.35-12:00	Potentiometric Oxygen Sensor Based on Gadolinia Doped Ceria (GDC) and Yttria Stabilized Zirconia (YSZ) for the Use in SFR Application	SangHun SHIN (Korea)
12.00-12.30	**Discussion**	
12.30-14.00	**Lunch**	

Session VI: Fundamentals & Ions vs. Neutrons
Chair: Frank Garner & Alessandro Gessi

14.00-14.25	An EXAFS Study of Radiation Damage in ZrC and ZrN	Jeff Terry (IIT, USA)
14.25-14.50	Overview of On-Going Studies on the Fast-Reactor Cladding Material AIM1	Arnaud Courcelle (CEA, France)
14.50-15.20	***Invited talk*** Perspectives on modelling materials far from equilibrium	Pascal Bellon (UIUC, USA)
15.20-15.35	Discussion on session	
15.35-16.00	**Coffee break**	
16.00-16.25	Nanostructure evolution under irradiation and correlation with mechanical property changes in neutron irradiated Fe-Cr alloys	Lorenzo Malerba (SCK-CEN, Belgium)
16.25-16.50	Ab initio based kinetic Monte-Carlo simulations of phase transformations in FeCrAl	Pär Olsson (KHT, Sweden)
16.50-17.00	**Discussion**	

Session 2: Posters on Fundamentals & Ceramics
Chairs: Grace Burke & Karl Nilsson

17.00-18.30	**Presentations on posters (3 mins each)**	
18.30-20.00	**Poster Session (+ drinks)**	

Thursday, 10 October

Session VII: Discussion on Ion vs. Neutron Irradiation
Chair: Stuart Maloy

9.00-9.20	Neutron vs ion irradiation: differences and similarities in the nanostructural evolution of Fe-Cr alloys irradiated at 300°C	Lorenzo Malerba (SCK-CEN, Belgium)
9.20-9.40	Ion Beams as a Quantitative Surrogate for Neutrons: is there a path forward?	Michael Fluss (LLNL, USA)
9.40-10.00	Is the "temperature shift" model valid for correlation of neutron and charged particle irradiations?	Frank Garner (DSL Extreme, USA)
10.00-11.00	**Discussion**	
11.00-11.45	Meeting Summary from the session chairs	

11.45-12.30	Open discussion	
	Closing speech (10 mins)	James Marrow (Uni. Oxford, UK)
12.30-14.00	**Lunch** (*provided for people on the tour*)	
14.00-17.00	**Technical tour – INL facilities**	