

Liquid Metal Thermal Hydraulics, Fuel Safety and Source Term

UPM & CIEMAT, Madrid, June 11th-14th, 2019

Day 1 (June 11th, 2019) UPM			
Time	Title	Lecturer	Organization
12:30	Registration		
13:00	Session 1: Introduction		
13:00	Introduction of UPM & CIEMAT (15')	D. Cuervo F. Alvarez-Velarde	UPM/CIEMAT
13:15	Overview ESFR-SMART (15')	C. Latgé	CEA
13:30	Session 2: General aspects of Liquid Metal Fast Reactors		
13:30	Why Fast Reactors versus Thermal reactors? (15')	F. Álvarez-Velarde	CIEMAT
13:45	Sodium cooled fast reactors: description, status of development (20')	C. Latgé	CEA
14:05	Sodium cooled fast reactors: coolant properties and main consequences on materials & Technologies (35')	C. Latgé	CEA
14:40	Lead/lead-bismuth cooled fast reactors: description, status of development, coolant properties and main consequences on materials & Technologies (30')	I. Di Piazza	ENEA
15:10	Coffee break (20')		
15:30	Session 3: Liquid Metal Thermal Hydraulics and numerical tools		
15:30	Thermal hydraulics of liquid metals: fundamentals (35')	F. Roelofs	NRG
16:05	Environmental effects of Thermal hydraulics on materials: stratification, stripping, jet effect (35')	A. Gerschenfeld	CEA
16:40	Discussion (10')		
16:50	Selection of the simulation tool considering the purpose/calculation domain/required accuracy. Code coupling (25')	A. Gerschenfeld	CEA
17:15	CFD codes, Sub-channel codes (25')	G. Jiménez	UPM
17:40	System codes (20')	C. Qeral	UPM
18:00	Discussion (10')		
18:10	End of day		

Day 2 (June 12th, 2019) UPM			
9:00	Session 4: Heat transfer and hydrodynamics in specific scenarios. Experimental facilities		
9:00	Pin, assembly and core resolution: experiments on NACIE (30')	I. Di Piazza	ENEA
9:30	Thermal hydraulics; heat transfer & pressure drop correlations in Na (30')	S. Pérez Martin	KIT
10:00	Pool Systems & Components thermal-hydraulics tests in CEA (H ₂ O): Simultaneous Measurements of Temperature and Velocity using Optical Methods in mixing jets: Experiments and Challenges on a Complex Mock Up (30')	M. Chitt	CEA
10:30	Coffee break (20')		
10:50	KASOLA Thermal hydraulics test on transitional conditions for CP-ESFR (SMART Project) (30')	W. Herring	KIT
11:20	Instrumentation to support thermo-hydraulics experiments (30')	S. Eckert	HZDR
11:50	Discussion (10')		
12:00	Session 5: Fuel safety in steady-state & severe accidents		
12:00	SFR fuel: fundamentals and behavior in steady state conditions (60')	N. Chauvin	CEA
13:00	Lunch (60')		
14:00	SFR fuel safety behavior experiments during transients & severe accidents: main aspects & source terms (35')	N. Girault	IRSN
14:35	SFR fuel safety behavior modeling during transients & severe accidents: main aspects & source terms (35')	F. Gabrielli	KIT
15:10	Discussion: 20'		
15:30	Coffee break (20')		
15:50	Session 6: Sodium fires and aerosol behavior		
15:50	Aerosol generation (25')	L.E. Herranz	CIEMAT
16:15	Current code predictability of aerosol behavior (25')	L.E. Herranz	CIEMAT
16:40	SFR vs. LWR Source Term (25')	L.E. Herranz	CIEMAT
17:05	Discussion: 10'		
17:15	End of day		

Day 3 (June 13th, 2019) UPM			
9:00	Session 7: Sodium fires and aerosol behavior (cont.)		
9:00	Sodium fires experiments & radio-nuclides scavenging (35')	N. Girault	IRSN
9:35	Aerosols behavior out of the SFR: carbonation during atmospheric dispersion (40')	T. Gilardi	CEA
10:15	Atmospheric dispersion of Na aerosols: modeling and simulation with Code_SATURNE" (35')	A. Defosse	EDF
10:50	Discussion (10')		
11:00	Coffee break (20')		
11:20	Session 8: 4 PhD presentation or poster (15' + 5' questions)		
11:20	PhD 1 on Thermal hydraulics		
11:40	PhD 2 on Fuel safety		
12:00	PhD 3 on Sodium fires: "Na fragmentation and impact on spray fire phenomenology"		
12:20	PhD 4 on Heat transfer		
12:40	Lunch (60')		
13:40	Session 10: Computational exercises (to test an education methodology proposed in Task 3.1.1)		
	SFR subchannel thermal-hydraulic analysis	S. Pérez Martin	KIT
		D. Cuervo	UPM
17:00	End of day		
21:00	Social Dinner		

Day 4 (June 14th, 2019) CIEMAT			
	Session 11: Visits at CIEMAT (3h to be detailed and duration to be confirmed))		
9:00	Visits at CIEMAT		
	The Helic Flexible TJ-II Facility, a large scientific installation in the National Magnetic Confinement Fusion Laboratory.		
	Neutron Detector Laboratory, to develop and characterize detectors for a wide range of applications for experimental nuclear, particle and astro-particle physics.		
	ARFRISOL building, to demonstrate bioclimatic architecture and low-temperature solar energy for thermal conditioning		
12:30	End of workshop		