

CFD for Nuclear Reactor Safety Applications

CFD4NRS-6 Workshop

September 13 -15, 2016
Massachusetts Institute of Technology

TUESDAY, SEPTEMBER 13 - 2016				
7:45 a.m.	- 8:45 a.m.	Breakfast and Registration - Wong Auditorium		
8:45 a.m.	- 9:15 a.m.	<p>Opening Remarks: E. Baglietto, General Chair Welcome Address:</p> <ul style="list-style-type: none"> • Jacopo Buongiorno, Professor & Associate Head, Nuclear Science & Engineering • Ho NIEH, Head of Nuclear Safety Technology and Regulation Division <p>General Information – Local Organizer, MIT <i>Wong Auditorium</i></p>		
9:15 a.m.	- 10:00 a.m.	<p>Keynote Lecture 1, Arnaldo Badillo, PSI, CH Synthesis of OECD-GEMIX Benchmark Results Session Chair: Dominique Bestion</p> <p style="text-align: right;"><i>Wong Auditorium</i></p>		
10:00 a.m.	- 10:20 a.m.	<p>Coffee Break <i>Ting foyer (outside Wong Auditorium)</i></p>		
10:20 a.m.	- 10:30 a.m.	<i>Short break to move into session rooms</i>		
10:30 a.m.	- 12:15 p.m.	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Fuel Applications 1 Session 1 </td> <td style="width: 50%; vertical-align: top;"> <p><i>Morss Hall</i></p> <ul style="list-style-type: none"> • Containment 1 Session 2 </td> </tr> </table>	<p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Fuel Applications 1 Session 1 	<p><i>Morss Hall</i></p> <ul style="list-style-type: none"> • Containment 1 Session 2
<p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Fuel Applications 1 Session 1 	<p><i>Morss Hall</i></p> <ul style="list-style-type: none"> • Containment 1 Session 2 			
12:15 p.m.	- 1:15 p.m.	Lunch Break - Morss Hall		
1:15 p.m.	- 2:00 p.m.	<p>Keynote Lecture 2, David W. Pointer, ORNL - USA Progress and Challenges in Predictive Simulation of Thermal Hydraulic Phenomena Session Chair: Adrian Tentner</p> <p style="text-align: right;"><i>Morss Hall</i></p>		
2:00 pm	- 2:10 a.m.	<i>Short break to move into session rooms</i>		
2:10 p.m.	- 3:30 p.m.	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Multiphase General 1 Session 3 </td> <td style="width: 50%; vertical-align: top;"> <p><i>Morss Hall</i></p> <ul style="list-style-type: none"> • Plant - PTS Session 4 </td> </tr> </table>	<p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Multiphase General 1 Session 3 	<p><i>Morss Hall</i></p> <ul style="list-style-type: none"> • Plant - PTS Session 4
<p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Multiphase General 1 Session 3 	<p><i>Morss Hall</i></p> <ul style="list-style-type: none"> • Plant - PTS Session 4 			
3:30 p.m.	- 4:15 p.m.	Poster Session 1 - Morss Hall - Coffee Break Served		
4:15 p.m.	- 4:25 p.m.	<i>Short break to move into session rooms</i>		
4:25 p.m.	- 5:45 p.m.	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Boiling 1 Session 5 </td> <td style="width: 50%; vertical-align: top;"> <p><i>Morss Hall</i></p> <ul style="list-style-type: none"> • Fluid Structure Interaction 1 Session 6 </td> </tr> </table>	<p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Boiling 1 Session 5 	<p><i>Morss Hall</i></p> <ul style="list-style-type: none"> • Fluid Structure Interaction 1 Session 6
<p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Boiling 1 Session 5 	<p><i>Morss Hall</i></p> <ul style="list-style-type: none"> • Fluid Structure Interaction 1 Session 6 			
5:45 p.m.		END OF FIRST DAY		

WEDNESDAY, SEPTEMBER 14 - 2016

7:45 a.m.	- 8:45 a.m.	Breakfast and Registration - Wong Auditorium	
8:45 a.m.	- 9:30 a.m.	Keynote Lecture 3 , Jan-patrice Simoneau, EDF - France CFD practices at EDF for nuclear safety - current applications and future challenges Session Chair: Ghani Zigh <div style="text-align: right;"><i>Wong Auditorium</i></div>	
9:30 a.m.	- 9:35 a.m.	<i>Short break to move into session rooms</i>	
9:35 a.m.	- 10:50 a.m.	<i>Wong Auditorium</i> <ul style="list-style-type: none"> • Fuel Applications 2 Session 7 	<i>Morss Hall:</i> <ul style="list-style-type: none"> • Containment 2 Session 8
10:50 a.m.	- 11:10 a.m.	Coffee and transition break– Coffee available outside at Morss and Wong	
11:10 a.m.	- 12:25 p.m.	<i>Wong Auditorium</i> <ul style="list-style-type: none"> • Boiling 2 Session 9 	<i>Morss Hall</i> <ul style="list-style-type: none"> • Fluid Structure Interaction 2 Session 10
12:25 p.m.	- 1:45 p.m.	Lunch Break and Poster Session 2 – Morss Hall	
1:45 p.m.	2:25 p.m.	Plenary Lecture , Dominique Bestion, CEA - France Review of Uncertainty methods for CFD application to nuclear reactor thermalhydraulics Session Chair: Yassin Hassan <div style="text-align: right;"><i>Wong Auditorium</i></div>	
2:30 pm	4:00 p.m.	Student Poster Competition – The Next Generation Safety Analyst <i>Ting foyer (outside Wong Auditorium) - coffee break during poster session</i>	
4:00 p.m.	4:15 p.m.	<i>Short break to move into session rooms</i>	
4:15 p.m.	5:30 p.m.	<i>Wong Auditorium</i> <ul style="list-style-type: none"> • Multiphase General 2 Session 11 	<i>Morss Hall:</i> <ul style="list-style-type: none"> • Containment 3 Session 12
7:00 p.m.	9:30 p.m.	CONFERENCE BANQUET AT THE MIT MUSEUM	

THURSDAY, SEPTEMBER 15 - 2016

7:45 a.m.	- 8:45 a.m.	Breakfast and Registration - Wong Auditorium	
8:45 a.m.	- 9:30 a.m.	<p>Keynote Lecture 4, Philippe Bardet, GWU - USA Laser diagnostic development for code benchmark and validation Session Chair: Matteo Bucci</p> <p style="text-align: right;"><i>Wong Auditorium</i></p>	
9:30 a.m.	- 9:40 a.m.	<i>Short break to move into session rooms</i>	
9:40 a.m.	- 10:55 a.m.	<p><i>Wong Auditorium</i></p> <ul style="list-style-type: none"> • Best Estimate / VUQ Session 13 	<p><i>Morss Hall:</i></p> <ul style="list-style-type: none"> • Containment 4 Session 14
10:55 a.m.	- 11:20 a.m.	Coffee and Transition Break – Cofee available Ting Foyer	
11:20 a.m.	- 12:35 p.m.	<p><i>Wong Auditorium</i></p> <p>Panel Session on Workshop Summaries Chaired by D. Bestion (CEA, Grenoble), Emilio Baglietto (MIT, USA)</p>	
12:35 p.m.	1:40 p.m.	Grab & Go Lunch – Ting Foyer	
2:00 p.m.	4:30 p.m.	<p>Tour of MIT Experimental Facility</p> <ul style="list-style-type: none"> Tour 1 – Thermal Hydraulics Lab Tour 2 – Mesoscale Nuclear Materials Lab Tour 3 – Plasma Science and Fusion Center Tour 4 – MIT Nuclear Reactor 	
END OF WORKSHOP			

TUESDAY, SEPTEMBER 13 - 2016

Session 1		Fuel Applications 1	
		Session Co Chairs: R. Brewster (WEC, USA) 10:30 a.m. - 12:15 p.m. – Wong Auditorium	
Presentation:	1.1		
Paper Title:	<u>New Insights Into The Flow Inside Nuclear Reactor Fuel Bundles Using Magnetic Resonance Velocimetry</u>		
Authors:	M. Bruschewski, D. Freudenhammer, M.H.A. Piro, C. Tropea and S. Grundmann		
Presentation:	1.2		
Paper Title:	<u>Demonstration of Advanced Hydraulic Benchmark Data for PWR Mixing Vane Grid</u>		
Authors:	M. E. Conner, C. E. Estrada Perez, E. Dominguez-Ontiveros and Y. Hassan		
Presentation:	1.3		
Paper Title:	<u>CFD Simulation of Flow Mixing and Heat Transfer in 4x4 Rod Bundle with Twist-Vane Grid</u>		
Authors:	W.-K. In, C.-H. Shin, C. Lee, K.-G. Lee and C-Y.. Lee		
Presentation:	1.4		
Paper Title:	<u>Experimental and Computational Investigations of Flow By-Pass in a 37-Element CANDU Fuel Bundle in a Crept Pressure Tube</u>		
Authors:	M. H. A. Piro, F. Wassermann, M. Bruschweski, D. Fruedenhammer, S. Grundmann, S.J. Kim, M. Christon, M. Berndt, C. Azih and C. Tropea		
Session 2		Containment 1	
		Session Co Chairs: M. Andreani (PSI, Switzerland), E. Laurien (UniStuttgart, Germany) 10:30 a.m. - 12:15 p.m. – Morss Hall	
Presentation:	2.1		
Paper Title:	<u>Double Blind Simulation Benchmark Based on Initial Operation Test of the Extended THAI+ Facility on Steam Condensation and Light Gas Mixing by Natural Convection</u>		
Authors:	M. Freitag and E. Schmidt		
Presentation:	2.2		
Paper Title:	<u>Blind Simulations of THAI Test TH27 with GASFLOW-MPI for Participation in the International Benchmark Conducted within the German THAI Program</u>		
Authors:	P. Royl, J. Xiao and T. Jordan		
Presentation:	2.3		
Paper Title:	<u>Numerical Simulation of Droplet Flows in the Model Containment THAI</u>		
Authors:	C. Kaltenbach and E. Laurien		
Presentation:	2.4		
Paper Title:	<u>URANS Analysis of the Erosion of a Stably Stratified Layer</u>		
Authors:	L. Ishay, G. Ziskind, U. Bieder and A. Rashkovan		

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Session 3		Multiphase General 1	
		Session Co Chairs: D. Bestion (CEA, France), A. Uchibori (JAEA, Japan) 2:10 p.m. - 3:30 p.m. – Wong Auditorium	
Presentation:	3.1		
Paper Title:	<u>Validation of the Baseline Model for Poly-Disperse Bubbly Flows</u>		
Authors:	D. Lucas, E. Krepper and R. Rzehak		
Presentation:	3.2		
Paper Title:	<u>CFD Calculations of Multiphase Flows with a Multifield Approach</u>		
Authors:	S. Mimouni, D. Lucas and I. Tiselj		
Presentation:	3.3		
Paper Title:	<u>Integral and Separate Effect Simulations of Bubbly Flows Using Interface Tracking Approach</u>		
Authors:	J. Fang, J. Feng and I. Bolotnov		
Session 4		Plant - PTS	
		Session Co Chairs: J.P. Simoneau (EDF, France), M. Tanaka (JAEA, Japan) 2:10 p.m. - 3:30 p.m. – Morss Hall	
Presentation:	4.1		
Paper Title:	<u>IAEA CRP Benchmark of ROCOM Boron Dilution and PTS Test Cases for the Use of CFD in Reactor Design</u>		
Authors:	T. Höhne and S. Kliem		
Presentation:	4.2		
Paper Title:	<u>Towards the Benchmarking Direct Numerical Simulations of a Single Phase Pressurized Thermal Shock</u>		
Authors:	D. Rosa, A. Shams and E.M.J. Komen		
Presentation:	4.3		
Paper Title:	<u>Methodology Development of CFD/PFM for PTS Analysis on Nuclear Reactor Safety</u>		
Authors:	J.-X. Kang, P.-C. Huang, Y.-C. Hung, C.-H. Lin, Y.-S. Tseng, Y.-M. Ferng and C.-Y. Shih		

TUESDAY, SEPTEMBER 13 - 2016

Poster Session 1	Plant and Mixing Applications 3:30 p.m. - 4:15 p.m. – Morss Hall
Poster:	P1.1
Poster Title:	<u>ANALYSIS OF THE COLD TRAP CONFIGURATION IN AP1000® USING CFD</u>
Authors:	H.Xu, R.F. Wright
Poster:	P1.2
Poster Title:	<u>NEPTUNE CFD VALIDATION FOR PRESSURIZED THERMAL SHOCK (PTS) APPLICATIONS ON TOPFLOW-PTS STEADY-STATE STEAM-WATER EXPERIMENTAL TESTS WITH DIFFERENT WATER LEVELS IN THE COLD LEG</u>
Authors:	J. Roy, C. Heib
Poster:	P1.3
Poster Title:	<u>COMPUTATIONAL STUDY OF THE SAFETY INJECTION TANK PERFORMANCE</u>
Authors:	J.O. Cho, J. I. Lee, Y. Addad, Y. S. Nietiadi, Y. S. Bang, S. H. Yoo
Poster:	P1.4
Poster Title:	<u>ANSYS CFX SIMULATION OF T-JUNCTION MIXING PHENOMENA AND VALIDATION AGAINST VATTENFALL EXPERIMENT RESULTS</u>
Authors:	M. Aghazarian, A. Nalbandyan, Ts. Malakyan, A. Amirjanyan
Poster:	P1.5
Poster Title:	<u>DEVELOPMENT OF UNSTRUCTURED MESH-BASED NUMERICAL METHOD FOR SODIUM-WATER REACTION PHENOMENON IN STEAM GENERATORS OF SODIUM-COOLED FAST REACTORS</u>
Authors:	A. Uchibori, A. Watanabe, T. Takata, S. Ohno, H. Ohshima
Poster:	P1.6
Poster Title:	<u>COMPARISON OF HYDROGEN FLAME ACCELERATION PREDICTIONS USING THE EDDY-DISSIPATION AND THE TURBULENT FLAME CLOSURE</u>
Authors:	Y. Halouane, A. Dehbi
Poster:	P1.7
Poster Title:	<u>PREDICTION OF THE TEMPERATURE DISTRIBUTION IN A DOUBLE TUBE COUNTER-FLOW HEAT EXCHANGER USING ANSYS CFX</u>
Authors:	A. Papukchiev, M. Scheuerer
Poster:	<i>OECD-GEMIX Benchmark Special Session</i>
Poster Title:	OECD-GEMIX Benchmark Results
Authors:	Christopher Boyd (US Nuclear Regulatory Commission)

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Session 5	Boiling 1 Session Co Chairs: S. Mimouni (EDF, France), S. Lo (CD-adapco, UK) 4:25 p.m. - 5:45 p.m. – Wong Auditorium
Presentation:	5.1
Paper Title:	<u>Evaluation of Coalescence and Break-Up Kernels of Subcooled Boiling Flows in Vertical Channels</u>
Authors:	S. Vahaji, L. Deju, S.C.P. Cheung, J.Y. Tu and Yeoh
Presentation:	5.2
Paper Title:	<u>Numerical Simulation of Nucleate Boiling Using Dynamic Models of Microlayer Formation and Evaporation</u>
Authors:	A. Guion, J. Buongiorno, S. Zaleski, S. Afkhami and C. Narayanan
Presentation:	5.3
Paper Title:	<u>CFD Model for Simulation of Subcooled Nucleate Flow Boiling – Implementation and Validation</u>
Authors:	M. Sonntag and X. Cheng
Session 6	Fluid Structure Interaction 1 Session Co Chairs: K. Miyoshi (INSS, Japan), T. Hoehne (HZDR, Germany) 4:25 p.m. - 5:45 p.m. – Morss Hall
Presentation:	6.1
Paper Title:	<u>Investigation of Cross-Flow Induced Vibrations in a Normal Square Tube Array by Means of Large-Eddy Simulations for Tube Damage Risk Assessment</u>
Authors:	J. Berland, E. Deri, A. Adobes
Presentation:	6.2
Paper Title:	<u>Numerical Prediction of Flow Induced Vibrations for Safety in Nuclear Reactor Applications</u>
Authors:	E. ter Hofstede, S. Kottapalli and A. Shams
Presentation:	6.3
Paper Title:	<u>Validation of Beam Vibration Simulations in Axial Flow</u>
Authors:	R.A. Brewster and Y. Aleshin

WEDNESDAY, SEPTEMBER 14 - 2016

Session 7	
Fuel Applications 2 Session Co Chairs: X. Cheng (SJTU, China), W-K. In (KAERI, Korea) 9:35 a.m. - 10:50 a.m. – Wong Auditorium	
Presentation:	7.1
Paper Title:	<u>CFD Analysis of the Turbulent Flow in a PWR 5x5 Rod Bundle with Staggered Structural Grids</u>
Authors:	P. E. Angeli and M. P. Peybernes
Presentation:	7.2
Paper Title:	<u>CFD Studies of Heat and Momentum Transfer at a Structured Fuel Rod Surface</u>
Authors:	M. Bottcher and R. Gomez
Presentation:	7.3
Paper Title:	<u>Departure From Nucleate Boiling Simulations Using Computational Fluid Dynamics</u>
Authors:	R.A. Brewster, Y. Xu, L. David Smith III, M.E. Conner and Z. Karoutas
Session 8	
Containment 2 Session Co Chairs: G. Zigh (USNRC, USA), S. Kelm (FZJ, Germany) 9:35 a.m. - 10:50 a.m. – Morss Hall	
Presentation:	8.1
Paper Title:	<u>CFD Simulation of Cooler Tests in the MISTRA Facility: A Focus on Liquid Condensate Re-evaporation</u>
Authors:	K. Hall and C. Boyd
Presentation:	8.2
Paper Title:	<u>Development of a Wall Condensation Model for Coarse Mesh Containment Scale Applications</u>
Authors:	H. Muller, J. Lehmkuhl, S. Kelm, A. Hundausen, A. Belt and H.-J. Allelain
Presentation:	8.3
Paper Title:	<u>Application of Two-Phase Flow CFD to the Phenomena Expected in the Fukushima Daiichi S/C</u>
Authors:	M. Pellegrini and M. Naitoh

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Session 9	
Boiling 2 Session Co Chairs: G. H. Yeoh (UNSW, Australia), D. Lucas (HZDR, Germany) 11:10 a.m. - 12:25 p.m. – Wong Auditorium	
Presentation:	9.1
Paper Title:	<u>Recent Advances in Nucleate Boiling Modelling and Application to DNB</u>
Authors:	S. Mimouni, W. Benguigui, J. Lavieville, N. Merigoux, M. Guingo, C. Baudry and O. Marfaing
Presentation:	9.2
Paper Title:	<u>A CFD Simulation Effort on the Departure from Nucleate Boiling (DNB) in Subcooled Flow</u>
Authors:	S.J. Kim, D.V. Rao, B. Okhuysen, R. Johns and E. Baglietto
Presentation:	9.3
Paper Title:	<u>State-of-the-Art Hydraulic Pressure Drop and Lift Force Analysis for a PWR Fuel Assembly by Using CFD as Compared to the Classical One-Dimensional Approach</u>
Authors:	D.-Y. Sheng and M. Seidl
Session 10	
Fluid Structure Interaction 2 Session Co Chairs: E. Komen (NRG, Netherlands), Gaurav Kewlani (MIT, USA) 11:10 a.m. - 12:25 p.m. – Morss Hall	
Presentation:	10.1
Paper Title:	<u>Fundamental Validation of Fluid-Structure Thermal Interaction Simulation Code for Thermal Striping in Sodium-Cooled Fast Reactors with Parallel Triple Jets Mixing Experiments</u>
Authors:	M. Tanaka, J. Kobayashi and K. Nagasawa
Presentation:	10.2
Paper Title:	<u>Effects of Seismically Induced Sloshing in Elsy Reactors</u>
Authors:	M. Jeltsov, W. Villanueva and P. Kudinov
Presentation:	10.3
Paper Title:	<u>Measurement of Wall Temperature with 148 Thermocouples to Improve Simulation Methods for Thermal Fatigue Evaluation at a Mixing Tee</u>
Authors:	K. Miyoshi, Y. Utanohara and A. Nakamura

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Poster Session 2		Fuel and General Multiphase 12:25 p.m. - 1:45 p.m. – Morss Hall
Poster:	P2.1	
Poster Title:	<u>NUMERICAL SIMULATION ON SUBCOOLED BOILING FLOW OF THE ULPU-V EXPERIMENTS USING RPI MODEL</u>	
Authors:	J. Suh, H. Ha	
Poster:	P2.2	
Poster Title:	<u>ON THE USE OF CFD TO ASSESS SUBCHANNEL MASS FLOW RATE MAPS IN COMPONENT SCALE SIMULATION OF A FUEL ASSEMBLY</u>	
Authors:	R. Denèfle, M. Montout, M. C. Gauffre, P. Vierstraete, S. Benhamadouche, C. Baudry, N. Merigoux	
Poster:	P2.3	
Poster Title:	<u>EXPERIMENT STUDY FOR LIFT FORCE IN TWO PHASE MODELING IN WATER</u>	
Authors:	L. ZhongChun, S. Xiaoming, J. ShengYao, M. Ishii	
Poster:	P2.4	
Poster Title:	<u>ADVANCES IN THE DEVELOPMENT OF NEK-2P: A TWO-PHASE FLOW MODELING CAPABILITY FOR THE NEK5000 CFD CODE</u>	
Authors:	A. Tentner, P. Vegendla, A. Tomboulides, A. Obabko, E. Merzari, D. Shaver	
Poster:	P2.5	
Poster Title:	<u>CFD VALIDATION FOR FLOW IN ROD BUNDLES WITH SPLIT-VANE SPACER GRIDS</u>	
Authors:	J. Xiong, X. Cheng, Y. Yang	
Poster:	P2.6	
Poster Title:	<u>WALL-RESOLVED LARGE EDDY SIMULATION OF SECONDARY FLOW IN GRID-FREE FUEL ASSEMBLY</u>	
Authors:	B. Mikuž, I. Tiselj	
Poster:	P2.7	
Poster Title:	<u>RESEARCH ON SUBCHANNEL RESISTANCE COEFFICIENT CALCULATION BASED ON CFD METHODOLOGY</u>	
Authors:	X. Chen, S. Du, S. Li, Z. Li	

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Session 11	Multiphase General 2 Session Co Chairs: A. Tentner (ANL, USA), J. Xiong (SJTU, China) 4:15 p.m. - 5:30 p.m. – Wong Auditorium
Presentation:	11.1
Paper Title:	<u>A Generalized Large Interface to Dispersed Bubbly Flow Approach to Model Two-Phase Flows in a Nuclear Power Plant</u>
Authors:	N. Mériçoux, J. Laviéville, S. Mimouni, M. Guingo and C. Baudry
Presentation:	11.2
Paper Title:	<u>Analysis and Applications of a Multi-Field Approach for Plunging Jet Configurations</u>
Authors:	E. Krepper, D. Lucas and F. Zidouni
Presentation:	11.3
Paper Title:	<u>Resolved Interface Taylor Bubble Simulations to Support Eulerian Multiphase Closures Derivation</u>
Authors:	G. Montoya and E. Baglietto
Session 12	Containment 3 Session Co Chairs: M. Pellegrini (IAE, Japan), C. Boyd (USNRC, USA) 4:15 p.m. - 5:30 p.m. – Morss Hall
Presentation:	12.1
Paper Title:	<u>Synthesis of a Blind CFD Benchmark Exercise Based on a Test in the PANDA Facility Addressing the Stratification Erosion by a Vertical Jet in Presence of a Flow Obstruction</u>
Authors:	M. Andreani, Y. Daqiang, A.J. Gaikwad, S. Ganju, B. Gera, S. Grigoryev, L.E. Herranz, R. Huhtanen, A. Kanaev, S. Kelm, J. Kim, T. Nishimura, B. Schramm, M. Sharabi and D. Paladino
Presentation:	12.2
Paper Title:	<u>Importance of Thermal Radiation Heat Transfer Modeling in Containment Typical Flows</u>
Authors:	S. Kelm, H. Müller, H.-J. Allelein
Presentation:	12.3
Paper Title:	<u>Modeling of Thermal Stratification and Mixing Induced by Steam Injection Through Spargers into a Large Water Pool</u>
Authors:	I. Gallego-Marcos, W. Villanueva, R. Kapulla, S. Paranjape, D. Paladino and P. Kudinov

THURSDAY, SEPTEMBER 15 - 2016

Session 13	
Best Estimate / VUQ Session Co Chairs: J. Laviéville, (EDF France), Matteo Bucci (MIT, USA) 9:40 a.m. – 10:55 a.m. – Wong Auditorium	
Presentation:	13.1
Paper Title:	<u>AESJ Guideline for Computer Simulation in Nuclear Engineering</u>
Authors:	S. Koshizuka, M. Tanaka and K. Nakada
Presentation:	13.2
Paper Title:	<u>Uncertainty Quantification and Validation of a CFD Simulation of Surface Condensation in the Presence of Non-Condensable Gas</u>
Authors:	K. Hall and C. Boyd
Presentation:	13.3
Paper Title:	<u>Application and Validation of the Multiscale Code ATHLET-ANSYS CFX for Transient Flows in Next Generation Reactors</u>
Authors:	A. Papukchiev, C. Geffray, D. Grischenko and P. Kudinov
Session 14	
Containment 4 Session Co Chairs: H. Müller (RWTH, Germany), K. Hall (ALDEN, USA) 9:40 a.m. – 10:55 a.m. – Morss Hall	
Presentation:	14.1
Paper Title:	<u>Simulation of a Natural Convection Flow with Humid Air in a Two-Room Geometry</u>
Authors:	A. Mansour and E. Laurien
Presentation:	14.2
Paper Title:	<u>Large Eddy Simulations of Free Convection Particle Transport Inside Cavities at Rayleigh Numbers up to 1010</u>
Authors:	A. Dehbi and J. Kalilainen
Presentation:	14.3
Paper Title:	<u>Investigations on Steam Condensation with Air at the Exterior Surface of a Circular Tube for Passive Containment Cooling System Design</u>
Authors:	D.-W. Jerng and J.-H. Hwang

GOLD SPONSORS



CEA

The French Alternative Energies and Atomic Energy Commission (CEA) is a key player in research, development and innovation in four main areas: defence and security, nuclear energy (fission and fusion), technological research for industry, fundamental research in the physical sciences and life sciences.



Elysium Industries

Elysium Industries is an advanced nuclear energy research and development firm that is developing liquid-fueled molten salt reactors for cost-effective, safe, and carbon conscious energy. Our goal is to revolutionize the world by eliminating our dependence on fossil fuels from both an economic and environmental standpoint without limiting one's quality of life.

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