Agenzia nazionale per le nuove tecnologie, l'energia
e lo sviluppo economico sostenibile

Ministero dello Sviluppo Economico

RICERCA DI SISTEMA ELETTRICO

Prosecuzione della Partecipazione a Comitati e Gruppi Internazionali

F. Mascari, G. Vella

RdS/2012/164

PROSECUZIONE DELLA PARTECIPAZIONE A COMITATI E GRUPPI INTERNAZIONALI

F. Mascari, G. Vella CIRTEN
Settembre 2012

Report Ricerca di Sistema Elettrico
Accordo di Programma Ministero dello Sviluppo Economico - ENEA
Area: Governo, Gestione e Sviluppo**,** del Sistema Elettrico Nazionale
Progetto: Nuovo Nucleare da Fissione: Collaborazioni Internazionali e sviluppo Competenze in Materia Nucleare
Responsabile del Progetto: Massimo Sepielli,ENEA

CIRTEN

CONSORZIO INTERUNIVERSITARIO
PER LA RICERCA TECNOLOGICA NUCLEARE

UNIVERSITA' DI PALERMO
DIPARTIMENTO dell' ENERGIA
Sezione INGEGNERIA NUCLEARE

Prosecuzione della Partecipazione a Comitati e Gruppi Internazionali

F. Mascari, G. Vella

CIRTEN-UNIPA RL- PAR 2011 1215/1250

Palermo, Agosto 2012

Lavoro svolto in esecuzione della linea progettuale LP1.C2 dell'AdP ENEA MSE, "Nuovo Nucleare da Fissione"

INDICE

SOMMARIO

SOMMARIO

Nell'ambito dell'attività relativa alla linea progettuale LP1.C2 "Prosecuzione della partecipazione a comitati e gruppi internazionali" dell'Adp ENEA MSE, di seguito è riportata una sintesi degli interventi, dei temi e dei contributi dal nostro gruppo di ricerca presentati al SPRING 2012 CAMP MEETING e alla conferenza internazionale ICONE20-POWER2012.

1 PARTECIPAZIONE AL PROGRAMMA DI RICERCA CAMP

Nell'anno 2012 nell'ambito delle attività promosse dal USNRC la sede di Palermo ha partecipato allo "SPRING 2012 CAMP MEETING".

Si sono recati a tale gruppo di lavoro il Prof. Giuseppe Vella e il Dr. Fulvio Mascari.

Il meeting si è tenuto dal 30 Maggio 2012 al 1 Giugno 2012 a Lubiana in Slovenia.

Il Code Applications and Maintenance Program (CAMP) è stato formato dalla USNRC e altri partner internazionali al fine di avere uno scambio di informazioni su problematiche termoidrauliche di sicurezza degli impianti nucleari. Il gruppo si incontra due volte l'anno. Il rappresentate CAMP per l'Italia è il Dr. Roberto Ranieri di ISPRA. Partecipando al CAMP si ha la possibilità di avere accesso ai codici di termoidraulica di sistema di tipo"Best Estimate" tipo TRACE, RELAP5 e di cinetica neutronica tridimensionale tipo PARCS necessari per le attività di ricerca da noi svolte.

L'agenda della riunione è riportata nella Appendice 1.

Gli argomenti di interesse trattati in questa riunione sono stati:

- Status of NRC Code Development
- Program and Code Status
- Member Country Reports
- Technical reports
- TPC Meeting

Di particolare interesse per le nostre attività di ricerca è il prossimo rilascio della patch 3 del codice TRACE.

Nella riunione sono stati da noi presentati tre *technical report:*

- Analyses of the OSU-MASLWR natural circulation phenomena by using TRACE code.
  Autori: Fulvio Mascari, Giuseppe Vella, Brian G. Woods, Kent Welter, Francesco D'Auria.

- Analyses of the SPES-3 accident condition by using TRACE code.
  Autori: Fulvio Mascari, Giuseppe Vella

- Analyses of the TRACE–PARCS coupling capability.
  Autori: Fulvio Mascari, Giuseppe Vella, Flavio Parozzi, Vincenzo Casamassima

Il primo technical report si basa sulla attività realizzata presso il Dipartimento dell'Energia in collaborazione con Oregon State University, NuScale e l'Università degli studi di Pisa, relativa all'impianto OSU-MASLWR in operazione presso Oregon State University (OSU).

L'impianto sperimentale OSU-MASLWR è stato progettato per investigare il comportamento termoidraulico del reattore nucleare MASLWR, prototipo di un reattore avanzato integrale a generatore di vapore elicoidali in cui il fluido primario, in circolazione naturale, asporta la potenza prodotta nel core in condizioni normali di funzionamento.
Una nodalizzazione TRACE dell'impianto OSU-MASLWR è stata sviluppata presso il Dipartimento dell'Energia dell'Università degli Studi di Palermo in collaborazione con Oregon State University. Una campagna sperimentale è stata condotta al fine di caratterizzare termoidraulicamente i fenomeni tipici del reattore MASLWR.
I transitori studiati sono il test 0SU-MASLWR-001, che consiste in un *"inadvertent actuation of 1 submerged ADS valve"* e ha lo scopo di riprodurre, sperimentalmente, la conseguente depressurizzazione del sistema primario e il conseguente comportamento del contenimento ad esso accoppiato, e il test OSU-MASLWR-002, *"natural circulation at core power up to 210 kW",* che colleziona sperimentalmente le portate volumetriche nel circuito primario e il grado di surriscaldamento all'uscita dei tubi elicoidali al variare della potenza fornita al core e della portata di FW.
I risultati presentati mostrano che i fenomeni che caratterizzano il test OSU-MASLWR-002 sono qualitativamente predetti dal codice nelle differenti condizioni di potenza del core e di portata secondaria. L'analisi del test OSU-MASLWR-001 mostra un generale accordo qualitativo con i dati sperimentali. Il codice TRACE è capace di predire i fenomeni tipici del transitorio quali lo svuotamento del circuito primario, la fase di "refill" del circuito primario e la fase di "long term cooling" tipica del MASLWR.

Il secondo technical report si basa sulla attività realizzata presso il Dipartimento dell'Energia in collaborazione con ENEA e SIET relativa all'impianto SPES-3. Tale impianto, è in fase di realizzazione presso la SIET, per caratterizzare i fenomeni termoidraulici che si destano, in transitori seguenti a postulati eventi incidentali nel reattore IRIS.
Una nodalizzazione TRACE dell'impianto SPES-3 è stata sviluppata presso il Dipartimento dell'Energia dell'Università degli studi di Palermo al fine di condurre analisi di eventuale supporto al progetto dell'impianto sperimentale SPES-3 e, dopo la costruzione dello stesso, calcoli di pre-test e calcoli di post-test.
In questo lavoro sono presentati i risultati di analisi di un caso di "low elevation SBLOCA" dovuto ad una rottura a ghigliottina della linea di iniezione diretta nel vessel. Tali analisi sono state paragonate con le analisi RELAP5 sviluppate dalla SIET.
Il paragone con i dati di simulazioni RELAP5, sviluppati dalla SIET, mostra un buon accordo in relazione ai più importanti parametri termoidraulici caratterizzanti il transitorio. In particolare l'uso del componente tridimensionale vessel, disponibile in TRACE, permette una più dettagliata analisi dei fenomeni attesi. Questo, ovviamente, implica un incremento del tempo di calcolo.

Il terzo technical report si basa sulla attività realizzata presso il Dipartimento dell'Energia in collaborazione con RSE relativa all'uso di codici termoidraulici di sistema e neutronici tridimensionali accoppiati.
Storicamente al fine di produrre analisi aventi in oggetto il progetto, l'ottimizzazione e la sicurezza di impianti nucleari, sono stati sviluppati software dedicati (codici di calcolo) miranti alla studio di particolari problematiche. Nell'ambito degli studi di analisi di sicurezza degli impianti nucleari hanno trovato largo impiego codici di simulazione termoidraulica e neutronica il cui utilizzo

permette un miglioramento nella sicurezza degli impianti di potenza già esistenti, una migliore utilizzazione del combustibile nucleare, un aumento della flessibilità operazionale. Con tali codici è inoltre possibile realizzare studi miranti all'estensione del funzionamento dei reattori, allo sviluppo di procedure di emergenza, allo studio di eventi operazionali ed infine alla realizzazione di simulatori per l'addestramento degli operatori. In questo contesto al fine di modellare le interazioni tra fenomeni di diversa natura, ma intimamente correlati, presenti in un reattore nucleare, sono state sviluppate tecniche di accoppiamento tra codici di calcolo aventi differenti campi di applicazione. Le analisi accoppiate hanno la potenzialità di produrre più accurati studi, ridurre le eventuali incertezze e dunque fornire una più realistica analisi dei fenomeni in oggetto che porta a una più completa e migliore comprensione delle sequenze dovute a postulati eventi incidentali.
Al fine di qualificare l'uso di procedure di accoppiamento di singoli codici "best estimate" e valutare le loro capacità, nell'ultimo decennio sono stati sponsorizzati dall'OECD/NEA tre benchmark internazionali:

- PWR Main Steam Line Break in TMI-1
- BWR Turbine Trip in Peach Bottom
- VVER1000 coolant transient.

Allo scopo di verificare le capacità dei codici accoppiati TRACE/PARCS viene presentato lo studio del transitorio di riferimento "PWR Main Steam Line Break" (MSLB) già proposto dal NEA, agenzia dell'OECD, e promosso dall'USNRC. Il benchmark è basato sui dati di progetto di un reale PWR della Babcock and Wilcox e sui dati operativi dell'impianto Three Miles Island 1.
Tra gli scopi principali di tale benchmark si ricordano quelli di verificare le capacità dei codici di analizzare transitori complessi con accoppiate interazioni neutroniche e termoidrauliche in condizioni tridimensionali e quelli di saggiare gli accoppiamenti di codici neutronici e termoidraulici.
I risultati delle analisi, ottenute simulando un "main steam line break" in un tipico PWR della Babcock and Wilcox, mostrano che analisi accoppiate hanno la capacità di riprodurre i fenomeni tipici di un reattore nucleare e la loro interazione. Le capacità grafiche di SNAP sono avanzate e utili per l'analisi e visualizzazione dei dati prodotti rendendo possibili visualizzazioni bidimensionali e tridimensionali.

2 PARTECIPAZIONE ALLA CONFERENZA INTERNAZIONALE ICONE20-POWER2012

La conferenza a cui si è partecipato è la "2012 20th International Conference on Nuclear Engineering and the ASME 2012 Power Conference (ICONE20-POWER2012).

Si è recato a tale conferenza il Dr. Fulvio Mascari.

La conferenza si è tenuta dal 30 Luglio 2012 al 3 Agosto 2012 ad Anaheim, California, USA.

ICONE20-POWER2012 è una Conferenza Internazionale organizzata da Nuclear and Power Divisions of the American Society of Mechanical Engineers (ASME), la Japan Society of Mechanical Engineers (JSME) e la Chinese Nuclear Society (CNS) in cooperazione con l' International Atomic Energy Agency (IAEA), la Canadian Nuclear Society (CNS), l'European Nuclear Society (ENS), la Society Nuclear Mexicana (SNM), la Nuclear Society of Slovenia (NSS), l'Atomic Energy Society of Japan (AESJ), l'Austrian Nuclear Society (ÖKTG) e la Canadian Standard Association (CSA). Lo scopo di questa conferenza è di mantenere i contatti tra gli esperti nelle aree dell'ingegneria nucleare, della termoidraulica e dell'energie rinnovabili mantenendoli aggiornati sugli ultimi sviluppi in questi settori.

Le varie *"technical track"* della conferenza con i vari contributi sono riportati nella appendice 2. Nella appendice 3 è riportato il programma del convegno. In particolare sono state presentati contributi su:

- Plant Operations, Maintenance, Engineering, Modifications, Life Cycle, and Balance of Plant;
- Component Reliability and Materials Issues;
- Plant Systems, Structures, and Components;
- Steam Generator Technology Applications and Innovations;
- Advanced Reactors and Near-Term Deployment;
- Safety and Security;
- Codes, Standards, Licensing, and Regulatory Issues;
- Fuel Cycle, Radioactive Waste Management and Decommissioning;
- Thermal-Hydraulics;
- Computational Fluid Dynamics (CFD) and Coupled Codes;
- Instrumentation and Controls;
- Next Generation Systems;
- Fusion Engineering;
- Reactor Physics, Neutronics, and Transport Theory;
- Nuclear Education, Human Resources, and Public Acceptance;
- Design Basis and Beyond Design Basis Events;
- Fuels and Combustion, Materials Handling, Emissions;
- Heat Exchangers and Cooling Systems;
- Turbines, Generators, and Auxiliaries;

- Advanced Energy Systems and Renewables (Wind, Solar, Geothermal);
- Performance Testing and Performance Test Codes;
- Simple and Combined Cycles.

Durante il convegno è stata organizzata anche una competizione tra studenti (Student Paper Competition).

Nella riunione è stato da noi presentato un articolo dal titolo:

"TRACE AND RELAP5 CODES FOR BEYOND DESIGN ACCIDENT CONDITION SIMULATION IN THE SPES3 FACILITY"

i cui autori sono in ordine, Roberta Ferri, Fulvio Mascari, Paride Meloni e Giuseppe Vella.
Tale articolo si basa sull'attività realizzata presso il Dipartimento dell'Energia in collaborazione con l'ENEA e la SIET relativa all'impianto SPES-3. Questo impianto è in fase di realizzazione presso la SIET, per caratterizzare i fenomeni termoidraulici che si destano, in transitori seguenti a postulati eventi incidentali nel reattore IRIS, indagando allo stesso tempo il comportamento dei sistemi passivi considerati in sede di progetto e le interazioni fra i vari componenti del contenimento e il primario. I dati sperimentali prodotti nell'impianto possono essere utilizzati anche per la validazioni di codici termoidraulici di sistema. I risultati di tale impianto potranno comunque essere di validità per i reattori nucleari integrati in generale.
Una nodalizzazione TRACE dell'impianto SPES-3 è stata sviluppata presso il Dipartimento dell'Energia dell'Università degli studi di Palermo al fine di condurre analisi di eventuale supporto al progetto dell'impianto sperimentale SPES-3 e, dopo la costruzione dello stesso, calcoli di pre-test, per contribuire al progetto termoidraulico dei test di interesse, e calcoli di post-test, con lo scopo di validare il codice TRACE.
In questo lavoro sono presentati i risultati delle analisi di un caso di "DVI line DEG break "in design and beyond design conditions dovuto ad una rottura a ghigliottina della linea di iniezione diretta nel vessel. Tali analisi sono state paragonate con le analisi RELAP5 sviluppate dalla SIET.
Il paragone con i dati delle simulazioni RELAP5, mostra un buon accordo in relazione ai più importanti parametri termoidraulici caratterizzanti il transitorio in design and beyond design condition. In particolare l'uso del componente tridimensionale vessel, disponibile in TRACE, nella modellazione della Reacor Cavity, del Pressure Suppression System, del Dry Well e del RWST permette una più dettagliata analisi dei fenomeni attesi senza ricorrere all'accoppiamento di codici di sistema e specifici codici di contenimento. Questo, ovviamente, implica un incremento del tempo di calcolo.

Il Dr. Fulvio Mascari ha anche partecipato ai lavori del "Nuclear Engineering Division Technical Committee Meetings on Themal Hydraulics".

APPENDICE 1

All Technical Sessions are at City Hotel conference center

Wednesday, May 30, 2012

8:15 AM	Registration	
8:30 AM	Opening and Welcome Leon Cizelj, Jožef Stefan Institute, Reactor Engineering Division, RED Head Franci Demšar, Slovene Research Agency, Director Stane Rožman, Nuclear Power Plant Krško, Director Andreja Peršič, Slovenian Nuclear Safety Administration, Nuclear Safety Division Borut Mavko and Andrej Prošek, Jožef Stefan Institute, Reactor Engineering Division	
8:50 AM	Chris Hoxie, USNRC, USA	Status of NRC Code Development (Chris L. Hoxie)
Program and Code Status		**Chair: Antony Calvo, USNRC**
9:20 AM	Antony Calvo, USNRC, USA	Review and Approval of the Fall 2011 Meeting Minutes
9:30 AM	Douglas Barber, ISL, USA	RELAP5 Status and User Problem Report (Douglas Barber, Dan Prelewicz)
10:00 AM	Break	
10:15 AM	Josh Whitman, USNRC, USA	TRACE Code Development Status (Joshua Whitman)
Member Country Reports		**Chair: Antony Calvo, USNRC**
10:45 AM	Chiung-Wen Tsai, National Tsing Hua University, Taiwan	Status of CAMP Activities in Taiwan (Jong-Rong Wang, Chiung-Wen Tsai , Hao-Tzu Lin, Chunkuan Shih)
11:15 AM	Jozsef Banati, Chalmers University of Technology, Sweden	Summary of Swedish CAMP Related Activities (Alexander Agung, József Bánáti, Ninos Garis, Weimin Ma)
11:45 AM	Ernest Staroń, National Atomic Energy Agency, Poland	The Polish Regulatory Body Activities (Ernest Staroń, Marcin Dąbrowski)
12:15 PM	Lunch	
1:15 PM	Miguel Sánchez Perea, Nuclear Safety Council, Spain	Status Report of CAMP Activities in Spain (Miguel Sánchez Perea)
1:45 PM	Omar Zerkak, Paul Scherrer Institut, Switzerland	Selected PSI activities using CAMP Agreement codes (C. Adamsson, J. Freixa, S. Canepa, T. Gudmundsson, D. Karanki, T-W. Kim, K. Nikitin, D. Papini, R. Szijarto)
2:15 PM	Seunghoon Ahn, Korea Institute of Nuclear Safety, Korea	Status of CAMP Activities in Korea (Seung-Hoon Ahn)
2:45 PM	Davor Grgić, University of Zagreb, Croatia	Status of CAMP Activities in Croatia (Vesna Benčik, Davor Grgić, Siniša Šadek)
3:15 PM	Break	

3:30 PM	Jinjun Feng, Nuclear and radiation Safety Center, China	CAMP Activities Status in China (Feng Jinjun, Chai Guohan)
4:00 PM	Aleksandar Delja, Canadian Nuclear Safety Commission, Canada	Canada CAMP (Code Applications and Maintenance Program) Updates (Aleksander Delja)
	Technical Reports	**Chair: Iztok Tiselj, JSI**
4:30 PM	Wadim Jaeger, Karlsruhe Institute of Technology, Germany	Uncertainty and Sensitivity Study with TRACE-DAKOTA and TRACE-SUSA: A comparison based on NUPEC BFBT experimental data (Wadim Jäger, Victor Sánchez, Francisco Montero, Cesar Queral)
5:00 PM	Ovidiu-Adrian Berar, Jožef Stefan Institute, Slovenia	IJS conversion procedure from RELAP5 to TRACE - example of Achilles test rig (Ovidiu-Adrian Berar, Andrej Prošek, Borut Mavko) Animation
5:30 PM	Adjourn	
7:30 PM	Welcome Reception, City hotel Ljubljana (sponsored by Nuclear Power Plant Krško)	

Thursday, May 31, 2012

8:00 AM	**Technical Reports (continued)**	**Chair: Josh Whitman, USNRC**
8:00 AM	Pavel Kral, Nuclear Research Institute Řež, Czech Republic	Application of RELAP5 and Uncertainty Methodology to Safety Analysis of VVER-1000 (Pavel Kral, Jelena Krhounkova, Frantisek Lahovsky, Jiri Macek, Radim Meca)
8:30 AM	Fulvio Mascari, Università degli Studi di Palermo, Italy	Analyses of the OSU-MASLWR natural circulation phenomena by using TRACE code (Fulvio Mascari, Giuseppe Vella, Brian G. Woods, Kent Welter, Francesco D'Auria)
9:00 AM	Hideo Konishi, JNES, Japan	Fukushima Daiichi Accident Analyses with RELAP5 (Hideo Konishi)
9:30 AM	Tong Soo Choi, KEPCO Nuclear Fuel, Korea	New Model and Correlation Package for RELAP5 Reflood Calculations (Tong Soo Choi)
10:00 AM	Break	
10:15 AM	Masahiro Furuya, Central Research Institute of Electric Power Industry, Japan	Code Validation for Flashing-Induced Density Wave Oscillations in SIRIUS-N Facility Which Simulates ESBWR (Masahiro Furuya, Yoshihisa Nishi, Nobuyuki Ueda)
10:45 AM	Filippo Fiori, GRNSPG, Italy	Status of the activity with RELAP5 and TRACE at GRNSPG (A. Petruzzi, M. Cherubini, W. Giannotti, N. Muellner, A. Kovtonyuk, F. Fiori, E. Coscarelli)
11:15 AM	Kiril Velkov, GRS, Germany	First Applications of PARCS and SNAP at GRS mbH (Kiril Velkov, Yann Perin, Carsten Köllein)
11:45 AM	Petr Heralecký, TES, Czech Republic	Post-Test Analysis of Hot Leg 2x25% Break at PSB VVER Facility Using RELAP5/MOD3.3 Code (Petr Heralecký)
12:15 PM	Lunch	
1:15 PM	Jose Felipe Villanueva, Universitat Politècnica de València, Spain	Spent Fuel Pool Analysis Using TRACE Code (Francisco Sánchez, Sofia Carlos, Jose Felipe Villanueva, Sebastián Martorell)
1:45 PM	Fulvio Mascari, Università degli Studi di Palermo, Italy	Analyses of the SPES-3 accident condition by using TRACE code (Fulvio Mascari, Giuseppe Vella)
2:15 PM	César Queral, Universidad Politecnica de Madrid, Spain	Analysis of LOCA sequences with TRACE code (César Queral, Juan Gonzalez-Cadelo, Javier Montero)
2:45 PM	Viktor Mukoid, State Scientific and Technical Center for Nuclear and Radiation Safety, Ukraine	Development of the TRACE Model for WWER-1000 Reactor Type (Yuriy Alekseev, Valeriy Shikhabutinov, Viktor Mukoid)
3:15 PM	Break	
3:30 PM	Benoit Arsenault, AMEC NSS, Canada	Benchmarking of a Generic CANDU Reactor with PARCS, MCNP and RFSP-IST (Benoit Arsenault, Omar Shaikh, David Luxat, Dan Jabaay, Yunlin Xu, Andrew Ward, Thomas

		Downar)
4:00 PM	Sergio Gallardo, Universidad Politecnica de Valencia, Spain	PKL/ROSA Counterpart Test. Post Test analysis with TRACE5 (S. Gallardo, A. Querol, G. Verdú)
4:30 PM	Gumersindo Verdú, Universitat Politècnica de València, Spain	IMPROVEMENTS IN THE DECAY HEAT MODEL IN THE THERMALHYDRAULIC CODE TRAC-BF1 (A. Soler, T. Barrachina, R. Miró, G. Verdú, A. Concejal, J. Melara)

5:30 PM Ljubljana Tour (1.5 hour)

8:00 PM Social dinner, City hotel Ljubljana (sponsored by GEN energija)

Friday, June 1, 2012

	Technical Reports (continued)	**Chair: Andrej Prošek, JSI**
8:00 AM	César Queral, Universidad Politecnica de Madrid, Spain	Simulation of CCW and SGTR sequences in a PWR-W (César Queral, Luisa Ibáñez, Gonzalo Jiménez-Varas)
8:30 AM	Fulvio Mascari, Università degli Studi di Palermo, Italy	Analyses of the TRACE–PARCS coupling capability (Fulvio Mascari, Giuseppe Vella, Flavio Parozzi, Vincenzo Casamassima) Animations
9:00 AM	Rafael Miró, Polytechnic University of Valencia, Spain	A COUPLING PROCEDURE BETWEEN TRAC-BF1 AND PARCS CODES FOR 3D TRANSIENT SIMULATIONS (A. Jambrina, T. Barrachina, R. Miró, G. Verdú, A. Concejal, J. Melara)
9:30 AM	Andrej Prošek, Jožef Stefan Institute, Slovenia	RELAP5, TRACE 1D and TRACE 3D comparison against Bethsy 9.1b test (Andrej Prošek, Ovidiu-Adrian Berar)
10:00 AM	Break	
10:15 AM	Suren Bznuni, Nuclear and Radiation Safety Centre, Armenia	Experience of PARCS-RELAP Implementation for WWER reactors modelling (S. Bznuni, T. Malakyan, A. Amirjanyan)

	TPC Meeting	**Chair: Antony Calvo, USNRC**
10:45 AM	Acceptance of Minutes from Fall 2011 TPC Meeting	
10:45 AM	NUREG/IA and CAMP Status (Antony Calvo)	
11:15 AM	Discussion of In-Kind Contributions	
11:45 PM	Final Discussion	
12:30 PM	End of Spring 2012 CAMP Meeting	

APPENDICE 2

- **Plant Operations, Maintenance, Engineering, Modifications, Life Cycle, and Balance of Plant**

ICONE20-POWER2012-54027
Improving Nuclear Power Plant's Operational Efficiences in the USA
Joseph S. Miller, Bob Stakenborghs, and Robert W. Tsai

ICONE20-POWER2012-54092
Developing the Initial Reliability Assurance Program (RAP) for Maintenance in New Nuclear Plants
J. K. August and Edward Dundon

ICONE20-POWER2012-54094
One Power Plant's Experience in Setting Up, Performing and Acting on a Pipe Hanger Surveillance Program
Lange Kimball and Kuda Mutama

ICONE20-POWER2012-54109
Development of a Manipulator-Supported Laser Decontamination System
Wolfgang Lippmann, Rene Littwin, and Antonio Hurtado

ICONE20-POWER2012-54158
Insights From Investigations of High Energy Arcing Fault "HEAF" Events in German Nuclear Power Plants
Marina Röwekamp, Steffen Katzer, Joachim Klindt, and Heinz-Peter Berg

ICONE20-POWER2012-54165
Effects of German Nuclear Power Plants Closure on Future Electricity Cost in Central Europe
Miroslav Vitek

ICONE20-POWER2012-54189
A Method for Incorporating Thermal Performance Characterization Tools With Real-Time and Historic Plant Data
Michael L. Morgan, Jr.

ICONE20-POWER2012-54276
Price Evaluation in Nuclear Power Industry: Modeling and Computation
Vasyl O. Kostiuk, Taras O. Kostyuk, and Volodymyr K. Dobrovolsky

ICONE20-POWER2012-54290
Evaluation of Reactor Recirculation Pump Adjustable Speed Drive Cell Bypass Recovery Scenarios for the Exelon Nuclear Plants
James W. Morgan, Hilary A. Neal, Eric R. Frantz, Mark Budelier, Hossein Youssefnia, and Thomas K. Lindqvist

ICONE20-POWER2012-54329
A Study for Heat-Loss Characteristics of Hot-Water Layer by the Increment of Reactor Power
Young-Chul Park, Kyoung-Woo Seo, Dae-Young Chi, Ju-Hyeon Yoon, and Hyun-Gi Yoon

ICONE20-POWER2012-54348
Optimizing Capacity of Nuclear Power Plants: Thermal Performance Assessment Using a Case Study
Komandur Sunder Raj

ICONE20-POWER2012-54352
Developing a Thermal Performance Monitoring System Specification for a Nuclear Power Plant: A Case Study
Komandur Sunder Raj

ICONE20-POWER2012-54406
Instrumentation Device and Surface Control Technology for Coolant Piping System of Nuclear Power Plants
Akihiko Nishimura, Takaya Terada, Yukihiro Shimada, Yukihiro Yonemoto, and Tomonori Yamada

ICONE20-POWER2012-54455
TRACE/PARCS Modelling of Feedwater Pump Trip Transients for Lungmen ABWR
Tsung-Sheng Feng, Jong-Rong Wang, Hao-Tzu Lin, and Chunkuan Shih

ICONE20-POWER2012-54475
Nuclear Power Plant Simulator for Concept Design and Performance Analysis
B. N. M. Mills, V. Badalassi, and R. I. Latchford

ICONE20-POWER2012-54493
Dust Generation and Transport Behavior in the Primary Circuit of HTTR
Shimpei Hamamoto, Yosuke Shimazaki, Takayuki Furusawa, Takahiro Nemoto, and Hiroyuki Inoi

ICONE20-POWER2012-54523
Exergy Analysis and Fuel Exergy Allocation in a HTGR Direct Combined Cycle
Atilio B. Lourenço, José Joaquim C. S. Santos, and João Luiz M. Donatelli

ICONE20-POWER2012-54578
Main Steam Isolation Valves of BWR: Requirements and Boundary Conditions Based on Operating Experience and New Technology
Otmar Promper and Egon Königstein

ICONE20-POWER2012-54656
Method for Establishing Risk Significance of Procedural Actions for Pre-Initiating Events for Operating Nuclear Power Plants
C. R. Grantom and Pamela Nelson

ICONE20-POWER2012-54681
Experiment and Numerical Simulation of Asymmetric Pipe Wall Thinning Behind an Orifice by Combined Effect of Swirling Flow and Orifice Bias
Takayuki Yamagata, Yuki Sato, Akihiro Ito, Tsuyoshi Takano, and Nobuyuki Fujisawa

ICONE20-POWER2012-54682
Experimental Study on Liquid Droplet Impingement Erosion by Uniformly Sprayed Droplets
Nobuyuki Fujisawa, Kanto Hayashi, Daichi Hama, Takayuki Yamagata, and Tsuyoshi Takano

ICONE20-POWER2012-54738
NQA-1 Requirements for Commercial Grade Item Acceptance
Taunia Van Valkenburg, Daniel Tepley, Rick Holmes, and Gary Sandquist

ICONE20-POWER2012-54767
Detection of the Symptoms of Weakening Safety Culture
Satoshi Kurata, Tsuyoshi Matsui, and Tetsuyaer Suzuki

ICONE20-POWER2012-54836
Underwater Laser Beam Welding for Nuclear Reactors
Masaki Yoda, Masataka Tamura, Takeshi Fukuda, Katsunori Shiihara, Kazuo Sudo, Takeshi Maehara, Yasuo Morishima, Hiromi Kato, and Hiroya Ichikawa

ICONE20-POWER2012-54953
Feedwater Heater Study for an Extended Power Uprate at a Nuclear Power Station
Eric Svensson, Michael Catapano, Aravind Krishnamoorthy, Dan Thomas, and Michael Coakley

ICONE20-POWER2012-54974
Rankine Cycle Modification for Improved Unit Efficiency
Fred D. Lang

ICONE20-POWER2012-55001
Electromagnetic Compatibility Between DCS and Switchboard
Hao Zhang, Yousheng Hou, Chuangbin Zhou, Liqiang Zhang, and Tao Jiang

ICONE20-POWER2012-55003
Resolution of the Pressure Locking Issue of Safety Related MOVs at NPP Krško
Tomislav Bajs, Matija Bajlic, and Bogoljub Sember

ICONE20-POWER2012-55012
Vogtle Electric Generating Plant Risk Managed Technical Specifications Implementation Program
Anees Farruk, Jeff Riley, and Chris Cragg

ICONE20-POWER2012-55035
Evaluation of Thermal Fatigue in Normally Stagnant Non-Isolable RCS Branch Lines in Maanshan Nuclear Power Plant
Yi-Hsiang Cheng, Chao-Jen Li, and Han-Jou Chang

ICONE20-POWER2012-55052
A Method for Improving the Quality of Images Used in Digital Radiographic Testing
Mitsutoshi Kobayashi, Atsushi Taniguchi, Kaoru Sakai, Masako Mori, Kenichi Kawai, Takahiko Kotani, and Yoshimitsu Aoki

ICONE20-POWER2012-55070
Field Experience of Water Jet Peening Application on BWR Reactor Internals With Cracked Surfaces
Ren Morinaka, Kunihiro Hasegawa, Masashi Fukaya, Yuji Matsui, Hisamitsu Hatoh, Noboru Saito, Fujio Yoshikubo, and Akihiro Kanno

ICONE20-POWER2012-55073
Building Maintenance Program for Piping and Pipe Support
Kotaro Iwahara, Koji Yamamoto, and Satoshi Momiyama

ICONE20-POWER2012-55231
Air Ingestion and Transport Testing in a Rotating Drum Raw Water Strainer
Ludwig C. Haber and James Smith

ICONE20-POWER2012-55264
Detection and Depth Sizing of Corrosion Defects in Anchor Bolts
Hideki Yuya, Shan Lin, Akihiro Kako, Hiroyuki Fukutomi, Satoru Shiroshita, and Keisuke Ito

ICONE20-POWER2012-55282
Optimizing Valve Maintenance and Testing Utilizing Acoustic Emissions (AE) Technology
Robert Greenlees and Stan Hale

ICONE20-POWER2012-55283
The Reasons of Rupture of Systems of Cooling of the Reactor as a Result of Earthquake
Konstantin Proskuryakov

- ## Component Reliability and Materials Issues

ICONE20-POWER2012-54007
Using Combustion Turbine Exhaust Heat for Turbine Inlet Air Chilling
Brad Buecker and Chris Mieckowski

ICONE20-POWER2012-54020
Efficient Functional Reliability Estimation of a Passive Residual Heat Removal System by Means of Improved Line Sampling
Baosheng Wang, Dongqing Wang, Taihong Qiu, Jin Jiang, and Jianmin Zhang

ICONE20-POWER2012-54131
Initial Classification of Events to Consider in a Multi-Unit PRA
Suzanne Schroer and Mohammad Modarres

ICONE20-POWER2012-54143
Hydrogen Ingress Into Zirconium Alloys as a Life-Limiting Factor—Methods of In-Line Monitoring, Prediction and Control
M. B. Elmoselhi, K. Tashiro, and A. C. Wallace

ICONE20-POWER2012-54170
V–Ti–N Microalloyed Reduced Activation Martensitic Steel for Fusion Applications
Lixin Zhou, Xuesong Xiong, and Jinping Suo

ICONE20-POWER2012-54176
Evaluation of Hydrogen Transport Behavior in the Power Rising Test of Japanese Prototype Fast Breeder Reactor Monju
Daisuke Doi and Toshio Nakagiri

ICONE20-POWER2012-54178
Development of Self-Healing Coating for Tritium Permeation Barriers
Jinping Suo, Jifeng Gao, and Dawei Liu

ICONE20-POWER2012-54248
Finite Element Modeling Applied to Nuclear Fuel Pellet Fabrication
Leo Carrilho and Steven Johnson

ICONE20-POWER2012-54277
Compatibility of Ferritic/Martensitic Steels With Flowing Lead-Bismuth Eutectic at 450°–550°C and 10^{-6} Mass% Dissolved Oxygen
Carsten Schroer, Olaf Wedemeyer, Josef Novotny, Aleksandr Skrypnik, and Jürgen Konys

ICONE20-POWER2012-54289
Life Assessment of Pipes and Pressure Vessels of a Petro-Chemical Plant
M. Shahid Khalil and Sajjad Akbar

ICONE20-POWER2012-55038
Advanced Performance Prediction Models for Globe Valves Under Design Basis Conditions
Zachary Leutwyler, Neal Estep, and Nimish Jagtap

ICONE20-POWER2012-55047
Characterization of LWR Cores by Radiation- and Electro-Chemical Approaches for Corrosion Studies
Genn Saji

ICONE20-POWER2012-55087
Evaluation of Creep Damage in a Gas Turbine First Stage Blade
Zdzislaw Mazur, Gerardo D. Ortega-Quiroz, and Rafael García-Illescas

ICONE20-POWER2012-55173
Calibration of an Anisotropic Plasticity Finite Element Model of a Polycrystal in Uniaxial Tension
Samir El Shawish, Leon Cizelj, and Igor Simonovski

ICONE20-POWER2012-55191
Finite Element Models of Progressive Failure of Grain Boundaries
Mihaela Irina Uplaznik, Leon Cizelj, and Igor Simonovski

ICONE20-POWER2012-55199
Nanostructural Characterization of Ni-Base Alloy/Low Alloy Steel Dissimilar Metal Weld (DMW) Interfaces
Kyoung Joon Choi, Jong Jin Kim, and Ji Hyun Kim

ICONE20-POWER2012-55202
Atomistic Modeling of Interstitial Diffusion of Oxygen in Nickel Chromium Binary Alloy
Jong Jin Kim and Ji Hyun Kim

ICONE20-POWER2012-55242
Use of FEA Software in Diagnosing Valve Performance Degradation
Gregory Kramer, Bob Stakenborghs, Sean Moles, and Lindsey Dziuba

ICONE20-POWER2012-55266
Stress Corrosion Cracking Behavior Around Interface Between Nickel Base Alloy (Alloy182) and Low-Alloy Steel
Yu Itabashi, Yohei Sakakibara, Mashahiro Takanashi, Guen Nakayama, and Takashi Hirano

- ## Plant Systems, Structures, and Components

ICONE20-POWER2012-54014
Evaluation of Tendon Anchorage Zone Stresses in Prestressed Concrete Nuclear Containment Using Detailed Finite Element Analysis
Shen Wang and Javeed A. Munshi

ICONE20-POWER2012-54088
Evaluation of Concrete Structures Using Nondestructive Techniques
Hemant S. Limaye

ICONE20-POWER2012-54146
Structural Integrity Evaluation of Spent Fuel Storage Racks and Support Frame for a Research Reactor
Jinho Oh, Jeong-Soo Ryu, and Young-Ki Kim

ICONE20-POWER2012-54171
Development of Long Rotating Blade Applied in the New Generation Nuclear Steam Turbine
Kai Cheng, Gongyi Wang, Xiaoming Wu, Deqi Yu, and Zeying Peng

ICONE20-POWER2012-54187
Generation of Response Spectra Compatible Artificial Acceleration Time Histories
Jukka Kähkönen and Pentti Varpasuo

ICONE20-POWER2012-54218
Simulation of a Reinforced Concrete Slab Punching Impact
Jukka Kähkönen and Pentti Varpasuo

ICONE20-POWER2012-54231
R&D of Validity Evaluation System for Seismic Simulation of Entire Nuclear Plant
Yoshio Suzuki, Hiroko Nakamura Miyamura, and Norihiro Nakajima

ICONE20-POWER2012-54250
Generation of In-Structure Response Spectra for Nuclear Power Plants Subjected to High-Frequency Ground Motion
Luis M. Moreschi, Qin Pan, Shen Wang, and Sanjeev R. Malushte

ICONE20-POWER2012-54319
Thermal-Hydraulic Character Effect Factors Analysis for Passive Residual Heat Removal System of Sodium-Cooled Fast Reactor
Xiaolong Sun, Min-jun Peng, and Genglei Xia

ICONE20-POWER2012-54320
Stability Analysis for Reactor Coolant Pump With Vertical Rotor Supported by Fluid Film Bearings
Yaoyu Hu, Dezhong Wang, Yujin Wang, Jige Zhang, and Weiguo Gu

ICONE20-POWER2012-54342
Finite Element Analysis of Elastomers Using ANSYS
Manoj Kunnil, David Yamarthi, and Santhosh K. Kompally

ICONE20-POWER2012-54346
Recent Advances in Test vs Finite Element Correlations Through Design for Six Sigma Tools
Santhosh K. Kompally, Vinay Ramanath, Karthikeyan Jeevanandan, and Manoj Kunnil Gopinathan

ICONE20-POWER2012-54355
A Comparative Study of Direct Soil Model and Soil Spring Model in Common Basemat Analysis of APR1400 Nuclear Power Plant
Seong Moon Ahn, Dong Seung Lee, Jae Wan Park, and Bhaskar Basu

ICONE20-POWER2012-54359
Dynamic Response Analysis of Control Rod Drive Mechanism Under the Stepping Impact Force for Nuclear Power Plants
Xiaoyao Shen and Yongcheng Xie

ICONE20-POWER2012-54492
PACE-1450: The Crack and Leakage Behaviour of a Prestressed Concrete Wall Considering the Prestressing Loss due to Aging
Nico Herrmann, Lutz Gerlach, Harald S. Müller, Christoph Niklasch, Sylvie Michel-Ponnelle, Yann Le Pape, and Christophe Bento

ICONE20-POWER2012-54517
Stress Test Evaluation of Refueling and Storage Pools for Loviisa NPP
Pentti Varpasuo and Jukka Kähkönen

ICONE20-POWER2012-54611
Vibration Analysis of Coolant Pump With Two Unbalanced Disks Based on the State-Space Newmark Method
YuJin Wang, DeZhong Wang, and YaoYu Hu

ICONE20-POWER2012-54614
A Strain Based Failure Criterion for Stainless Steel 316L
Necip Onder Akinci and Kenneth Jaquay

ICONE20-POWER2012-54818
Module Fabrication Strategy for Today's Nuclear Industry
Clayton T. Smith, John H. Hammeran, and Carl Lockwood

ICONE20-POWER2012-54897
Simplified Approach to Design of Crushable Material due to Dynamic Load
Hari M. Srivastava, Asgar Faal-Amiri, and Sivadol Vongmongkol

ICONE20-POWER2012-54912
Calculation of Curvature Using Linear Thermal Gradient
Sungjin Bae

ICONE20-POWER2012-54945
Graphite Component Testing on the Load Capacity of the Dowel-Brick Structure in HTR-PM
Li Shi, Libin Sun, Zonggang Wang, Yuqin Hu, and Zhensheng Zhang

ICONE20-POWER2012-54961
Seismic Test and Analyses on Double-Layer Model of HTR-PM Graphite Structure
Libin Sun, Li Shi, Hongtao Wang, Haitao Wang, Yuqin Hu, and Zhensheng Zhang

ICONE20-POWER2012-54978
Transient Characteristics of Nuclear Coolant Pump During Coastdown Process
Peng Wu, Dazhuan Wu, and Leqin Wang

ICONE20-POWER2012-55008
An Experimental Study on Fracture Toughness of a Fine-Grained Isotropic Graphite
Hongtao Wang, Libin Sun, Haitao Wang, Li Shi, and Zhensheng Zhang

ICONE20-POWER2012-55024
Tank Diaphragm Kinematic Behavior and Conditions for Safe Tank Withdrawal
Ludwig C. Haber and Amie Humphrey-Facendola

ICONE20-POWER2012-55075
Vibration Isolation System to Reduce High Frequency Vibrations due to Airplane Crash
Hiroshi Niwa, Urara Watanabe, Masahiko Warashina, and Tetsuharu Tanoue

ICONE20-POWER2012-55176
Dynamic Analysis of Elastic Structures on Spreadsheet
J.-M. Rambach

ICONE20-POWER2012-55217
Validation and Benchmarking of Comprehensive Vibration Assessment Program for Prototype Reactor Internals
Jianfeng Yang, Lixin Yu, and Byounghoan Choi

ICONE20-POWER2012-55240
Experimental and Analysis Study of Free Standing Rack Under Seismic Excitation
Katsuhiko Taniguchi, Daisaku Okuno, Akihisa Iwasaki, Yoshitsugu Nekomoto, and Toshihiro Matsuoka

ICONE20-POWER2012-55256
Investigation of Hydrodynamic Loads Associated With Pyrotechnic Valve Actuation
Christopher E. Henry, Jaehyok Lim, and Basar Ozar

ICONE20-POWER2012-55257
Investigation of Effects of Piping Configuration and Water Supply Pressure on Air Intrusion
Jaehyok Lim, Basar Ozar, Christopher E. Henry, and Kevin B. Ramsden

- ## Steam Generator Technology Applications and Innovations

ICONE20-POWER2012-54191
Fluidized Bed Reheat Processes for Biomass Power Plant Applications
Eero T. Ikäheimonen, Seppo K. Hulkkonen, Peter C. E. Fabritius, and Esa-Pekka J. Kapanen

ICONE20-POWER2012-54255
A Probabilistic Approach to Support Health Management of Steam Generator Tubes Using Uncertain Inputs From In-Service Inspections
Kaushik Chatterjee and Mohammad Modarres

ICONE20-POWER2012-54354
The Study of Thermal-Hydraulic Analysis for Feedwater Line Break in Steam Generator
Minji Jang and Jongin Kim

ICONE20-POWER2012-54559
Continuous Monitoring, Maintenance, and Optimization of Pressurized Water Reactor Steam Generator Secondary Sides
David S. Taylor

ICONE20-POWER2012-54580
Manufacturing Stress Corrosion Cracking Tube Specimens for Eddy Current Technique Evaluation
Chi Bum Bahn, Sasan Bakhtiari, Jangyul Park, and Saurin Majumdar

ICONE20-POWER2012-54599
Development of U-Bending Technology for Alloy 690 Tubes
Tae-Wan Ku, Woo-Sung Jin, Jin-Hyun Cha, and Won-Seok Kim

- ## Advanced Reactors and Near-Term Deployment

ICONE20-POWER2012-54132
Standard Core Design and Safety Analysis for Advanced Power Reactor Plus (APR^{+})
Sang Jong Lee, Yong Soo Park, and Jong Ryul Park

ICONE20-POWER2012-54155
Margin Assessment of AP1000 In-Vessel Retention Using RELAP5-3D
Hsiang Chun Liu, Min Lee, and Thomas K. S. Liang

ICONE20-POWER2012-54905
Conceptual Design of the NGNP Reactor System
Matt Richards, Chris Ellis, Oscar Gutierrez, Jessie Crozier, and Alan Baxter

ICONE20-POWER2012-54922
Autonomous Corium Reactor for Terrestrial Applications
Jesse M. Johns and Pavel V. Tsvetkov

ICONE20-POWER2012-54963
The Validation of the 4S Safety Analysis Code for Loss of Offsite Power Event
Nobuhiko Usui, Atsuko Matsuda, Jun Ohno, Chikako Iwaki, Fumie Sebe, and Hisao Watanabe

ICONE20-POWER2012-54983
Economic Performance and Extended Capabilities of SMRs
Sara Boarin and Marco E. Ricotti

ICONE20-POWER2012-54994
Advanced Mitigative Strategies of EU-ABWR Based on the Fukushima Accident
Kazuhiro Kamei, Hiroshi Yamazaki, and Takeo Shimizu

ICONE20-POWER2012-55066
Definition and Analysis of Modularity Degree of Nuclear Power Plant Construction
Xiaopeng Fang, Liqiang Gu, and Fengwei Song

ICONE20-POWER2012-55254
Development of the Steam Cycle-Modular Helium Reactor Steam Utilization System for High-Efficiency Cogeneration
Scott R. Penfield, Jr.

- ## Safety and Security

ICONE20-POWER2012-54026
Influence of Boron Carbide on Core Degradation During Severe Accidents in LWRs
Martin Steinbrück

ICONE20-POWER2012-54041
Study on the Core Cooling Scheme After Accident Shutdown of the Pebble-Bed Modular High Temperature Gas-Cooled Reactor
Yanhua Zheng, Lei Shi, and Fubing Chen

ICONE20-POWER2012-54073
Preliminary Analysis of In-Vessel Corium Confinement and Cooling in a Large Sodium Fast Reactor
Franco Polidoro and Flavio Parozzi

ICONE20-POWER2012-54078
Test and Evaluation of a Filtering System for Retention of Fibres in a Coolant Flow After Loss-of-Coolant Accident
A. Kratzsch, T. Gocht, W. Kästner, and M. Strasser

ICONE20-POWER2012-54124
Study on Pressure Relief Transient for High Temperature Gas Cooled Reactor
Yan Wang

ICONE20-POWER2012-54126
Heat Sink Issue: A Specific Problematic Issue for NPP Implementation in Warm Countries With Extreme Climatic Conditions
Andrei Rodionov and Jean-Marie Mattei

ICONE20-POWER2012-54613
IVR Model Study for Passive PWR
Hong Xu, Peng Zhang, and Zhiwei Zhou

ICONE20-POWER2012-54788
Characteristics Analysis of SCWR During Partial Loss of Reactor Coolant Flow Transient
Juan Chen, Tao Zhou, Zhousen Hou, and Canhui Sun

ICONE20-POWER2012-54810
Risk-Informed and Defense-in-Depth Oriented Plant Design Approach
Hidetsugu Morota, Hiroshi Suzuki, Takashi Sakihama, Hiroshi Sano, and Hesham Nasif

ICONE20-POWER2012-54814
Teaching of Nuclear Power Plant Safety at the National Technical University of Ukraine Within the New Course in Safety Culture
Vasilij V. Begun, Olena O. Kilina, and Sergij V. Begun

ICONE20-POWER2012-54847
Development of a Safety Analysis Code SCTRAN for SCWR
Junli Gou, Jue Yang, Pan Wu, Jianqiang Shan, and Bo Zhang

ICONE20-POWER2012-54871
Simulation of the TMI-2 Accident With ATHLET-CD and Analysis of the Late-Phase Modeling
Mathias Hoffmann and Marco K. Koch

ICONE20-POWER2012-54900
Underground Siting of Nuclear Power Plants: Insights From Fukushima
Jay F. Kunze, James M. Mahar, C. W. Myers, and Kellen M. Giraud

ICONE20-POWER2012-54914
The Analysis of Partial Flow Blockage Accidents for a Sodium Cooled Fast Reactor
Won-Pyo Chang, Kwi-Seok Ha, Kwi-Lim Lee, and Hae-Yong Jeong

ICONE20-POWER2012-54955
Effect of CRGT Cooling on Modes of Global Vessel Failure of a BWR Lower Head
Walter Villanueva, Chi-Thanh Tran, and Pavel Kudinov

ICONE20-POWER2012-54964
Estimation of Emergency Planning Zones (EPZs) for Nuclear Research Reactor Using Plume Dispersion Code
Mazzammal Hussain, Salah Ud-Din Khan, and Waqar A. Adil Syed

ICONE20-POWER2012-55040
Reliability Analysis for Passive Containment Cooling System in Seismic Hazard
Yu Yu, Shengfei Wang, Xuefeng Lv, and Fenglei Niu

ICONE20-POWER2012-55048
Estimation of Thyroid Doses From Land Contamination Maps for the Fukushima Disaster
Genn Saji

ICONE20-POWER2012-55058
Power Coefficient of Reactivity Determination for HTPBR and its Application for Reactivity Initiated Transients
Kushal DinkarBadgujar, Om Pal Singh, Suneet Singh, and Shripad T. Rewankar

ICONE20-POWER2012-55062
Preliminary Study of the Application of PEFS on PCWA
Jianhua Cao, Xiangang Fu, and Yong Zhang

ICONE20-POWER2012-55064
Preliminary Study on the Primary Side Structure Design Improvement Based on CPR1000
Chengjun Zhuang, Jianshu Lin, Jun Cui, Ting Wang, and Yong Zhang

ICONE20-POWER2012-55069
Development of New Simulation Software System to Evaluate Radiation Dose Rates in a Wide Radioactively Contaminated Area
Tomoharu Hashimoto, Ryuichi Tayama, Masahiro Kondo, and Hideho Gamo

ICONE20-POWER2012-55156
A Sensitivity Study of the Key Parameters in a Feedwater System Piping Break Analysis
Jinzhen Leng, Dawei Cui, Chengjun Zhuang, Ting Wang, and Kun Mo

ICONE20-POWER2012-55158
Analysis of Main Steam Line Break Accident at Hot Shutdown State Using a Coupled Method
Dawei Cui, Jinzhen Leng, Jun Chen, and Kun Mo

ICONE20-POWER2012-55171
Highlights of Preliminary Level 1 PSA Results for a Research Reactor
Yoon-Hwan Lee, Won-Dea Jung, Su-Ki Park, and Jin-Hong Lee

ICONE20-POWER2012-55186
Risk-Informed Approach to Debris Bed Coolability Issue
Sergey E. Yakush, Nazar T. Lubchenko, and Pavel Kudinov

ICONE20-POWER2012-55220
Hydrogen Detonation in a Flat Semi-Confined Layer
M. Kuznetsov, J. Grune, T. Jordan, W. Rudy, and A. Teodorczyk

- ## Codes, Standards, Licensing, and Regulatory Issues

ICONE20-POWER2012-54015
ASME Division 4 Fusion Energy Devices
W. K. Sowder and Richard W. Barnes

ICONE20-POWER2012-54023
Supporting Qualified Database for Uncertainty Evaluation
F. Fiori, A. Kovtonyuk, O. Lisovyy, F. Veronese, M. Kovtonyuk, A. Petruzzi, and F. D'Auria

ICONE20-POWER2012-54024
The Best-Estimate Plus Uncertainty (BEPU) Challenge in the Licensing of Current Generation of Reactors
A. Petruzzi, N. Muellner, F. D'Auria, and O. Mazzantini

ICONE20-POWER2012-54052
2012 Status of "Low Power and Shutdown PRA Methodology Standard", ANSI/ANS-58.22
Donald J. Wakefield

ICONE20-POWER2012-54190
Interpretive Comparison of the Requirements Relating to Welding and Non-Destructive Examination in the French and US Codes for Nuclear Components
Marcello Consonni and Peter Mudge

ICONE20-POWER2012-54192
Structural Integrity of HDPE Piping and Joints in Nuclear Safety-Related Applications
S. Kalyanam, P. Krishnaswamy, D.-J. Shim, Y. Hioe, and E. Focht

ICONE20-POWER2012-54243
Summary and Comparision of Significant Historical Changes in the Design Requirements for Safety Class 2 and 3 Piping Systems in the ASME Boiler and Pressure Vessel Code, Section III, Division 1
Timothy M. Adams and Charles A. Papadelis

ICONE20-POWER2012-54244
Basis of the Fatigue Capacities, Stress Intensification Factors, and Flexibility Factors for High Density Polyethylene Pipe in the ASME Boiler and Pressure Vessel Code, Section III, Division 1
Timothy M. Adams and Douglas Munson

ICONE20-POWER2012-54249
Expansion of the ASME Certification Process to Provide a NQA-1 Quality Certification
John G. Adkins and Joseph Pang

ICONE20-POWER2012-54350
Development of the Level 2 PRA Standard
Ray Schneider, M. T. Leonard, Paul Boneham, John Lehner, E. T. Burns, Aram Hakoby an, David Bradley, and Jason Petti

ICONE20-POWER2012-54441
Periodic Safety Review: A Tool to Maintain and Enhance Safety
Heinz-Peter Berg, Marina Röwekamp, and Csilla Toth

ICONE20-POWER2012-54474
PWROG Buried Pipe Degradation Evaluation Handbook
Mark A. Moenssens

ICONE20-POWER2012-54484
Non-Linear Design Evaluation of Nuclear Power Piping Subjected to Time-History Dynamic Loads According to ASME B&PV III
Lingfu Zeng and Lennart Jansson

ICONE20-POWER2012-54598
Location Dependent Loss of Coolant Accident Frequencies for Risk-Informed Resolution of Generic Safety Issue 191
Karl N. Fleming, Bengt O. Y. Lydell, and C. Rick Grantom

ICONE20-POWER2012-54739
Regulatory Issues for the Waste Control Specialists LLRW Facility in Andrews Texas
Gary B. Merrell, Bill Dornsife, and Gary M. Sandquist

ICONE20-POWER2012-54740
CMRR QA Application and Graded Approach
Taunia Van Valkenburg, Rick Holmes, and Gary Sandquist

ICONE20-POWER2012-54821
Nuclear Quality Program Management in an Integrated Project Environment
Clayton T. Smith, Steven C. White, and Chris Ashby

ICONE20-POWER2012-54874
Nuclear Safety and Site Evaluation for the Darlington New Nuclear Project
Jack Vecchiarelli, Paul Arthurs, and John V. Marczak

ICONE20-POWER2012-54876
AFCEN – ETC-C — A New Code for Design and Construction of NPP Civil Structures: Recent Developments and Perspectives
Philippe Bécue and Etienne Gallitre

ICONE20-POWER2012-54894
Case Studies in Nuclear Codes and Standards: A Successful Incorporation of Codes and Standards Into Engineering School Curriculum
Kenneth R. Balkey, G. Gary Elder, Larry R. Foulke, and John D. Metzger

ICONE20-POWER2012-54920
ASME Applicability for Small Modular Reactors
Clayton T. Smith, Dennis K. Williams, and George Beltz

ICONE20-POWER2012-55010
Lessons Learned While Pursuing the 10 CFR 50.69 Project at Vogtle Electric Generating Plant
Vish Patel, Patrick O'Regan, and Erick Sweat

ICONE20-POWER2012-55090
Laboratory Experiments on Soil Dynamic Characteristics of NPP Site
Vlatko Sheshov

ICONE20-POWER2012-55211
Preparation of Risk-Informed Decision for NPP: Evaluation of Risk Acceptability and the Level of Decision Influence on Defence-in-Depth
Mikhail Lankin

ICONE20-POWER2012-55243
Safety and Licensing Aspects of Power Reactor Reactivity Coefficients
Nik K. Popov and Victor G. Snell

ICONE20-POWER2012-55244
Licensing Challenges for New Countries Entering a Nuclear Power Program
N. K. Popov

- ## Fuel Cycle, Radioactive Waste Management and Decommissioning

ICONE20-POWER2012-54042
Derivation Clearance Levels for Solid Radioactive Materials From Nuclear Installations Decommissioning
Jozef Pritrsky and Jana Frankovska

ICONE20-POWER2012-54051
Education and Training in Radiochemistry: The NAMP Initiative
Patricia Paviet-Hartmann and Mansour Akbarzadeh

ICONE20-POWER2012-54803
Time-Dependent Coincidence Method to Measure Uranium Casting Enrichment
Wen-xiong Xie, Jian-sheng Li, Jian Gong, Jian-yu Zhu, and Po Huang

ICONE20-POWER2012-54850
Corrosion Study of Titanium-5% Tantalum Alloy in Hot Nitric Acid Condensate
Masayuki Takeuchi, Yuichi Sano, Yasuo Nakajima, Gunzo Uchiyama, Yasuo Nojima, and Sachio Fujine

ICONE20-POWER2012-54877
Engineering Design and Construction of the Waste Control Specialists, LLC LLRW in Texas
Mark S. Day, Dennis Owen, and Gary M. Sandquist

ICONE20-POWER2012-55104
Applicability of Single Mode Fiber Laser for Wrapper Tube Cutting
Ryohei Wakui, Toru Kitagaki, Kenji Koizumi, Hidetoshi Higuchi, Tadahiro Washiya, and Masayuki Takeuchi

ICONE20-POWER2012-55106
Study on Corrosion of Stainless Steel in Boiling Nitric Acid Under Heat Transfer Conditions
Fumiyoshi Ueno, Hironori Shiraishi, Shun Inoue, Takafumi Motooka, Chiaki Kato, Masa hiro Yamamoto, Gunzo Uchiyama, Yasuo Nojima, and Sachio Fujine

ICONE20-POWER2012-55177
Preliminary Study on Nuclear Fuel Cycle Scenarios of China Before 2050
Bo Cao, Tongrui Yang, Xubo Ma, and Yixue Chen

ICONE20-POWER2012-55234
Options for Multiple Recycling of Reprocessed U in PWR: Technical and Economic Comparison
Hubert Druenne and Charles Hardy

- ## Thermal-Hydraulics

ICONE20-POWER2012-54012
Temperature Fluctuations Inside the CANDU Reactor Moderator Test Facility (MTF)
Araz Sarchami, Nasser Ashgriz, and Marc Kwee

ICONE20-POWER2012-54025
A Procedure for Characterizing the Range of Input Uncertainty Parameters by the Use of the FFTBM
A. Kovtonyuk, A. Petruzzi, and F. D'Auria

ICONE20-POWER2012-54045
Researches of Bypass Flows From Cold Plenum to Hot Plenum in HTR-PM by the Flow Network Method
Jun Sun, Yanhua Zheng, and Fu Li

ICONE20-POWER2012-54059
Model for Choking of Subcooled Flashing Flow Through a Steam Generator Tube Crack
Brian Wolf, Shripad T. Revankar, and Jovica R. Riznic

ICONE20-POWER2012-54066
Identificaton of Limiting Case Between DBA and SBDBA (CL Break Break Sensitivity): A New Model for the Boron Injection System
Raul Gonzalez Gonzalez, Alessandro Petruzzi, Francesco D'Auria, and Oscar Mazzantini

ICONE20-POWER2012-54071
DNB Prediction Method Using Local Void Fraction Applied to a PWR Rod Bundle With Mixing Vane Grid
Tatsuya Sasakawa, Tsutomu Ikeno, and Isao Kataoka

ICONE20-POWER2012-54093
Numerical Evaluation of Wall Temperature Measurement Methods Developed to Investigate Thermal Fatigue at T-Junction Pipe
Koji Miyoshi, Nakamura Akira, and Nobuyuki Takenaka

ICONE20-POWER2012-54099
Thermal Mixing Phenomenon of a Tee Piping in Operating Nuclear Power Plant
Chao-Jen Li, Yi-Hsiang Cheng, Yao-Long Tsai, Han-Jou Chang, and Li-Hua Wang

ICONE20-POWER2012-54101
Simulation of a Containment Spray System Test With the European Lumped-Parameter Codes ASTEC and COCOSYS
Tobias Risken and Marco K. Koch

ICONE20-POWER2012-54125
Flow Instability Inside Heat Transfer Tubes of MSR
Jun Manabe

ICONE20-POWER2012-54140
On Distribution of Local Thermal and Mass Flow Rate Parameters of Two-Phase Coolant in the Bundle of 7 Rods
V. A. Dalipagich, E. M. Mayevskiy, V. G. Razumovskiy, E. N. Pis'mennyi, A. E. Kolosko v, and I. L. Pioro

ICONE20-POWER2012-54183
Comparative Study in the Stability Analysis Code of LAPUR5.2 and LAPUR6.0 for the Kuosheng NPP
Chang-Lung Hsieh, Guan-Yu Chen, Hao-Tzu Lin, Jong-Rong Wang, and Chunkuan Shih

ICONE20-POWER2012-54196
AP1000 Plant CILC/CIPS Risk Assessment Using Advanced TH Methodology
G. Wang, P. Sapienza, R. J. Fetterman, M. Y. Young, J. R. Secker, S. W. Nelson, R. L. Oelrich, and Y. Sung

ICONE20-POWER2012-54206
Assessment of Heat-Transfer Correlations Against Experimental Data Obtained With Supercritical Water in Vertical Annuli
Zhendong Yang, Qincheng Bi, Han Wang, Gang Wu, and Laurence K. H. Leung

ICONE20-POWER2012-54207
Experimental Investigation on Rapid Evaporation of High-Pressure Liquids due to Depressurization
Qiaoling Zhang, Qincheng Bi, Zesen Nie, Jun Liang, Yajun Guo, Chunming Wang, and Yanping Wang

ICONE20-POWER2012-54211
MARS-KS Calculations for ATLAS 6-Inch Cold Leg Break (SBLOCA) Test
Dong-Gu Kang, Joo-Sung Kim, and Seung-Hoon Ahn

ICONE20-POWER2012-54212
Transient Critical Heat Fluxes of Subcooled Water Flow Boiling in a Short SUS304-Tube With Twisted-Tape Insert
Koichi Hata, Yasuyuki Shirai, and Suguru Masuzaki

ICONE20-POWER2012-54225
Numerical Study of Flow and Heat Transfer in Rectangular Channel With Periodic Longitudinal Vortex Generators Under Pulsating Flow
Lin Tian, Bai Wei, Shanhu Xue, Zipeng Huang, and Qiuwang Wang

ICONE20-POWER2012-54240
Validation of the LP Code MELCOR 1.8.6 for Containment Analyses With Hydrogen Recombiners Using Results From the OECD/NEA Experimental Project THAI
Miroslav Kotouc

ICONE20-POWER2012-54257
Study on Resistance Characteristics of Single-Phase Pulsating Flow in the Horizontal Rectangular Channel
Jing-da Tiam, Pu-zhen Gao, and Bao Zhou

ICONE20-POWER2012-54280
Accident Management Actions in a Lower Head SBLOCA With HPSI Failed
J. Gonzalez-Cadelo, C. Queral, J. Montero, and J. C. Martinez-Murillo

ICONE20-POWER2012-54295
Experimental Investigation on the Effect of Bubble Behavior on Flow Boiling Pressure Drop in Narrow Channel
Deqi Chen, Ren Song, and Liang-ming Pan

ICONE20-POWER2012-54299
Vapor Bubble Condensation Characteristics of Subcooled Flow Boiling in Vertical Rectangular Channel
Liang-ming Pan and Zhi-wei Tan

ICONE20-POWER2012-54302
Scaling Evaluation of the Two-Phase Natural Circulation
Han Wang and Yuquan Li

ICONE20-POWER2012-54304
Scaling Analysis of the Pressurizer Surge Line in Nuclear Plant Integral Test Facilities
Cheng-Cheng Deng, Hua-Jian Chang, Ben-Ke Qin, Han Wang, and Lian Chen

ICONE20-POWER2012-54309
ACME Upper Plenum Entrainment Phenomena Scaling Analysis and Criteria
Zishen Ye, Yuquan Li, Han Wang, Wei Li, and Lian Chen

ICONE20-POWER2012-54312
Investigation on Characteristics of Experiment About Single-Beam Measurements of Supercritical Fluid
Yu Zhao, Qincheng Bi, Hu Richa, and Huixiong Li

ICONE20-POWER2012-54318
Dynamic Simulation Research on Primary Coolant System of Sodium Cooled Fast Reactor
Yang Yu and Yun Guo

ICONE20-POWER2012-54338
Development of a New Heat Transfer Model Near the Quench Front in the Reflooding Phase of a Tight Lattice
Dan Wu, Hongxing Yu, Junchong Yu, Jie Li, and Jiyang Yu

ICONE20-POWER2012-54353
Two-Group Relative Velocity in Boiling Two-Phase Flow
Caleb S. Brooks, Basar Ozar, Takashi Hibiki, and Mamoru Ishii

ICONE20-POWER2012-54356
Station Blackout Analysis of Lungmen ABWR Using TRACE
Jong-Rong Wang, Hao-Tzu Lin, Hsiung-Chih Chen, Wei-Chen Wang, and Chunkuan Shih

ICONE20-POWER2012-54358
Calculation Study on Onset of Nucleate Boiling of Natural Circulation Based on Density Gradient
Sheng Cheng, Tao Zhou, Lei Zhang, and Yanping Huang

ICONE20-POWER2012-54362
A Large Eddy Simulation of the Bubbly Flow in Vertical Tube
Peng Zhang and Xu Hong

ICONE20-POWER2012-54366
Development for CANDU-6 Moderator Temperature Prediction by Using Porous Media Approach
Jae Ryong Lee, Han Young Yoon, Hyoung Tae Kim, and Jae Jun Jeong

ICONE20-POWER2012-54373
The Thermal-Hydraulic Analyses of Transients in PBWFR
Yonghong Tain, Guanghui Su, Jun Wang, Wenxi Tian, and Suizheng Qiu

ICONE20-POWER2012-54377
Study on the Minimum Drag Coefficient Phenomenon of Supercritical Pressure Water in the Pseudocritical Region
Xianliang Lei, Huixiong Li, ShuiQing Yu, YiFan Zhang, and TingKuan Chen

ICONE20-POWER2012-54390
Development of Modeling Transport of Graphite Dust in HTGR During Normal Operation Condition
Zhipeng Chen, Fei Xie, Yanhua Zheng, Lei Shi, and Fu Li

ICONE20-POWER2012-54404
Investigation on Velocity Distribution Around the Wrapping Wire in an Inner Subchannel of Fuel Pin Bundle
Masahiro Nishimura, Hiroyuki Sato, Hideki Kamide, Hiroyuki Ohshima, Kazuyoshi Naga sawa, and Yasutomo Imai

ICONE20-POWER2012-54407
Structure Design of Pressure Equipment for Experimental Test on Steam Condensation on the Cold Surface
Lin Yang, Lingyun Li, and Liyong Han

ICONE20-POWER2012-54410
Insulation Material Deposition and Distribution in a PWR Fuel Assembly Cluster
Stefan Renger, Wolfgang Kästner, Soeren Alt, André Seeliger, and Frank Zacharias

ICONE20-POWER2012-54415
Validation Results of TRACG05 Against BWR and ABWR Start-Up Test Data
Hitoshi Ochi, Taichi Takii, Yoshiro Kudo, Rui Kagiyama, Takeshi Yamada, Kimiko Isono , Mitsuko Nishijima, and Junichi Kaneko

ICONE20-POWER2012-54416
The Effect of Flow Field on the Mass Transfer Coefficient in the Orifice Downstream
Atsushi Fujishiro, Feng Shan, Retsu Kojo, Momoe Takeuchi, and Yoshiyuki Tsuji

ICONE20-POWER2012-54427
OECD/NEA ROSA Project Experiment on Steam Condensation in PWR Horizontal Legs During Large-Break LOCA
Takeshi Takeda, Iwao Ohtsu, and Hideo Nakamura

ICONE20-POWER2012-54438
Validation of TRACG05 for Application to BWR AOO
Asuka Matsui, Masashi Tamitani, Yoshiro Kudo, Sho Takano, Tatsuya Iwamoto, Mitsuko Nishijima, Junichi Kaneko, Hitoshi Ochi, Taichi Takii, and Hideo Soneda

ICONE20-POWER2012-54450
Two-Phase Flow in an Annular Channel With an Obstacle
O. N. Kashinsky, P. D. Lobanov, A. S. Kurdyumov, and N. A. Pribaturin

ICONE20-POWER2012-54453
Local Void Fraction in Triangular Arranged Rod Bundle
N. A. Pribaturin, O. N. Kashinsky, P. D. Lobanov, A. S. Kurdyumov, and S. E. Volkov

ICONE20-POWER2012-54469
Thermal Hydraulic Test of Advanced Fuel Bundle With Spectral Shift Rod (SSR) for BWR: Steady State and Transient Test Results and Analysis
Takao Kondo, Kazuaki Kitou, Masao Chaki, Yukiharu Ohga, and Takeshi Makigami

ICONE20-POWER2012-54477
MARS Code Reflood Model Improvement and Assessment
Moonkyu Hwang, Bub-Dong Chung, and Seung-Wook Lee

ICONE20-POWER2012-54479
Development of Prediction Technology of Two-Phase Flow Dynamics Under Earthquake Acceleration: (4) Measurement of Bubble Deformation Near Wall Under Flow Rate Fluctuation
Satoshi Okachi, Masaki Seto, Hideaki Monji, Akiko Kaneko, Yutaka Abe, Hiroyuki Yoshida, and Kazuyuki Takase

ICONE20-POWER2012-54480
Experimental Study of Two-Phase Flow Thermal-Hydraulic Instabilities
L. C. Ruspini, C. A. Dorao, and M. Fernandino

ICONE20-POWER2012-54499
Prediction of Hydrogen Distribution Under Severe Accident Conditions With CFD and Lumped Parameter Codes
Tobias Szabo, Stefan Benz, Frank Kretzschmar, Peter Royl, and Thomas Jordan

ICONE20-POWER2012-54506
Validation Experiment for the Cooling Capability of Passive Auxiliary Feedwater System (PAFS) With PASCAL Facility
Byoung-Uhn Bae, Seok Kim, Yu-Sun Park, Bok-Deuk Kim, Kyoung-Ho Kang, and Byong-Jo Yun

ICONE20-POWER2012-54510
Measurement of Void Fraction in Dispersed Bubbly Flow With Constant Electric Current Method
Shin-ichiro Uesawa, Akiko Kaneko, and Yutaka Abe

ICONE20-POWER2012-54533
Subcooled Flow Boiling in a Rectangular Channel With Added Turbulence and Longitudinal Vortices
Gregor Bloch, Christina Jochum, Tobias Schechtl, and Thomas Sattelmayer

ICONE20-POWER2012-54537
A Study on Phase Difference Between Pressure Drop and Flow Rate of Sine Fluctuation in Rectangular Channel
Bao Zhou, Pu-zhen Gao, Si-chao Tan, and Jing-da Tian

ICONE20-POWER2012-54550
Analysis of the Threshold Peculiarities of Density Wave Instabilities in a Parallel Vertical Twin Channels With Risers: IPPE Database
Yuri Kornienko

ICONE20-POWER2012-54552
AREVA's Advanced Thermal-Hydraulic Codes and Methods for Levels III and IV Crud Risk Assessment
John H. Jones, Mihnea S. Anghelescu, Michael S. Bradbury, Mathieu G. Martin, Azat Y. Galimov, Anca Hatman, Richard L. Harne, Thomas H. Keheley, Uta Wende, and Jérôme Bigot

ICONE20-POWER2012-54566
Experiment of Adiabatic Two-Phase Flow in an Annulus Under Low-Frequency Vibration
Shao-Wen Chen, Caleb S. Brooks, Takashi Hibiki, Mamoru Ishii, Michitsugu Mori, and Chris Macke

ICONE20-POWER2012-54591
Investigations on Slug Flow in a Horizontal Pipe Using Stereoscopic Particle Image Velocimetry and CFD Simulation With Volume of Fluid Method
Marek Czapp, Matthias Utschick, Johannes Rutzmoser, and Thomas Sattelmayer

ICONE20-POWER2012-54594
Void Fraction Covariance in Two-Phase Flows
Caleb S. Brooks, Yang Liu, Takashi Hibiki, and Mamoru Ishii

ICONE20-POWER2012-54602
Development of Prediction Technology of Two-Phase Flow Dynamics Under Earthquake Acceleration: (5) Measurement of Bubble Deformation Near Wall Under Structure Vibration
Kousuke Mizuno, Akiko Kaneko, Hideaki Monji, Yutaka Abe, Hiroyuki Yoshida, and Kazuyuki Takase

ICONE20-POWER2012-54605
Pressure Drop and Flow Pulsation in Tight-Lattice Rod Bundle
Chi Young Lee, Chang Hwan Shin, Ju Yong Park, Dong Seok Oh, Tae Hyun Chun, and Wang Kee In

ICONE20-POWER2012-54634
Experimental Investigation of Friction Reduction in Transport of Fluids Using Surfactants
Florencio Sanchez-Silva, Ignacio Carvajal-Mariscal, Pedro Quinto-Diez, and Juan Gabriel Barbosa-Saldana

ICONE20-POWER2012-54635
Slug Flow Main Parameters in a Combined Inclined Up and Down Two-Phase Flow
Florencio Sanchez-Silva, Ignacio Carvajal-Mariscal, Miguel Toledo-Velázquez, and Georgiy Polupan

ICONE20-POWER2012-54649
Development and Implementation of a 3D Heat Conduction Model for (Very) High Temperature Reactors Into the Reactor Dynamics Code DYN3D
Silvio Baier, Ulrich Rohde, Soeren Kliem, and Emil Fridman

ICONE20-POWER2012-54663
Development of Prediction Technology of Two-Phase Flow Dynamics Under Earthquake Acceleration: (6) Numerical Simulation of Bubble Deformation Near Wall Under Accelerating Condition
Hiroyuki Yoshida, Taku Nagatake, Kazuyuki Takase, Akiko Kaneko, Hideaki Monji, and Yutaka Abe

ICONE20-POWER2012-54689
Analysis of Graphite Dust Deposition in Steam Generator of HTR
Wei Peng, Xiao-yong Yang, Jie Wang, and Su-yuan Yu

ICONE20-POWER2012-54698
Methodology for the Analysis of Fuel Behavior During LOCA and RIA for Licensing Purposes
Martina Adorni, Alessandro Del Nevo, and Francesco D'Auria

ICONE20-POWER2012-54716
Experimental Study of Heat Transfer Deteriorations of Supercritical Water Flowing Upward in Tube
Hong-bo Li, Jue Yang, Xian-gang Fu, Dong-hua Lu, Han-yang Gu, Meng Zhao, Fei Wang, Jian-min Zhang, and Yong Zhang

ICONE20-POWER2012-54741
Sub-Channel Analysis of SCWR Assembly With Double-Row Rods
Fei Wang, Jue Yang, Xiangang Fu, Hongbo Li, Yong Zhang, Jianmin Zhang, Jianqiang Shan, Junli Gou, Bo Zhang, and Chao Chen

ICONE20-POWER2012-54751
Development of PCCSAP-3D Code for the Analysis of Passive Containment Performance
Ran Li and Jiyang Yu

ICONE20-POWER2012-54802
The Analysis of Instability in a Two-Phase Natural Circulation Loop Under Rolling Motion
Wenchao Zhang, Sichao Tan, and Puzhen Gao

ICONE20-POWER2012-54804
Measurement of Gas Entrainment Rate From Free Surface by Vortex
Yasuo Koizumi, Naosuke Ohte, Hideki Kamide, Shuji Ohno, and Kei Ito

ICONE20-POWER2012-54809
Effect of Pressure on Underdeveloped Nucleate Boiling on the Single Horizontal Tube Heated by Condensing Steam
A. V. Morozov, O. V. Remizov, and D. S. Kalyakin

ICONE20-POWER2012-54843
Break Size Effects on CET Response in an Upper Head SBLOCA Transient
S. Gallardo, A. Querol, and G. Verdú

ICONE20-POWER2012-54846
Simulation of Mixing Induced by a Hot PAR Exhaust Plume
Michele Andreani and Stephan Kelm

ICONE20-POWER2012-54848
Role of Complicated Flow Fields in Lower Plenum on Coolant Flow Distribution to Core of ABWR
Shun Watanabe, Yutaka Abe, Akiko Kaneko, Fumitoshi Watanabe, and Kazuki Hirao

ICONE20-POWER2012-54849
Validation of FIDOM-Rod: A Mechanistic Code for the Critical Power Prediction in BWR Fuel Rod Assemblies
D. K. Chandraker, P. K. Vijayan, and M. Aritomi

ICONE20-POWER2012-54851
Capability of the Integral Code ASTEC V2 to Simulate a Blow Down in Plant Scale Tests
Thimo Brähler, Tobias Risken, and Marco K. Koch

ICONE20-POWER2012-54854
Plant Dynamics Evaluation of a Monju Ex-Vessel Fuel Storage System During a Station Blackout
Takero Mori, Masutake Sotsu, Kei Honda, Satoshi Suzuki, and Hiroaki Ohira

ICONE20-POWER2012-54881
Analysis of the Onset of Dryout Conditions in Diabatic Annular Two-Phase Flows
Henryk Anglart

ICONE20-POWER2012-54921
A New Approach to Calculating Fuel Temperature in TRIGA Mark I Research Reactors
Jesse M. Johns and W. D. Reece

ICONE20-POWER2012-54930
Visual Experiments on the Subcooled Water Droplet Behavior in High Temperature Molten Metal
Yuan Zhou, Meng Lin, Zhengming Zhang, and Lei Lei

ICONE20-POWER2012-54938
Assessment of Selected Two-Phase Friction Multiplier Correlations for Steam-Water Flows in Vertical Heated and Unheated Tubes
A. Durmayaz, I. A. Odabas, D. C. Groeneveld, and N. E. Gengeç

ICONE20-POWER2012-54959
Study of Droplets Behaviors in the Steam-Water Separator With Monte Carlo Method
Huang Zhang and HanLiang Bo

ICONE20-POWER2012-55011
Uncertainty Evaluation of the Rod Withdrawal at Power Accident Analysis Including 3D Neutron Kinetics
Tomislav Bajs, Alessandro Petruzzi, and Davor Grgic

ICONE20-POWER2012-55049
The Safety Analysis of the 600 MWe Sodium-Cooled Fast Reactor With MARS-LMR
Kwi Lim Lee, Kwi Seok Ha, Hae Yong Jeong, and Won Pyo Chang

ICONE20-POWER2012-55053
Research on Vortex Eliminating of the Sump of Cooling Pump by CFD
Li Cheng and Chao Liu

ICONE20-POWER2012-55081
Stability Analysis of a Supercritical Water Natural Circulation Loop
ZhongChun Li, JiYang Yu, and XiaoMing Song

ICONE20-POWER2012-55101
Correlation Investigation of Condensation Heat Exchanger Design for Secondary Passive Cooling System
Hee Joon Lee, Han-Ok Kang, Tae-Ho Lee, and Cheon-Tae Park

ICONE20-POWER2012-55107
Visualization and Numerical Simulation of Exchange Flow in Density Different Gases
Motoo Fumizawa, Shuhei Ohkawa, Isaku Buma, and Suguru Tanaka

ICONE20-POWER2012-55132
Validation of TRACE Code for Flashing-Induced Density Wave Oscillations in SIRIUS-N Facility, Which Simulates ESBWR
Masahiro Furuya, Yoshihisa Nishi, and Nobuyuki Ueda

ICONE20-POWER2012-55134
Thermal-Hydraulic Analysis of Concept Design of Spallation Target in Chinese Accelerator Driven Subcritical System
Yaoli Zhang, Zhiwei Zhou, Sicong Xiao, and Yongwei Yang

ICONE20-POWER2012-55136
The Sensitivity Analysis of Passive Containment Cooling System During Design Basis Accidents
Yaoli Zhang, Zhiwei Zhou, and Yanning Yang

ICONE20-POWER2012-55155
Heat Transfer Characteristics of One Side Heated Vertical Rectangular Channel Inserting Porous Material
Tetsuaki Takeda, Akihiro Sato, and Shumpei Funatani

ICONE20-POWER2012-55159
Analytical Prediction of Turbulent Friction Factor in Circular Pipe Under Supercritical Conditions
Jinguang Zang, Xiao Yan, Shanfang Huang, Yanping Huang, and Zejun Xiao

ICONE20-POWER2012-55167
Effect of Void Fraction on Pressure Drop in Upward Vertical Two-Phase Gas-Liquid Pipe Flow
Clement C. Tang, Sanjib Tiwari, and Afshin J. Ghajar

ICONE20-POWER2012-55206
Performance Evaluation of a High Thermal Conductivity Fuel With Graphene Additives During the LBLOCA
Seung Won Lee, Hyoung Tae Kim, and In Cheol Bang

ICONE20-POWER2012-55225
Experimental Investigation on Heat Transfer for Two-Phase Flow Under Natural Convection
Milan Amižic, Estelle Guyez, and Jean-Marie Seiler

ICONE20-POWER2012-55276
Reactor Cavity Cooling System Facility Shakedown and RELAP5-3D Model Validation
R. Vaghetto, Saya Lee, and Y. A. Hassan

•

- **Computational Fluid Dynamics (CFD) and Coupled Codes**

ICONE20-POWER2012-54053
Numerical Simulation of Three-Phase Flows With Rich Solid Particles by Coupling Multi-Fluid Model With Discrete Element Method
Liancheng Guo, Koji Morita, and Yoshiharu Tobita

ICONE20-POWER2012-54087
CFD Model Development and Validation for VHTR Air Ingress Scenarios
J. Baggemann, S. Kelm, H.-J. Allelein, and A. Hurtado

ICONE20-POWER2012-54161
Applications and Development of the PORFLO 3D Code in Nuclear Power Plant Thermal Hydraulics
Eveliina Takasuo, Ville Hovi, and Mikko Ilvonen

ICONE20-POWER2012-54163
CFD Modeling and Experiment Validation of Flow Characteristic in a Structured Pebble Bed
ZhongChun Li, Jian Li, XiaoMing Song, and JianChao Lu

ICONE20-POWER2012-54182
Computational Study on the Particle Sedimentation Performance of a Reactor Building Floor Weir by Means of Two-Dimensional Lattice Boltzmann Method
Jong Woon Park, Won Seok Kim, Keun Sung Lee, and Jinsu Kim

ICONE20-POWER2012-54274
Numerical Analysis of the Flow Blockage Accidents in Plate-Type Fuel Assembly
Lei Song, Yun Guo, and Heyi Zeng

ICONE20-POWER2012-54317
Numerical Simulation of Liquid Sodium Convection Flowing Through Wire-Wrapped Subassembly
Zheng Li, Heyi Zeng, and Yun Guo

ICONE20-POWER2012-54347
CFD Simulation of Direct Contact Condensation With ANSYS CFX Using Locally Defined Heat Transfer Coefficients
Sabin Cristian Ceuca and Rafael Macián-Juan

ICONE20-POWER2012-54367
Analysis of Pressure Change on the Splitter Plate in Flow Over a Circular Cylinder
Ding Lin and Zhang Li

ICONE20-POWER2012-54437
Numerical Methods for Compressible Multiphase Flow With Sodium-Water Chemical Reaction
Akihiro Uchibori and Hiroyuki Ohshima

ICONE20-POWER2012-54444
Numerical Analysis of Heat Transfer Phenomena When Mitigating Severe Accident With External Reactor Vessel Flooding
Tae Hyub Hong, Chan Kook Moon, and Hyeong Taek Kim

ICONE20-POWER2012-54464
CFD Modeling of Mass Transfer in the Flow Through an Orifice With ζ-f Model
Jinbiao Xiong, Xu Cheng, and Yanhua Yang

ICONE20-POWER2012-54539
Anisotropic Porosity Formulation of the Coarse-Grid-CFD (CGCFD)
Mathias Viellieber and Andreas G. Class

ICONE20-POWER2012-54583
3D Coupled Code SPARKLE-2 for PWR Non-LOCA Analysis
Hikaru Sakamoto, Manabu Miyata, Manabu Maruyama, and Junto Ogawa

ICONE20-POWER2012-54607
Application of a Second Order Shock Capturing Scheme to the Solution of the Water Faucet Problem With a 1D Two-Fluid Model
William D. Fullmer, Xiaoying Zhang, and Martin A. Lopez de Bertodano

ICONE20-POWER2012-54612
Three-Dimensional Numerical Study on Condensation-Conduction-Evaporation Coupled Heat Transfer
Chang Lei and Yanning Yang

ICONE20-POWER2012-54645
Assessment of Performance of Turbulence Models of CFX in Predicting Supercritical Water Heat Transfer in a Vertical Tube
Jie Li, Junchong Yu, Guangming Jiang, and Jiyang Yu

ICONE20-POWER2012-54650
Numerical Simulations of MISTRA 2009 Campaign for ITER Hydrogen Explosion Mitigation Studies
Jianjun Xiao and John R. Travis

ICONE20-POWER2012-54653
Investigations on Bubble-Induced Turbulence Modeling for Vertical Pipe Bubbly Flows
Yixiang Liao and Dirk Lucas

ICONE20-POWER2012-54675
Numerical Simulations of Shock-Induced Nozzle Flow Separation
Xiang Zhao, Sujun Dong, and Sijun Zhang

ICONE20-POWER2012-54732
Three-Dimensional Numerical Study of Natural Convection in Passive Residual Heat Removal Heat Exchanger
Mingyuan Wang, Ruojun Xue, and He Zhu

ICONE20-POWER2012-54754
CFD of the Upper Plenum and its Hot Legs for a PWR: Sensitivity to the Turbulence Model
Arièle Défossez, Sofiane Benhamadouche, and Serge Bellet

ICONE20-POWER2012-54773
Design of Passive Concrete Cooling System Using CFD
A. M. Vaidya, N. K. Maheshwari, and P. K. Vijayan

ICONE20-POWER2012-54792
Validation of a Pseudo-3D Modelling of Reactor Pressure Vessel With ATHLET System Code for Coupled Code Applications
Kiril Velkov, Sergey Nikonov, Georg Lerchl, and Ihor Pasichnyk

ICONE20-POWER2012-54797
Numerical Simulation of a Completely Passive Spent Fuel Pool: Lessons Learned
Elia Merzari and Yousry Gohar

ICONE20-POWER2012-54872
Extension and Application of the Coupled 1D-3D Thermal-Hydraulic Code ATHLET-ANSYS CFX for the Simulation of Liquid Metal Coolant Flows in Advanced Reactor Concepts
Angel Papukchiev and Georg Lerchl

ICONE20-POWER2012-54882
Application of the Convolution Theorem to Predict Heated Wall Temperature Subject to Various Axial Power Distributions
Henryk Anglart

ICONE20-POWER2012-54891
Multi-Scale Thermalhydraulic Analyses Performed in NURESIM and NURISP Projects
D. Bestion, D. Lucas, B. Niceno, H. Anglart, and L. Vyskocil

ICONE20-POWER2012-54936
Local Mesh Refinement in COM3D
Ke Ren, Alexei Kotchourko, and Alexander Lelyakin

ICONE20-POWER2012-54981
LES and URANS Predictions of Thermal Load in Piping Systems: T-Junction
Yacine Addad and Jeong Ik Lee

ICONE20-POWER2012-55203
A CFD-Based Integral Pump-Down Model for Computing Solids Transfer From a Mixing Vessel
Michael P. Kinzel, Leonard J. Peltier, Brigette Rosendall, Andri Rizhakov, and Kelly J. Knight

ICONE20-POWER2012-55214
CFD Simulations of a Heat Recovery Steam Generator for the Aid of Power Plant Personnel
Iván F. Galindo-Garcia, Ana K. Vázquez-Barragán, and Miguel Rossano-Román

- ## Instrumentation and Controls

ICONE20-POWER2012-54238
Automated, On-Line Loss-on-Ignition (LOI) Sensor
James A. Bickford, Michael Y. Feng, Mitchell Hansberry, Daniel Harjes, Eric Balles, Joe Estrada, Chris Hill, and Bill Kirkenir

ICONE20-POWER2012-54349
Defence-in-Depth and Diversity Analysis of FPGA-Based NPP I&C Systems: Conception, Technique and Tool
Vyacheslav S. Kharchenko, Volodymyr V. Sklyar, Olexandr A. Siora, and Andriy V. Volkoviy

ICONE20-POWER2012-54518
A Study on the Power and Power Control System of the Passive Core Cooling Integral Test
Fang Tian, Qing Clio Dai, and Zhen-feng Qi

ICONE20-POWER2012-54633
Diffusive Polarization of Electrodes in Molten-Salt Galvanic Circuit
Alexander L. Shimkevich

ICONE20-POWER2012-54884
The Role of FPGA-Based Architectures in the Control Room Modernization Process: Preliminary Results of a Case-Study
M. Cappelli, F. Memmi, L. Falconi, M. Palomba, R. Bove, and M. Sepielli

ICONE20-POWER2012-54944
Development of a New Oscillation Power Range Monitor Algorithm Based on Period Standard Deviation
Norio Sakai, Yutaka Takeuchi, Hiroyuki Takeuchi, and Kazuki Yano

ICONE20-POWER2012-55080
Application of Computer-Based Operating Procedure to the US-APWR Human-System Interface
Satoshi Hanada, Koji Ito, Kenji Mashio, Masashi Hirahatake, and Robert E. Hall

ICONE20-POWER2012-55088
Hydraulic Cylinders-Response in Fluid Power Control Systems
Tahany W. Sadak and Mahassen Rizk

ICONE20-POWER2012-55100
Nuclear Industry Applications of Si-Diode Based High Gamma Dose Rate Detectors
S. Yue, B. Sur, A. Das, G. Jonkmans, and L. Li

ICONE20-POWER2012-55143
Optimal H_∞ Loop Shaping Based Steam Generator Level PID Controller Tuning
Yuyan Liu and Shiliang Zhou

ICONE20-POWER2012-55146
A Simple Robust Gain Scheduled PID Control for Steam Generator Water Level
Shiliang Zhou and Yuyan Liu

ICONE20-POWER2012-55185
Safety Assessment of FPGA Based RPS System for Lungmen NPP
Jun-Jen Lu, Hwai-Pwu Chou, and Kin-Wah Wong

- ## Next Generation Systems

ICONE20-POWER2012-54040
Experimental Investigations and Analytical Improvements for HTR Pebble Bed Cores
H.-J. Allelein, B. Schloegl, J. Baggemann, S. Juehe, and S. Kasselmann

ICONE20-POWER2012-54074
Parametric and Uncertainty Study of a Counter Current LBE-Water Heat Exchanger With TRACE and SUSA
Wadim Jäger, Victor Sánchez, and Diego Castelliti

ICONE20-POWER2012-54095
Thermochemical Hydrogen Production IS process
Jin Iwatsuki, Shinji Kubo, Seiji Kasahara, Nobuyuki Tanaka, Hiroki Noguchi, Yoshiyuki I mai, and Kaoru Onuki

ICONE20-POWER2012-54184
High-Temperture Structural Analysis on a Small-Scale PHE Prototype Considering Mechanical Properties in the Heat-Affected Zone and in the Weld Zone
Kee Nam Song, Sung-Deok Hong, and Hong-Yoon Park

ICONE20-POWER2012-54351
Control Strategies for VHTR Gas-Turbine System With Dry Cooling
Hiroyuki Sato, Xing L. Yan, Hirofumi Ohashi, Yukio Tachibana, and Kazuhiko Kunitomi

ICONE20-POWER2012-54384
Numerical Analysis for a Molten Salt Reactor in the Presence of Fissile Lump
Yao Xiao, Dalin Zhang, Zhangpeng Guo, and Suizheng Qiu

ICONE20-POWER2012-54411
Preliminary Design of Hybrid Energy Reactor
Maosheng Li, Chan Gao, Xueming Shi, and Xianjue Peng

ICONE20-POWER2012-54429
Dynamic Behavior Analysis of a Supercritical Water Cooled System Using Modified ATHLET
Chong Zhou, Xu Cheng, and Yanhua Yang

ICONE20-POWER2012-54435
Simulation of the Natural Convection Test of Phenix Reactor Using Modified ATHLET
Chong Zhou, Klaus Huber, and Xu Cheng

ICONE20-POWER2012-54460
Investigation of a Heavy Liquid Metal Free Surface Target Experiment
Karsten Litfin, Frank Fellmoser, Abdalla Batta, Andreas G. Class, and Thomas Wetzel

ICONE20-POWER2012-54542
Development of a Core Management Tool for MYRRHA: Work in Progress
David Jaluvka, Gert Van den Eynde, and Stefan Vandewalle

ICONE20-POWER2012-54547
Dynamic Analysis of S-CO_2 Cycle Control With Coupled PDC-SAS4A/SASSYS-1 Codes
Anton Moisseytsev and James J. Sienicki

ICONE20-POWER2012-54548
Modeling of the SNL S-CO_2 Loop With ANL Plant Dynamics Code
Anton Moisseytsev and James J. Sienicki

ICONE20-POWER2012-54556
High-Speed Steam Turbine Systems for Small-Scale Power Generation Applications
Miroslav P. Petrov, Jens Fridh, Ake Göransson, and Torsten H. Fransson

ICONE20-POWER2012-54641
Reactor Kinetics in a Loss-of-Forced-Cooling (LOFC) Test of HTGRs
Kuniyoshi Takamatsu and Kazuhiro Sawa

ICONE20-POWER2012-54708
A Type of SCWR Core Design Study With 3-D Coupled Neutronics/Thermal-Hydraulics Analysis
Yong Zhang, Jue Yang, Dongsheng Li, Liangzhi Cao, Qianhua Su, Jianmin Zhang, Fei Wang, and Hongbo Li

ICONE20-POWER2012-54725
Improvement of the Fast Breeder Reactor Plant Dynamic Analysis Code ADYTUM
Isao Tatewaki, Hiroshi Endo, Yoshihisa Shindo, and Tomoko Ishizu

ICONE20-POWER2012-54733
LIFUS5/Mod2: The Experimental Facility for HLM/Water Interaction Investigation
Alessandro Del Nevo, Andrea Ciampichetti, Nicola Forgione, and Simone Mannori

ICONE20-POWER2012-54757
A Pre-Test CFD Analysis of HLM Fuel Pin Bundle
Ivan Di Piazza, Marco Scarpa, and Mariano Tarantino

ICONE20-POWER2012-54844
Investigation on the Characteristic of the Annular Fuel Based on Subchannel Analysis Under Supercritical Condition
Bo Zhang, Jue Yang, Yuanbin Zhu, Jianqiang Shan, and Junli Gou

ICONE20-POWER2012-54933
The Screening Methodologies and/or Achievement Evaluation in Japanese FR Cycle Development Program With the Changing Needs for Evaluation
Hiroki Shiotani, Kiyoshi Ono, Nariaki Uto, Takashi Namba, Koichi Kawaguchi, and Yoshihiko Shinoda

ICONE20-POWER2012-54952
Post Test Analysis of ICE Tests
Mariano Tarantino, Alessandro Del Nevo, Nicola Forgione, and Giacomino Bandini

ICONE20-POWER2012-54972
Integrated Multi-Modular Fast Reactor Concept Design
Vishal Patel and Pavel Tsvetkov

ICONE20-POWER2012-55042
Mechanical Aspects of the Canadian Generation IV Supercritical Water-Cooled Pressure Tube Reactor
M. Yetisir, M. Gaudet, and D. Martin

ICONE20-POWER2012-55152
A Design of Simulation Experiment System for the Helium Turbine
Liang Zhu and Zhengang Shi

- ## Fusion Engineering

ICONE20-POWER2012-54208
Thermal-Hydraulic Analysis of Design Basis Accidents for Chinese Helium-Cooled Solid Breeder TBM
Jie Wang, Guanghui Su, Wenxi Tian, and Suizheng Qiu

ICONE20-POWER2012-54209
Basic Experiment on Lithium Removal Technique
Tomohiro Furukawa and Yasushi Hirakawa

ICONE20-POWER2012-54445
Calculations of the Dual Functional Lithium Lead-Test Blanket Module for ITER With Three-Dimensional Deterministic Method
GuangChun Zhang, Hongchun Wu, Liangzhi Cao, and Youqi Zheng

ICONE20-POWER2012-54483
The Neutronic Calculation of Hybrid Energy Reactor
Chan Gao and Maosheng Li

ICONE20-POWER2012-54730
In Vessel Loss of Coolant Accident Analysis for the JET Tokomak in Support of the Safety Case Review
Joelle Vallory, Helen Boyer, Fabien Moreno, and Dominique Kadri

ICONE20-POWER2012-54789
Hydrocarbon Catalytic Nuclear Fusion by Using Quantum Spin Hall Effect
Abul Hasanat Muhammad Jahanur Rahman

ICONE20-POWER2012-55046
Scientific Bases of Corrosion Control for Water-Cooled Fusion Reactors Such as ITER
Genn Saji

- ## Reactor Physics, Neutronics, and Transport Theory

ICONE20-POWER2012-54214
Automatic Modeling of Complex Geometries for MCNP Simulation Using GEOMIT Code
Noha Shaaban, Wael El Gammal, Hesham Nasif, and Hidetsugu Morota

ICONE20-POWER2012-54229
Acceleration and Parallelization of Arbitrary Trajectory Based Three-Dimensional Method of Characteristics
Zhizhu Zhang, Kan Wang, and Qing Li

ICONE20-POWER2012-54369
Reactor Core Physics Simulation Method for HTR
Chunlin Wei, Zhe Sui, Jun Sun, and Wen-zhi Shan

ICONE20-POWER2012-54383
The Ultra-Fine-Group Panel Method for Neutron Slowing Down
Robert A. Joseph III, Ivan Maldonado, and Barry Ganapol

ICONE20-POWER2012-54428
Research on the Subgroup Method and 2D Arbitrary Geometry Resonance Calculation Code
Lei He, Hongchun Wu, Liangzhi Cao, Youqi Zheng, and Hongbo Zhang

ICONE20-POWER2012-54535
Performance Study of the MORET Monte Carlo Code for Local Power Density Calculations in a Full Size Reactor Core
Franck Bernard, Joachim Miss, and Gabriel Juhel

ICONE20-POWER2012-54544
The 2nd Generation Fuel of VVER-440 and the Validation of the Correspondent Calculation Route
György Hegyi, András Keresztúri, Csaba Maráczy, and Emese Temesvári

ICONE20-POWER2012-54554
Assessment of Reactor Core Simulations Using DONJON for a 2-Dimensional SCWR Benchmark Core
Xiaolin Wang and Jeremy Pencer

ICONE20-POWER2012-54586
Neutron Facility Based on High Intensity DT Neutron Generator
Vitaly Kovaltchouk, Ahmed Hosny, Rachid Machrafi, Muhammad Ali, and Nafisah Khan

ICONE20-POWER2012-54878
Xenon Correction in Homogenized Neutron Cross Sections
Davor Grgic, Radomir Jecmenica, and Dubravko Pevec

ICONE20-POWER2012-54939
The Investigation of Thermal Neutron Scattering Data of FLiBe
Longwei Mei, Xiangzhou Cai, Jingen Chen, Wei Qin, and Wei Guo

ICONE20-POWER2012-54948
Development of CAD-MCNP Interface Program "GEOMIT"
Hesham Nasif, Akihiro Masui, Hidetsugu Morota, Takashi Sato, and Hideo Kitagawa

ICONE20-POWER2012-54956
Development of a Nodal Kinetics Code System GalaxyCosmo-K for PWR Transient Analyses
Kazuya Yamaji, Kazuki Kirimura, and Hideki Matsumoto

ICONE20-POWER2012-55109
An Approximation for the Interference Term Applied to the Calculation of the Average Scattering Cross Section Using Fourier Series
Alessandro C. Gonçalves, Daniel A. P. Palma, and Aquilino S. Martinez

ICONE20-POWER2012-55280
Secondary Particles Produced by 1.5 GeV Proton Beams Incident on Lead-Bismuth Eutectic Target of C-ADS
Hongli Wu, Xiangqi Wang, Jingyu Tang, Yuanjie Bi, Weimin Li, and Lei Shang

- ## Nuclear Education, Human Resources, and Public Acceptance

ICONE20-POWER2012-54039
ASN and IRSN Contribution in European Union "Instrument for Nuclear Safety Cooperation" Projects: The Case of Egypt
Christophe Herer, Jean-Yves Ravachol, Jean-Christophe Gariel, Christophe Clement, Laurent Guimier, Vincent Rebour, David Baumont, and Pascal Bailly-du-Bois

ICONE20-POWER2012-54055
Challenge in the Public Acceptance and Cooperation on the Verge of Building the First Nuclear Power Plant in Indonesia
Susetyo Hario Putero, Haryono Budi Santosa, and Widya Rosita

ICONE20-POWER2012-54107
A Study on the Public Perception in Nuclear Area in Brazil
Renata A. Almeida, Maria de Lourdes Moreira, Patricia Wieland, and Antonio Cesar F. Guimarães

ICONE20-POWER2012-54389
Smart Energy Management and Comprehensive Utilization of Nuclear Energy
Shutang Zhu and Zhaoqi Zhu

ICONE20-POWER2012-54926
Fukushima: What Impact on Radiation Regulatory Conservatism?
Gary M. Sandquist, Jay F. Kunze, and Eric J. Wells

ICONE20-POWER2012-55055
Time-Series Visualization on Nuclear Power Plant Trouble Database
Yutaka Hongo, Koji Okamoto, and Shuhei Takahashi

ICONE20-POWER2012-55149
Research and Education in Nuclear Safety: Perspective of the Smallest Nuclear Country
Leon Cizelj and Iztok Tiselj

ICONE20-POWER2012-55205
Basic vs. Applied Doctoral Theses in Nuclear Engineering in Slovenia
Ivo Kljenak, Borut Mavko, Leon Cizelj, and Iztok Tiselj

ICONE20-POWER2012-55230
International Training Program in Support of Safety Analysis: 3D S.UN.COP—Scaling, Uncertainty and 3D Thermal-Hydraulics/Neutron-Kinetics COuPled Codes Seminar
A. Petruzzi, F. Fiori, A. Kovtonyuk, F. D'Auria, T. Bajs, and F. Reventos Puigjaner

ICONE20-POWER2012-55265
National Technical University of Ukraine "Kiev Politechnical Institute" and its Nuclear Education Programs
V. G. Razumovskiy, E. N. Pis'mennyi, M. Z. Zgurovskiy, and I. L. Pioro

- ## Student Paper Competition

ICONE20-POWER2012-54080
Experiments on Choking Flow of Subcooled Liquid Through a Simulated Steam Generator Tube Crack
Brian Wolf, Shripad T. Revankar, and Jovica R. Riznic

ICONE20-POWER2012-54103
Suitability of Eutectic Field's Metal for Use in an Electromagnetohydrodynamically-Enhanced Experimental Two-Phase Flow Loop
A. Lipchitz, Lilian Laurent, and G. D. Harvel

ICONE20-POWER2012-54154
Probability Analysis of the Fuel Microsphere Distribution of Dispersion-Type Nuclear Fuel Plates
Lijun Gao, Hua Pang, Bingde Chen, Shengyao Jiang, Jiyang Yu, and Zhong Xiao

ICONE20-POWER2012-54188
Post Test Calculations of a Severe Accident Experiment for VVER-440 Reactors by the ATHLET Code
Hunor György and István Trosztel

ICONE20-POWER2012-54199
Accounting Nuclear Fuel Burnup for Criticality Safety Justification of Spent Nuclear Fuel Storages
Vladislav Solovyov and Vitaliy Galchenko

ICONE20-POWER2012-54221
Code Simulation of Quenching of a High Temperature Debris Bed: Model Improvement and Validation With Experimental Results
A. Bachrata, F. Fichot, G. Repetto, M. Quintard, and J. Fleurot

ICONE20-POWER2012-54239
Study of Aerosol Scavenging by Rain in Case of a Radioactive Contamination of the Atmosphere
Arnaud Quérel, Pascal Lemaitre, Marie Monier, Emmanuel Porcheron, and Flossmann Andrea

ICONE20-POWER2012-54245
Triboengineering Problems of Lead and Lead-Bismuth Coolants in Innovative Fast Reactors
Artem Shumilkov, A. V. Lvov, A. V. Beznosov, T. A. Bokova, and Kirill Makhov

ICONE20-POWER2012-54251
Nuclear Fuel Burn-Up Depth in WWER Reactors With Various Burnable Absorbers
Vasyl Zaiets

ICONE20-POWER2012-54266
On the Use of Support Vector Regression Technique for the Analysis of Rod Ejection Accidents
Botao Jiang, Yang Liu, and Fuyu Zhao

ICONE20-POWER2012-54288
Experimental Investigation of Cavitation in the Circulation Pumps With Lead and Lead-Bismuth Coolants
A. V. Lvov, A. I. Shumilkov, P. A. Bokov, A. V. Beznosov, and O. O. Novozhilova

ICONE20-POWER2012-54315
The Perspective of Creating a Closed Fuel Cycle Based on the Fast Reactors in Ukraine
I. A. Tereshchenko and S. O. Ustimenko

ICONE20-POWER2012-54327
Research on Enhancement of Natural Circulation Capability in Lead-Bismuth Alloy Cooled Reactor by Using Gas-Lift Pump
Juanli Zuo, Wenxi Tian, Suizheng Qiu, and Guanghui Su

ICONE20-POWER2012-54361
Theoretical Study on the Flow Instability of Supercritical Water in the Parallel Channels
Yali Su, Jian Feng, Wenxi Tian, Suizheng Qiu, and Guanghui Su

ICONE20-POWER2012-54381
Application of Fine Depletion Calculation for LLFPs In-Core Transmutation Evaluation in PWRs
Kun Liu, Hongchun Wu, Liangzhi Cao, Youqi Zheng, and Changhui Wang

ICONE20-POWER2012-54396
Visualization on Inert Gas Jets Impinging to a Glass Tube Submerged in Liquid Sodium
Hideyuki Kudoh, Ken-ichiro Sugiyama, Tadashi Narabayashi, Hiroyuki Ohshima, and Akikazu Kurihara

ICONE20-POWER2012-54397
Thermal Hydraulics Behavior Around a Single Heated Rod With Adhesion Products of Sodium-Water Reaction
Junki Ohta, Ken-ichiro Sugiyama, and Hideyuki Kudoh

ICONE20-POWER2012-54399
Estimation of Fragmentation on Jet Breakup in Coolant
Taihei Kuroda, Yutaka Abe, Akiko Kaneko, Iwasawa Yuzuru, Hideki Nariai, Hiroshi Sak aba, Kazuya Koyama, and Eiji Matsuo

ICONE20-POWER2012-54402
Study on Mixing Process of Two Component Gases in a Vertical Fluid Layer: Effectiveness on One-Dimensional Natural Circulation
Hiroki Mizuno, Tetsuaki Takeda, and Shumpei Funatani

ICONE20-POWER2012-54412
Jet Breakup Behavior With Surface Solidification
Yuzuru Iwasawa, Yutaka Abe, Akiko Kaneko, Taihei Kuroda, Eiji Matsuo, Hideki Nariai, Hiroshi Sakaba, Kazuya Koyama, and Kazuhiro Itoh

ICONE20-POWER2012-54454
Surface Tension of Liquid Sodium With Suspended Nanoparticles
Takuro Ogawa and Ken-ichiro Sugiyama

ICONE20-POWER2012-54467
Measurements of RF-Induced SOL Modifications in Tore Supra Tokamak
Martin Kubic, James P. Gunn, Laurent Colas, Stéphane Heuraux, and Eric Faudot

ICONE20-POWER2012-54490
Study on Control Method of Natural Circulation by Injection of Helium Gas
Masashi Nomura, Tetsuaki Takeda, Shumpei Funatani, and Takuya Shimura

ICONE20-POWER2012-54508
Numerical Flow Analysis of Electromagnetic Fluid Using GSMAC Finite-Element Method
Kun Yang, Yoshitaka Saitoh, Hideki Kawai, Nobuyoshi Tsuzuki, Hiroshige Kikura, and Gaku Hashimoto

ICONE20-POWER2012-54516
Development of a Heat Transfer Correlation for Supercritical CO_2 Based on Multiple Data Sets
Tiberiu Preda, Eugene Saltanov, Igor Pioro, and Kamiel S. Gabriel

ICONE20-POWER2012-54519
Analysis of the MSFR Core Neutronics Adopting Different Neutron Transport Models
Carlo Fiorina, Manuele Aufiero, Antonio Cammi, Claudia Guerrieri, Jiri Krepel, Lelio Luz zi, Konstantin Mikityuk, and Marco Enrico Ricotti

ICONE20-POWER2012-54521
A Preliminary Study of the MSFR Dynamics
Claudia Guerrieri, Manuele Aufiero, Antonio Cammi, Carlo Fiorina, and Lelio Luzzi

ICONE20-POWER2012-54524
A Study of Air-Coupled Ultrasonic Flowmeter
Keisuke Tsukada, Tomonori Ihara, and Hiroshige Kikura

ICONE20-POWER2012-54527
Preliminary Study on Features of Key Components for HTGR Helium Turbine System
Haoran Hao, Xiaoyong Yang, and Jie Wang

ICONE20-POWER2012-54530
Sensitivity Analysis of Fuel Centerline Temperature in SCWRs
Ayman Abdalla, Wargha Peiman, Igor Pioro, and Kamiel Gabriel

ICONE20-POWER2012-54531
Experimental Study of Heat Transfer in a 7-Element Bundle Cooled With Supercritical Freon-12
G. Richards, J. Samuel, A. S. Shelegov, P. L. Kirillov, I. L. Pioro, and G. Harvel

ICONE20-POWER2012-54546
Assessment of Different Turbulence Models in Helically Coiled Pipes Through Comparison With Experimental Data
Marco Colombo, Antonio Cammi, and Marco E. Ricotti

ICONE20-POWER2012-54558
Current Status and Future Applications of Supercritical Pressures in Power Engineering
Anastasiia Zvorykina, Sahil Gupta, Wargha Peiman, Igor Pioro, and Natalia Fialko

ICONE20-POWER2012-54592
Experiments and Simulations on the Steady-State and Transient Behavior of Gas/Liquid Interfaces in Impulse Pipes for Hydrostatic Level Measurements
Stephan Schulz and Rainer Hampel

ICONE20-POWER2012-54596
Power Distribution and Fuel Centerline Temperature in a Pressure-Tube Supercritical Water-Cooled Reactor (PT SCWR)
W. Peiman, Eu. Saltanov, L. Grande, I. Pioro, B. Rouben, and K. Gabriel

ICONE20-POWER2012-54626
Developing Heat-Transfer Correlations for Supercritical CO_2 Flowing in Vertical Bare Tubes
Sahil Gupta, Prabu Surendran, Igor Pioro, Donald McGillivray, and Liliana Trevani

ICONE20-POWER2012-54630
Comparison of Existing Supercritical Carbon Dioxide Heat Transfer Correlations for Horizontal and Vertical Bare Tubes
Prabu Surendran, Sahil Gupta, Tiberiu Preda, and Igor Pioro

ICONE20-POWER2012-54636
An Addendum: Probabilistic Failure Analysis of a Residual Heat Removal Heat Exchanger During Postulated Loss of Coolant Accident
Matt Solom, Christopher Pannier, Christopher Chance, Robert Seager, Paola Alicea, Ta m Duong, Alan Lee, and Jordan Green

ICONE20-POWER2012-54640
Experimental Investigation of Nucleate Boiling on Capillary Tubes Under PWR Specific Subcooling and Flow Parameters
C. Schneider, R. Hampel, A. Hurtado, A. Traichel, S. Meissner, and E. Koch

ICONE20-POWER2012-54660
Use of Risk-Management Methods in NPP Safety Regulation
A. V. Taranovski

ICONE20-POWER2012-54665
Comparison of Transient Responses for SCWRs With Different Flow Path Designs Under Loss of Flow Accident
Dahuan Zhu, Wenxi Tian, Suizheng Qiu, and Guanghui Su

ICONE20-POWER2012-54669
Numerical Simulation of Graphite Oxidation in HTGR
Yao Wang, Peng Wang, and Suyuan Yu

ICONE20-POWER2012-54670
Research on the Loading Pattern of Reactor Core With MOX Fuel in the First Cycle
Tianqi Zhang, Shihe Yu, and Xinrong Cao

ICONE20-POWER2012-54676
Response Functions of a Boron-Loaded Plastic Scintillator to Neutron and Gamma Radiation
Nafisah Khan, Muhammad Ali, Ahmed Hosny, and Rachid Machrafi

ICONE20-POWER2012-54683
Neutronics Performance of a Fusion-Fission Hybrid Reactor With Pressure Tube Assemblies
Tiejun Zu, Hongchun Wu, Youqi Zheng, and Liangzhi Cao

ICONE20-POWER2012-54686
Supercritical-Water Experimental Setup for In-Pile Operation
M. Miletic, I. Pioro, M. Ružicková, R. Fukac, and W. Peiman

ICONE20-POWER2012-54693
Best Estimate Analysis of PHEBUS FPT1 Test Using RELAP/SCDAPSIM Code
Tadas Kaliatka, Eugenijus Ušpuras, and Virginijus Vileiniškis

ICONE20-POWER2012-54777
Molecular Dynamics Simulations to Evaluate the Effect of Applied Strain on Interstitial Cluster Formation and Orientation Under Collision Cascade Damage
Satoshi Miyashiro, Satoshi Fujita, Mitsuhiro Itakura, and Taira Okita

ICONE20-POWER2012-54782
Sensitivity Analysis of CFD Code FLUENT-12 for Supercritical Water Heat Transfer in Vertical Bare Tubes
Amjad Farah, Patrick Haines, Glenn Harvel, and Igor Pioro

ICONE20-POWER2012-54834
A Probabilistic Assessment of Flow-Accelerated Corrosion Rate in Pipe Bends With Unknown Initial Thickness
D. Lu, M. D. Pandey, and Jovica Riznic

ICONE20-POWER2012-54840
Molecular Dynamics Simulations to Evaluate the Effect of the Difference in Material Properties on Irradiation-Induced Defect Formation Under Applied Strain
Toshihiro Horinouchi, Satoshi Miyashiro, Mitsuhiro Itakura, and Taira Okita

ICONE20-POWER2012-54841
Investigation of Liquid Dispersion in the Packed-Bed by Electrical Resistance Tomography
Takeshi Eda, Achyut Sapkota, and Masahiro Takei

ICONE20-POWER2012-54842
Boiling Heat Transfer and Critical Heat Flux Enhancement of Upward- and Downward-Facing Heater in Nanofluids
Muhamad Zuhairi Sulaiman, Masahiro Takamura, Kazuki Nakahashi, and Tomio Okawa

ICONE20-POWER2012-54857
Effects of Various Fuel Parameters on the HTTR Criticality Calculations
Chun-Yen Li, Rong-Jiun Sheu, Jinn-Jer Peir, Der-Sheng Chao, and Jenq-Horng Liang

ICONE20-POWER2012-54904
Modeling and Synthesis of Spatially Correlated, Site-Reflected, and Non-Stationary Ground Motions Compatible With Vector-Valued Uniform Hazard Spectra
De-Yi Zhang, Wei-Chau Xie, and Mahesh D. Pandey

ICONE20-POWER2012-54907
Safety Assessment of the Implementation of Five-Year Fuel Operation With Use of Enhanced-Algorithm at Ukrainian NPPs
R. S. Glushenkov

ICONE20-POWER2012-54918
Gas-Liquid Bubbly Turbulent Upward Flow in Square Duct
HaoMin Sun, Tomoaki Kunugi, DaZhuan Wu, HongNa Zhang, Hideo Nakamura, and XiuZhong Shen

ICONE20-POWER2012-54929
Neutron Generation Based Method for Monte Carlo Three-Dimensional Reactor Time-Dependent Simulation
Qi Xu, Ganglin Yu, and Kan Wang

ICONE20-POWER2012-54940
Distributed Energy Storage Control for Optimal Adoption of Solar Energy in Residential Networks
Reza Arghandeh and Robert Broadwater

ICONE20-POWER2012-54951
Generation and Mechanical Analysis of Repeatable Random Rough Surfaces
Hector E. Medina and Brian Hinderliter

ICONE20-POWER2012-54997
Evaluation of Debris Transport Augmentation by Turbulence During the Recirculation Cooling Phase of a LOCA
Jong-Pil Park, Kyung Sik Choi, Ji Hwan Jeong, and Jae Jun Jeong

ICONE20-POWER2012-55025
Observations of Irradiation-Induced Defect Formation on Si (111) Surface by a Linked Facility Between an Ion Accelerator and STM
Motohiro Sato, Tairo Kikuchi, Kenta Murakami, Satoshi Miyashiro, and Taira Okita

ICONE20-POWER2012-55060
Study on Saturated Flow Boiling Heat Transfer Under Vibration Conditions
Yoshitaro Fujiyama and Hiroyasu Ohtake

ICONE20-POWER2012-55068
Visualization of Entrainment and Surface Behavior of High Speed Air Jet Blowing Out From a Hole to Stagnant Water
Kohei Nago, Yasuo Koizumi, Akihiro Uchibori, and Hiroyuki Ohshima

ICONE20-POWER2012-55082
On the Immersed Boundary Method: Finite Element Versus Finite Volume Approach
Angelo Frisani and Yassin A. Hassan

ICONE20-POWER2012-55094
Pool Boiling and Flow Boiling CHF Enhancement at Atmospheric Pressure Using Magnetic Nanofluid
Taeseung Lee, Jong Hyuk Lee, and Yong Hoon Jeong

ICONE20-POWER2012-55130
A Feasibility Study on Various Power-Conversion Cycles for a Sodium-Cooled Fast Reactor
Alexey Dragunov, Eugene Saltanov, Sergey Bedenko, and Igor Pioro

ICONE20-POWER2012-55141
Thermal-Hydraulics Design of Water-Cooled Pressure Tube Blanket for a Fusion Driven Subcritical Reactor
Xinli Gao, Tiejun Zu, Hongchun Wu, Suizheng Qiu, Guanghui Su, and Wenxi Tian

ICONE20-POWER2012-55145
An Advanced Model on Mixed Convection in Passive Containment Cooling System
He Zhang and Fenglei Niu

ICONE20-POWER2012-55148
Research on Nuclear Heat Deposition Behavior in the Spallation Target of an Accelerator Driven Subcritical System
S. Xiao, Y. Yang, and Z. Zhou

ICONE20-POWER2012-55201
Parametric Study of MISTRA M5 Test Using Lumped Parameter COCOSYS Code
Mantas Povilaitis, Egidijus Urbonavicius, and Sigitas Rimkevicius

ICONE20-POWER2012-55235
Sensitivity Study of the South Texas Project Power Plant Steady-State Simulations Using RELAP5-3D Coupled With DAKOTA
O. A. Rodriguez, R. Vaghetto, and Y. A. Hassan

ICONE20-POWER2012-55237
Modeling and Experimental Study of Inorganic Crystal Response Function for Gamma Spectroscopy and Dosimetry
Muhammad Ali, Nafisah Khan, Ahmed Hosny, and Rachid Machrafi

ICONE20-POWER2012-55245
On the Inflow Phenomenon in Near Field of Buoyant Jet at Low Froude Number
Atsushi Maeda, Nobuyuki Fujisawa, and Takayuki Yamagata

- ## Design Basis and Beyond Design Basis Events

ICONE20-POWER2012-54129
Application of RELSIM-RELAP/SCDAPSIM for the Assessment of the In-Vessel Damage Progression in Fukushima Daichii Units 1-3
Brian S. Allison, Chris M. Allison, Judith K. Hohorst, Uwe Luettringhaus, and Fred Torri

ICONE20-POWER2012-54142
EC6 Instrumentation, Control, and Electrical Design for Station Blackouts
Philip Foster, John Harber, Steven Ford, Boris Lekakh, and Chunlei Nie

ICONE20-POWER2012-54241
Beyond Design Basis Seismic Analysis for Atucha II Nuclear Plant
Tao Zhang, Frederick W. Brust, Gery Wilkowski, Heqin Xu, Alfredo Betervide, and Oscar Mazzantini

ICONE20-POWER2012-54253
Extreme Events: The New Social Design Basis
Romney B. Duffey

ICONE20-POWER2012-54278
TRACE and RELAP5 Codes for Beyond Design Accident Condition Simulation in the SPES3 Facility
Fulvio Mascari, Roberta Ferri, Paride Meloni, and Giuseppe Vella

ICONE20-POWER2012-54300
Single Bubble Growth at Different Gravity and the Effects of Microgravity on Marangoni Convection
Yan Yang, Liang-ming Pan, and Long-Chang Xue

ICONE20-POWER2012-54301
Importance of Reactor Heat Transport System Overpressure Protection System Under Severe Accident Conditions With Special Reference to CANDU Reactors
Sunil Nijhawan

ICONE20-POWER2012-54382
Self-Propelling Cooling Systems: Back-Fitting Passive Cooling Functions to Existing Nuclear Power Plants
Dominik von Lavante, Dietmar Kuhn, and Ernst von Lavante

ICONE20-POWER2012-54387
Improved Regulatory Oversight and Immediate Retrofits for Operating Pressurized Heavy Water Reactors for Beyond Design Basis Accidents
Sunil Nijhawan

ICONE20-POWER2012-54528
Evaluation of a Method for Remote Detection of Fuel Relocation Outside the Original Core Volumes of Fukushima Reactor Units 1-3
Douglas W. Akers and Edwin A. Harvego

ICONE20-POWER2012-54541
CANDU 6 Severe Accident Prevention and Mitigation Features
Steven Ford, Boris Lekakh, Ed Choy, Kamal Verma, and Sorin Ghelbereu

ICONE20-POWER2012-54564
Identification of Non-Safety Systems to Withstand Beyond Design Basis Events
James Nygaard, Ping Wan, Desmond Chan, and Sara Barrientos

ICONE20-POWER2012-54582
Probability of the Loss of Offsite Power and Damage to Road Network due to a Rare Event
Chase Gilmore, Bilal Khan, Jack Cavaluzzi, and Minh Hong Tran

ICONE20-POWER2012-54604
The Benefits of Using a Risk-Informed Approach to Resolving GSI-191
Timothy D. Sande, Gilbert L. Zigler, Ernie J. Kee, Bruce C. Letellier, C. Rick Grantom, and Zahra Mohaghegh

ICONE20-POWER2012-54674
Safety Assurance for Boiling Water Reactors (BWRs) Beyond Design Basis
Salomon Levy

ICONE20-POWER2012-54684
Numerical Simulation of the Self-Leveling Phenomenon by Modified SIMMER-III
Bin Zhang, Tatsuya Matsumoto, Koji Morita, Hidemasa Yamano, Hirotaka Tagami, Tohr u Suzuki, and Yoshiharu Tobita

ICONE20-POWER2012-54729
Preliminary Evaluation of the Reliability of Gen II or III Reactors in BDBE Conditions
Rosa Lo Frano and Giuseppe Forasassi

ICONE20-POWER2012-54856
Seismic Fragility Analysis of a Condensate Storage Tank With Multiple Uncertain Degradation Scenarios
Jinsuo R. Nie, Joseph I. Braverman, Charles H. Hofmayer, Young-Sun Choun, Min Kyu Kim, and In-Kil Choi

ICONE20-POWER2012-54868
Operating Condition of Steam Injector as a Passive Cooling System at Severe Accident of Nuclear Power Plant
Yutaka Abe, Shunsuke Shibayama, Akiko Kaneko, Chikako Iwaki, Tadashi Narabayashi , and Michitsugu Mori

ICONE20-POWER2012-54925
Analysis of Fuel-Coolant Interaction Potential in Sodium Cooled Fast Reactor Safety Experiments
John C. Petrykowski

ICONE20-POWER2012-55002
Integration of Direct/Indirect Influences of Severe Accidents for Improvements of Nuclear Safety
Kampanart Silva, Yuki Ishiwatari, and Shogo Takahara

ICONE20-POWER2012-55114
A Concept of Classification Criteria of External Hazards for PRA of Nuclear Power Plants
Yoshiyuki Narumiya and Takahiro Kuramoto

ICONE20-POWER2012-55129
Flow Characterization and Heat Transfer of Core-Catcher in Passive Safety System
Tomohisa Kurita, Mika Tahara, Toshimi Tobimatsu, Masato Yamada, and Yoshihiro Kojima

ICONE20-POWER2012-55131
Severe Accident Analysis for BWR With Containment Outer Pool
Koki Yoshimura and Kohei Hisamochi

ICONE20-POWER2012-55239
Function of Isolation Condenser of Fukushima Unit-1 Nuclear Power Plant
Masanori Naitoh, Hiroaki Suzuki, and Hidetoshi Okada

ICONE20-POWER2012-55255
Analysis for Low Pressure Cooling Injection System Suction Hydrodynamics for a Boiling Water Reactor
Basar Ozar, Rodney Harvill, Christopher E. Henry, and Deborah A. Norton

- ## Fuels and Combustion, Materials Handling, Emissions

ICONE20-POWER2012-54089
Hydrogen Addition Effects on High Intensity Distributed Combustion
Ahmed E. E. Khalil and Ashwani K. Gupta

ICONE20-POWER2012-54123
Methanol Fuel as Low Cost Alternative for Emission Reduction in Gas Turbines and Utility Boilers
B. Chudnovsky, Y. Hain, A. Kunin, N. Rappoport, M. Reshef, M. Shternshus, S. Baitel, and A. Talanker

ICONE20-POWER2012-54273
A Study of the Effect of Gas Turbine Emissions on the Economics of Natural Gas Pipeline Transportation
A. Nasir, P. Pilidis, S. Ogaji, and W. Mohamed

ICONE20-POWER2012-54486
Temperature and Pressure Characteristics of Ultra-Low Concentration Coal Bed Methane Combustion in a Fluidized Bed
Zhongqing Yang, Li Zhang, and Shiwei Zheng

ICONE20-POWER2012-54638
Comparative Research on the Economy and Emissions of Nuclear Powered Ship and Diesel Ship
Yoshiaki Fumino and Kenji Ishida

ICONE20-POWER2012-54696
Fuel Oil Emulsion Operations in Boilers at El Cafe Plant, Guayaquil, Ecuador
T. Houlihan, P. Grimes, B. Owen, B. Plata, J. Waldron, R. Astudillo, R. Espinel, and R. Maspons

ICONE20-POWER2012-54766
Long-Term Demonstration of a Lean, Premixed, Prevaporized (LPP) System for Gas Turbines
Leo D. Eskin, Maclain M. Holton, Brent A. Turner, Richard G. Joklik, Michael S. Klassen , and Richard J. Roby

ICONE20-POWER2012-55135
The Structure and Performance of a New Type of Industrial Circulating Fluidized Bed Boiler With a Circulating Ash Heat Exchanger
Honghao He, Xiaofeng Lu, Xuanyu Ji, and Quanhai Wang

ICONE20-POWER2012-55215
Increasing Boiler Efficiency Through Intelligent Combustion Optimization
Sudha Thavamani, Matthias Behmann, and Till Spaeth

ICONE20-POWER2012-55222
Hybrid Power Generation Plant for CO_2 Capture
Shimin Deng, Rory Hynes, and Brian Drover

ICONE20-POWER2012-55232
Development of Wasteless Combined Aggregate–Coal-Fired Steam-Generator/Melting-Converter
Igor Pioro and Leonard Pioro

- ## Heat Exchangers and Cooling Systems

ICONE20-POWER2012-54033
Transient Analysis of a Passive Residual Heat Removal System Following a Station Blackout Accident
Dongqing Wang, Baosheng Wang, Taihong Qiu, Jin Jiang, and Jianmin Zhang

ICONE20-POWER2012-54037
Recommended Practices for the Development of an Effective Steam Surface Condenser Maintenance Regime; Including Suggested Maintenance Solutions and Design Modifications That Can Improve Condenser Performance and Reliability
Darren M. Nightingale

ICONE20-POWER2012-54116
The Variation in Effectiveness of Low-Finned Tubes Within a Shell-and-Tube Heat Exchanger for Supercritical CO_2
Patrick M. Fourspring and Joseph P. Nehrbauer

ICONE20-POWER2012-54175
Experimental Study on Condensate Inundation for Condensation of Horizontally Flowing Steam in a Large Condenser Tube Bundle
Issaku Fujita, Koichi Inoue, Satoshi Hiraoka, Manabu Ishihara, and Kotaro Machii

ICONE20-POWER2012-54203
Dynamic Heat-Exchanger Model for Any Combination of Water and Steam States
Eunkyeong Kim, Takuya Yoshida, and Tatsurou Yashiki

ICONE20-POWER2012-54247
Improving Air-Cooled Condenser Performance and Availability Through Innovative Cleaning, Inspection and In-Situ Sleeving
Gary Fischer and Craig Ripley

ICONE20-POWER2012-54828
Performance Experienced From Switching Copper Condenser Tubing to a High Performance Stainless
Summer Goebel and Colin R. Criminger

ICONE20-POWER2012-55076
Design and Control of Bypass Condensers
Ranga Nadig and Michael Phipps

ICONE20-POWER2012-55113
High Pressure Feedwater Heater Hemi Head Manway Hoist
Frank L. Michell, David Adkins, Curt Winiger, and Tim Selby

ICONE20-POWER2012-55124
How Vertical Project Team Integration Between End User, End User's Engineer, Nuclear QA, and Equipment Vendor Provided for Minimized Cost and Installation Expense
Jordan Tyman, Joe Bruno, and Perry Holzman

ICONE20-POWER2012-55125
Condenser Refurbishment (Retube / Rebundle): Lost Opportunity
Mark Tagliamonte

ICONE20-POWER2012-55216
Tube Pullout Testing Experience
Kim M. Massey and Merwin W. Jones

ICONE20-POWER2012-55227
Thermal Analysis Technique for Coolers Operating in Off and Low Load Conditions
Thomas J. Muldoon

- ## Turbines, Generators, and Auxiliaries

ICONE20-POWER2012-54330
Research on Low Cycle Fatigue in 26m^2 Low Pressure Inner-Casing of Nuclear Power Plant
Yifeng Hu, Gang Chen, and Ming Kang

ICONE20-POWER2012-54434
Missile Safety Analysis of Nuclear Steam Turbine
Rong Chen, Feng Liang, Wen Xiang Hua, Pu Ning Jiang, and Xiao Zhong He

ICONE20-POWER2012-54555
Operation and Maintenance Solutions for Generator Water Cooling
Matthias Svoboda and Robert Svoboda

ICONE20-POWER2012-54584
Failure of Modern Generators
Clyde V. Maughan

ICONE20-POWER2012-54694
The Advantages of Using Hydraulic Coupling Bolts Over Standard Fitted Bolts in Steam Turbine Flange Couplings
Tom Kennedy

ICONE20-POWER2012-54779
Lifetime Assessments of an Old Westinghouse-Design Steam Chest
Sazzadur Rahman, Waheed Abbasi, and Thomas W. Joyce

ICONE20-POWER2012-54805
A Compressible Three-Dimensional Inverse Design Method Based on the Streamline Curvature Approach and Clebsch Formulation for Radial and Mixed Flow Turbomachines
Xiao Pei Tian and Peng Shan

ICONE20-POWER2012-54862
Steady and Unsteady Flow Measurements Under Low Load Conditions in a Low Pressure Model Steam Turbine
Kiyoshi Segawa, Shigeki Senoo, Hisashi Hamatake, Takeshi Kudo, Tateki Nakamura, and Naoaki Shibashita

ICONE20-POWER2012-54887
Steam Turbine Overspeed Protection Failures, Causes and Strategies to Avoid Them
Wallace F. Ebner

ICONE20-POWER2012-55029
Subsynchronous Resonance and Torsional Effects on a Steam Turbine Generator in Transmission Systems With Series Capacitor Compensation
K. R. Mutama, D. H. Baker, R. D'Aquila, B. Fitzgerald, C. Wegner, R. M. Staulters, and J. Seeliger

ICONE20-POWER2012-55093
The Effects of Cycling on Generator Rotors
Bill Moore

ICONE20-POWER2012-55139
A Resurgence of Torsional Vibration Concerns for Nuclear and Fossil Steam Turbine Generator Retrofits
Stephen R. Reid and James B. Lewis

ICONE20-POWER2012-55140
Proven Methods to Repair and Extend the Life of Low Pressure Turbine Rotors
Stephen R. Reid and James B. Lewis

ICONE20-POWER2012-55208
Main Generator Life Cycle Management
Arun Puri and John DiBiase

ICONE20-POWER2012-55223
Steam Turbine, Boiler, and Valve Optimization Strategies to Recover Parasitic Load and Provide Life Extension
Michael W. Smiarowski

- **Advanced Energy Systems and Renewables (Wind, Solar, Geothermal)**

ICONE20-POWER2012-54216
Basic Characteristics of a Compact PV/T Simulator
Elkata Yandri, Naoto Hagino, Kazutaka Itako, and Hiro Yoshida

ICONE20-POWER2012-54424
Thermodynamic and Economic Analysis of Reheat Transcritical Organic Rankine Power Cycle Using a Low Temperature Geothermal Heat Source
Hanfei Tuo

ICONE20-POWER2012-54532
Evaluation of Distributed Generation Technologies in a University Context
Marco Gambini and Michela Vellini

ICONE20-POWER2012-54576
A CO_2 Compression and Dehydration System Utilizing Absorption Chillers and Heat Recovery Concepts
David Hasler, David Stopek, Roger Smith, and John Klumpyan

ICONE20-POWER2012-54799
Process Simulation for Enhanced Energy Recovery in a 10 MW(e) Base-Load Solar Thermal Power Plant
Sadaf Siddiq, Zafar Ullah Koreshi, and Shahab Khushnood

ICONE20-POWER2012-54811
Parameter Analysis of Low Grade Thermal Energy Sources Use With Organic Rankine Cycle
Gang Zhao, Jie Wang, and Qian Shi

ICONE20-POWER2012-55115
A Highly Efficient Cogeneration System Using APT Coupled With Biomass Gasification
Y. Tsujikawa

ICONE20-POWER2012-55120
Rooftop Solar Electric Generator Project
Jack Robinson, Jr. and Robert J. Durscher

ICONE20-POWER2012-55151
Economical Impact of Using Wind/PV Hybrid Systems on Energy Sector in Jordan
Mohammad AL Zubi, Trilochan Singh, and Hesham AL Salem

ICONE20-POWER2012-55224
A Design of a Hydrofoil Family for Current-Driven Marine-Hydrokinetic Turbines
Henry Shiu, C. P. "Case" van Dam, Matthew Barone, Erick Johnson, Ryan Phillips, Willi am Straka, Arnold Fontaine, and Michael Jonson

- ## Performance Testing and Performance Test Codes

ICONE20-POWER2012-54136
Experimental Investigations of Control Rod Drive Mechanism
Wenyuan Xiang, Yonghong Lv, Wenyou Huang, Gguangyao Lu, and Jianming Zhou

ICONE20-POWER2012-54551
Combined Cycle Phased Testing Philosophy: Revisited
Jagadish Nanjappa and Mike Gross

ICONE20-POWER2012-54609
Practical Considerations for Power Plant Thermal Performance Test Accuracy
Evan E. Daigle, Thomas P. Schmitt, and Christopher R. Banares

ICONE20-POWER2012-54971
Efficiency Based on Free-Energy Instead of Isentropic Conditions
William Ernest Schenewerk

ICONE20-POWER2012-55039
Total Solar Field Direct Normal Insolation Measurement Method Under Investigation for ASME PTC 52
Dave W. Price, Keith Kirkpatrick, Wayne D. Ferguson, and Dudley Benton

ICONE20-POWER2012-55102
Performance Testing of a Multi-Stage Centrifugal Compressor With Sidestream Extraction
A. I. C. Hunter, R. G. Nyquist, M. F. Andrews, J. Smith, and H. Boice

ICONE20-POWER2012-55212
A Study of Venturi Tubes
Richard L. Wakeland

- ## Simple and Combined Cycles

ICONE20-POWER2012-54711
How the Use of Limited Plant Data Can Support Limited Improvements in Combined Cycle Operation
James M. Perez and Tina L. Toburen

ICONE20-POWER2012-54719
Current Technology for Power Plant Makeup Water Treatment and Wastewater Recovery
Brad Buecker

ICONE20-POWER2012-54822
Performance Evaluation of Evaporative Compressor Inlet Air Cooling System in a Gas Turbine-Based Cogeneration Plant
Farshid Zabihian, Alan S. Fung, and Fabio Schuler

ICONE20-POWER2012-54902
The Convergence of Squeeze: With Respectable Speed, a New Gas Turbine Power Plant Rises at an Arizona Mine
John Baker and Marshall Ralph

ICONE20-POWER2012-55111
Smart Lube Systems for Gas Turbine Engines
Thomas B. Kenney

ICONE20-POWER2012-55192

Numerical Study on Flow Separation Control for High-Lift Low-Pressure Turbine Split Blade

Jianhui Chen, Yonghui Xie, Di Zhang, and Zhongyang Shen

APPENDICE 3

ICONE20 POWER2012 PROGRAM

	Room Size	Tower	Monday, July 30th		Tuesday, July 31st					Wednesday, August 1st						Thursday, August 2nd						Friday, August 3rd		
TIMES	POWER	ICONE	8:00am - 12:00pm	8:00am - 5:00pm	8:00am - 10:00am	10:30am - 12:00pm	12:15am - 1:15pm	1:30pm - 3:15pm	3:45pm - 5:30pm	8:00am - 9:45am	10:15am - 12:00pm	12:15am - 1:15pm	1:30pm - 3:15pm	3:45pm - 5:30pm	6:30pm - 8:30pm	8:00am - 9:45am	10:15am - 12:00pm	12:15am - 1:15pm	1:30pm - 3:15pm	3:45pm - 5:30pm	5:40am - 6:40pm	8:00am - 9:45am	10:15am - 12:00pm	1:00pm - 4:00pm
Exhibit Hall B	60 ppl	Lower					Lunch	21-2	21-9		21-1	Lunch	21-4	21-3			21-8	Lunch	21-7	21-6		21-5		
Exhibit Hall C	60 ppl	Lower						1-15	1-14	1-3	1-4		1-5	1-6		9-18	9-19		9-33	9-21		7-8		
Exhibit Hall D	60 ppl	Lower						12-1	12-2	12-3	12-4		12-5	11-3		9-24	9-34		9-25	9-35		8-2	8-6	
Exhibit Hall E	60 ppl	Lower						4-9	4-10	2-8	5-1		5-2	10-10		1-7	1-12		10-7	10-8		17-5	17-6	
Exhibit Hall G	60 ppl	Lower						20-1	20-8	5-3	20-3		20-4	20-2		2-15	20-5		20-8	9-28				
Exhibit Hall H	60 ppl	Lower						2-1	2-2	2-13	2-6		2-17	2-14		2-16	2-5		18-14	18-5		2-4	2-7	
Exhibit Hall I	60 ppl	Lower						19-1	11-1	11-2	4-11		19-3	19-4		7-6	19-5					19-9		
Exhibit Hall J	60 ppl	Lower						7-1	7-2	7-3	7-4		17-1	7-5		17-2	17-3		17-4	7-7		6-15	6-16	
North Ballroom A/B	200 ppl	Lower			FOOD	FOOD		FOOD	FOOD	FOOD	FOOD		FOOD	FOOD	ICONE AWARDS Reception	FOOD	FOOD		FOOD	FOOD	ICONE Students AWARDS Reception	FOOD	FOOD	Steering Committee Exit Meeting
Center Ballroom	720 ppl	Lower			Opening Keynote I	Keynote II		ICONE Plenary I		Power Plenary I						Power Plenary II	ICONE Plenary II		ICONE Plenary III	18-18				
South Ballroom A	200 ppl	Lower					Lunch		Comm Mtg		18-11	Lunch	18-13	18-17						18-16				
South Ballroom B	200 ppl	Lower							Comm Mtg		18-15		18-6	18-12					18-10					
Magic Kingdom 1	250 ppl	Upper	Workshop or Tutorial					9-1	9-26	9-27	9-3		9-4											
Magic Kingdom 2	300 ppl	Upper	Workshop or Tutorial					9-6	9-29	9-30	9-31		9-11											
Magic Kingdom 3	300 ppl	Upper	Workshop or Tutorial					9-8	9-9	9-10	9-16		9-32											
Magic Kingdom 4	250 ppl	Upper	Workshop or Tutorial					10-1	10-2	10-3	10-4		10-5											
A Ticket	25 ppl	Upper	Practice																					
B Ticket	100 ppl	Upper						22-1	4-12															
Sleeping Beauty	200 ppl	Upper	Comm Mtg	ICONE Steering Committee Initial Meeting 12:00 1:30 PM	Comm Mtg	Comm Mtg	NED TC # 1 Meeting	Comm Mtg	Comm Mtg	Comm Mtg	Comm Mtg	NED TC # 2 Meeting	Power Awards	Power Awards										
Monorail A	49 ppl	L Lower					Lunch	24-2	24-3	15-1	15-2	Lunch	24-1	24-7		15-3	1-1	Lunch	6-11	6-14				
Monorail B	49 ppl	L Lower	Workshop or Tutorial					6-2	6-4	6-5	22-2		22-3	22-4		17-7				15-4				
Monorail C	49 ppl	L Lower	Workshop or Tutorial					3-2	3-3	3-1	3-4		6-6	6-7		6-10	3-5		3-6	3-7				
Castle A	49 ppl	L Lower	ASME	ASME	ASME	ASME		ASME	ASME	ASME	ASME		ASME	ASME		ASME	ASME		ASME	ASME	ASME	ASME	ASME	ASME
Castle B	49 ppl	L Lower	Workshop or Tutorial					13-1	13-2	8-3	23-1		23-2	23-3			23-4							
Castle C	49 ppl	L Lower	Workshop or Tutorial					14-1	14-2	14-3						14-4			8-1	8-5				
Congo	30 ppl	Adventure					NED TC # 5 Meeting					NED TC # 7 Meeting						NED TC # 6 Meeting			NED TC # 3 Meeting			
Zambezi	18 ppl	Adventure	NED EC Daily Meetings																					
Mark Twain	100 ppl	Frontier							18-9															
Mississippi	42 ppl	Frontier					Lunch	16-1	Poster	16-5	Poster	Lunch	16-9	Poster		16-13	Poster							
Columbia	44 ppl	Frontier						16-2	Poster	16-6	Poster		16-10	Poster			Poster							
Wilderness	60 ppl	Frontier						16-3	Poster	16-7	Poster		16-11	Poster		Comm Meeting	Comm Meeting	NED TC # 4 Meeting	Comm Meeting	Comm Meeting	Comm Meeting			
Western	60 ppl	Frontier						16-4	Poster	16-8	Poster		16-12	Poster		Comm Meeting	Comm Meeting							

UPDATED 7/19/2012

APPENDICE 4

Breve curriculum scientifico del gruppo di lavoro impegnato nell'attività

Il prof. Giuseppe Vella , Ordinario del Settore Scientifico Disciplinare ING-IND/19 Impianti Nucleari, è Responsabile del reattore nucleare di ricerca AGN 201 - COSTANZA dell'Università di Palermo. Ha coordinato diversi programmi di ricerca finanziati dal Ministero della Ricerca Scientifica e Tecnologica. E' stato Coordinatore nazionale di un progetto di ricerca di interesse nazionale PRIN-2007 finanziato dal MIUR. E' autore o coautore di più di 140 articoli pubblicati su riviste scientifiche nazionali ed internazionali e/o presentati a conferenze, congressi o simposi. E' anche coautore di diversi rapporti nell'ambito dei PAR trascorsi. L'attività scientifica del prof. Vella ha riguardato principalmente le seguenti tematiche: tubi di calore al sodio, problemi di ribagnamento di superfici ad elevata temperatura, efflussi critici bifase, analisi termoidrauliche relative alla sicurezza dei reattori nucleari a fissione, analisi neutroniche, termoidrauliche e termomeccaniche del mantello e di componenti ad alto flusso termico di un tipico reattore a fusione di tipo TOKAMAK. E' stato referee per la rivista "Fusion Engineering and Design" e "Nuclear Engineering and Design".

Fulvio Mascari, assegnista di ricerca del S.S.D. ING-IND/19, da circa 6 anni svolge attività di ricerca su problematiche termoidrauliche e nucleari connesse allo sviluppo dei reattori a fissione. Partecipa alle attività di validazione dei codici termoidraulici di sistema TRACE e RELAP5, collaborando con il Department of "Nuclear Engineering & Radiation Health Physics" della Oregon State University, NuScale, l'Università degli Studi di Pisa e ENEA. Recentemente ha preso parte alle attività di un International Collaborative Standard Problem (ICSP) on "Integral PWR Design Natural Circulation Flow Stability and Thermo-Hydraulic Coupling of Containment and Primary System during Accidents" promosso dall'IAEA.

I risultati delle sue attività di ricerca sono stati pubblicati su una ventina di memorie in riviste internazionali, capitoli di libro, in atti di congresso nazionali e internazionali e rapporti. E' anche coautore di diversi rapporti nell'ambito dei PAR trascorsi. E' stato referee per le riviste "Nuclear Engineering and Design" e "Science and Technology of Nuclear Installations".