

# **International Congress on Advances in Nuclear Power Plants 2009**

**(ICAPP 2009)**

**Shinjuku, Tokyo, Japan  
10-14 May 2009**

**Volume 1 of 3**

ISBN: 978-1-61738-608-4

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2009) by the Atomic Energy Society of Japan  
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact the Atomic Energy Society of Japan  
at the address below.

Atomic Energy Society of Japan  
3-7 Shimbashi 2-chome  
Minato-ku, Tokyo 105-0004 Japan

Phone: 81-3-3508-1261

Fax: 81-3-3581-6128

atom@aesj.or.jp

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: curran@proceedings.com  
Web: www.proceedings.com

# TABLE OF CONTENTS

## VOLUME 1

### TRACK 1: WATER-COOLED REACTOR PROGRAMS AND ISSUES

#### 1-1 BWR (1)

<b>9459 : CUSTOMER-OPERATOR PARTNERSHIP: A BOILING WATER REACTOR DEVELOPED JOINTLY BY AREVA NP AND E.ON KERNKRAFT</b> .....	1
<i>D. Pasler, J. Gauthier, F. Diercks, M. Fuchs</i>	
<b>9088 : DEVELOPMENT OF BWR EX-CORE NUCLEAR INSTRUMENTATION SYSTEM -- EXPERIMENTAL VERIFICATION OF EX-CORE LOCAL POWER MONITORING METHOD BY USING NEUTRON STREAMING PIPES --</b> .....	5
<i>S. Naito, M. Takemura, H. Kumanomido, K. Yoshioka, S. Sakurai, Y. Goto, Y. Karino, M. Izumi</i>	
<b>9139 : THERMAL-HYDRAULIC STABILITY OF NATURAL CIRCULATION BWR UNDER STARTUP – FLASHING EFFECTS</b> .....	14
<i>R. Hu, M. Kazimi</i>	
<b>9528 : OHMA FULL MOX-ABWR</b> .....	25
<i>T. Ihara, M. Sasagawa, Y. Iwata</i>	

#### 1-2 BWR (2)

<b>9022 : BREEDER-TYPE OPERATION BASED ON THE LWR-MOX FUEL TECHNOLOGIES IN LIGHT WATER REACTORS WITH HARD NEUTRON SPECTRUM (FLWR)</b> .....	31
<i>S. Uchikawa, T. Okubo, Y. Nakano</i>	
<b>9304 : NEUTRONIC CHARACTERISTICS OF FLWR IN THE TRANSITION PHASE CHANGING FROM HIGH CONVERSION CORE TO BREEDER CORE</b> .....	40
<i>H. Akie, Y. Nakano, T. Okubo</i>	
<b>9092 : EVALUATION OF UNCERTAINTIES IN FEMAXI-6 CALCULATIONS FOR PREDICTING MOX FUEL BEHAVIORS IN FLWR DESIGN</b> .....	49
<i>A. Yamaji, M. Suzuki, T. Okubo</i>	
<b>9071 : GENERAL CONSIDERATION ON EFFECTIVE PU UTILIZATION IN FUTURE LWRS</b> .....	58
<i>N. Ishikawa, T. Okubo</i>	

#### 1-3 PWR (1)

<b>9116 : SUPERIOR OPERATION PERFORMANCE OF ATMEA1</b> .....	66
<i>Y. Okabe, T. Kanagawa, P. Lauret, G. Castello</i>	
<b>9140 : DESIGN CONTROL FOR STANDARD U.S. EPR™ PLANTS</b> .....	67
<i>T. A. Mathews, M. Miller</i>	
<b>9061 : EPR™ ENGINEERED FEATURES FOR CORE MELT MITIGATION IN SEVERE ACCIDENTS</b> .....	75
<i>M. Fischer, A. Henning</i>	
<b>9196 : MELT SPREADING CODE ASSESSMENT, MODIFICATIONS, AND INITIAL APPLICATION TO THE EPR CORE CATCHER DESIGN</b> .....	85
<i>M. T. Farmer, S. Basu</i>	
<b>9335 : US-APWR HUMAN SYSTEMS INTERFACE SYSTEM VERIFICATION &amp; VALIDATION RESULTS; APPLICATION OF THE MITSUBISHI ADVANCED DESIGN TO THE US MARKET</b> .....	95
<i>R. E. Hall, J. Easter, E. Roth, L. Kabana, K. Mashio, K. Takahashi, T. Clouser</i>	

#### 1-4 PWR (2)

<b>9087 : MAIN FEATURES OF MODERN RUSSIAN DESIGN OF NPP WITH HIGH POWER VVER REACTORS (AES-2006 DESIGN)</b> .....	103
<i>S. Svetlov, A. Altshuller, A. Molchanov, A. Kazarin</i>	
<b>9154 : COMPETITIVENESS OF SMALL-MEDIUM REACTORS: A PROBABILISTIC STUDY ON THE ECONOMY OF SCALE FACTOR</b> .....	114
<i>A. Trianni, G. Locatelli, P. Trucco</i>	
<b>9204 : IRIS-50: A 50 MWE ADVANCED PWR DESIGN FOR SMALLER REGIONAL GRIDS AND SPECIALIZED APPLICATIONS</b> .....	122
<i>B. Petrovic, M. Carelli, L. Conway, R. Hundal, E. Barbaso, F. Gamba, M. Centofante</i>	
<b>9067 : CALCULATION OF AXIAL XENON-OSCILLATIONS IN THE HPLWR</b> .....	126
<i>T. Reiss, S. Fehér, S. Czifrus</i>	

## **1-5 COMMON (1)**

<b>9182 : ON THE EVOLUTION OF THE REGULATORY GUIDANCE FOR SEISMIC QUALIFICATION OF ELECTRIC AND ACTIVE MECHANICAL EQUIPMENT FOR NUCLEAR POWER PLANTS</b> .....	135
<i>C. H. Ng, P. Chen</i>	
<b>9273 : BANDWIDTH OF REACTOR INTERNALS VIBRATION RESONANCE WITH COOLANT PRESSURE OSCILLATIONS</b> .....	141
<i>K. Proskuryakov, K. Novikov, E. Galivec</i>	
<b>9275 : SOUND VELOCITY IN THE COOLANT OF BOILING NUCLEAR REACTORS</b> .....	150
<i>K. Proskuryakov, D. Parshin, K. S. Novikov, E. Y. Galivec</i>	
<b>9241 : LOGIC QUALIFICATION OF FPGA-BASED SAFETY-RELATED I&amp;C SYSTEMS</b> .....	156
<i>T. Hayashi, N. Oda, T. Ito, T. Miyazaki, Y. Haren</i>	

## **1-6 COMMON (2)**

<b>9481 : ADVANCED CONSTRUCTION METHODS FOR NEW NUCLEAR POWER PLANTS</b> .....	164
<i>S. Bilbao Y Leon, S. Moon, A. Rao, B. Tyobeka, J. Cleveland</i>	
<b>9529 : DEVELOPMENT OF NEXT GENERATION LIGHT WATER REACTOR IN JAPAN (1)</b> .....	168
<i>K. Tsuzuki, T. Shiotani, I. Ohno, S. Kasai</i>	
<b>9530 : DEVELOPMENT OF NEXT GENERATION LIGHT WATER REACTOR IN JAPAN (2)</b> .....	169
<i>T. Yamamoto, Y. Ohga, T. Kurosaki, S. Shimizu, H. Soneda, K. Hiraiwa</i>	
<b>9531 : DEVELOPMENT OF NEXT GENERATION LIGHT WATER REACTOR IN JAPAN (3)</b> .....	170
<i>Y. Ohga, T. Yamamoto, T. Kurosaki, M. Matsuura, S. Shimizu, A. Murase</i>	

## **TRACK 2: HIGH TEMPERATURE GAS COOLED REACTORS AND HYDROGEN PRODUCTION**

### **2-1 HTR CONCEPTS AND DESIGN INNOVATIONS (1)**

<b>9234 : ASSESSMENTS OF BEYOND DESIGN BASIS ACCIDENTS WITH AIR INGRESS INTO A BLOCK-TYPE VHTR CORE</b> .....	171
<i>M. Richards, E. Takada, N. Tsuji, M. Nakano, K. Ohashi</i>	
<b>9383 : EFFECTS OF A GRAPHITE AEROSOL ON COUPLED RADIATION-CONVECTION HEAT TRANSFER IN THE HTGR REACTOR CAVITY COOLING SYSTEM</b> .....	179
<i>B. Ahmed, A. Charneau, S. Anghaie</i>	
<b>9427 : GRAPHITE OXIDATION AND STRUCTURAL STRENGTH OF GRAPHITE SUPPORT COLUMN IN VHTR</b> .....	188
<i>B. Park, H. No, E. Kim, C. Oh</i>	

### **2-2 HTR CONCEPTS AND DESIGN INNOVATIONS (2)**

<b>9146 : EFFECT OF CHANNEL CONFIGURATIONS FOR TRITIUM TRANSFER IN PRINTED CIRCUIT HEAT EXCHANGERS</b> .....	198
<i>C. Oh, E. S. Kim, R. Shrake, M. Patterson</i>	
<b>9441 : EFFECT OF REACTING SURFACE DENSITY ON THE OVERALL GRAPHITE OXIDATION RATE</b> .....	206
<i>C. Oh, E. Kim, J. Lim, R. Schultz, D. Petti</i>	
<b>9443 : PHENOMENA IDENTIFICATION RANKING TABLE AND KNOWLEDGE BASE GAPS AND NEEDS FOR THE MODULAR HIGH-TEMPERATURE GAS-COOLED REACTOR</b> .....	213
<i>A. Tokuhiko, G. Poitriche, K. Rink</i>	
<b>9471 : ARTIFICIAL NEURAL NETWORKS VERSUS GENETIC ALGORITHMS IN THERMOHYDRAULICS FOR ENERGY CONVERSION SYSTEM DESIGN OPTIMIZATION FOR AN ADVANCED NUCLEAR HEAT REMOVAL SYSTEM</b> .....	227
<i>A. Tokuhiko, A. Ridluan, O. Linda, M. Manic</i>	
<b>9473 : DESIGN OPTIMIZATION OF A NGNP CANDIDATE HEAT EXCHANGER WITH COST MODEL</b> .....	235
<i>A. Tokuhiko, A. Ridluan, W. Danchus</i>	

### **2-3 HTR CONCEPTS AND DESIGN INNOVATIONS (3)**

<b>9073 : HTGR CORE AND STRUCTURAL INTEGRITY STUDY FOR LONGER BURNUP CYCLE</b> .....	243
<i>M. Nakano, N. Tsuji</i>	
<b>9123 : ANALYSIS OF THE POROUS STRUCTURE OF AN ANNULAR PEBBLE BED REACTOR</b> .....	248
<i>W. Van Antwerpen, J. Du Toit, P. Rousseau</i>	
<b>9124 : ACCOUNTING FOR POROUS STRUCTURE IN EFFECTIVE THERMAL CONDUCTIVITY CALCULATIONS IN A PEBBLE BED REACTOR</b> .....	258
<i>W. Van Antwerpen, J. Du Toit, P. Rousseau</i>	
<b>9476 : CONTRIBUTION TO IMPROVEMENT OF HTGR TECHNOLOGY BY USING HTR OPERATION DATA</b> .....	270
<i>S. Nakagawa, D. Tochio, M. Shinohara, N. Nojiri, T. Nishihara, M. Goto, K. Takamatsu</i>	

## 2-4 MODELING AND SIMULATION OF GCRS

<b>9014 : INVESTIGATING THE THERMAL-HYDRAULIC CHARACTERISTICS IN THE HTGR CORE USING A TRANSIENT CFD MODEL</b> .....	276
<i>C. T. Chen, Y. Ferng, C. C. Chieng, B. S. Pei</i>	
<b>9046 : HTR FUEL MODELING WITH THE ATLAS CODE: THERMAL MECHANICAL BEHAVIOR AND FISSION PRODUCT RELEASE ASSESSMENT</b> .....	285
<i>P. Guillermier, L. Daniel, L. Gauthier</i>	
<b>9091 : OPTIMIZATION OF INLET PLENUM OF A PBMR USING SURROGATE MODELING</b> .....	295
<i>S. Lee, K. Kim</i>	
<b>9205 : COMPARISON OF GAMMA RESULTS WITH EXPERIMENTAL DATA IN THE NATURALLY CIRCULATING GAS LOOP</b> .....	300
<i>J. Lee, H. No</i>	
<b>9409 : ANALYSIS FOR HTTR BURNUP CHARACTERISTICS</b> .....	309
<i>M. Goto, N. Fujimoto, S. Nakagawa</i>	
<b>9446 : VALIDATION OF CFD MODELING FOR VGM LOSS-OF-FORCED-COOLING ACCIDENTS</b> .....	315
<i>A. Wysocki, B. Ahmed, A. Charneau, S. Anghaie</i>	

## 2-5 GFR AND OTHER ADVANCED CONCEPTS

<b>9062 : GFR DEMONSTRATOR ALLEGRO DESIGN STATUS</b> .....	323
<i>C. Poette, J. Malo, V. Brun-Magaud, F. Morin, I. Dor, B. Mathieu, H. Duhamel, R. Stainsby, K. Mikityuk</i>	
<b>9063 : DESIGN OF A SUPERCRITICAL CARBON DIOXIDE COOLED REACTOR FOR MARINE APPLICATIONS</b> .....	333
<i>S. Jewer, M. Wilson, T. Verchère, T. Pâris De Bollardière, P. O’Sullivan, S. Heap, A. Thompson, P. Beeley</i>	
<b>9109 : GAS COOLED FAST REACTOR 2400 MWTH, STATUS ON THE CONCEPTUAL DESIGN STUDIES AND PRELIMINARY SAFETY ANALYSIS</b> .....	341
<i>J. Malo, N. Alpy, F. Bentivoglio, F. Bertrand, L. Cachon, G. Geffraye, D. Haubensack, A. Messie, F. Morin, Y. Penelieu, D. Plancq, F. Pra, P. Richard</i>	
<b>9152 : SUPERCRITICAL CO<sub>2</sub> TEST LOOP OPERATION AND FIRST TEST RESULTS</b> .....	351
<i>S. A. Wright, P. S. Pickard</i>	
<b>9225 : DESIGN OF MULTI-INPUT MULTI-OUTPUT CONTROLLER FOR MAGNETIC BEARING WHICH SUSPENDS HELIUM-TURBINE GENERATOR ROTOR FOR HIGH TEMPERATURE GAS COOLED REACTOR</b> .....	361
<i>S. Takada, Y. Funatake, Y. Inagaki</i>	

## 2-6 HTR FUEL AND HIGH TEMPERATURE MATERIALS

<b>9069 : DIFFUSION BONDING IN COMPACT HEAT EXCHANGERS</b> .....	366
<i>D. Southall</i>	
<b>9149 : APPLICATION OF X-RAY IMAGING FOR HTR FUEL CHARACTERIZATION</b> .....	371
<i>P. Guillermier, D. Tisseur, J. Banquet, M. Taglione, M. Perez, J. Letang</i>	
<b>9333 : AN EXPERIMENTAL STUDY ON THE FLOW AND HEAT TRANSFER OF FLINAK MOLTEN SALT IN SMALL CHANNELS FOR THE APPLICATION TO THE VHTR INTERMEDIATE HEAT EXCHANGER</b> .....	379
<i>K. Bang, I. Hwang, H. Jeong, K. Kim, O. Choi</i>	
<b>9466 : DESIGN OF THE NEXT GENERATION NUCLEAR PLANT GRAPHITE CREEP EXPERIMENT FOR IRRADIATION IN THE ADVANCED TEST REACTOR</b> .....	385
<i>S. B. Grover</i>	

## 2-7 POWER CONVERSION SYSTEMS AND NON-ELECTRIC APPLICATIONS

<b>9294 : RESEARCH AND DEVELOPMENT ON IS PROCESS COMPONENTS FOR HYDROGEN PRODUCTION. (I) TESTFABRICATION OF SULFURIC ACID TRANSFER PUMP</b> .....	392
<i>J. Iwatsuki, A. Terada, Y. Watanabe, R. Hino, S. Kubo, K. Onuki</i>	
<b>9291 : RESEARCH AND DEVELOPMENT ON IS PROCESS COMPONENTS FOR HYDROGEN PRODUCTION (II) CORROSION RESISTANCE OF GLASS LINING IN HIGH TEMPERATURE SULFURIC ACID</b> .....	396
<i>N. Tanaka, J. Iwatsuki, S. Kubo, A. Terada, K. Onuki</i>	
<b>9417 : EXPERIMENTAL STUDIES OF AN OPTIMAL OPERATING CONDITION FOR THE BUNSEN PROCESS IN THE I-S THERMOCHEMICAL CYCLE</b> .....	401
<i>H. Yoon, H. No, B. Lee, H. Jin, Y. Kim, J. Lee</i>	
<b>9406 : OPTIMIZATION OF THE HYBRID SULFUR CYCLE FOR NUCLEAR HYDROGEN PRODUCTION USING UNISIM DESIGN</b> .....	406
<i>Y. Jung, Y. Jeong</i>	
<b>9351 : COGENERATION USING A NUCLEAR REACTOR TO GENERATE PROCESS HEAT</b> .....	441
<i>G. Alonso, J. R. Ramirez</i>	

<b>9524 : EVALUATION FOR INDIRECT CCGT AND STEAM CYCLE IN HIGH TEMPERATURE GAS COOLED REACTOR PLANT FROM THE VIEWPOINT OF PLANT DYNAMICS AND CONTROLLABILITY</b> .....	445
<i>I. Minatsuki, Y. Mizokami, D. Hittner, D. Petit</i>	

### **TRACK 3: LMFR & LONGER TERM REACTOR PROGRAMS**

#### **3-1 SUPERCRITICAL-PRESSURE WATER-COOLED FAST REACTOR (1)**

<b>9257 : LOSS OF COOLANT ACCIDENT ANALYSIS OF A SUPERCRITICAL-PRESSURE WATER-COOLED FAST REACTOR WITH DOWNWARD FLOW CHANNELS</b> .....	446
<i>S. Ikejiri, Y. Ishiwatari, Y. Oka</i>	
<b>9261 : DESIGN AND IMPROVEMENT OF PLANT CONTROL SYSTEM FOR A SUPER FAST REACTOR</b> .....	453
<i>Y. Ishiwatari, C. Peng, T. Sawada, S. Ikejiri, Y. Oka</i>	
<b>9262 : CFD ANALYSES IN TIGHT-LATTICE SUBCHANNELS AND SEVEN-RODS BUNDLE GEOMETRIES OF A SUPER FAST REACTOR</b> .....	462
<i>J. Gou, Y. Ishiwatari, Y. Oka, M. Yamakawa, S. Ikejiri</i>	
<b>9263 : EVALUATION OF TRANSMUTATION PERFORMANCE OF LONG-LIVED FISSION PRODUCTS WITH A SUPER FAST REACTOR</b> .....	474
<i>H. Lu, Y. Ishiwatari, C. Han, Y. Oka, S. Ikejiri</i>	

#### **3-2 SUPERCRITICAL-PRESSURE WATER-COOLED FAST REACTOR (2)**

<b>9264 : CORE DESIGN AND FUEL ROD ANALYSES OF A SUPER FAST REACTOR WITH HIGH POWER DENSITY</b> .....	482
<i>H. Ju, L. Cao, Y. Ishiwatari, H. Lu, Y. Oka, S. Ikejiri</i>	
<b>9265 : THERMAL AND STABILITY CONSIDERATIONS FOR A SUPERCRITICAL WATER-COOLED FAST REACTOR DURING POWER-RAISING PHASE OF PLANT STARTUP</b> .....	492
<i>J. Cai, Y. Ishiwatari, S. Ikejiri, Y. Oka</i>	
<b>9268 : RESULTS OF THE MID-TERM ASSESSMENT OF THE HIGH PERFORMANCE LIGHT WATER REACTOR PHASE 2 PROJECT</b> .....	501
<i>J. Starflinger, T. Schulenberg, P. Marsault, D. Bittermann, C. Maraczy, E. Laurien, J. Lycklama, H. Anglart, M. Andreani, M. Ruzickova, L. Heikinheimo</i>	
<b>9391 : DETERIORATION OF HEAT TRANSFER IN UPWARD FLOWING SUPERCRITICAL PRESSURE WATER</b> .....	512
<i>J. R. Licht, M. Anderson, M. Corradini</i>	
<b>9187 : DESIGN CONCEPT OF THE HPLWR MODERATOR FLOW PATH</b> .....	519
<i>C. Koehly, T. Schulenberg, J. Starflinger</i>	

#### **3-3 4S SERIES (1)**

<b>9214 : DEVELOPMENT OF THE 4S AND RELATED TECHNOLOGIES (1); PLANT SYSTEM OVERVIEW AND CURRENT STATUS</b> .....	527
<i>Y. Tsuboi, S. Kasuga, Y. Sakashita, H. Matsumiya, K. Hasegawa, N. Ueda, A. Greci, N. Handa</i>	
<b>9195 : DEVELOPMENT OF 4S AND RELATED TECHNOLOGIES(2) LONG LIFE METALLIC FUEL</b> .....	535
<i>A. M. Yacout, Y. Tsuboi, N. Ueda</i>	
<b>9200 : DEVELOPMENT OF 4S AND RELATED TECHNOLOGIES (3) STATISTICAL EVALUATION OF SAFETY PERFORMANCE OF 4S ON ULOF EVENT</b> .....	545
<i>K. Ishii, H. Matsumiya, H. Horie, K. Miyagi</i>	
<b>9162 : DEVELOPMENT OF 4S AND RELATED TECHNOLOGIES (4) COMPARISON OF TRANSIENT ACCIDENT SEQUENCES BETWEEN THE SAS4A/SASSYS-1 AND CERES REACTOR SYSTEM ANALYSIS CODES</b> .....	553
<i>T. H. Fanning, F. E. Dunn, Y. Nishi</i>	

#### **3-4 4S SERIES (2)**

<b>9076 : DEVELOPMENT OF 4S AND RELATED TECHNOLOGIES(5) THERMAL HYDRAULICS ANALYSIS OF REACTOR TRIP EVENT</b> .....	564
<i>H. Watanabe, A. Matsuda</i>	
<b>9493 : DEVELOPMENT OF THE 4S AND RELATED TECHNOLOGIES (7) SUMMARY OF THE FCA XXIII EXPERIMENT ANALYSES TOWARDS EVALUATION OF PREDICTION ACCURACIES FOR THE 4S CORE CHARACTERISTICS</b> .....	571
<i>N. Ueda, M. Fukushima, S. Okajima, T. Tekeda, T. Kitada, Y. Nauchi, I. Kinoshita, T. Matsumura</i>	
<b>9166 : DEVELOPMENT OF 4S AND RELATED TECHNOLOGIES (7) – ANALYTICAL EVALUATION OF RVACS PERFORMANCE UNDER LOSS OF STACKS CONDITION</b> .....	580
<i>S. Nishimura, Y. Nishi, N. Ueda</i>	

<b>9184 : DEVELOPMENT OF 4S AND RELATED TECHNOLOGIES (8) AN APPLICATION OF PHYSICS BENCHMARK EXPERIMENT RESULTS TO SAFETY ANALYSES OF SMALL FAST REACTORS -- AN ANALYSIS OF DELAYED NEUTRON FRACTION BENCHMARK RESULTS USING NUCLEAR DESIGN METHODOLOGY --</b>	588
<i>M. Kawashima, Y. Tsuboi, S. Matsuyama</i>	

### **3-5 JSFR SERIES**

<b>9298 : CONCEPTUAL DESIGN FOR JAPAN SODIUM-COOLED FAST REACTOR (1): CURRENT STATUS OF SYSTEM DESIGN FOR JSFR</b>	595
<i>N. Uto, T. Sakai, T. Mihara, M. Toda, S. Kotake, K. Aoto</i>	
<b>9296 : CONCEPTUAL DESIGN OF JAPAN SODIUM-COOLED FAST REACTOR (2) THERMAL-HYDRAULIC DESIGN FOR REACTOR UPPER SODIUM PLENUM IN JSFR</b>	606
<i>K. Ohyama, O. Watanabe, H. Yamano</i>	
<b>9281 : CONCEPTUAL DESIGN FOR JAPAN SODIUM-COOLED FAST REACTOR (3): DEVELOPMENT OF ADVANCED FUEL HANDLING SYSTEM FOR JSFR</b>	617
<i>A. Katoh, S. Hirata, Y. Chikazawa, N. Uto, H. Obata, S. Kotake</i>	
<b>9418 : CONCEPTUAL DESIGN FOR JAPAN SODIUM-COOLED FAST REACTOR (4): DEVELOPMENTAL STUDY OF STEEL PLATE REINFORCED CONCRETE CONTAINMENT VESSEL FOR JSFR</b>	623
<i>T. Hosoya, K. Satoh, T. Somaki, I. Matsuo, K. Shimizu, K. Negishi</i>	

### **3-6 SFR DESIGN CONCEPT (1)**

<b>9027 : DESIGN CONSIDERATIONS FOR ECONOMICALLY COMPETITIVE SODIUM COOLED FAST REACTORS</b>	630
<i>H. Zhang, H. Zhao, V. Mousseau, R. Szilard</i>	
<b>9064 : EUROPEAN COMMISSION - 7<sup>TH</sup> FRAMEWORK PROGRAMME : THE COLLABORATIVE PROJECT ON EUROPEAN SODIUM FAST REACTOR (CP ESFR)</b>	642
<i>G. Fiorini</i>	
<b>9402 : STUDY OF AN ELECTROMAGNETIC PUMP APPLIED TO A PRIMARY MAIN PUMPS OF LARGE SCALE SODIUM COOLED REACTOR</b>	651
<i>K. Aizawa, S. Kotake, A. Kuniaki, H. Araseki, R. Aizawa, H. Ota, Y. Chikazawa</i>	
<b>9455 : STATUS OF ADVANCED SFR CONCEPT DESIGN STUDIES AT KAERI</b>	659
<i>D. Hahn, Y. Kim</i>	
<b>9041 : APPROACH TO DESIGN OF FUTURE FBRS WITH ENHANCED SAFETY AND ECONOMY</b>	660
<i>B. Raj, V. Balasubramanian, P. Puthiyavinayagam, P. Selvaraj, P. Chellapandi, S. C. Chetal</i>	

### **3-7 SFR DESIGN CONCEPT (2)**

<b>9004 : CROSS-CUTTING CFD SUPPORT TO INNOVATIVE REACTOR DESIGN</b>	667
<i>F. Roelofs</i>	
<b>9105 : EVALUATION OF ALTERNATIVE FLUIDS FOR SFR INTERMEDIATE LOOPS</b>	679
<i>L. Brissonneau, N. Simon, F. Baqué, M. Saez, F. Balbaud, D. Rochwerger, A. Gerber, G. Prèle, A. Capitaine, G. Rodriguez</i>	
<b>9198 : STEAM PRODUCING PLANT CONCEPT OF 4S FOR OIL SAND EXTRACTION</b>	690
<i>S. Matsuyama, Y. Nishiguchi, Y. Sakashita, S. Kasuga, M. Kawashima</i>	
<b>9206 : PASSIVE SAFETY DESIGN CHARACTERISTICS OF THE KALIMER-600 BURNER REACTOR</b>	697
<i>Y. Kwon, H. Jeong, C. Cho, K. Ha, S. Kim</i>	
<b>9342 : PROGRESS ON TRAVELING-WAVE REACTOR DESIGN</b>	705
<i>J. Gilleland</i>	

### **3-8 NEUTRONICS AND CORE DESIGN**

<b>9065 : GENERATION IV SODIUM FAST REACTOR: FEEDBACKS REACTIVITY COEFFICIENTS ROLE AND OPTIMIZATION TO IMPROVE SAFE NATURAL CORE BEHAVIOUR DURING ACCIDENTAL TRANSIENTS</b>	706
<i>A. G. Zaetta, B. Bernardin, M. Vanier, J. Tommasi, F. Varaine</i>	
<b>9160 : ENHANCED MINOR ACTINIDE BURNING CORE FOR CLOSED FUEL CYCLE</b>	712
<i>K. Ikeda, W. Nakazato, J. W. Maddox, S. Kunishima</i>	
<b>9244 : ELSY NEUTRONIC ANALYSIS BY DETERMINISTIC AND MONTE CARLO METHODS: AN INNOVATIVE CONCEPT FOR THE CONTROL ROD SYSTEMS</b>	718
<i>C. Artioli, M. Sarotto, G. Grasso, J. Krepel</i>	
<b>9384 : NEUTRONIC ANALYSIS OF TWO-FLUID THORIUM MOLTEN SALT REACTOR</b>	726
<i>J. Frýbort, R. Vocka</i>	
<b>9525 : ANALYSIS ON SMALL LONG LIFE REACTOR USING THORIUM FUEL FOR WATER COOLED AND METAL COOLED REACTOR TYPES</b>	732
<i>S. Permana</i>	

### **3-9 CORE DESIGN AND CYCLE ANALYSIS**

<b>9121 : EFFECTS OF CONVERSION RATIO CHANGE ON CORE PERFORMANCES IN MEDIUM TO LARGE TRU BURNING REACTORS</b> .....	742
<i>H. Song, S. Kim, J. Yoo, Y. Kim</i>	
<b>9226 : SFR EQUILIBRIUM CYCLE ANALYSIS WITH THE EQL3D PROCEDURE</b> .....	749
<i>J. Krepel, K. Mikityuk, K. Sun, G. Rimpault</i>	
<b>9288 : FAST REACTOR CORE DESIGN STUDIES TO COPE WITH TRU FUEL COMPOSITION CHANGES IN THE LWR-TO-FBR TRANSITION PERIOD</b> .....	759
<i>K. Kawashima, S. Maruyama, S. Ohki, T. Mizuno</i>	
<b>9300 : TRU COMPOSITION CHANGES AND THEIR INFLUENCE ON FBR CORE CHARACTERISTICS IN THE LWR-TO-FBR TRANSITION PERIOD</b> .....	766
<i>S. Maruyama, S. Ohki, T. Mizuno</i>	
<b>9419 : A PRELIMINARY COMPREHENSIVE DYNAMIC ANALYSIS OF THE TYPICAL FACT SCENARIOS WITH JSFR AND RELATED FUEL CYCLE FACILITIES</b> .....	775
<i>H. Shiotani, K. Ono, T. Ogawa, Y. Koma, K. Kawaguchi</i>	

### **3-10 FUELS AND MATERIALS FOR SFR**

<b>9033 : SUBCHANNEL ANALYSIS OF SODIUM-COOLED REACTOR FUEL ASSEMBLIES WITH ANNULAR FUEL PINS</b> .....	785
<i>M. J. Memmott, J. Buongiorno, P. Hejzlar</i>	
<b>9178 : HIGH BURN-UP FUELS FOR FAST REACTORS: PAST EXPERIENCE AND NOVEL APPLICATIONS</b> .....	795
<i>K. D. Weaver, J. Gilleland, C. Whitmer, G. Zimmerman</i>	
<b>9151 : MATERIALS CHALLENGES SUPPORTING NEW SODIUM FAST REACTOR DESIGNS</b> .....	803
<i>O. Gelineau, S. Dubiez-Le Goff, P. Dubuisson, M. Blat, F. Dalle</i>	
<b>9194 : STUDY ON AN INNOVATIVE FAST REACTOR UTILIZING HYDRIDE NEUTRON ABSORBER – DEVELOPMENT OF COATING TECHNIQUE ON CLADDING INNER SURFACE –</b> .....	814
<i>T. Kido, K. Itoh, A. Suzuki, Y. Matsumura, K. Konashi</i>	
<b>9277 : MODELING OF CONSTITUENT REDISTRIBUTION AND FISSION PRODUCT MIGRATION IN FAST REACTOR U-PU-ZR FUEL</b> .....	821
<i>Y. Kim, G. L. Hofman, A. M. Yacout</i>	
<b>9097 : PRELIMINARY STRUCTURAL INTEGRITY EVALUATIONS FOR THE ELEVATED TEMPERATURE PIPING OF THE SFR IHTS AGAINST TYPICAL LEVEL A SERVICE EVENTS</b> .....	825
<i>C. Park, J. Kim, J. Lee</i>	

### **3-11 STEAM GENERATORS AND COOLANT TECHNOLOGY**

<b>9078 : DEVELOPMENT OF AN ACOUSTIC STEAM GENERATOR LEAK DETECTION SYSTEM USING DELAY-AND-SUM BEAMFORMER</b> .....	831
<i>Y. Chikazawa</i>	
<b>9169 : A STUDY ON LMFBR STEAM GENERATOR DESIGN WITHOUT TUBE FAILURE PROPAGATION IN WATER LEAK EVENTS</b> .....	837
<i>S. Futagami, H. Hayafune, K. Fujimura, M. Sato</i>	
<b>9362 : DEVELOPMENT OF AN INNOVATIVE PLATE-TYPE SG FOR SODIUM COOLED FAST REACTOR – CRACK PROPAGATION AT THE BONDING SURFACE -</b> .....	845
<i>Y. Nishi, I. Kinoshita</i>	
<b>9283 : STUDY ON THE CORROSION BEHAVIOR OF STEELS IN A STAGNANT LEAD-BISMUTH EUTECTIC (LBE)</b> .....	846
<i>J. Choi, B. Choi, J. Kim, B. Kim</i>	

### **3-12 BRAYTON CYCLES AND COOLANT TECHNOLOGY**

<b>9026 : USE OF MULTIPLE REHEAT HELIUM BRAYTON CYCLES TO ELIMINATE THE INTERMEDIATE HEAT TRANSFER LOOP FOR ADVANCED LOOP TYPE SFERS</b> .....	849
<i>H. Zhao, H. Zhang, S. E. Bays</i>	

## **VOLUME 2**

<b>9077 : DESIGN, FABRICATION AND TEST PLAN OF SMALL CENTRIFUGAL COMPRESSOR TEST MODEL FOR A SUPERCRITICAL CO<sub>2</sub> COMPRESSOR IN THE FAST REACTOR POWER PLANT</b> .....	859
<i>Y. Muto, T. Ishizuka, M. Aritomi</i>	
<b>9112 : DEVELOPMENT OF SODIUM LEAK DETECTION TECHNOLOGY USING LASER RESONANCE IONIZATION MASS SPECTROMETRY - DESIGN AND FUNCTIONAL TEST USING PROTOTYPE SODIUM DETECTION SYSTEM -</b> .....	867
<i>T. Aoyama, K. Okazaki, C. Ito, H. Harano, K. Watanabe, T. Iguchi</i>	



<b>9390 : REAL-TIME ALGORITHMS FOR THE MEASUREMENT OF LIQUID METAL COOLANT FLOW VELOCITY WITH CORRELATED THERMAL SIGNALS</b> .....	875
<i>T. Moazzeni, Y. Jiang, J. Ma</i>	

**TRACK 4: OPERATION, PERFORMANCE & RELIABILITY MANAGEMENT**

**4-1 TOPICS ON KASHIWAZAKI-KARIWA NUCLEAR POWER STATION**

<b>9398 : LESSONS LEARNED FROM OPERATIONAL EXPERIENCE OF THE CHUETSU-OKI EARTHQUAKE AND NEW TRAINING PROGRAM DEVELOPMENT</b> .....	883
<i>H. Tomita, T. Serizawa, K. Terazu, K. Iwatare, K. Noji</i>	
<b>9404 : ACTIONS AT KASHIWAZAKI KARIWA NUCLEAR POWER STATION AFTER THE NIIGATAKEN CHUETSU-OKI EARTHQUAKE</b> .....	885
<i>S. Orita</i>	
<b>9405 : CONTROL ROD UNCOUPLING AT KASHIWAZAKI KARIWA #6</b> .....	892
<i>M. Kawasaki, S. Yamaguchi</i>	
<b>9408 : PLANNING RATIONAL INSPECTION FOR THE NIIGATA CHUETSU-OKI EARTHQUAKE AT THE KASHIWAZAKI-KARIWA NUCLEAR POWER PLANT</b> .....	894
<i>K. Nishioka</i>	
<b>9435 : THE AGEING DEGRADATIONS AND THE EARTHQUAKE EXPERIENCE</b> .....	900
<i>A. Shima</i>	

**4-2 PERFORMANCE AND RELIABILITY IMPROVEMENTS (1)**

<b>9012 : A NEW STRATEGY OF AXIAL POWER DISTRIBUTION CONTROL BASED ON THREE AXIAL OFFSETS CONCEPT</b> .....	902
<i>Y. Shimazu</i>	
<b>9031 : USING NEURO-FUZZY BASED METHOD TO DEVELOP NUCLEAR TURBINE CYCLE MODEL</b> .....	906
<i>Y. Chan, C. Chang</i>	
<b>9120 : A COMPARATIVE STUDY ON THE RELIABILITY CRITERIA DETERMINATION</b> .....	913
<i>D. Jerng, T. Ju</i>	

**4-3 PERFORMANCE AND RELIABILITY IMPROVEMENTS (2)**

<b>9254 : KHNP SPECIAL SAFETY REVIEW</b> .....	914
<i>S. Lee, T. Lee, B. Lee, G. Park</i>	
<b>9287 : ARTIFICIAL NEURAL NETWORK WITH SELF-ORGANIZING MAPPING FOR REACTOR STABILITY MONITORING</b> .....	920
<i>M. Okumura, M. Tsuji, Y. Shimazu</i>	
<b>9485 : A NEW APPROACH FOR REDUCTION OF THE RECONTAMINATION AFTER THE CHEMICAL DECONTAMINATION</b> .....	926
<i>T. Ito, H. Hosokawa, M. Nagase, M. Sakashita, M. Fuse</i>	
<b>9520 : SAFETY CULTURE ASSESSMENT DEVELOPED BY JANTI</b> .....	931
<i>J. Hamada</i>	

**4-4 RISK-BASED MAINTENANCE AND LIFE CYCLE MANAGEMENT**

<b>9094 : DEVELOPMENT OF A SPV MANAGEMENT PROGRAM FOR NUCLEAR POWER PLANTS</b> .....	934
<i>E. Lee, J. Na, D. Lee, S. Oh, D. Jerng</i>	
<b>9181 : RISK-BASED ASSESSMENT OF THE ALLOWABLE OUTAGE TIMES FOR THE UNIT 1 LENINGRAD NUCLEAR POWER PLANT ECCS COMPONENTS</b> .....	941
<i>B. Vinnikov, S. Koukhar</i>	
<b>9279 : RISK-INFORMED APPROACH IN US-APWR TECHNICAL SPECIFICATIONS</b> .....	946
<i>E. Saji, F. Tanaka, K. Kuroiwa, K. Kawai</i>	
<b>9208 : SOME ASPECTS ON A GOOD DEPENDABILITY MANAGEMENT FOR A CANDU NPP REACTOR IN ROMANIA</b> .....	953
<i>G. Vieru</i>	
<b>9183 : OSSA – A SECOND GENERATION OF SEVERE ACCIDENT MANAGEMENT GUIDELINES</b> .....	957
<i>E. C. Sauvage, G. Musoyan, V. Ducros</i>	

**4-5 REPAIR AND REPLACEMENT**

<b>9397 : NEW MAINTENANCE STRATEGY OF TOKYO ELECTRIC POWER COMPANY AND FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT FOR SAFE LONG-TERM OPERATION AND AGEING MANAGEMENT AND SAFE LONG-TERM OPERATION</b> .....	970
<i>T. Inagaki, N. Yamashita</i>	
<b>9029 : DEVELOPMENT OF PORTABLE LASER PEENING SYSTEMS FOR NUCLEAR POWER REACTORS</b> .....	980
<i>I. Chida, T. Uehara, M. Yoda, H. Miyasaka, H. Kato</i>	

<b>9327 : DEVELOPMENT OF TECHNIQUE TO APPLY INDUCTION HEATING STRESS IMPROVEMENT TO RECIRCULATION INLET NOZZLE</b> .....	986
<i>M. Ootaka, K. Chiba, K. Nihei</i>	
<b>9293 : A GUIDELINE FOR COMPREHENSIVE EVALUATION OF A LICENSEE'S EFFORT TO CULTIVATE SAFETY CULTURE</b> .....	987
<i>M. Makino, Y. Ishii</i>	

#### **4-6 MAJOR COMPONENT RELIABILITY**

<b>9388 : PILOT VALVE INSTABILITY AND SUBSEQUENT DAMAGE DURING DESIGN/DEVELOPMENT TESTING OF A REACTOR CIRCUIT RELIEF VALVE FOR A PRESSURISED WATER REACTOR (PWR) PLANT, AND DEVELOPMENT OF A RELIEF VALVE TEST FACILITY</b> .....	994
<i>J. L. Sulley, E. Miller, S. Lockley</i>	
<b>9008 : IMPROVEMENT IN DECAY RATIO CALCULATION IN LAPUR5 METHODOLOGY FOR BWR INSTABILITY</b> .....	1009
<i>H. Lee, T. Yang, C. Shih, J. Wang, H. Lin</i>	
<b>9059 : SIZE OPTIMIZATION OF IMPACT LIMITER IN TRANSPORTATION PACKAGE BASED ON DYNAMIC MATERIAL PROPERTIES</b> .....	1012
<i>W. Choi, K. Bang, J. Lee, K. Seo</i>	
<b>9156 : CHEMICAL TREATMENT OF DEPOSITS OF JUNCTIONS “COLLECTOR – TUBE” OF HORIZONTAL STEAM GENERATORS</b> .....	1019
<i>S. N. Alkassem</i>	

#### **4-7 O&M COSTS AND OPERATIONAL EXPERIENCE**

<b>9414 : ECONOMICAL EVALUATION FOR I&amp;C MODERNIZATION APPROACHES IN NPPS</b> .....	1026
<i>H. Kang, C. Sung, J. Lee</i>	
<b>9052 : MEASUREMENT UNCERTAINTY RECAPTURE (MUR) POWER UPRATES OPERATION AT KUOSHENG NUCLEAR POWER STATION</b> .....	1032
<i>C. Chang, T. Wang, C. Lin</i>	
<b>9379 : TEPCO'S CHALLENGES FOR OCCUPATIONAL EXPOSURE REDUCTION</b> .....	1040
<i>A. Makihira</i>	
<b>9380 : APPLICATION OF ZINC INJECTION TO REDUCE RADIATION SOURCES AT TAKAHAMA UNIT 4</b> .....	1041
<i>M. Matsuura, M. Egawa, M. Tukamoto, R. Umehara, T. Nishimura, Y. Shoda, K. Kasahara</i>	

### **TRACK 5: PLANT SAFETY ASSESSMENT AND REGULATORY ISSUES**

#### **5-1 SEVERE ACCIDENT LWR/HWR**

<b>9001 : SIMULATION OF FIRST SERENA KROTOS STEAM EXPLOSION EXPERIMENT</b> .....	1042
<i>M. Uršic, M. Leskovar</i>	
<b>9068 : INTERACTION OF CONCRETES WITH OXIDE + METAL CORIUM: THE VULCANO VBS SERIES</b> .....	1050
<i>C. G. Journeau, J. M. Bonnet, L. Ferry, J. F. Haquet, P. Piluso</i>	
<b>9083 : A EUROPEAN JOINT WORK PLAN ON MOLTEN CORE CONCRETE INTERACTION</b> .....	1058
<i>C. G. Journeau, M. Cranga, J. J. Foit, W. M. Ma, P. P. Grudev</i>	
<b>9176 : THE RESULTS FROM THE THIRD HIGH-PRESSURE MELT EJECTION TEST COMPLETED IN THE MOLTEN FUEL MODERATOR INTERACTION FACILITY AT CHALK RIVER LABORATORIES</b> .....	1066
<i>T. Nitheanandan, G. Kyle, B. O'Connor</i>	
<b>9302 : HEAT REMOVAL CAPABILITY OF CORE-CATCHER WITH INCLINED COOLING CHANNELS</b> .....	1075
<i>Y. Suzuki, M. Tahara, T. Kurita, R. Hamazaki, S. Morooka</i>	
<b>9385 : LIVE EXPERIMENTS ON MELT BEHAVIOR IN THE RPV LOWER HEAD</b> .....	1083
<i>A. Miassoedov, T. Cron, J. Foit, X. Gaus-Liu, A. Palagin, S. Schmidt-Stiefel, T. Wenz</i>	

#### **5-2 SOURCE TERM**

<b>9145 : INFLUENCE OF CORIUM OXIDATION ON FISSION PRODUCT RELEASE FROM MOLTEN POOL</b> .....	1084
<i>S. Bechta, E. Krushinov, S. Vitol, S. Kotova, A. Sulatsky, R. Kosarevsky, V. Gusarov, V. Almyashev, G. Ducros, C. Journeau, D. Bottomley, B. Clément, L. Herranz, S. Guntay, K. Trambauer, A. Auvinen</i>	
<b>9310 : PHEBUS FPT2 TEST: OVERVIEW OF FISSION PRODUCTS AND MATERIAL RELEASE AND TRANSPORT IN THE EXPERIMENTAL CIRCUIT</b> .....	1094
<i>A. Gregoire, F. Payot</i>	
<b>9340 : IODINE CHEMISTRY EFFECT ON SOURCE TERM ASSESSMENTS: A MELCOR 186 YT STUDY OF A PWR SEVERE ACCIDENT SEQUENCE</b> .....	1104
<i>L. Herranz, M. García, B. Otero</i>	

### **5-3 FBR SAFETY**

<b>9117 : DEVELOPMENT OF SEVERE ACCIDENT EVALUATION TECHNOLOGY (LEVEL 2 PSA) FOR SODIUM-COOLED FAST REACTORS (1) OVERVIEW OF EVALUATION METHODOLOGY DEVELOPMENT</b> .....	1110
<i>R. Nakai, T. Suzuki, H. Yamano, H. Seino, H. Ishikawa, K. Kamiyama, K. Koyama, K. Morita</i>	
<b>9132 : DEVELOPMENT OF SEVERE ACCIDENT EVALUATION TECHNOLOGY (LEVEL 2 PSA) FOR SODIUM-COOLED FAST REACTORS (2) IDENTIFICATION OF DOMINANT FACTORS IN THE INITIATING PHASE OF UNPROTECTED EVENTS</b> .....	1120
<i>I. Sato, H. Yamano, Y. Tobita</i>	
<b>9127 : DEVELOPMENT OF SEVERE ACCIDENT EVALUATION TECHNOLOGY (LEVEL 2 PSA) FOR SODIUM-COOLED FAST REACTORS (3) IDENTIFICATION OF DOMINANT FACTORS IN THE TRANSITION PHASE OF UNPROTECTED EVENTS</b> .....	1128
<i>Y. Tobita, H. Yamano, I. Sato</i>	
<b>9126 : DEVELOPMENT OF SEVERE ACCIDENT EVALUATION TECHNOLOGY (LEVEL 2 PSA) FOR SODIUM-COOLED FAST REACTORS (4) IDENTIFICATION OF DOMINANT FACTORS IN CORE MATERIAL RELOCATION AND HEAT REMOVAL PHASES</b> .....	1136
<i>K. Koyama, Y. Yamada, S. Hayakawa, M. Watanabe, O. Watanabe</i>	
<b>9110 : DEVELOPMENT OF SEVERE ACCIDENT EVALUATION TECHNOLOGY (LEVEL 2 PSA) FOR SODIUM-COOLED FAST REACTORS (5) IDENTIFICATION OF DOMINANT FACTORS IN EX-VESSEL ACCIDENT SEQUENCES</b> .....	1144
<i>S. Ohno, H. Seino, S. Miyahara</i>	

### **5-4 ACCIDENT ANALYSIS**

<b>9011 : POST-TEST ANALYSIS OF THE QUENCH-13 BUNDLE TEST INCLUDING AN AG-IN-CD ABSORBER ROD</b> .....	1153
<i>J. C. Birchley, T. Haste, B. Jaeckel, M. Steinbrueck, J. Stuckert</i>	
<b>9274 : ASSESSMENT OF ASTEC-CPA POOL SCRUBBING MODELS AGAINST POSEIDON-II AND SGTRARTIST DATA</b> .....	1161
<i>L. E. Herranz, J. Fontanet</i>	
<b>9007 : OXIDATION OF ADVANCED ZIRCONIUM ALLOYS IN STEAM AT TEMPERATURES 600-1200 C</b> .....	1170
<i>M. Steinbrueck, M. Grosse, N. Vér</i>	
<b>9040 : STUDY ON SILICIDE FUEL BEHAVIOR DURING RIA</b> .....	1180
<i>K. Yanagisawa</i>	

### **5-5 SAFETY EVALUATION**

<b>9272 : PILOT APPLICATIONS OF THE INTEGRATED SAFETY ASSESSMENT METHODOLOGY</b> .....	1188
<i>G. Rodríguez-Martín, I. Cañamón, C. Queral, A. Expósito, L. Ibáñez, F. J. Elorza, J. M. Izquierdo, J. Hortal, M. Sánchez-Perea, E. Meléndez, R. Herrero, J. Gil, I. Fernández, J. Mundina, C. Ibáñez, F. Nieto</i>	
<b>9332 : JAPANESE STANDARD METHOD FOR SAFETY EVALUATION USING BEST ESTIMATE CODE BASED ON UNCERTAINTY AND SCALING ANALYSES WITH STATISTICAL APPROACH</b> .....	1196
<i>S. Mizokami, A. Hotta, Y. Kudo, T. Yonehara, M. Watada, H. Sakaba</i>	
<b>9375 : ACTIVITIES TOWARD PSA QUALITY IMPROVEMENT IN JAPAN</b> .....	1197
<i>S. Imai</i>	
<b>9488 : VALIDATION AND APPLICABILITY OF THE 3D CORE KINETICS AND THERMAL HYDRAULICS COUPLED CODE SPARKLE</b> .....	1198
<i>M. Miyata, M. Maruyama, J. Ogawa, Y. Otake, S. Miyake, S. Tabuse, H. Tanaka</i>	

### **5-6 RISK INFORMATION APPLICATION**

<b>9197 : STUDY ON PRACTICAL APPLICATION OF RISK INFORMED INSERVICE INSPECTION</b> .....	1206
<i>C. Sato, H. Machida, S. Takeda, H. Abe, K. Miyata, S. Nishino</i>	
<b>9255 : SHUTDOWN RISK MONITORING IN TEPCO</b> .....	1207
<i>H. Sato, T. Masuda, Y. Denda, M. Yoneyama, S. Imai, K. Miyata</i>	
<b>9361 : UPGRADE OF INTERNAL EVENTS PSA MODEL USING THE AESJ LEVEL-1 PSA STANDARD FOR OPERATING STATE</b> .....	1214
<i>T. Sato, M. Yoneyama, N. Hirokawa, C. Sato, E. Sato, S. Tomizawa</i>	
<b>9448 : A RISK-INFORMED PERSPECTIVE ON DETERMINISTIC SAFETY ANALYSIS OF NUCLEAR POWER PLANTS</b> .....	1219
<i>P. T. Wan</i>	

## **5-7 OPERATIONAL SAFETY & SEISMIC SAFETY**

<b>9329 : RELIABILITY AND EFFICIENCY IMPROVEMENT OF WIRING WORK IN NUCLEAR POWER PLANT</b> .....	1229
<i>M. Ito</i>	
<b>9394 : APPROACH OF TOKYO ELECTRIC POWER COMPANY IN NEW INSPECTION SYSTEM</b> .....	1232
<i>K. Furuhashi</i>	
<b>9412 : ANALYSIS OF OPERATOR RESPONSE STRATEGIES TO STATION BLACKOUT</b> .....	1233
<i>A. Matev, J. K. Hohorst</i>	
<b>9374 : SEISMIC MARGIN ANALYSIS FOR KASHIWAZAKI KARIWA ABWR PLANT CONSIDERING THE NIIGATAKEN CHUETSU-OKI EARTHQUAKE</b> .....	1246
<i>T. Matsuo, K. Nagasawa, S. Kawamura, T. Ueki, T. Higuchi, I. Sakaki</i>	
<b>9440 : APPROACH OF SEISMIC UPGRADING IN KASHIWAZAKI-KARIWA NUCLEAR POWER PLANT</b> .....	1247
<i>H. Sato</i>	

## **5-8 SAFETY DESIGN**

<b>9147 : DESIGN FEATURES TO ACHIEVE DEFENCE-IN-DEPTH IN SMALL AND MEDIUM SIZED REACTORS</b> .....	1255
<i>V. V. Kuznetsov</i>	
<b>9167 : BASIS FOR THE SAFETY APPROACH FOR DESIGN &amp; ASSESSMENT OF GENERATION IV NUCLEAR SYSTEMS</b> .....	1265
<i>G. Fiorini, T. J. Leahy</i>	
<b>9365 : PROBABLE VARIATIONS OF A PASSIVE SAFETY CONTAINMENT FOR A 1700 MWE CLASS PWR WITH PASSIVE SAFETY SYSTEMS</b> .....	1272
<i>T. Sato, Y. Fujiki, H. Oikawa, R. P. Ofstun</i>	
<b>9447 : SAFETY DESIGN PHILOSOPHY OF THE ABWR FOR THE NEXT GENERATION LWRS</b> .....	1283
<i>T. Sato, M. Akinaga, Y. Kojima</i>	

## **5-9 RI DIFFUSION & DOSE EVALUATION**

<b>9252 : NUMERICAL MODEL FOR STACK GAS DIFFUSION IN TERRAIN WITH BUILDINGS - VARIATIONS IN AIR FLOW AND GAS CONCENTRATION WITH THE ADDITIONAL BUILDING NEAR STACK -</b> .....	1293
<i>K. Sada, S. Komiyama, K. Numata, T. Michioka, Y. Ichikawa</i>	
<b>9376 : EVALUATION OF MAIN CONTROL ROOM HABITABILITY IN JAPANESE LWR (1) OUTLINE OF EVALUATION METHOD AND CONDITIONS</b> .....	1303
<i>Y. Fujita, J. Yoneda, R. Fukuda, K. Okabayashi</i>	
<b>9377 : EVALUATION OF MAIN CONTROL ROOM HABITABILITY IN JAPANESE LWR (2) EVALUATION FOR APPLICABILITY OF EXISTING ATMOSPHERIC DISPERSION MODELS TO BUILDING WAKE DISPERSION BY USING WIND TUNNEL EXPERIMENT</b> .....	1311
<i>Y. Fujita, R. Fukuda, J. Yoneda, K. Okabayashi, S. Tabuse, M. Watada</i>	
<b>9444 : PLANNING AND ARCHITECTURAL SAFETY CONSIDERATIONS IN DESIGNING NUCLEAR POWER PLANTS</b> .....	1319
<i>A. A. Konsowa</i>	

## **TRACK 6: REACTOR PHYSICS AND ANALYSIS**

### **6-1 CALCULATION METHOD**

<b>9150 : APPLICATION OF THE SP3 NODAL METHOD WITH SECOND ORDER SOURCE AND LEAKAGE APPROXIMATIONS IN AXIAL DIRECTION FOR BWR PIN-BY-PIN CORE ANALYSIS</b> .....	1327
<i>K. Tada, A. Yamamoto, Y. Yamane, S. Kosaka, G. Hirano</i>	
<b>9185 : AN ANALYTICAL EVALUATION FOR SPATIAL-DEPENDENT INTRA-PEBBLE DANCOFF FACTOR AND ESCAPE PROBABILITY</b> .....	1332
<i>S. Kim, H. Kim, S. Kim, J. Noh, J. Kim</i>	
<b>9199 : A PIN BY PIN MICROSCOPIC DEPLETION SCHEME USING AN HOMOGENEOUS CORE CALCULATION WITH PIN-POWER RECONSTRUCTION</b> .....	1336
<i>F. Hoareau, M. Fliscounakis, D. Couyras, M. Guillo, Y. Pora</i>	
<b>9246 : DEVELOPMENT OF A NEW TECHNIQUE FOR METHOD OF CHARACTERISTICS WITH AN APPROXIMATION ON RAY TRACING</b> .....	1346
<i>K. Yamaji, D. Sato, H. Matsumoto, T. Takeda</i>	
<b>9250 : COMPONENT ANALYSIS OF SODIUM VOID REACTIVITY OF STEP TYPE FBR CORES WITH GROUP-WISE MONTE CARLO CODE "GMVP"</b> .....	1352
<i>T. Yokoyama</i>	
<b>9401 : DEVELOPMENT OF PIN-BY-PIN CORE ANALYSIS METHOD USING THREE-DIMENSIONAL DIRECT RESPONSE MATRIX</b> .....	1358
<i>K. Ishii, T. Hino, T. Mitsuyasu, M. Aoyama</i>	

## **6-2 CRITICAL EXPERIMENT AND ANALYSIS**

<b>9209 : DETERMINISTIC MODELLING OF 100%MOX ABWR LATTICES WITH INCREASING VOID FRACTION: VALIDATION OF THE REL2005 CODE PACKAGE ON THE FUBILA EXPERIMENTAL PROGRAM</b> .....	1366
<i>P. Blaise, C. Vaglio-Gaudard, J. Vidal, J. Ruggieri</i>	
<b>9210 : VALIDATION OF THE REL2005 CODE PACKAGE ON POISONED PWR TYPE ASSEMBLIES THROUGH THE CAMELEON EXPERIMENTAL PROGRAM</b> .....	1372
<i>P. Blaise, J. Vidal, A. Santamarina</i>	
<b>9251 : CRITICAL EXPERIMENTS SIMULATING THE OPERATING CONDITIONS OF PWRs IN THE TOSHIBA NCA FACILITY</b> .....	1378
<i>T. Umamo, T. Kikuchi, K. Yoshioka, I. Mitsuhashi, H. Kumanomido, S. Gunji, S. Sugahara, K. Hiraiwa, M. Ouisloumen</i>	
<b>9290 : ANALYSIS OF CORE PHYSICS EXPERIMENTS ON MOX ASSEMBLIES LOADED WITH GD2O3-UO2 AND UO2 RODS</b> .....	1384
<i>T. Yamamoto, Y. Ando, T. Sakai</i>	
<b>9339 : CRITICAL EXPERIMENTS ON MINIMAL-CONTENT GADOLINIA FOR ABOVE-5WT% ENRICHMENT FUELS IN TOSHIBA NCA</b> .....	1390
<i>T. Kikuchi, S. Watanabe, K. Yoshioka, I. Mitsuhashi, H. Kumanomido, S. Sugahara, K. Hiraiwa</i>	

## **6-3 ON-POWER REACTOR EXPERIMENT AND ANALYSIS**

<b>9081 : CORE MODIFICATION TO IMPROVE THE IRRADIATION EFFICIENCY AND INCREASE THE CORE BURN-UP OF THE EXPERIMENTAL FAST REACTOR JOYO</b> .....	1396
<i>S. Maeda, Y. Ohkawachi, T. Soga, T. Sekine, T. Aoyama</i>	
<b>9113 : ACTINIDE DECAY HEAT ERROR EVALUATION ON FAST REACTOR BY SENSITIVITY ANALYSIS WITH JENDL-3.3</b> .....	1406
<i>N. Hagura, T. Yoshida</i>	
<b>9131 : ERROR SENSITIVITY ANALYSIS OF THE DOPPLER REACTIVITY COEFFICIENT ESTIMATED BY A DYNAMICS IDENTIFICATION METHOD FROM LOW POWER TRANSIENT DATA OF A PWR POWER PLANT</b> .....	1407
<i>M. Tsuji, T. Narabayashi, Y. Shimazu, Y. Hanayama, Y. Ohoka, M. Yamasaki</i>	
<b>9138 : IMPROVING THE AGR FUEL TESTING POWER DENSITY PROFILE VERSUS IRRADIATION-TIME IN THE ADVANCED TEST REACTOR</b> .....	1417
<i>G. Chang, M. A. Lillo, J. T. Maki, D. A. Petti</i>	
<b>9243 : MAJOR UPGRADE OF THE REACTOR DOSIMETRY INTERPRETATION METHODOLOGY USED AT CEA: ARCHITECTURE DESCRIPTION</b> .....	1422
<i>G. Gregoire, C. Destouches, D. Beretz, S. Bourganell</i>	

## **6-4 NUCLEAR DATA AND UNDERLYING PHYSICS**

<b>9172 : A DISPERSIVE, LANE-CONSISTENT COUPLED-CHANNEL OPTICAL MODEL BASED ON SOFT-ROTATOR THEORY FOR ACCURATE CALCULATION OF NUCLEAR REACTION DATA</b> .....	1429
<i>E. S. Soukhovitski, S. Chiba, R. Capote, J. M. Quesada</i>	
<b>9312 : NUCLEAR-CHARGE POLARIZATION AT SCISSION IN FISSION FROM MODERATELY EXCITED LIGHT-ACTINIDE NUCLEI</b> .....	1436
<i>I. Nishinaka</i>	
<b>9400 : IMPACT OF UP-TO-DATE EVALUATED NUCLEAR DATA FILES ON THE MONTE-CARLO ANALYSIS RESULTS OF METALLIC FUELED BFS CRITICAL ASSEMBLIES</b> .....	1442
<i>J. Yoo, D. Kim, S. Kim, Y. Kim</i>	

## **6-5 NEW REACTOR AND CYCLE CONCEPT**

<b>9190 : PRELIMINARY CORE DESIGN OF IRIS-50</b> .....	1449
<i>B. Petrovic, F. Franceschini</i>	
<b>9233 : REACTOR PHYSICAL EXPERIMENTAL PROGRAM EROS IN THE FRAME OF THE MOLTEN SALT APPLYING REACTOR CONCEPTS DEVELOPMENT</b> .....	1452
<i>M. J. Hron, J. Kyncl, M. Mikisek</i>	
<b>9341 : STUDY OF THE BURNUP BEHAVIOR, SAFETY CHARACTERISTICS AND TRANSMUTATION PERFORMANCE OF THE LWRS WITH INNOVATIVE FUEL CONCEPTS</b> .....	1459
<i>R. Nabbi, H. Allelein, W. V. Lensa, O. Schitthelm</i>	
<b>9416 : APPLICATION STUDY OF NFI 9X9 FUEL FOR EXTENDED CYCLE OPERATION OF BWR UP TO 24MONTHS</b> .....	1468
<i>T. Miyaji, Y. Aoki, K. Oguchi</i>	

## **6-6 NOVEL TECHNOLOGY**

<b>9085 : RESEARCH AND DEVELOPMENT OF THE SOFTWARE FOR VISUALIZING NUCLEAR REACTOR AND NEUTRONICS ANALYSIS.</b> .....	1469
<i>S. Okui, H. Sekimoto</i>	
<b>9180 : THEORETICAL HYPOTHESIS OF A DOUBLE BARRIER REGARDING THE D-D INTERACTION IN A PD LATTICE</b> .....	1473
<i>F. Frisone</i>	
<b>9015 : ANALYSIS OF SPENT FUEL ASSAY WITH A LEAD SLOWING DOWN SPECTROMETER</b> .....	1480
<i>V. Gavron, L. E. Smith, J. J. Ressler</i>	
<b>9521 : ALL HEAVY METALS CLOSED-CYCLE ANALYSIS ON WATER-COOLED REACTORS OF URANIUM AND THORIUM FUEL CYCLE SYSTEMS</b> .....	1485
<i>S. Permana, A. Waris, N. Takaki, H. Sekimoto</i>	

## **TRACK 7: THERMAL HYDRAULICS ANALYSIS AND TESTING**

### **7-1 ADVANCES IN TWO-PHASE FLOW AND HEAT TRANSFER-I**

<b>9352 : IMPLEMENTATION OF NON-DRAG INTERFACIAL FORCES INTO THE CUPID CODE</b> .....	1493
<i>I. Park, H. Cho, J. Kim, H. Yoon, J. Jeong</i>	
<b>9334 : INTERFACIAL AREA TRANSPORT OF VERTICAL UPWARD AIR-WATER TWO-PHASE FLOW IN AN ANNULUS AT ELEVATED PRESSURES</b> .....	1500
<i>B. Ozar, D. Euh, T. Hibiki, M. Ishii</i>	
<b>9491 : ENTRAINMENT IN VERTICAL ANNULAR TWO-PHASE FLOW</b> .....	1510
<i>P. Sawant, M. Ishii, M. Mori</i>	
<b>9423 : EXPERIMENTAL STUDY ON BUBBLE DEPARTURE AND LIFT-OFF DIAMETER IN SUBCOOLED POOL BOILING NEAR VERTICALLY HEATED WALL</b> .....	1522
<i>Y. Cho, S. Yoon, G. Park</i>	

### **7-2 ADVANCES IN TWO-PHASE FLOW AND HEAT TRANSFER-II**

<b>9114 : THE EFFECTIVE CONVECTIVITY MODEL FOR SIMULATION OF MOLTEN METAL LAYER HEAT TRANSFER IN A BOILING WATER REACTOR LOWER HEAD</b> .....	1523
<i>T. C. Tran, P. Kudinov</i>	
<b>9463 : LARGE EDDY SIMULATION OF THE FLOW IN A T-JUNCTION</b> .....	1538
<i>E. Merzari, E. Baglietto, H. Ninokata</i>	
<b>9003 : EXPERIMENTAL AND THEORETICAL STUDY OF STEAM CONDENSATION INDUCED WATER HAMMER PHENOMENA</b> .....	1539
<i>I. F. Barna, G. Baranyai, G. Ézsöl</i>	
<b>9462 : NUMERICAL SIMULATION OF THE FLOW IN A NATURAL CIRCULATION LOOP WITH NANOFUIDS AND DIFFERENTIAL HEATING</b> .....	1546
<i>E. Merzari, I. Bang, H. Ninokata</i>	

### **7-3 CFD APPLICATIONS TO WATER, LIQUID METAL AND GAS REACTORS-I**

<b>9527 : CIAU METHODOLOGY AND BEPU APPLICATIONS</b> .....	1547
<i>A. Petruzzi, F. D'Auria</i>	
<b>9142 : SAFETY EVALUATION OF THE LARGE BWR ASSEMBLY WITH SMALL PINS</b> .....	1557
<i>A. Karahan, Y. Kimura, K. Kito, P. Hejzlar, M. S. Kazimi</i>	
<b>9136 : THE LIMITING EVENTS TRANSIENT ANALYSIS BY RETRAN02 AND VIPRE FOR AN ABWR</b> .....	1566
<i>C. Tsai, C. Shih, J. Wang, H. Lin, J. Jin, S. Cheng</i>	
<b>9051 : VALIDATION STUDY OF FLUENT FOR THE APPLICATION OF DRY-STORAGE SYSTEM THERMAL ANALYSIS</b> .....	1573
<i>Y. Tseng, J. Wang, Y. Cheng, C. Shih</i>	
<b>9164 : CFD MODELING OF POOL SWELL DURING LARGE BREAK LOCA</b> .....	1580
<i>J. Yan, F. Bolger, G. Li</i>	

### **7-4 CFD APPLICATIONS TO WATER, LIQUID METAL AND GAS REACTORS-II**

<b>9285 : APPLICATION OF U-RANS TO ELBOW PIPE FLOW WITH SMALL CURVATURE RADIUS UNDER HIGH REYNOLDS NUMBER CONDITION</b> .....	1586
<i>M. Tanaka, H. Ohshima, H. Yamano, K. Aizawa, T. Fujisaki</i>	
<b>9096 : PRESSURE LOSS PREDICTIONS IN CFD SIMULATIONS OF WIRE-WRAPPED SFR FUEL ASSEMBLIES</b> .....	1594
<i>J. G. Smith, A. Tokuhiko, W. D. Pointer, P. F. Fischer</i>	

<b>9311 : THREE DIMENSIONAL CONJUGATED HEAT TRANSFER ANALYSIS IN SODIUM FAST REACTOR WIRE-WRAPPED FUEL ASSEMBLY</b> .....	1603
<i>C. Peniguel, J. Juhel, I. Rupp, S. Rolfo, N. Gervais, M. Guillaud</i>	
<b>9382 : HIGH RESOLUTION CALCULATION OF HEAT TRANSFER IN HTGR REACTOR CAVITY COOLING SYSTEMS</b> .....	1613
<i>A. Charneau, B. Ahmed, A. Wysocki, H. Wei, M. P. Rose, B. W. Cunningham, S. Anghaie</i>	
<b>9445 : FLUID FLOW AND HEAT TRANSFER ANALYSIS OF THE HTR-10 REACTOR CAVITY COOLING SYSTEM DURING HEAT-UP ACCIDENTS</b> .....	1622
<i>H. Wei, M. Rose, A. Charneau, B. Ahmed, S. Anghaie</i>	

### **7-5 CFD APPLICATIONS TO WATER, LIQUID METAL AND GAS REACTORS-III**

<b>9158 : FULL SCALE QUASI STEADY STATE COMPONENT TESTS OF THE SWR 1000 EMERGENCY CONDENSER AT THE INKA TEST FACILITY</b> .....	1627
<i>S. Leyer, F. Maisberger, B. Schaub, W. Bretschuh, M. Doll, M. Wich, H. Schäfer, A. Manera, H. M. Prasser</i>	
<b>9159 : FULL SCALE STEADY STATE COMPONENT TESTS OF THE SWR 1000 FUEL POOL COOLER AT THE INKA TEST FACILITY</b> .....	1629
<i>S. Leyer, F. Maisberger, B. Schaub, W. Bretschuh, M. Doll, M. Wich, H. Schäfer, J. Unger</i>	
<b>9292 : NUMERICAL SIMULATION OF COMPLEX MULTI-DIMENSIONAL TWO-PHASE FLOWS IN NUCLEAR POWER PLANT COOLANT CIRCUITS BY MEANS OF THE BEST-ESTIMATE THERMAL HYDRAULIC CODE BAGIRA</b> .....	1634
<i>V. E. Kroshilin, A. E. Kroshilin, S. D. Kalinichenko, A. V. Smirnov</i>	
<b>9330 : CFD SIMULATION OF A TURBULENT FLOW ALONG A ROW OF CONFINED CYLINDERS</b> .....	1643
<i>M. Kim, W. Lee</i>	

### **7-6 CFD APPLICATIONS TO WATER, LIQUID METAL AND GAS REACTORS-IV**

<b>9193 : EVALUATION OF THERMAL-HYDRAULIC BEHAVIORS IN LOSS-OF-RHR EVENT DURING MID-LOOP OPERATION</b> .....	1650
<i>M. Murase, H. Nagumo, N. Minami, Y. Utanohara, I. Kinoshita</i>	
<b>9153 : DRACCAR, A NEW 3D-THERMAL MECHANICAL COMPUTER CODE TO SIMULATE LOCA TRANSIENT ON NUCLEAR POWER PLANTS : STATUS OF THE DEVELOPMENT AND THE VALIDATION</b> .....	1661
<i>G. Repetto, F. Jacq, F. Lamare, J. Ricaud, F. Barré</i>	
<b>9378 : CATHARE SIMULATION OF TRANSIENTS FOR THE 2400 MW GAS FAST REACTOR CONCEPT</b> .....	1672
<i>F. Bentivoglio, A. Messie, G. Geffraye, J. Malo, F. Bertrand, D. Plancq</i>	
<b>9509 : A NUSSELT NUMBER CORRELATION OF THE PRINTED CIRCUIT HEAT EXCHANGER PROPOSED BY CFD SIMULATIONS</b> .....	1682
<i>I. Kim, H. No, J. Lee, B. Jeon</i>	

### **7-7 CFD CODE AND VALIDATION**

<b>9177 : VALIDATION OF TRACE USING THE VOID FRACTION TESTS OF THE NUPEC BFBT FACILITY</b> .....	1692
<i>M. Thieme, W. Tietsch, R. Macian, V. H. Sánchez Espinoza</i>	
<b>9010 : TRACE ANALYSIS OF LOSS OF FEEDWATER FLOW EVENT IN LUNGMAN ABWR</b> .....	1706
<i>J. Wang, H. Lin, W. Wang, S. Yang, C. Shih</i>	
<b>9247 : A SEPARATE EFFECT TEST ON THE CORE COOLING BEHAVIOR UNDER A LOW REFLOODING RATE CONDITION BY USING THE ATLAS</b> .....	1713
<i>H. Park, K. Choi, S. Cho, K. Kang, D. Kim, N. Choi, Y. Kim, W. Baek</i>	

### **7-8 THERMAL HYDRAULICS OF LMFR SYSTEMS**

<b>9239 : COMPASS CODE DEVELOPMENT AND VALIDATION: A MUTI-PHYSICS ANALYSIS OF CORE DISRUPTIVE ACCIDENTS IN SODIUM-COOLED FAST REACTORS USING PARTICLE METHOD</b> .....	1722
<i>S. Koshizuka, J. Liu, K. Morita, T. Arima, S. Zhang, Y. Tobita, H. Yamano, T. Ito, M. Naitoh, N. Shirakawa, S. Hosoda, Y. Uehara, Y. Yamamoto, H. Kozakai, M. Himi, E. Hirano, S. Shimizu, M. Oue</i>	

## **VOLUME 3**

<b>9507 : COMPARISON OF THERMO-HYDRAULIC ANALYSIS WITH MEASUREMENTS FOR HELIOS - THE SCALED INTEGRAL TEST LOOP FOR PEACER</b> .....	1723
<i>J. Cho, J. Lim, J. Kim, I. Hwang</i>	
<b>9436 : ANALYSIS AND TESTING OF W-DHR SYSTEM FOR DECAY HEAT REMOVAL IN THE LEAD-COOLED ELSY REACTOR</b> .....	1731
<i>G. Bandini, P. Meloni, M. Polidori, P. Gaggini, V. Labanti, M. Tarantino, L. Cinotti, L. Presciuttini</i>	

<b>9439 : EXPERIMENTAL AND NUMERICAL INVESTIGATION OF TURBULENT LIQUID METAL HEAT TRANSFER ALONG A HEATED ROD IN ANNULAR CAVITY .....</b>	<b>1739</b>
<i>A. A. Batta, J. Zeininger, R. Stieglitz</i>	

### **7-9 THERMAL HYDRAULICS OF SCWR SYSTEMS-I**

<b>9368 : EXPERIMENTAL STUDY FOR RESEARCH AND DEVELOPMENT OF A SUPER FAST REACTOR (1) CRITICAL HEAT FLUX IN THE NEAR-CRITICAL PRESSURE REGION .....</b>	<b>1748</b>
<i>H. Mori, M. Ohno, Y. Hamamoto</i>	
<b>9369 : EXPERIMENTAL STUDY FOR RESEARCH AND DEVELOPMENT OF A SUPER FAST REACTOR (2) OSCILLATORY CONDENSATION OF HIGH TEMPERATURE VAPOR DIRECTLY DISCHARGED INTO SUB-COOLED LIQUID POOL .....</b>	<b>1756</b>
<i>H. Mori, Y. Hamamoto, M. Ohno</i>	
<b>9475 : MECHANISTIC MULTIDIMENSIONAL ANALYSIS OF HEAT TRANSFER IN FLUIDS AT SUPERCRITICAL PRESSURES.....</b>	<b>1765</b>
<i>M. Z. Podowski, T. Gallaway, S. P. Antal</i>	
<b>9134 : ASSESSMENT OF HEAT TRANSFER CORRELATIONS FOR SUPERCRITICAL WATER IN THE FRAME OF BEST-ESTIMATE CODE VALIDATION .....</b>	<b>1773</b>
<i>W. Jaeger, V. H. Sánchez Espinoza, N. Schneider, A. Hurtado</i>	

### **7-10 THERMAL HYDRAULICS OF SCWR SYSTEMS-II**

<b>9464 : HEAT TRANSFER IN A SEVEN-ROD TEST BUNDLE WITH SUPERCRITICAL PRESSURE WATER - (1): EXPERIMENTS.....</b>	<b>1786</b>
<i>K. Ezato, Y. Seki, M. Dairaku, S. Suzuki, M. Enoeda, M. Akiba, H. Mori, H. Oka</i>	
<b>9487 : HEAT TRANSFER IN A SEVEN-ROD TEST BUNDLE WITH SUPERCRITICAL PRESSURE WATER (2) NUMERICAL SIMULATION .....</b>	<b>1787</b>
<i>T. Misawa, T. Nakatsuka, H. Yoshida, K. Takase</i>	
<b>9482 : IAEA COORDINATED RESEARCH PROGRAMME ON HEAT TRANSFER BEHAVIOR AND THERMO-HYDRAULICS CODE TESTING FOR SUPER CRITICAL WATER COOLED REACTORS.....</b>	<b>1788</b>
<i>S. Bilbao Y Leon, N. Aksan</i>	

### **7-11 HEAT TRANSFER IN FUEL PIN BUNDLE**

<b>9337 : COMPUTATIONAL FLUID DYNAMICS ANALYSIS FOR K24B CASK DESIGN WITH BURNUP CREDIT .....</b>	<b>1793</b>
<i>S. Yoon, D. Lee, J. Park, G. Park</i>	
<b>9093 : ASSESSMENT OF NEW MODELING IN RELAP/SCDAPSIM USING EXPERIMENTAL RESULTS FROM THE QUENCH PROGRAM .....</b>	<b>1799</b>
<i>J. Hohorst, L. Siefken, C. Allison</i>	
<b>9216 : DEVELOPMENT OF THE COOLING TECHNOLOGY ON TRU FUEL PIN BUNDLE DURING FUEL FABRICATION PROCESS (4) STEADY STATE COOLING TEST OF FULL MOCK UP FUEL PIN BUNDLE .....</b>	<b>1806</b>
<i>K. Itoh, K. Ikeda, K. Hishida, A. Yamaguchi, T. Takata, Y. Manabe</i>	
<b>9207 : DEVELOPMENT OF THE COOLING TECHNOLOGY ON TRU FUEL PIN BUNDLE DURING FUEL FABRICATION PROCESS(5)DEVELOPMENT OF HEAT TRANSFER CORRELATION FOR SUB-CHANNEL ANALYSIS TOOL .....</b>	<b>1813</b>
<i>Y. Manabe, T. Takata, A. Yamaguchi, K. Hishida, K. Itoh, K. Ikeda</i>	
<b>9163 : DESIGN OPTIMIZATION OF A T MIXING VANE IN NUCLEAR FUEL ASSEMBLY .....</b>	<b>1814</b>
<i>S. Jung, M. Moon, K. Kim</i>	

### **7-12 SYSTEM ANALYSIS AND ASSESSMENT**

<b>9372 : COMPUTATIONAL INVESTIGATION OF PRESSURE FLUCTUATIONS IN BWR MAIN STEAM LINE.....</b>	<b>1820</b>
<i>R. Morita, F. Inada, S. Takahashi, K. Yoshikawa</i>	
<b>9030 : CHARACTERISTICS OF FLUCTUATING PRESSURE GENERATING IN BWR MAIN STEAM LINES.....</b>	<b>1827</b>
<i>S. Takahashi, K. Okuyama, A. Tamura, K. Nishida, M. Ohtsuka, M. Tsubaki, Y. Mabuchi, K. Yoshikawa, F. Inada, R. Morita</i>	
<b>9054 : DESIGN IMPROVEMENTS OF PASSIVE FLOW CONTROLLING SAFETY INJECTION TANK.....</b>	<b>1835</b>
<i>I. Chu, T. Kwon, C. Song</i>	
<b>9098 : CONTAINMENT SAFETY: ON THE ANALYSIS OF A LIGHT GAS STRATIFICATION BREAK-DOWN BY A WATER SPRAY .....</b>	<b>1841</b>
<i>J. Malet, J. Vizet, E. Porcheron, J. Vendel</i>	
<b>9424 : A STUDY OF SMALL NUCLEAR POWER PLANT SYSTEM FOR DISTRICT HEATING.....</b>	<b>1847</b>
<i>M. Imamura, K. Sato, T. Narabayashi, Y. Shimazu, M. Tsuji</i>	



## **TRACK 8: FUEL CYCLE AND WASTE MANAGEMENT**

### **8-1 WASTE MANAGEMENT (1)**

<b>9006 : THE IMPORTANCE OF INDEPENDENT RESEARCH AND EVALUATION IN ASSESSING NUCLEAR FUEL CYCLE AND WASTE MANAGEMENT FACILITY SAFETY</b> .....	1853
<i>W. D. Downing, W. C. Patrick, B. Sagar</i>	
<b>9465 : CURRENT STATUS ON ADVANCED AQUEOUS REPROCESSING PROCESS (NEXT) IN FACT PROJECT</b> .....	1859
<i>T. Washiya, M. Myochin, T. Koyama</i>	
<b>9415 : NEED FOR ASIAN REGIONAL SPENT FUEL RECYCLE CENTER (ARRC)</b> .....	1865
<i>O. Yamamura</i>	

### **8-2 WASTE MANAGEMENT (2)**

<b>9411 : DEVELOPMENT OF NEW TREATMENT PROCESS FOR LOW LEVEL RADIOACTIVE WASTE AT TOKAI REPROCESSING PLANT</b> .....	1869
<i>K. Horiguchi, A. Sugaya, Y. Saito, K. Tanaka, S. Akutsu, T. Hirata</i>	
<b>9144 : DEVELOPMENT OF BIOLOGICAL TREATMENT OF HIGH CONCENTRATION SODIUM NITRATE WASTE LIQUID</b> .....	1878
<i>N. Ogawa, K. Kuroda, Y. Kawato, Y. Meguro, K. Takahashi, K. Shibata</i>	
<b>9301 : PERFORMANCE OF CEMENT SOLIDIFICATION WITH BARIUM FOR HIGH ACTIVITY LIQUID WASTE INCLUDING SULPHATE</b> .....	1882
<i>T. Waki, M. Yamada, Y. Horikawa, M. Kaneko, M. Saso, Y. Haruguchi, Y. Yamashita, H. Sakai</i>	

### **8-3 QUALIFICATION AND MONITORING**

<b>9518 : MONITORING OF RELEASED RADIOACTIVE GASEOUS AND LIQUID EFFLUENT AT ROKKASHO REPROCESSING PLANT</b> .....	1887
<i>M. Oka, S. Keta, S. Nagai, M. Kano, N. Ishihara, T. Moriyama, K. Ogaki, K. Noda</i>	
<b>9429 : ENVIRONMENTAL RADIOACTIVITY MONITORING AROUND THE ROKKASHO REPROCESSING PLANT</b> .....	1894
<i>K. Sasaki, H. Hareyama, M. Takeishi</i>	
<b>9492 : IMPACT ASSESSMENT AT THE SUBMERGENCE OF RADIOACTIVE MATERIALS DURING SEA TRANSPORT</b> .....	1899
<i>D. Tsumune, T. Tsubono, T. Saegusa, C. Ito</i>	
<b>9323 : QUALIFICATION TESTING FACILITY FOR PACKAGES TO BE USED FOR TRANSPORT AND STORAGE OF RADIOACTIVE MATERIALS</b> .....	1907
<i>G. Vieru</i>	

### **8-4 FUEL FABRICATION PROCESS**

<b>9457 : OUTLINE OF J-MOX PROGRAM AND SAFETY MEASURES</b> .....	1912
<i>T. Sato, Y. Yamaji, A. Oe, M. Fujita</i>	
<b>9494 : INTERNAL GELATION AT PSI: THE PAST AND THE FUTURE</b> .....	1919
<i>M. A. Pouchon, F. Ingold</i>	
<b>9461 : CONFIRMATION TEST OF POWDER MIXING PROCESS J-MOX</b> .....	1927
<i>H. Ota, S. Osaka, I. Kurita</i>	

### **8-5 MATERIAL PROPERTY**

<b>9314 : RADIATION STABILITY OF PROTON IRRADIATED ZIRCONIUM CARBIDE</b> .....	1932
<i>Y. Yang, C. A. Dickerson, T. R. Allen</i>	
<b>9451 : MELTING TEMPERATURES OF OXIDE FUEL FOR FAST REACTOR</b> .....	1940
<i>M. Kato</i>	
<b>9057 : OECD/NEA EXPERT GROUP ON ASSAY DATA OF SPENT NUCLEAR FUEL</b> .....	1948
<i>Y. Rugama, K. Suyama, I. Gauld</i>	
<b>9095 : PERFORMANCE OF THE DIFFUSION BARRIER IN THE METALLIC FUEL IN SODIUM-COOLED FAST REACTOR</b> .....	1953
<i>J. Kim, H. Ryu, S. Yang, B. Lee, S. Oh, C. Lee, D. Hahn</i>	
<b>9305 : STUDY ON THE IMPROVED EVALUATION OF RADIOACTIVITY OF ACTIVATED CONTROL RODS IN PWR</b> .....	1959
<i>A. Sakashita, T. Waki, M. Yamada, Y. Horikawa, Y. Miyake</i>	

## **8-6 FUEL CYCLE (1)**

<b>9319 : PROGRESS OF CRITICALITY EXPERIMENTS AND NUCLEAR DESIGN STUDIES ON ERBIA-BEARING SUPER HIGH BURNUP FUEL</b> .....	1966
<i>M. Yamasaki, T. Kuroishi, T. Takeda, A. Yamamoto, H. Unesaki, M. Mori</i>	
<b>9171 : METHODOLOGY FOR INVESTIGATING THE APPLICABILITY OF THORIUM BASED FUELS IN EXISTING BWRS</b> .....	1974
<i>K. Insulander Björk, V. Fhager, C. Demazière</i>	
<b>9170 : COMPARISON OF THORIUM-BASED FUELS WITH DIFFERENT FISSILE COMPONENTS IN EXISTING BWRS</b> .....	1982
<i>K. Insulander Björk, V. Fhager, C. Demazière</i>	
<b>9517 : BREEDING AND PLUTONIUM CHARACTERIZATION ANALYSIS ON ACTINIDES CLOSED WATER-COOLED THORIUM REACTOR</b> .....	1988
<i>S. Permana, N. Takaki, H. Sekimoto</i>	

## **8-7 FUEL CYCLE (2)**

<b>9227 : EFIT FUEL CYCLE ANALYSIS WITH THE EQL3D PROCEDURE</b> .....	1996
<i>J. Krepel, M. Sarotto, K. Mikityuk, C. Artioli</i>	
<b>9526 : CORE PERFORMANCE AND PLUTONIUM PRODUCTION OF SMALL LONG LIFE FAST REACTOR USING DOPING ACTINIDES</b> .....	2005
<i>S. Permana, Z. Suud</i>	
<b>9297 : ENHANCING THE URANIUM UTILIZATION RATE IN LWRS: A STEP TOWARD A SUSTAINABLE NUCLEAR ENERGY</b> .....	2015
<i>M. Delpech, D. Greneche, A. Zaetta, J. Tommasi, L. Boucher, M. Durin, B. Carlier</i>	
<b>9260 : FUEL CYCLE ASPECTS OF MOLTEN SALT REACTOR SYSTEM</b> .....	2019
<i>J. Uhlir</i>	

## **8-8 SCENARIO ANALYSIS (1)**

<b>9413 : PARAMETERS' INFLUENCE ESTIMATION ON PUF SUPPLY &amp; DEMAND IN TRANSITIONAL PERIOD FROM LWR TO FBR IN JAPAN</b> .....	2023
<i>H. Kobayashi, H. Ohta, T. Inoue</i>	
<b>9513 : FLEXIBLE FUEL CYCLE SYSTEM FOR THE TRANSITION FROM LWR TO FBR</b> .....	2025
<i>T. Fukasawa, J. Yamashita, K. Hoshino, A. Sasahir, T. Inoue, K. Minato, S. Sato</i>	
<b>9148 : FEASIBILITY STUDY OF RECYCLE MATERIAL STORAGE FACILITY IN THE FLEXIBLE FUEL CYCLE SYSTEM DURING TRANSITION FROM LWR CYCLE TO FBR CYCLE</b> .....	2031
<i>K. Fujimura, A. Sasahira, T. Fukasawa, J. Yamashita, K. Hoshino, Y. Shimazu, K. Sugiyama</i>	

## **8-9 SCENARIO ANALYSIS (2)**

<b>9218 : ANALYSIS OF FAST REACTOR SCENARIO WITH DIFFERENT CONVERSION RATIOS</b> .....	2037
<i>C. Jeong, W. Ko</i>	
<b>9222 : REDUCTION OF NUCLEAR WASTE BURDEN FROM LWR BY DEPLOYMENT OF THE SCNES</b> .....	2045
<i>M. Kawashima, K. Arie, J. Watanabe, K. Mori, K. Kubota, Y. Nakayama, R. Nakazono, Y. Kuroda, Y. Fuji-Ie</i>	
<b>9421 : TOWARD A SUSTAINABLE ENERGY SUPPLY WITH REDUCED ENVIRONMENTAL BURDEN: DEVELOPMENT OF METAL FUEL FAST REACTOR CYCLE</b> .....	2049
<i>T. Koyama, H. Kobayashi, K. Kinoshita</i>	

## **TRACK 9: MATERIALS AND STRUCTURAL ISSUES**

### **9-1 LWR REACTOR DESIGN AND IRRADIATION**

<b>9191 : MATERIAL PROPERTY CHANGES OF STAINLESS STEEL UNDER PWR IRRADIATION</b> .....	2051
<i>K. Fukaya, H. Nishioka, M. Kamaya, T. Miura, T. Torimaru</i>	
<b>9422 : INFLUENCE OF ANNEALING ON GRAIN BOUNDARY SEGREGATION OF NEUTRON IRRADIATED TYPE 316L STAINLESS STEEL</b> .....	2059
<i>Y. Ishiyama, M. Kodama</i>	
<b>9425 : EFFECT OF NEUTRON FLUX ON IASCC SUSCEPTIBILITY IN TYPE 304 STAINLESS STEEL</b> .....	2067
<i>M. Kodama, T. Torimaru</i>	

### **9-2 LWR FATIGUE**

<b>9086 : CYCLIC RESPONSE AND DISLOCATION STRUCTURES EVOLUTION OF TP 347 PIPING STAINLESS STEEL DURING THERMOMECHANICAL AND LOW CYCLE FATIGUE LOADING</b> .....	2072
<i>M. Ramesh, H. Leber, C. Solenthaler, M. Diener, R. Spolenak</i>	

<b>9403 : LOW CYCLE FATIGUE BEHAVIORS OF ELBOW PIPE WITH LOCAL WALL THINNING</b> .....	2073
<i>K. Takahashi, K. Ando, Y. Urabe, S. Watanabe, M. Hisatsune, A. Hidaka</i>	
<b>9407 : ENVIRONMENTAL FATIGUE BEHAVIORS OF WROUGHT AND CAST STAINLESS STEELS IN 310°C DEOXYGENATED WATER</b> .....	2081
<i>P. Cho, H. Jang, I. Jeong, J. Lee, C. Jang</i>	
<b>9431 : INTERGRANULAR CRACKING SUSCEPTIBILITY OF ALLOY 152 IN LOW TEMPERATURE WATER WITH HYDROGEN</b> .....	2087
<i>Y. Nomura, K. Tsutsumi, H. Kanasaki, S. Asada</i>	

### **9-3 LWR CORROSION**

<b>9511 : CREVICE CORROSION CONTROL FOR STAINLESS STEEL USING RADIATION-INDUCED SURFACE ACTIVATION</b> .....	2088
<i>T. Kato, T. Hazuku, S. Motoda, T. Takamasa, M. Hishida, T. Kumata, H. Abe, M. Furuya</i>	
<b>9396 : INSPECTION OF PIPING WALL LOSS WITH FLOW ACCELERATED CORROSION ACCELERATED SIMULATION TEST</b> .....	2095
<i>K. Ryu, J. Kim, I. Hwang, N. Lee</i>	
<b>9495 : STUDY ON PIPE WASTAGE MECHANISM BY LIQUID DROPLET IMPINGEMENT EROSION</b> .....	2104
<i>Y. Higashi, T. Narabayashi, Y. Shimazu, M. Tsuji, S. Ohmori, M. Mori, K. Tezuka</i>	

### **9-4 LWR SCC/RESIDUAL STRESS**

<b>9399 : EFFECT OF SURFACE TREATMENTS ON STRESS CORROSION CRACKING SUSCEPTIBILITY OF NICKEL BASE ALLOYS</b> .....	2109
<i>M. Iwanami, J. Kaneda, H. Tamako, H. Hato, S. Takamoto</i>	
<b>9430 : SCC GROWTH RATE OF COLD WORKED AUSTENITIC STAINLESS STEEL IN PWR</b> .....	2117
<i>Y. Nomura, T. Kobayashi</i>	
<b>9486 : RESIDUAL STRESS MEASUREMENT AND ANALYSIS OF DISSIMILAR METAL SURGE LINE NOZZLE</b> .....	2118
<i>N. Ogawa, I. Muroya, Y. Iwamoto, T. Ohta, K. Nakacho, K. Ogawa</i>	

### **9-5 LWR WELDING/BOLTING**

<b>9024 : METALLURGICAL AND MECHANICAL INVESTIGATION INTO THE SIMULATED WELD HAZS OF SA508 GR.4N REACTOR PRESSURE VESSEL STEEL</b> .....	2119
<i>M. Kim, B. Lee</i>	
<b>9075 : UNDERWATER LASER BEAM WELDING OF ALLOY 690</b> .....	2125
<i>T. Hino, M. Tamura, W. Kono, S. Kawano, M. Yoda</i>	
<b>9044 : ESTIMATION ON CLAMPING FORCE OF HIGH STRENGTH BOLT BY TEMPERATURE PARAMETER</b> .....	2133
<i>H. Nah, K. Kim, H. Lee, W. Kim</i>	
<b>9103 : THE EVALUATION ON CLAMPING FORCE OF HIGH STRENGTH BOLTS BY LENGTH PARAMETER</b> .....	2141
<i>K. Kim, H. Nah, H. Lee, K. Lee</i>	

### **9-6 LWR COMPONENT**

<b>9192 : A NEW SEISMIC DAMAGE ANALYSIS METHOD FOR CYLINDRICAL LIQUID STORAGE TANKS IN NUCLEAR POWER PLANTS</b> .....	2149
<i>A. Maekawa</i>	
<b>9256 : A STRUCTURAL DESIGN OF NUCLEAR POWER PLANT USING STIFFENED STEEL PLATE CONCRETE STRUCTURE</b> .....	2156
<i>I. Moon, T. Mun, S. Kim, K. Kim, W. Sun</i>	
<b>9453 : EFFECT OF MICROSTRUCTURE ON ION-IRRADIATION-INDUCED HARDENING IN A533B MODEL ALLOYS AT 563K</b> .....	2161
<i>K. Murakami, H. Abe, T. Iwai, S. Tamura, Y. Katano, T. Iwata, T. Nishida, N. Sekimura</i>	
<b>9484 : STUDY ON SEISMIC DESIGN MARGIN BASED UPON INELASTIC SHAKING TEST OF THE PIPING AND SUPPORT SYSTEM</b> .....	2168
<i>T. Ishiguro, K. Eto, K. Ikeda, T. Yoshii, M. Kondo, K. Tai</i>	
<b>9389 : HOT ISOSTATICALLY PRESSED (HIPED) THICK WALLED COMPONENT FOR A PRESSURISED WATER REACTOR (PWR) APPLICATION</b> .....	2180
<i>J. L. Sulley, I. Hookham, B. Burdett, K. Bridger</i>	

## **9-7 SUPER ODS (1)**

<b>9220 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 1) INTRODUCTION AND ALLOY DESIGN</b> .....	2187
<i>A. Kimura, R. Kasada, N. Iwata, H. Kishimoto, C. Zhang, P. Dou, J. Isselin, N. Muthkumar, J. Lee, T. Okuda, M. Inoue, S. Ukai, S. Ohnuki, T. Fujisawa, F. Abe</i>	
<b>9306 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 2) EFFECT OF MINOR ALLOYING ELEMENTS</b> .....	2195
<i>S. Ohnuki, N. Hashimoto, S. Ukai, A. Kimura, M. Inoue, T. Kaito, T. Fujiwara, T. Okuda, F. Abe</i>	
<b>9229 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 3) DEVELOPMENT OF HIGH-PERFORMANCE ATTRITION TYPE BALL MILL</b> .....	2200
<i>T. Okuda, M. Fujiwara, T. Nakai, K. Shibata, A. Kimura, M. Inoue, S. Ukai, S. Ohnuki, T. Fujisawa, F. Abe</i>	
<b>9221 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 4) MECHANICAL PROPERTIES AT ELEVATED TEMPERATURES</b> .....	2204
<i>T. Furukawa, S. Ohtsuka, M. Inoue, T. Okuda, F. Abe, S. Ohnuki, T. Fujisawa, A. Kimura</i>	

## **9-8 SUPER ODS (2)**

<b>9072 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 5) MECHANICAL PROPERTIES AND MICROSTRUCTURE</b> .....	2211
<i>R. Kasada, C. Zhang, P. Dou, J. Isselin, S. Lee, A. Kimura, M. Inoue, S. Ukai, S. Ohnuki, T. Fujisawa, T. Okuda, F. Abe, J. Lee, T. Omura</i>	
<b>9223 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 6) CORROSION BEHAVIOR IN SCPW</b> .....	2216
<i>A. Kimura, J. Lee, R. Kasada, N. Iwata, H. Kishimoto, C. Zhang, J. Isselin, P. Dou, N. Muthkumar, T. Okuda, M. Inoue, S. Ukai, S. Ohnuki, T. Fujisawa, F. Abe</i>	
<b>9308 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 7) CORROSION BEHAVIOR AND MECHANISM IN LBE</b> .....	2222
<i>H. Sano, T. Fujisawa, A. Kimura, M. Inoue, S. Ukai, S. Ohnuki, T. Okuda, F. Abe</i>	
<b>9219 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 8) ION IRRADIATION EFFECTS AT ELEVATED TEMPERATURES</b> .....	2227
<i>H. Kishimoto, R. Kasada, A. Kimura, M. Inoue, T. Okuda, F. Abe, S. Ohnuki, T. Fujisawa</i>	
<b>9307 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 9) DAMAGE STRUCTURE EVOLUTION UNDER ELECTRON-IRRADIATION</b> .....	2235
<i>S. Ohnuki, N. Hashimoto, S. Ukai, A. Kimura, M. Inoue, T. Kaito, T. Fujiwara, T. Okuda, F. Abe</i>	
<b>9232 : SUPER ODS STEELS R&amp;D FOR FUEL CLADDING OF NEXT GENERATION NUCLEAR SYSTEMS 10) CLADDING TUBE MANUFACTURING AND SUMMARY</b> .....	2239
<i>S. Ukai, A. Kimura, M. Inoue, T. Kaito, S. Ohnuki, T. Fujisawa, T. Okuda, F. Abe</i>	

## **9-9 LWR MANAGEMENT**

<b>9168 : ADVANCED TEST REACTOR NATIONAL SCIENTIFIC USER FACILITY ADVANCING NUCLEAR TECHNOLOGY</b> .....	2246
<i>T. R. Allen, M. C. Thelen, M. K. Meyer, J. A. Foster, F. M. Marshall, J. B. Benson</i>	
<b>9325 : LWR AGING MANAGEMENT USING A PROACTIVE APPROACH TO CONTROL MATERIALS DEGRADATION</b> .....	2251
<i>L. J. Bond, S. R. Doctor, S. E. Cumblidge, S. M. Bruemmer, W. B. Taylor, A. B. Hull, S. N. Malik</i>	
<b>9395 : A PROBABILISTIC EAC MANAGEMENT OF NI-BASE ALLOY IN PWR</b> .....	2262
<i>T. Lee, I. Hwang</i>	

## **9-10 SCWR AND FUTURE APPLICATIONS**

<b>9289 : EVALUATION OF WEIGHT LOSS OF STAINLESS STEELS IN SUPERCRITICAL WATER</b> .....	2267
<i>Y. Maruno, J. Kaneda, S. Kasahara, N. Saito, T. Shikama, H. Matsui</i>	
<b>9428 : THERMAL AND IRRADIATION EFFECTS ON HIGH TEMPERATURE MECHANICAL PROPERTIES OF MATERIALS FOR SCWR FUEL CLADDINGS</b> .....	2277
<i>F. Kano, Y. Tsuchiya, K. Oka, N. Saito, S. Mimura, S. Kasahara, J. Kaneda, H. Matsui, T. Shikama, M. Narui, Y. Oka</i>	
<b>9456 : CORROSION PROPERTIES OF MODIFIED PNC1520 AUSTENITIC STAINLESS STEEL IN SUPERCRITICAL WATER AS A FUEL CLADDING CANDIDATE MATERIAL FOR SUPERCRITICAL WATER REACTOR</b> .....	2287
<i>Y. Nakazono, T. Iwai, H. Abe</i>	
<b>9479 : DEVELOPMENT OF FUEL CLADDING MATERIAL FOR THE NEXT GENERATION NUCLEAR POWER REACTOR</b> .....	2298
<i>Y. Kawaharada, F. Kano, T. Kaneko, K. Kitano, K. Okonogi, S. Higuchi</i>	
<b>9189 : OVERVIEW OF WELDING OF OXIDE DISPERSION STRENGTHENED (ODS) ALLOYS FOR ADVANCED NUCLEAR REACTOR APPLICATIONS</b> .....	2302
<i>P. Kalvala, S. K. Raja, M. Misra, R. A. Tache</i>	

## **9-11 NUCLEAR FUEL AND CONTROL ROD**

<b>9034 : RESULTS OF THE QUENCH-13 REFLOOD BUNDLE TEST WITH INCORPORATION OF AN AG-IN-CD ABSORBER ROD</b> .....	2307
<i>L. K. Sepold, T. Lind, A. Pintér Csordás, M. Steinbrueck, U. Stegmaier, J. Stuckert</i>	
<b>9331 : EXPERIMENTAL STUDIES ON THE TRANSPORT OF SILVER AND CESIUM FISSION PRODUCTS IN SIC</b> .....	2308
<i>T. J. Gerczak, T. Allen, L. Tan</i>	
<b>9437 : EFFECT OF COLD WORKING AND SUBSEQUENT ANNEALING ON STRUCTURAL PROPERTIES OF HAFNIUM</b> .....	2316
<i>T. Mihara, H. Abe, T. Iwai, Y. Katano, N. Sekimura</i>	

## **9-12 GEN-IV**

<b>9303 : CONSTRUCTION OF LONG-TERM ISOCHRONOUS STRESS-STRAIN CURVES BY MODELING OF SHORT-TERM CREEP CURVES FOR A GRADE 9CR-1MO STEEL</b> .....	2322
<i>W. Kim, S. Yin, G. Goo</i>	
<b>9432 : SOME METALLIC MATERIALS AND FLUORIDE SALTS FOR HIGH TEMPERATURE APPLICATIONS</b> .....	2328
<i>P. Hosnedl, M. J. Hron, O. Matal</i>	
<b>9267 : CORROSION OF STRUCTURAL MATERIALS FOR GENERATION IV SYSTEMS</b> .....	2335
<i>F. Balbaud-Célérier, P. Arnoux, C. Cabet, J. Courouau, L. Martinelli</i>	
<b>9360 : NEW CONCEPT OF DAMAGE EVALUATION METHOD FOR CORE INTERNAL MATERIALS CONSIDERING RADIATION INDUCED STRESS RELAXATION (1) - EXPERIMENTS AND MODELING OF RADIATION EFFECTS -</b> .....	2348
<i>Y. Miwa, K. Kondo, N. Okubo, Y. Kaji, T. Tsukada</i>	
<b>9359 : NEW CONCEPT OF DAMAGE EVALUATION METHOD FOR CORE INTERNAL MATERIALS CONSIDERING RADIATION INDUCED STRESS RELAXATION (2) - SIMULATION OF MATERIAL DEGRADATION BEHAVIOR USING INTEGRATED MODEL -</b> .....	2349
<i>Y. Kaji, Y. Miwa, K. Kondo, N. Okubo, T. Tsukada</i>	

## **9-13 HTR**

<b>9058 : MATERIALS FOR NUCLEAR DIFFUSION-BONDED COMPACT HEAT EXCHANGERS</b> .....	2350
<i>X. Li, T. Smith, D. Kininmont, S. Dewson</i>	
<b>9245 : IRRADIATION HARDENING OF MOD.9CR-1MO STEEL</b> .....	2359
<i>W. Ryu, S. Kim, K. Choo, D. Kim</i>	
<b>9270 : ACHIEVEMENTS OF THE US-FRANCE I-NERI PROGRAM ON HEAT EXCHANGER ALLOYS FOR HTR</b> .....	2360
<i>C. Cabet, R. Wright, F. Balbaud-Célérier, F. Rouillard, H. Burlet, J. Gentzbittel, P. Lamagnère, S. Dubiez-Legoff, M. Blat</i>	
<b>9477 : CREEP BEHAVIORS OF NICKEL-BASE SUPERALLOYS ALLOY 617 AND HAYNES 230 AT HIGH TEMPERATURE</b> .....	2367
<i>D. Kim, C. Jang, W. Ryu</i>	
<b>9326 : RECENT ADVANCES IN THE STUDY OF THERMODYNAMICS OF FECR AND FECR-HE</b> .....	2368
<i>M. Caro, A. Stukowski, P. Erhart, B. Sadigh, A. Caro</i>	

## **9-14 LEB AND MSR**

<b>9018 : PRELIMINARY EVALUATION OF STEAM GENERATOR TUBE RUPTURE (SGTR) ACCIDENT IN LEAD COOLED REACTOR</b> .....	2369
<i>R. Lo Frano, G. Forasassi</i>	
<b>9021 : CORROSION RESISTANCE OF FE-AL ALLOY-COATED STEEL UNDER BENDING STRESS IN HIGH TEMPERATURE LEAD-BISMUTH EUTECTIC</b> .....	2377
<i>E. Yamaki, M. Takahashi</i>	
<b>9309 : CORROSION OF STRUCTURAL METALLIC MATERIALS FOR MOLTEN SALT REACTORS</b> .....	2382
<i>S. Fabre, F. Balbaud-Célérier, C. Cabet, J. Finne, P. Chamelot, L. Cassayre, L. Massot</i>	

## **TRACK 10: NUCLEAR ENERGY AND GLOBAL ENVIRONMENT**

### **10-1 SCENARIO ANALYSIS AND DEVELOPMENT PLAN**

<b>9458 : PROPOSAL ON CONCEPT OF SECURITY OF ENERGY SUPPLY WITH NUCLEAR ENERGY</b> .....	2385
<i>H. Ujita, K. Matsui, E. Yamada</i>	
<b>9499 : AN ANALYSIS OF JAPAN'S LARGE-SCALE REDUCTION OF CO<sub>2</sub> EMISSIONS AND NUCLEAR POWER'S ROLE IN ITS PURSUIT</b> .....	2393
<i>K. Nagano</i>	

<b>9005 : SCENARIO-BASED ROADMAPING; ASSESSING NUCLEAR TECHNOLOGY DEVELOPMENT PATHS FOR FUTURE NUCLEAR ENERGY SYSTEM SCENARIOS</b> .....	2394
<i>L. Van Den Durpel, F. Roelofs, A. Yacout</i>	

## **10-2 BIOLOGICAL EFFECTS OF LOW DOSE RADIATION**

<b>9356 : A GRAPHICAL REVIEW OF RADIOGENIC ANIMAL CANCER DATA USING THE “DOSE AND DOSE-RATE MAP”</b> .....	2401
<i>K. Yoshida, Y. Hoshi, A. Hirasugi, K. Sakai</i>	
<b>9357 : IMPORTANCE AND PRESENT STATE OF THE RESEARCH IN RADIATION-INDUCED BYSTANDER RESPONSES</b> .....	2406
<i>M. Tomita</i>	
<b>9358 : SIGNIFICANCE OF EPIDEMIOLOGICAL AND CYTOGENETIC STUDIES ON HIGH BACKGROUND RADIATION AREA RESIDENTS</b> .....	2407
<i>T. Iwasaki</i>	

## **10-3 EXTENSION OF NUCLEAR ENERGY UTILIZATION**

<b>9213 : DEVELOPMENT FOR A MULTI-PURPOSE NUCLEAR ENERGY SUPPLY SYSTEM</b> .....	2408
<i>T. Narabayashi, Y. Shimazu, K. Sato, M. Imamura, M. Tsuji</i>	
<b>9449 : POTENTIAL OF PLUG-IN HYBRID ELECTRIC VEHICLE FOR REDUCTION OF CO<sub>2</sub> EMISSION AND ROLE OF NONFOSSIL POWER PLANT</b> .....	2417
<i>R. Hiwatari, K. Okano, H. Yamamoto</i>	

## **TRACK 11: NEAR TERM DEPLOYMENT**

### **11-1 NEAR TERM DEPLOYMENT (1)**

<b>9483 : TECHNOLOGY ASSESSMENT OF ADVANCED NUCLEAR POWER PLANTS</b> .....	2425
<i>S. Bilbao Y Leon</i>	
<b>9042 : NUCLEAR ENERGY FOR THE GREEN DEVELOPMENT OF KOREA</b> .....	2427
<i>Y. K. Jeong, S. D. Lee, I. D. Kim, Y. E. Jung</i>	
<b>9128 : NUCLEAR DEPLOYMENT FROM A PUBLIC AND POLITICAL PERSPECTIVE</b> .....	2447
<i>F. Roelofs, S. D. Groot</i>	
<b>9363 : SMALL PWR "PFWR50" USING CERMET FUEL OF TH-PU PARTICLES</b> .....	2454
<i>T. Hirayama, Y. Shimazu</i>	
<b>9370 : A NEW PASSIVE SAFETY FBR CONCEPT OF “KAMADO” - EASY REPLACEMENT FROM THE EXISTING LIGHT WATER REACTOR TO FBR -</b> .....	2461
<i>T. Matsumura, T. Kameyama, Y. Nauchi, I. Kinoshita</i>	
<b>9125 : ONE PLANT, THREE REGULATORS: A CASE HISTORY OF THE IMPACT OF REGULATORY REVIEW ON EPR<sup>TM</sup> DESIGN</b> .....	2466
<i>J. D. Trotter</i>	

## **TRACK 12: INNOVATIVE AND SPACE REACTOR SYSTEMS**

### **12-1 SPACE NUCLEAR APPLICATION**

<b>9373 : STUDY ON A NUCLEAR SPACESHIP FOR INTERPLANETARY CRUISE— CORE DESIGN OF A SMALL FAST REACTOR —</b> .....	2473
<i>T. Kitamura, Y. Yoshida, Y. Honma, T. Narabayashi, Y. Shimazu, M. Tsuji</i>	
<b>9186 : PROPOSAL OF NUCLEAR REACTORS FOR NUCLEAR ELECTRIC PROPULSION SYSTEM</b> .....	2480
<i>T. Nishiyama, H. Nagata, H. Nakashima</i>	
<b>9371 : DESIGN STUDY OF NUCLEAR POWER SYSTEMS FOR DEEP SPACE EXPLORERS (1) CRITICALITY OF LOW ENRICHED URANIUM FUELED CORE</b> .....	2487
<i>T. Kugo, H. Akie, A. Yamaji, K. Nabeshima, T. Iwamura, H. Akimoto</i>	
<b>9366 : DESIGN STUDY OF NUCLEAR POWER SYSTEMS FOR DEEP SPACE EXPLORERS (2) ELECTRICITY SUPPLY CAPABILITIES OF SOLID CORES</b> .....	2495
<i>A. Yamaji, T. Takizuka, K. Nabeshima, T. Iwamura, H. Akimoto</i>	
<b>9500 : NUCLEAR ENHANCED MHD FOR MULTIMEGAWATT SPACE POWER</b> .....	2503
<i>A. Swallow, S. Anghaie</i>	
<b>9469 : THE MOA THRUSTER - A HIGH PERFORMANCE PLASMA ACCELERATOR USING ALFVEN WAVES FOR FOR NUCLEAR POWER AND PROPULSION APPLICATIONS</b> .....	2510
<i>N. Frischauf, M. Hettmer, A. Grassauer, T. Bartusch, O. Koudelka</i>	

## **12-2 INNOVATIVE NUCLEAR SYSTEMS**

<b>9350 : MODIFICATION OF JAPANESE FIRST NUCLEAR SHIP REACTOR FOR A REGIONAL ENERGY SUPPLY SYSTEM USING GADOLINIA AS A BURNABLE POISON .....</b>	<b>2524</b>
<i>K. Sato, Y. Shimazu, T. Narabayashi, M. Tsuji</i>	
<b>9343 : LIBRARY DEPENDENCY OF EFFECTIVE MULTIPLICATION FACTOR IN THORIUM MOLTEN SALT REACTOR.....</b>	<b>2533</b>
<i>Y. Kamiyama, Y. Shimazu, T. Narabayashi, M. Tsuji</i>	
<b>9353 : INNOVATIVE NUCLEAR SYSTEM BASED ON LIQUID FUEL .....</b>	<b>2538</b>
<i>S. Delpuch, E. Merle-Lucotte, X. Doligez, S. Jaskierowicz, D. Heuer, G. Picard</i>	
<b>9111 : RESEARCH FOR THE SUPERCRITICAL CARBON DIOXIDE BRAYTON CYCLE ENERGY CONVERSION SYSTEM RELATED WITH GEN-IV SFR .....</b>	<b>2541</b>
<i>J. Cha, J. Eoh, T. Lee, S. Seong, S. Kim, D. Kim, M. Kim</i>	
<b>9039 : CONCEPT OF SMALL REACTOR FOR NEUTRON TRANSMUTATION DOPING USING PWR TYPE FUEL ELEMENTS .....</b>	<b>2548</b>
<i>T. Obara, P. Liem, H. Yagi</i>	

## **TRACK 13: INFRASTRUCTURE TO DEPLOY WORLD NUCLEAR**

### **13-1 SESSION (1)**

<b>9519 : FUTURE SCENARIOS FOR THE DEVELOPMENT OF NUCLEAR POWER: HOW WILL NUCLEAR POWER DEVELOP OVER THE NEXT TWENTY TO FORTY YEARS?.....</b>	<b>2549</b>
<i>S. E. Pickett</i>	
<b>9498 : SUPPLY GUARANTEE INITIATIVES FOR NUCLEAR FUEL MATERIALS AND SERVICES AND THEIR COMPATIBILITY WITH THE MARKET.....</b>	<b>2554</b>
<i>K. Nagano</i>	
<b>9508 : PROJECT BASED LEARNING FOR REACTOR ENGINEERING EDUCATION .....</b>	<b>2556</b>
<i>T. Narabayashi, M. Tsuji, Y. Shimazu</i>	

### **13-2 SESSION (2)**

<b>9230 : SUPPORT SERVICES FOR NEW NUCLEAR POWER PLANT PROJECTS.....</b>	<b>2565</b>
<i>A. B. Manrique, F. Cazorla</i>	
<b>9321 : A PARADIGM SHIFT NEEDED FOR NUCLEAR REACTORS: FROM ECONOMIES OF UNIT SCALE TO ECONOMIES OF PRODUCTION SCALE.....</b>	<b>2568</b>
<i>N. Li</i>	
<b>9322 : LOS ALAMOS NUCLEAR ENTERPRISE RESOURCE AND INFRASTRUCTURE MODEL (LANERIM) .....</b>	<b>2582</b>
<i>N. Li, C. Dale, K. Kern, S. Scott</i>	

**Author Index**