<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>vii</td>
<td>Preface: Nineteenth Topical Meeting on the Technology of Fusion Energy</td>
<td>Farrokh Najmabadi</td>
</tr>
<tr>
<td>3</td>
<td>Impact of Burning Plasma on Fusion Technology Development</td>
<td>Akio Sagara, Yasuji Kozaki, Masahiro Tanaka, Takuya Goto</td>
</tr>
<tr>
<td>11</td>
<td>The National Ignition Facility and the Promise of Inertial Fusion Energy</td>
<td>E. I. Moses</td>
</tr>
<tr>
<td>19</td>
<td>Timely Delivery of Laser Inertial Fusion Energy (LIFE)</td>
<td>M. Dunne et al.</td>
</tr>
<tr>
<td>28</td>
<td>Compact, Efficient Laser Systems Required for Laser Inertial Fusion Energy</td>
<td>A. Bayramian et al.</td>
</tr>
<tr>
<td>49</td>
<td>LIFE Pure Fusion Target Designs: Status and Prospects</td>
<td>Peter Amendt, M. Dunne, D. D. Ho, J. D. Lindl</td>
</tr>
<tr>
<td>54</td>
<td>Chamber Design for the Laser Inertial Fusion Energy (LIFE) Engine</td>
<td>Jeffery F. Latkowski et al.</td>
</tr>
<tr>
<td>61</td>
<td>Challenges Surrounding the Injection and Arrival of Targets at LIFE Fusion Chamber Center</td>
<td>Robin Miles et al.</td>
</tr>
<tr>
<td>72</td>
<td>Fusion-Fission Blanket Options for the LIFE Engine</td>
<td>Kevin J. Kramer et al.</td>
</tr>
<tr>
<td>81</td>
<td>Nuclear Shielding for the Toroidal Field Coils of ITER</td>
<td>M. J. Loughlin, E. Polunovskiy, K. Ioki, M. Merola, G. Sannazzaro, M. Sawan</td>
</tr>
</tbody>
</table>

(Continued)
CONTENTS / JULY 2011—VOL. 60, NO. 1

(Continued)

87 ITER’s Tokamak Cooling Water System and the Use of ASME Codes to Comply with French Regulations for Nuclear Pressure Equipment / Jeanette Berry, Juan Ferrada, Seokho Kim, Warren Curd, Giovanni Dell’Orco, Vladimir Barabash

95 Design of the ITER In-Vessel Coils / C. Neumeyer et al.

100 Study on the Optimization of the ITER Tokamak Cooling Water System / Giovanni Dell’Orco, Warren Curd, Fabien Berruyer, Seokho Kim, Roy Shearin, Juan Ferrada

105 RAMI Analysis for Designing and Optimizing ITER Tokamak Cooling Water System / J. J. Ferrada, W. T. Reiersen

113 Nuclear Analysis of Toroidal and Poloidal Legs of ITER ELM Coils / Tim D. Bohm, Mohamed E. Sawan


123 Thermomechanical Performance of the EU TBM Under a Typical ITER Transient / F. Cismondi, G. Aiello, S. Kecskes, G. Rampal

128 Modeling and Simulation of the ITER First Wall/Blanket Primary Heat Transfer System / Emilian Popov, Alice Ying

134 Optimizing ITER Power Supplies Operation Through RAMI and Standardization / François Sagot, Didier van Houtte, Katsumi Okayama, Joel Hourtoule, Inho Song

139 Performance Test of the Electromagnetic Pump in an Experimental Liquid Breeder Loop for Developing a KO Test Blanket Module / Jae Sung Yoon, Young-Dug Bae, Suk Kwon Kim, Seungyon Cho, Dong Won Lee

144 Effect of Residual Tritiated Water on Air Detritiation Dryer Packed with Silica Gel / Yasunori Iwai, Toshihiko Yamanishi

150 Thermal Design of the ITER Vacuum Vessel Cooling System / Juan J. Carbajo, Graydon L. Yoder, Seokho H. Kim

156 Critical Design Issues of the Tokamak Cooling Water System of ITER’s Fusion Reactor / Seokho H. Kim, Jeanette B. Berry

161 High Heat Flux Test of the KO Standard Mockups for ITER First Wall Semi-Prototype / Suk-Kwon Kim et al.

165 Small Mock-Up Fabrication and High Heat Flux Test for Preparing the 2nd Qualification of the ITER Blanket First Wall / Dong Won Lee, Suk Kwon Kim, Young-Dug Bae, Yang Il Jung, Jeong Yong Park, Yong Hwan Jeong, Byung Yoon Kim

170 Thermomechanical Analysis of the Revised U.S. ITER DCLL Test Blanket Module / Aaron T. Aoyama, Shahram Sharafat, Nasr Ghoniem, Mohamad Dagher, Clement Wong

DIVERTOR & HIGH HEAT FLUX COMPONENTS


(Continued)
CONTENTS / JULY 2011—VOL. 60, NO. 1

(Continued)

185 W-Based Alloys for Advanced Divertor Designs: Options and Environmental Impact of State-of-the-Art Alloys / L. El-Guebaly, R. Kurtz, M. Rieth, H. Kurishita, A. Robinson, ARIES Team


203 Design and Fabrication of a Flat-Plate Multichannel He-Cooled Refractory HX for Divertor Applications / Shahram Sharafat, Aaron Aoyama, Nasr Ghoniem, Brian Williams

208 Design and Fabrication of a Rectangular He-Cooled Refractory Foam HX-Channel for Divertor Applications / Shahram Sharafat, Aaron T. Aoyama, Nasr Ghoniem, Brian Williams

213 Optimization of the ARIES T-Tube Divertor Concept / Jeremy A. Burke, X. R. Wang, M. S. Tillack, ARIES Team

218 High Performance Divertor Target Plate for a Power Plant: A Combination of Plate and Finger Concepts / X. R. Wang, S. Malang, M. S. Tillack, ARIES Team


228 Experimental Studies of the Thermal Performance of Gas-Cooled Plate-Type Divertors / M. D. Hageman, D. L. Sadowski, M. Yoda, S. I. Abdel-Khalik

233 Elastic-Plastic Analysis of the Transition Joint for a High Performance Divertor Target Plate / D. Navaei, X. R. Wang, M. S. Tillack, S. Malang, ARIES Team

238 Sub-Channels-Inserted Porous Evaporator for Efficient Divertor Cooling / Kazuhisa Yuki, Hidetoshi Hashizume, Saburo Toda

243 Parametric Analysis of Low-Q Gnome Reactor Under Peak Heat Load Constraint at the Divertor / Kenzo Iibano, Yasushi Yamamoto, Satoshi Konishi

IN-VEssel COMPONENTS—FW, BLANKET, SHIELD & VV


257 Effects of Radial Variation of the Magnetic Field on the Pressure Distribution in the European Liquid-Metal Blanket Concept / Leo Bühler, Chiara Mistrangelo

264 Assessment of the DCLL TBM Thermostructural Response Based on ITER Design Criteria / Shahram Sharafat, Aaron T. Aoyama, Nasr Ghoniem

272 Electromagnetic Analysis of Forces and Torques on Selected Components of the ITER Blanket System due to Plasma Disruption / J. D. Kotulski, R. S. Coats, M. F. Pasik, M. Ulrickson

278 Novel Solution for the Problem of Neutron Streaming Through Inboard Assembly Gaps of ARIES Tokamak Power Plants / Tim D. Bohm, Laila El-Guebaly, ARIES Team

(Continued)
CONTENTS / JULY 2011—VOL. 60, NO. 1

(Continued)

283 Thermo-Fluid Simulation in a Liquid Metal Blanket with Three-Surface-Multi-Layered Channel / Mitsuhiro Aoyagi, Satoshi Ito, Shinji Ebara, Takeo Muroga, Hidetoshi Hashizume


292 Simulation of MHD Flows in Liquid Metal Blanket with Flow Channel Insert / Ming-Jiu Ni, Shi-Jing Xu, Zeng-Hui Wang, Nian-Mei Zhang

298 High Temperature Operation of LiPb Loop / K. Noborio, Y. Yamanoto, C. Park, Y. Takeuchi, S. Konishi

303 Neutral Beam Armor for NSTX Upgrade / K. Tresemer, T. Stevenson, C. Priniski, J. Winkelman, L. Bryant, R. Wood

308 Innovative First Wall Concept Providing Additional Armor at High Heat Flux Regions / X. R. Wang, S. Malang, M. S. Tillack, ARIES Team

313 Ratcheting Models for Fusion Component Design / James P. Blanchard, Carl J. Martin, Mark Tillack, Xueren Wang

MATERIALS DEVELOPMENT & PLASMA-MATERIAL INTERACTIONS

321 Midterm Summary of Japan-US Fusion Cooperation Program TITAN / T. Muroga et al.


334 Effect of PWHT on the Mechanical and Metallographical Properties of a Dissimilar-Metal Weld Joint of F82H and SUS316L Steels / S. Nogami, N. Hara, T. Nagasaka, A. Hasegawa, T. Muroga

339 Modeling of Damage and Lifetime Analysis of Plasma Facing Components During Plasma Instabilities in Tokamaks / F. Genco, A. Hassanein

344 Surface Pore Formation in Helium Implanted Fine-Grain Tungsten and Tungsten Needles as Engineered First Wall and Divertor Plate Materials / Samuel J. Zenobia, Lauren M. Garrison, Gerald L. Kulcinski

349 The PFC Erosion in DEMO due to Runaway Electrons / Yuri Igitkhanov, Boris Bazylev

354 Assessment of Beryllium Tile Size in ITER EHF First Wall / Ryan Hunt, Hongjie Zhang, Alice Ying, Michael Ulrickson

359 Influence of Exposure to Pb-Li on Microstructure and Mechanical Properties of 9Cr-ODS and CLAM Steels / Y. F. Li, M. Kondo, T. Nagasaka, T. Muroga, V. Tsisar

364 Electrical Conductivity of 2D-SiC/CVI-SiC / G. E. Youngblood, E. C. Thomsen, R. J. Shinavski

369 Hydrogen Isotope Behavior Transferring Through Water Metal Boundary / Takumi Hayashi, Hirofumi Nakamura, Kanetsugu Isobe, Kazuhiro Kobayashi, Makoto Oyaizu, Yasuhisa Oya, Kenji Okuno, Toshihiko Yamanishi

(Continued)
Experimental Determination of Selected Thermo Physical Properties of ZrCo and ZrCoHx / Sei-Hun Yun et al.

Impact Properties of Low Activation Vanadium Alloy After Low-Temperature Neutron Irradiation at 450°C and Below / Takuya Nagasaka, Takeo Muroga, Takeshi Miyazawa, Hideo Watanabe, Masanori Yamazaki

Analysis of Tritium Behavior in the Atmosphere near the Water Surface / Toshihiro Shibata, Kazuyuki Noborio, Yasushi Yamamoto, Satoshi Konishi

Modeling of Tritium Permeation Through Erbium Oxide Coatings / Takumi Chikada, Akihiro Suzuki, Hans Maier, Takayuki Terai, Takeo Muroga

Influence of Quenching Process on Structure and Microhardness of CLAM Steel / Qian Han, Qunying Huang, Shaojun Liu, Qingsheng Wu, Chunjing Li, Lei Peng, Bo Huang, FDS Team

Retention and Desorption Behaviors of Hydrogen Isotopes in Gamma-Ray Irradiated Li2TiO3 / Akiko Hamada, Makoto Kobayashi, Rie Kurata, Masato Suzuki, Hajimu Yamana, Toshiyuki Fujii, Yasuhisa Oya, Kenji Okuno

Dynamic Behaviors of Deuterium Retained in SS-316 Oxidized at Various Temperatures / Makoto Kobayashi et al.

Moderation of Negative Oxygen Effects by Small Yttrium Addition to Low Activation Vanadium Alloys / Takeshi Miyazawa, Takuya Nagasaka, Yoshimitsu Hishinuma, Takeo Muroga, Yanfen Li

Impurity Effects on Hydrogen Isotope Retention in Carbon-Oxygen Containing Boron Films / Katsushi Matsuoka, Makoto Kobayashi, Rie Kurata, Junya Osuo, Naoko Ashikawa, Akio Sagara, Yasuhisa Oya, Kenji Okuno

Study on Dissimilar-Material Welding with Vanadium and Austenitic Stainless Steel / S. Nogami, J. Miyazaki, T. Nagasaka, A. Hasegawa, T. Muroga

Joining of Be to Ferritic-Martensitic Steels with Diffusion Barrier Interlayer / Jeong-Yong Park, Yang-il Jung, Byung-Kwon Choi, Yong Hwan Jeong, Suk-Won Kim, Dong Won Lee, Seungyon Cho

Adsorption Behavior of Hydrogen Isotopes on Mordenite Adsorbents at 77K / Kenzo Munakata, Yoshinori Kawamura