

CONTENTS OF PART C

VIII. Nuclear Systems and Conceptual Reactor Design

INVITED PAPERS

- Contributions of the National Ignition Facility to the development of inertial fusion energy, *M. Tobin, G. Logan, T. Diaz De La Rubia, V. Schrock, K. Schultz, R. Tokheim, M. Abdou and R. Bangerter* 3
- Overview of the Russian Demo plant study, *Yu.A. Sokolov* 18

CONTRIBUTED PAPERS

- Energetic and economic balance for an inertial fusion power plant, *N. Cerullo, S. Lanza and M. Vezzani* 28
- The logic behind thick, liquid-walled, fusion concepts, *R.W. Moir* 34
- Using the shield for thermal energy storage in pulsar, *G.T. Sager, D.-K. Sze, C.P.C. Wong, C.G. Bathke, J.P. Blanchard, C. Brimer, E.T. Cheng, L.A. El-Guebaly, M.Z. Hasan, F. Najmabadi, S. Sharafat, I.N. Sviatoslavski and L. Waganer* 43
- Blanket and divertor design for force free helical reactor (FFHR), *A. Sagara, O. Motojima, K. Watanabe, S. Imagawa, H. Yamanishi, O. Mitarai, T. Satow and H. Tikaraishi* 51
- Preliminary analysis of MHD-Brayton cycle applied to fusion reactors (CFAR), *M. Ishikawa, Y. Inui, J. Umoto and K. Yoshikawa* 57
- Transmutation of the actinide neptunium-237 with a hybrid reactor, *K.M. Feng and J.H. Huang* 64
- Conceptual design of a poloidal field coil system and operation scenario for an inductively operated day-long pulsed tokamak reactor, *J.F. Wang, T. Yamamoto, T. Amano, Y. Ogawa, K. Okano and N. Inoue* 69
- A preliminary study of a D-T tokamak fusion reactor with advanced blanket using the compact fusion advanced Brayton (CFAB) cycle, *K. Yoshikawa, M. Ohnishi, Y. Yamamoto, H. Toku, I. Kataoka, Y. Inui, M. Ishikawa, J. Umoto, A. Fukuyama, O. Mitarai, M. Okamoto, H. Sekimoto and M. Nagatsu* 78
- Thermomechanical design of the grazing incidence metal mirror of the Prometheus-L IFE reactor, *N.M. Ghoniem and A. El-Azab* 89
- Liquid-metal-cooled divertor for ARIES, *E. Muraviev* 98
- Impact of improvements in HYLIFE-II on safety, performance and cost, *M.A. Hoffman and Y.T. Lee* 105
- Conceptual design of helium recycling control system in a divertor of a tokamak reactor, *M. Kashiwagi and S. Ido* 111

IX. Safety and Licensing

INVITED PAPER

- Report on the European Safety and Environmental Assessment of Fusion Power (SEAFP), *J. Raeder* 121

CONTRIBUTED PAPERS

- Consequence modelling of postulated upper-bound accidents in a fusion power plant, *N.P. Taylor, C.B.A. Forty, W.E. Han, J.-Ch. Sublet and I. Cook* 141
- The effect of composition on volatility from a copper alloy, *K.A. McCarthy, G.R. Smolik, R.S. Wallace and K. Messick* 150
- Design standard issues for ITER in-vessel components, *S. Majumdar* 158
- Experimental study of ^{210}Po release from 17Li–83Pb eutectic, *O. Schipakin, N. Borisov and S. Churkin* 164
- Shield water system design options to improve the safety of fusion reactor blankets, *K.M. Crosswait and J.E. Meyer* 170
- Waste management strategies for fusion materials, *H. Dworschak, P. Rocco and M. Zucchetti* 176
- Calculation and classification of radioactive waste inventory in the structural components of a compact ignition fusion machine, *D.G. Cepraga, G. Cambi and S.A.M.M. Siddiqui* 181
- Fusion reactor design parameters relevant to the passive removal of decay heat, *F. Andritsos* 188
- SEAFP: passive removal of the decay heat, *F. Andritsos, A. Angelini, H.W. Bartels, W. Daenner and M. Zucchetti* 193
- Radioactive waste produced by demonstration and commercial fusion reactors extrapolated from ITER and advanced databases, *W.M. Stacey, N.E. Hertel and E.A. Hoffman* 198
- Source terms due to the activated corrosion products in primary cooling loops of ITER, *G. Cambi, D.G. Cepraga, S. Ciattaglia, L. Di Pace and G. Cavallone* 207
- Assessment of radiological hazards of tungsten divertors, *S.K. Ho and M.D. Lowenthal* 214
- Comparative radiological assessment of SiC_f/SiC composites as structural materials in nuclear fusion technology, *H.W. Scholz and M. Zucchetti* 219
- Tritium permeation through helium-heated steam generators of ceramic breeder blankets for DEMO, *M.A. Fütterer, X. Raepsaet and E. Proust* 225
- Thermohydraulic experiments on a water jet into vacuum during ingress of coolant event in a fusion experimental reactor, *M. Ogawa and T. Kunugi* 233
- Experiments on high temperature graphite and steam reactions under loss of coolant accident conditions, *T. Uda, M. Ogawa, Y. Seki, T. Kunugi, I. Aoki, T. Honda, T. Okazaki and N. Nishino* 238

X. Repair and Maintenance

INVITED PAPERS

- Remote handling technology development for fusion experimental reactors, *E. Tada, D. Maisonnier and J. Herndon* 249
- Reliability, availability, and quality assurance considerations for fusion components, *R. Buende* 262

CONTRIBUTED PAPERS

- Reliability of robotics: an overview with identification of specific aspects related to remote handling in fusion machines, *T. Maier, G. Volta and M. Wilikens* 286

Remote handling of the blanket segments: testing of 1/3 scale mock-ups at the Robertino facility, <i>D. Maisonnier, F. Amelotti, A. Chiasera, P. Gaggini, C. Damiani, L. Degli Esposti, G. Gatti, E. Castillo, D. Caravati, F. Farfalletti-Casali, P. Gritzmam and E. Ruiz</i>	298
Application of eddy current testing inspection to the first wall of fusion reactor with wavelet analysis, <i>G. Chen, Y. Yoshida, K. Miya and M. Uesaka</i>	309
Synthetic viewing: comprehensive work representation, making remote work clearer to the operator, <i>K. Leinemann, F. Katz, H. Knüppel, W. Olbrich and D. Maisonnier</i>	317
Development of a remote handling system for replacement of armor tiles in the Fusion Experimental Reactor, <i>J. Adachi, S. Yoshizawa, Y. Nakano, S. Sato, K. Shibanuma, S. Kakudate, K. Oka and M. Seki</i>	324
Radiation-tolerant electronics testing of a prototype isolating preamplifier, <i>J. Millard</i>	330
Mechanical characteristics and seismic response of divertor support structure with locking system, <i>H. Fukushima, K. Itoh, N. Miki, N. Tachikawa, Y. Saito, M. Nakahira, S. Nishio, M. Shibui and E. Tada</i>	334
Development of titanium alloy metallic balloon for locking system in tokamak fusion reactor, <i>S. Sato, S. Yamazaki, K. Sato, S. Iio, S. Nishio, E. Tada and K. Kobatake</i>	340
Fasteners for structural bolted joints to be assembled in remote handling, <i>A. Colaiuda, F. Amelotti, E. Di Pietro, C. Alessandrini, L. Bettinali, G. Malavasi, M. Sironi, D. Maisonnier, F. Olezza, G. Ghia, R. Cusolito, G. Merckling and L. Crippa</i>	347
Latest developments on valve seat-seal assembly, <i>R. De Villepoix, M. Lefrancois, J. Montuclard and C. Rouaud</i>	358

XI. Materials Engineering

CONTRIBUTED PAPERS

Charpy impact properties of martensitic 10.6% Cr steel (MANET-I) before and after neutron exposure, <i>M. Rieth, B. Dafferner, H.D. Röhrig and C. Wassilew</i>	365
Assessment of austenitic stainless steels, <i>A.A. Tavassoli</i>	371
Resonant creep enhancement in austenitic stainless steels due to pulsed irradiation at low doses, <i>N. Kishimoto, H. Amekura and T. Saito</i>	391
Development of vanadium-base alloys for fusion first-wall-blanket applications, <i>D.L. Smith, H.M. Chung, B.A. Loomis, H. Matsui, S. Votinov and W. Van Witzenburg</i>	399
Status and prospects for SiC-SiC composite materials development for fusion applications, <i>S. Sharafat, R.H. Jones, A. Kohyama and P. Fenici</i>	411
Fatigue assessment of the conductor jacket for the Next European Torus toroidal field and poloidal field coils, <i>K.M. Nikbin, G.A. Webster and N. Mitchell</i>	421
Radiation damage of graphite: degradation of material parameters and defect structures, <i>T. Tanabe, T. Maruyama, M. Iseki, K. Niwase and H. Atsumi</i>	428
Neutron-induced luminescence of insulators, <i>T. Tanabe, M. Fujiwara, T. Iida, S. Tanaka, K. Yamaguchi and M. Yamawaki</i>	435
Modelling hydrogen embrittlement in 316L austenitic stainless steel for the first wall of the Next European Torus, <i>J. Toribio, A. Valiente, R. Cortes and L. Caballero</i>	442
First in situ measurement of electrical resistivity of ceramic insulator during irradiation with neutrons of energy 14 MeV, <i>K. Noda, T. Nakazawa, Y. Oyama, H. Maekawa, J. Kaneda and C. Kinoshita</i>	448
Properties of V-4Cr-4Ti for application as fusion reactor structural components, <i>H.M. Chung, B.A. Loomis and D.L. Smith</i>	455

Evaluation of the mechanical behaviour of Cr ₂ O ₃ coating film under tensile load, <i>M. Nakamichi, H. Kawamura, T. Sawai, Y. Ooka and M. Saito</i>	465
Helium content and induced swelling of neutron irradiated beryllium, <i>L. Sannen, Ch. De Raedt, F. Moons and Y. Yao</i>	470
Compatibility test between beryllium and ferritic stainless steel(F82H), <i>H. Kawamura, M. Kato, E. Ishitsuka, S. Hamada, K. Nishida and M. Saito</i>	475
Author Index of Parts A, B and C	481