

TABLE OF CONTENTS

1	FERRITIC/MARTENSITIC STEEL DEVELOPMENT	
1.1	ADVANCE CASTABLE NANOSTRUCTURED ALLOYS FOR FIRST-WALL/BLANKET APPLICATIONS—L. Tan, W. Tang, Y. Yang, Y. Katoh (Oak Ridge National Laboratory), K.G. Field (University of Michigan)	1
1.2	REFINING CARBON CONTENT IN CARBIDE-VERSION CASTABLE NANOSTRUCTURED ALLOYS: MICROSTRUCTURES, MECHANICAL PROPERTIES, AND ION IRRADIATION RESPONSES—L. Tan, Y. Yang, W. Zhong, T. Graening (Oak Ridge National Laboratory), P. Patki, K.G. Field (University of Michigan)	3
1.3	MICROSTRUCTURE CHARACTERIZATION OF F82H-IEA AFTER LOW DOSE HFIR NEUTRON IRRADIATIONS AT 300 °C—A. Bhattacharya, S.M. Levine, J. Poplawsky, P.D. Edmondson, J.W. Geringer, Y. Katoh (Oak Ridge National Laboratory), T. Nozawa, H. Tanigawa (National Institutes for QST)	6
1.4	HFIR IRRADIATION-INDUCED MECHANICAL PROPERTY CHANGES IN A ⁵⁴Fe-DOPED F82H STEEL—A. Bhattacharya, J. Reed, J.W. Geringer, Y. Katoh (Oak Ridge National Laboratory), T. Nozawa (National Institutes for QST)	12
1.5	ON THE EFFECTS OF IRRADIATION ENHANCED THERMAL SOFTENING ON THE CREEP PROPERTIES OF 9Cr TEMPERED MARTENSITIC STEELS—M.E. Alam, T. Yamamoto, G.R. Odette (University of California Santa Barbara, CA)	15
1.6	CROSS-WELD CREEP-RUPTURE CHARACTERIZATION IN MODIFIED 3Cr BAINITIC STEELS—Y. Yamamoto (Oak Ridge National Laboratory)	23
1.7	ADVANCED CHARACTERIZATION OF RAFM STEEL MICROSTRUCTURES—C. M. Parish (Oak Ridge National Laboratory)	26
2	ODS AND NANOCOMPOSITED ALLOY DEVELOPMENT	
2.1	TEMPERATURE AND DOSE EFFECTS ON PHASE SEPARATION IN NEUTRON IRRADIATED PM2000 AND MA957—Samara Levine, Steven Zinkle (University of Tennessee), Arunodaya Bhattacharya, Jonathan Poplawsky, David Hoelzer, Yutai Katoh (Oak Ridge National Laboratory)	31
3	CERAMIC COMPOSITE STRUCTURAL MATERIAL DEVELOPMENT	
3.1	X-RAY CHARACTERIZATION OF ANISOTROPIC DEFECT FORMATION IN SiC UNDER IRRADIATION WITH APPLIED STRESS—Takaaki Koyanagi, Yutai Kato (Oak Ridge National Laboratory), David J. Sprouster, Lance Snead (Stony Brook University)	36

TABLE OF CONTENTS

4	PLASMA-FACING AND HIGH HEAT FLUX MATERIALS AND COMPONENT TESTING	
4.1	PROPERTIES AND CHARACTERIZATION OF THE 2nd GENERATION OF Cu-Cr-Nb-Zr ALLOYS FOR FUSION ENERGY APPLICATIONS —Ying Yang, Ling Wang (Oak Ridge National Laboratory), Steven Zinkle (University of Tennessee), Lance Snead (Stony Brook University)	38
4.2	RADIATION ENHANCED GRAIN GROWTH IN TUNGSTEN AND TUNGSTEN ALLOYS —H. Gietl, T. Koyanagi, Y. Kato (Oak Ridge National Laboratory), X. Hu (Sichuan University)	41
4.3	ELECTRICAL CONDUCTIVITY EVALUATION OF NEUTRON IRRADIATED TUNGSTEN MATERIALS FROM THE PHENIX COLLABORATION —J. R. Echols, L. M. Garrison (Oak Ridge National Laboratory)	47
4.4	THERMAL TRANSPORT EVALUATION OF NEUTRON IRRADIATED TUNGSTEN MATERIALS FROM THE PHENIX AND TITAN COLLABORATIONS —J. R. Echols, L. M. Garrison, Y. Kato (Oak Ridge National Laboratory)	52
4.5	MEASURING AND TRACKING DEFORMATION IN DUCTILE PHASE TOUGHENED W-NiFe HEAVY ALLOYS USING IN-SITU MECHANICAL TESTING AND COMPUTER VISION —Jing Wang, James V. Haag IV, Amra Peles, Wahyu Setyawan, Danny J. Edwards (Pacific Northwest National Laboratory), Mitsu Murayama (Virginia Tech), Jonathan Roman (Carnegie Mellon University)	55
4.6	MICROHARDNESS AND TENSILE PROPERTIES OF A HOT-ROLLED 90W-NiFe TUNGSTEN HEAVY METAL ALLOY —M.E. Alam, G.R. Odette (University of California Santa Barbara), J. Wang, C.H. Henager Jr., W. Setyawan (Pacific Northwest National Laboratory)	64
4.7	X-RAY DIFFRACTION STUDY OF W Fe-Ni LIQUID PHASE SINTERED TUNGSTEN HEAVY ALLOYS —D.J. Sprouster, L.L. Snead (Stony Brook University), M.E. Alam, G.R. Odette (University of California, Santa Barbara)	74
4.8	ON THE STRENGTH OF INTERPHASE BOUNDARIES IN A HOT-ROLLED TUNGSTEN HEAVY ALLOY —James V. Haag IV, Mitsu Murayama (Virginia Tech), Danny J. Edwards, Jing Wang, Wahyu Setyawan (Pacific Northwest National Laboratory)	82
4.9	QUANTIFYING MICROSTRUCTURE-MECHANICAL PROPERTY CORRELATION IN DUCTILE PHASE TOUGHENED W-NiFe HEAVY ALLOY —Jing Wang, Ramprashad Prabhakaran, Wahyu Setyawan, Charles H. Henager (Pacific Northwest National Laboratory)	88
5.0	ADVANCED MANUFACTURING	
5.1	FABRICATION OF CERAMIC AND METAL MATRIX ENHANCED SHIELD THROUGH DIRECT CURRENT SINTERING —J.M. Gentile, B. Cheng, D.J. Sprouster, J. R. Trelewicz, L.L. Snead (Stony Brook University)	96

TABLE OF CONTENTS

5.2	SYNCHROTRON ANALYSIS OF WIRE ARC ADDITIVE MANUFACTURING G-91 STEEL - PRINT-DIRECTION MICROSTRUCTURAL ANISOTROPY —I.K. Robin, S.J. Zinkle (University of Tennessee), D.J. Sprouster, L.L. Snead (Stony Brook University)	102
6.0	EFFECTS OF IRRADIATION	
6.1	X-RAY DIFFRACTION STUDY OF BASELINE AND NEUTRON IRRADIATED RAFM AND CNA STEELS —D.J. Sprouster, L.L. Snead (Stony Brook University), W. Zhong, T. Koyanagi, L. Tan, Y. Kato (Oak Ridge National Laboratory)	106
6.2	HELIUM BUBBLES IN ISHI 14YWT AND ON-ZONE STEM IMAGING OF DISLOCATION LOOPS —D. Zhang, D.J. Edwards, M.J. Olszta, A. Schemer-Kohrn, Karen Kruska, Wahyu Setyawan (Pacific Northwest National Laboratory), T. Yamamoto, Y. Wu, G.R. Odette (University of California, Santa Barbara)	111
6.3	ON BIAS EVOLUTION DRIVEN VOID SWELLING IN TEMPERED MARTENSITIC STEELS —G. Robert Odette, Takuya Yamamoto (University of California, Santa Barbara)	117
6.4	EFFECT OF HELIUM ON CAVITY SWELLING IN DUAL-ION IRRADIATED HIGH PURITY IRON-CHROMIUM ALLOYS —Yan-Ru Lin, Steven John Zinkle (University of Tennessee), Arunodaya Bhattacharya (Oak Ridge National Laboratory)	125
6.5	EFFECT OF ION IRRADIATION ON PHASE STABILITY IN Fe-12%Cr AND Fe-14%Cr —Y. Zhao, S.J. Zinkle (University of Tennessee), A. Bhattacharya (Oak Ridge National Laboratory)	131
6.6	BUBBLE FORMATION IN HELIUM-IMPLANTED NANOSTRUCTURED FERRITIC ALLOYS AT ELEVATED TEMPERATURES —Yan-Ru Lin, Steven John Zinkle (University of Tennessee), Lizhen Tan, David T. Hoelzer (Oak Ridge National Laboratory)	136
6.7	DOSE RATE EFFECTS ON DAMAGE ACCUMULATION AND VOID GROWTH IN SELF-ION IRRADIATED TUNGSTEN —Weilin Jiang, Yuanyuan Zhu (Pacific Northwest National Laboratory), Limin Zhang (Lanzhou University), Danny J. Edwards, Nicole R. Overman, Giridhar Nandipati, Wahyu Setyawan, Charles H. Henager Jr., Richard J. Kurtz (Pacific Northwest National Laboratory)	138
6.8	MICROSTRUCTURES IN 87R DPT W IRRADIATED WITH Ni⁺ AND He⁺ IONS —Weilin Jiang, Dongsheng Li, Dalong Zhang, Bethany Matthews, Wahyu Setyawan (Pacific Northwest National Laboratory)	140
7.0	PLASMA MATERIAL INTERACTIONS	

TABLE OF CONTENTS

7.1	FLUX EFFECT ON HELIUM ACCUMULATION IN W{100} SUB-SURFACE —Giridhar Nandipati, Kenneth J. Roche, Richard J. Kurtz, Wahyu Setyawan (Pacific Northwest National Laboratory), Karl D. Hammond (University of Missouri), Dimitrios Maroudas (University of Massachusetts), Brian D. Wirth (University of Tennessee)	146
8.0	CORROSION AND COMPATIBILITY IN FUSION SYSTEMS	
8.1	LIQUID METAL COMPATIBILITY OF PRE-OXIDIZED FeCrAl IN FLOWING Sn —B. A. Pint, J. Jun, M. Romedenne, Y.-F. Su (Oak Ridge National Laboratory)	151
9.0	MODELING AND COMPUTATIONAL STUDIES	
9.1	MECHANICAL PROPERTIES AND RADIATION EFFECTS IN FUSION MATERIALS —Y. Osetskiy (Oak Ridge National Laboratory)	156
9.2	A DATA DRIVEN FUSION RELEVANT VOID SWELLING MODEL UPDATE —Takuya Yamamoto, G. Robert Odette (University of California, Santa Barbara)	159
9.3	A MICROMECHANICAL MODEL FOR IRRADIATION EMBRITTLEMENT OF 9Cr TEMPERED MARTENSITIC STEELS UNDER FUSION SERVICE RELEVANT CONDITIONS —T. Yamamoto, M. Hribernik, G. R. Odette (University of California, Santa Barbara)	171
9.4	MODELING MICROSTRUCTURAL EFFECTS ON THE MECHANICAL BEHAVIOR AND DAMAGE DEVELOPMENT IN DUCTILE-PHASE TOUGHENED TUNGSTEN COMPOSITES —Ba Nghiep Nguyen, Jing Wang, Charles H. Henager Jr., James V. Haag IV, Wahyu Setyawan (Pacific Northwest National Laboratory)	183
9.5	MOLECULAR DYNAMICS STUDY OF INTERPHASE BOUNDARIES IN W-Ni-Fe TUNGSTEN HEAVY ALLOYS —S. P. Edwards, N. Chen, W. Setyawan (Pacific Northwest National Laboratory)	194
10	IRRADIATION AND TESTING ANALYSIS, METHODS, EXPERIMENTS, AND SCHEDULES	
10.1	IAEA SMALL SPECIMEN TEST TECHNIQUE DEVELOPMENT: MASTER CURVE FRACTURE TOUGHNESS TESTING UPDATE AT ORNL —X. Chen, J. Reed, E. Mannes Schmidt, M. Sokolov (Oak Ridge National Laboratory)	200

TABLE OF CONTENTS

10.2	MATERIALS FOR FRONTIER US-JAPAN COLLABORATION —L. M. Garrison, Y. Katoh, J. R. Echols, J. W. Geringer, N. C. Reid, Hanns Gietl, Y. Yang (Oak Ridge National Laboratory), T. Hinoki (Kyoto University), N. Hashimoto (Hokkaido University), J. P. Allain (Pennsylvania State University), B. Cheng, L. L. Snead, J. R. Trelewicz (Stony Brook University), D. Dorow-Gerspach, V. Ganesh (Forschungszentrum Juelich GmbH), S. A. Humphry-Baker (Imperial College), E. Lang (University of Illinois, Urbana-Champaign), I. McCue (John Hopkins University), J. Riesch (Max-Planck-Institut für Plasmaphysik), G. D. W. Smith (Oxford University), S. J. Zinkle (University of Tennessee)	214
10.3	RECOIL SPECTRA IN W-Ni-Fe TUNGSTEN HEAVY ALLOYS —C. W. Trucks, G. Nandipati, W. Setyawan (Pacific Northwest National Laboratory)	215
10.4	MINIATURE MECHANICAL TEST DEVELOPMENT FOR TUNGSTEN-BASED MATERIALS —L. M. Garrison, N. C. Reid, J. R. Echols (Oak Ridge National Laboratory)	224
10.5	HFIR IRRADIATION EXPERIMENTS —C. On, J. W. Geringer, J. L. McDuffee (Oak Ridge National Laboratory)	228