

TABLE OF CONTENTS

1	FERRITIC/MARTENSITIC STEEL DEVELOPMENT	
1.1	DEVELOPMENT OF CASTABLE NANOSTRUCTURED ALLOYS AS ADVANCED RAFM STEELS —L. Tan, C.M. Parish (Oak Ridge National Laboratory)	1
1.2	IRRADIATION HARDENING BEHAVIOR OF F82H IN JP28 AND 29 —H. Sakasegawa, M. Ando, H. Tanigawa, T. Hirose (National Institutes for Quantum and Radiological Science and Technology, Japan), and X. Chen, J.W. Geringer, Y. Katoh (Oak Ridge National Laboratory)	3
1.3	EFFECTS OF HIGH DOSE NEUTRON IRRADIATION ON REDUCED-ACTIVATION FERRITIC/MARTENSITIC STEEL F82H —T. Hirose, H. Tanigawa, H. Sakasegawa, M. Ando (National Institutes for Quantum and Radiological Science and Technology, Japan), Y. Katoh, K.G. Field, B.K. Kim, D.T. Hoelzer, L. Tan, R.E. Stoller (Oak Ridge National Laboratory), and L.L. Snead (Stony Brook University)	8
1.4	FATIGUE PRECRACKING M4CVN TYPE STEEL SPECIMENS FOR THE EUROfusion PROJECT —X. Chen, R.L. Swain, E.T. Manneschmidt, K.D. Linton (Oak Ridge National Laboratory)	14
2	ODS AND NANOCOMPOSITED ALLOY DEVELOPMENT	
2.1	EFFECT OF DEFORMATION PROCESSING ON THE MICROSTRUCTURE AND TEXTURE OF 14YWT NFA-1 —S. Pal, M. E. Alam, G. R. Odette (University of California, Santa Barbara), S. A. Maloy (Los Alamos National Laboratory), D. T. Hoelzer (Oak Ridge National Laboratory), and J. J. Lewandowski (Case Western Reserve University)	28
2.2	ANNEALING TREATMENTS TO HEAL MICROCRACKS IN 14YWT NFA-1 AND THEIR EFFECTS ON MICROSTRUCTURAL AND MECHANICAL BEHAVIOR —M.E. Alam, S. Pal, D. Gragg, K. Fields, N. J. Cunningham, G. R. Odette (University of California, Santa Barbara), D. T. Hoelzer (Oak Ridge National Laboratory) and S. A. Maloy (Los Alamos National Laboratory)	45
2.3	APT AND TEM CHARACTERIZATION OF α-PHASE FORMATION IN NEUTRON IRRADIATED 14YW AND 14YWT ODS STEELS USING STEM AND 3D-APT —Karen Kruska, Danny Edwards, Richard J. Kurtz (Pacific Northwest National Laboratory)	61
3	CERAMIC COMPOSITE STRUCTURAL MATERIAL DEVELOPMENT	
3.1	LOW ACTIVATION JOINING OF SiC/SiC COMPOSITES FOR FUSION APPLICATIONS: A DUAL-PHASE MICROSTRUCTURAL APPROACH TO MODEL THERMAL AND IRRADIATION-INDUCED SWELLING EFFECTS ON INTEGRITY OF Ti_3SiC_2/SiC JOINTS —B.N. Nguyen, C.H. Henager, Jr., R.J. Kurtz; (Pacific Northwest National Laboratory)	73
3.2	IRRADIATION-INDUCED β TO α SiC TRANSFORMATION AT LOW TEMPERATURE —C.M. Parish, T. Koyanagi, Y. Katoh (Oak Ridge National Laboratory) and S. Kondo (Kyoto University)	79

TABLE OF CONTENTS

3.3	MICROSTRUCTURAL EVOLUTION OF NEUTRON IRRADIATED 3C-SiC—D.J. Sprouster, E. Dooryhee, S.K. Ghose, L.E. Ecker (Brookhaven National Laboratory) and Y. Katoh, T. Koyanagi (Oak Ridge National Laboratory)	80
3.4	EQUILIBRIUM SHAPES AND SURFACE SELECTION OF NANOSTRUCTURES IN 6H-SiC—S. Kondo (Kyoto University) and C.M. Parish, T. Koyanagi, Y. Katoh (Oak Ridge National Laboratory)	81
4	HIGH HEAT FLUX MATERIALS AND COMPONENT TESTING	
4.1	PROPERTIES AND CHARACTERIZATION OF NOVEL COPPER ALLOYS FOR FUSION ENERGY APPLICATIONS—Ying Yang (Oak Ridge National Laboratory), Ling Wang (University of Tennessee at Knoxville), Steven J. Zinkle (University of Tennessee at Knoxville and Oak Ridge National Lab), and Lance Snead (Stony Brook University)	82
4.2	FABRICATION OF ROLL BONDED FUNCTIONALLY GRADED TUNGSTEN-STEEL LAMINATE—L. M. Garrison, J. Mettler, J. Moon (Oak Ridge National Laboratory)	93
4.3	FABRICATION OF ULTRASONIC WELDED FUNCTIONALLY GRADED TUNGSTEN-STEEL LAMINATE—L. M. Garrison, D. Leonard (Oak Ridge National Laboratory) and M. Norfolk, J. Wenning (Fabrisonic LLC.)	102
4.4	4.4 TUNGSTEN/SiC AND TUNGSTEN/GRAPHITE JOINING—L.M. Garrison, Y. Katoh, E. Proehl, P. Menchhofer (Oak Ridge National Laboratory)	108
4.5	PREPARATION OF TUNGSTEN SURFACES FOR PLASMA-MATERIAL INTERACTION STUDIES—L.M. Garrison, M. Bannister, F. Meyer, D. Leonard (Oak Ridge National Laboratory)	109
4.6	MICROSTRUCTURE AND MECHANICAL PROPERTIES OF IRRADIATED PHENIX PROGRAM TUNGSTEN—L.M. Garrison, Y. Katoh, N. Reid, E. Proehl, (Oak Ridge National Laboratory) and M. Fukuda (Tohoku University)	112
4.7	CHARACTERIZATION OF SELF-ION IRRADIATED TUNGSTEN—Weilin Jiang, Danny Edwards, Giridhar Nandipati, Wahyu Setyawan, Charles H. Henager Jr., Richard J. Kurtz (Pacific Northwest National Laboratory) and Aaron French, Xuemei Wang, Lin Shao (Texas A&M University)	125
4.8	MORPHOLOGIES OF TUNGSTEN NANOTENDRILS GROWN UNDER HELIUM EXPOSURE—Amith Darbal, Robert Stroud (AppFive, Tempe, AZ), Kun Wang, F. W. Meyer, M. E. Bannister, Chad M. Parish (Oak Ridge National Laboratory), and R. P. Doerner, M. J. Baldwin (University of California-San Diego)	131
4.9	PRECIPITATION OF TRANSMUTANT ELEMENTS IN NEUTRON IRRADIATED TUNGSTEN—X. Hu, C. Parish, K. Wang, Y. Katoh (Oak Ridge National Laboratory)	132

TABLE OF CONTENTS

4.10	NEUTRON IRRADIATION EFFECTS IN TUNGSTEN—L.M. Garrison, Y. Katoh, M. McAlister, T. Koyanagi (Oak Ridge National Laboratory), L. L. Snead (Stony Brook University), T. S. Byun (Pacific Northwest National Laboratory), and T. Hwang, M. Fukuda (Tohoku University, Japan)	145
5	MAGNETIC AND DIAGNOSTIC SYSTEM MATERIALS <i>No contributions this reporting period.</i>	
6	FUSION CORROSION AND COMPATIBILITY SCIENCE <i>No contributions this reporting period.</i>	
7	MECHANISMS AND ANALYSIS	
7.1	VIEWPOINT: NANOSCALE CHEMISTRY AND CRYSTALLOGRAPHY ARE BOTH THE OBSTACLE AND PATHWAY TO ADVANCED RADIATION-TOLERANT MATERIALS—Chad M. Parish, Kun Wang, Philip D. Edmondson (Oak Ridge National Laboratory)	148
7.2	EXPLORATION OF THE RADIATION RESISTANCE OF HIGH ENTROPY ALLOYS—C. Li, S.J. Zinkle (University of Tennessee), and X. Hu, J. Qiu (Oak Ridge National Laboratory)	149
7.3	EFFECTS OF IRRADIATION AND ANNEALING ON THE MICROSTRUCTURE AND MECHANICAL PROPERTIES OF BULK METALLIC GLASS ALLOYS—L. Mora, Y. Zhang, H. Bei, J. Neufeind, W. Dmowski, T. Egami, S. J. Zinkle (Oak Ridge National Laboratory) and J. Brechtl, M. L. Crespiello, T. Yang, H. Wang, J. Salasin, I. Gussev, M. Lang (University of Tennessee)	158
7.4	MICROSTRUCTURE-BASED VISCOPLASTICITY MODEL OF TUNGSTEN IN PLASMA TRANSIENTS—David Rivera, Giacomo Po, Yue Haung, Nasr M. Ghoniem (University of California, Los Angeles)	179
7.5	CONTROLLING STRAIN BURSTS AND AVALANCHES AT THE NANO-TO-MICRO SCALE—Y.N. Cui, G. Po, N.M. Ghoniem (University of California, Los Angeles)	202
8	MODELING PROCESSES IN FUSION SYSTEM MATERIALS	
8.1	DEVELOPMENT OF INTERATOMIC POTENTIALS IN TUNGSTEN-RHENIUM SYSTEMS—W. Setyawan and R. J. Kurtz (Pacific Northwest National Laboratory), and N. Gao (Institute of Modern Physics, Chinese Academy of Science, China)	206
8.2	CONFIGURATIONAL MULTIPLICITY OF GRAIN BOUNDARY PHASES IN BCC METALS—Timofey Frolov, R. E. Rudd (Lawrence Livermore National Laboratory), W. Setyawan, R. J. Kurtz (Pacific Northwest National Laboratory), J. Marian (University of California Los Angeles), A. R. Oganov (Stony Brook University), and Q. Zhu (University of Nevada Las Vegas)	213
8.3	EFFECT OF SIA TRAPPING AND DETRAPMING ON DEFECT ACCUMULATION IN TUNGSTEN DUE TO RADIATION CORRESPONDING TO 14-MeV-NEUTRON AND HFIR PKA SPECTRA—Giridhar Nandipati, Wahyu Setyawan, Kenneth J. Roche, Richard J. Kurtz (Pacific Northwest National Laboratory), Brian D. Wirth (University of Tennessee)	214

TABLE OF CONTENTS

8.4	SIMULATING IRRADIATION HARDENING IN TUNGSTEN UNDER FAST NEUTRON IRRADIATION INCLUDING TRANSMUTATION RHENIUM PRODUCTION —Chen-Hsi Huang, Jaime Marian (Department of Materials Science and Engineering, University of California Los Angeles), and Mark R. Gilbert (Culham Science Centre, Abingdon, UK)	215
8.5	MODELING DUCTILE-PHASE TOUGHENED TUNGSTEN FOR PLASMA-FACING MATERIALS: PROGRESS IN DAMAGE FINITE ELEMENT ANALYSIS OF TUNGSTEN-COPPER BEND TESTS —B. N. Nguyen, C. H. Henager, Jr., R. J. Kurtz (Pacific Northwest National Laboratory)	232
9	FUSION SYSTEM DESIGN <i>No contributions this reporting period.</i>	
10	IRRADIATION METHODS, EXPERIMENTS AND SCHEDULES	
10.1	MINIATURE MECHANICAL TEST DEVELOPMENT FOR TUNGSTEN-BASED MATERIALS —L. M. Garrison, Emily Proehl, Frank Chen (Oak Ridge National Laboratory)	239
10.2	HFIR IRRADIATION EXPERIMENTS —J.P. Robertson (Oak Ridge National Laboratory)	241