

TABLE OF CONTENTS

1	FERRITIC/MARTENSITIC STEEL DEVELOPMENT	
1.1	PROGRESS ON CASTABLE NANOSTRUCTURED ALLOY DEVELOPMENT—L. Tan and Y. Yang (Oak Ridge National Laboratory)	1
1.2	POST-IRRADIATION EVALUATION OF THE IRRADIATION TEMPERATURE AND VICKERS MICROHARDNESS FOR EUROFUSION M4CVN BEND BAR SPECIMENS—X. Chen, A. Campbell, R. Howard, A. Bhattacharya, J.W. Geringer, Y. Katoh (Oak Ridge National Laboratory), T. Graening (Karlsruhe Institute of Technology)	3
1.3	CHARACTERIZATION OF HFIR IRRADIATED EUROFER97 STEEL VARIANTS FOR THE EUROFUSION PROGRAM—A. Bhattacharya, X. Chen, J.W. Geringer, Y. Katoh (Oak Ridge National Laboratory), T. Graening and M. Rieth (Karlsruhe Institute of Technology)	26
1.4	DESIGN OF 3Cr-3WV BAINITIC STEEL FOR CROSS-WELD PROPERTY IMPROVEMENT—Y. Yamamoto (Oak Ridge National Laboratory)	30
2	ODS AND NANOCOMPOSITED ALLOY DEVELOPMENT	
2.1	IRRADIATION DAMAGE EFFECTS IN 14YW AND 14YWT FERRITIC ODS ALLOYS STUDIED BY ATEM AND APT—Karen Kruska, Danny J. Edwards, Jing Wang, Richard Kurtz (Pacific Northwest National Laboratory), T. Yamamoto, Y. Wu and G.R. Odette (University of California-Santa Barbara)	35
3	CERAMIC COMPOSITE STRUCTURAL MATERIAL DEVELOPMENT	
3.1	MULTISCALE EXPERIMENTAL CHARACTERIZATION OF COATINGS ON CERAMICS: A CASE STUDY OF TUNGSTEN ON SiC—Huaxin Li (Hefei University of Technology), Takaaki Koyanagi, Xunxiang Hu, Yutai Katoh (Oak Ridge National Laboratory)	37
3.2	NANO-SCALE MICROSTRUCTURE DAMAGE BY NEUTRON IRRADIATIONS IN A NOVEL BORON-11 ENRICHED TiB₂ ULTRA-HIGH TEMPERATURE CERAMIC—A. Bhattacharya, C. M. Parish, T. Koyanagi, C. M. Petrie, Y. Katoh (Oak Ridge National Laboratory), D. King, G. Hilmas, W. G. Fahrenholtz (Missouri University of Science and Technology), S. J. Zinkle (University of Tennessee)	38
4	HIGH HEAT FLUX MATERIALS AND COMPONENT TESTING	
4.1	INFLUENCE OF SPECIMEN SIZE, DUCTILE PHASE PROPERTIES AND LARGE IMPURITY INCLUSIONS ON THE FRACTURE TOUGHNESS OF TUNGSTEN HEAVY METAL ALLOYS: WNiFe and WNiCu—M.E. Alam, G.R. Odette (University of California Santa Barbara)	39
4.2	IN SITU ANALYSIS OF DAMAGE EVOLUTION IN ULTRAFINE GRAINED TUNGSTEN CONTAINING TITANIUM CARBIDE DISPERSOIDS—W.S. Cunningham, J.R. Trelewicz (Stony Brook University), O. El-Atwani, E. Esquivel, B. P. Uberuaga, S.A. Maloy (Los Alamos National Laboratory), M. Li (Argonne National Laboratory)	52

TABLE OF CONTENTS

4.3	THERMAL AND MECHANICAL PROPERTIES OF TUNGSTEN IN THE PHENIX COLLABORATION IRRADIATION —L.M. Garrison, Hsin Wang, Y. Katoh, W. Geringer (Oak Ridge National Laboratory), Takeshi Miyazawa (Tohoku University, Japan), Masafumi Akiyoshi (Radiation Research Center, Japan)	56
5	MAGNETIC AND DIAGNOSTIC SYSTEM MATERIALS <i>No contributions this reporting period.</i>	
6	FUSION CORROSION AND COMPATIBILITY SCIENCE	
6.1	LIQUID METAL COMPATIBILITY IN STATIC Li, Sn AND Sn-Li —J. Jun and B. A. Pint (Oak Ridge National Laboratory)	60
7	MECHANISMS AND ANALYSIS	
7.1	MECHANICAL PROPERTIES AND RADIATION EFFECTS IN FUSION MATERIALS —Yury Osetskiy (Oak Ridge National Laboratory)	63
7.2	EQUILIBRIUM DISTRIBUTION OF POINT DEFECTS IN SYSTEMS WITH PRECIPITATES - Fe-Y-O AS A REPRESENTATIVE SYSTEM —G. D. Samolyuk, Y. N. Osetsky, (Oak Ridge National Laboratory, Oak Ridge, TN)	65
7.3	A COUPLED RATE THEORY-MONTE CARLO MODEL OF HELIUM BUBBLE EVOLUTION IN PLASMA-FACING MICRO-ENGINEERED TUNGSTEN —Edward Gao, Nasr M. Ghoniem (University of California, Los Angeles)	68
7.4	BUBBLE FORMATION IN HELIUM-IMPLANTED NANOSTRUCTURED 14YWT AND CNA FERRITIC ALLOYS AT ELEVATED TEMPERATURES —Yan-Ru Lin, Steven J. Zinkle (University of Tennessee, Knoxville) David T. Hoelzer, Lizhen Tan (Oak Ridge National Laboratory)	71
7.5	ALPHA-PRIME (α') PRECIPITATE FORMATION IN ION IRRADIATED Fe18Cr ALLOYS —Y. Zhao, S. Zinkle (University of Tennessee), A. Bhattacharya (Oak Ridge National Laboratory)	74
7.6	CAVITY DENUDED ZONE IN NEUTRON-IRRADIATED COPPER —Yan-Ru Lin and Steven J. Zinkle (University of Tennessee, Knoxville)	78
7.7	ADVANCED-STEM-BASED DEEP LEARNING FOR SEMANTIC SEGMENTATION OF DEFECTS IN STEELS —Yuanyuan Zhu (University of Connecticut), Graham Roberts, Rajat Sainju, Brian Hutchinson, Richard J. Kurtz, Mychailo B. Toloczko, Danny J. Edwards, and Charles H. Henager, Jr. (Pacific Northwest National Laboratory)	83
8	MODELING PROCESSES IN FUSION SYSTEM MATERIALS	
8.1	RFITML: REVERSE FITTING WITH MACHINE LEARNING FOR IMPROVING INTERATOMIC POTENTIALS —W. Setyawan and Charles H. Henager Jr. (Pacific Northwest National Laboratory)	85

TABLE OF CONTENTS

8.2	THREE-DIMENSIONAL MODELING OF THE EFFECTS OF HELIUM BUBBLES ON THE ROOM-TEMPERATURE STRESS-STRAIN BEHAVIOR OF AN IRON BICRYSTAL BY A MECHANISTIC FINITE ELEMENT APPROACH INFORMED BY MOLECULAR DYNAMICS DATA —B.N. Nguyen, R.J. Kurtz (Pacific Northwest National Laboratory)	97
8.3	DEVELOPMENT OF A CRYSTAL PLASTICITY BASED DEFORMATION PROCESSING MODEL FOR 14YWT NFA —S. Pal, M. E. Alam, I. J. Beyerlein, G. R. Odette (University of California, Santa Barbara)	103
8.4	MODELING DUCTILE-PHASE TOUGHENED TUNGSTEN FOR PLASMA-FACING MATERIALS BY A MULTISCALE MICROSTRUCTURAL APPROACH: EXPERIMENTAL VALIDATION OF THE NICKEL-IRON-TUNGSTEN TENSILE TEST ANALYSIS —B.N. Nguyen, C.H. Henager, Jr., R.J. Kurtz (Pacific Northwest National Laboratory)	120
9	FUSION SYSTEM DESIGN <i>No contributions this reporting period.</i>	
10	IRRADIATION METHODS, EXPERIMENTS AND SCHEDULES	
10.1	PROGRESS OF LIGHT-ION TRANSMISSION IRRADIATION IN TUNGSTEN FOILS —Weilin Jiang, Giridhar Nandipati, Wahyu Setyawan, Charles H. Henager Jr., Richard J. Kurtz (Pacific Northwest National Laboratory)	126
10.2	NEUTRON FLUENCE MEASUREMENTS AND RADIATION DAMAGE CALCULATIONS FOR THE MFE-RB-19J EXPERIMENT IN HFIR —L. R. Greenwood, B. D. Pierson, and T. Trang-Le (Pacific Northwest National Laboratory)	132
10.3	DESIGNS AND SPECIMEN MATRICES FOR RE-IRRADIATION OF ISHI SAMPLES IN HFIR RABBIT CAPSULE ALONG WITH NEUTRON-ION BOOTSTRAPPING EXPERIMENTS —T. Yamamoto, G.R. Odette, P.B. Wells (University of California, Santa Barbara), D.J. Edwards, K. Kruska, R.J. Kurtz (Pacific Northwest National Laboratory), S.J. Tumey (Lawrence Livermore National Laboratory)	139
10.4	HFIR IRRADIATION EXPERIMENTS —Y. Katoh, J.L. McDuffee, C. Bryan, J.P. Robertson (Oak Ridge National Laboratory)	148