

TABLE OF CONTENTS

| | | |
|------------|--|-----------|
| 1 | FERRITIC/MARTENSITIC STEEL DEVELOPMENT | |
| 1.1 | PROPERTY EVALUATION OF NEWLY PROPOSED PWHT-FREE BAINITIC STEELS—Y. Yamamoto, T. Graening Seibert (Oak Ridge National Laboratory) | 1 |
| 1.2 | INVESTIGATION OF HIGH TEMPERATURE HE EMBRITTLEMENT (HTE) EFFECTS IN Fe-9%Cr AND AUSTENITIC STAINLESS STEEL—Z. Qi, S. Zinkle (The University of Tennessee) | 5 |
| 1.3 | IRRADIATION EFFECT ON THE STABILITY OF MX PRECIPITATE IN FERRITIC MODEL ALLOYS—W. Zhong, Y. Yang (Oak Ridge National Laboratory), E. Proehl (University of Tennessee) | 13 |
| 1.4 | MICROSTRUCTURE EVOLUTION IN PROTON IRRADIATED ULTRA-HIGH PURITY Fe-Cr ALLOYS—S. Chen, S. Zinkle (The University of Tennessee) | 15 |
| 1.5 | MICROSTRUCTURE EVOLUTION IN BCC PURE Fe AT DIFFERENT TEMPERATURES AFTER ENERGETIC SELF-ION IRRADIATION—Y. Li, Z. Qi, S. Zinkle (University of Tennessee) | 21 |
| 2 | ODS AND NANOCOMPOSITED ALLOY DEVELOPMENT | |
| 2.1 | COLD SPRAY AND FRICTION STIR PROCESSING OF ODS ALLOYS ON A FERRITIC MARTENSITIC STEEL SUBSTRATE—D. Zhang, X. Wang, J. Darsell, K. Ross, L. Li, W. Setyawan (Pacific Northwest National Laboratory) | 26 |
| 2.2 | COST-EFFECTIVE THERMOMECHANICAL PROCESSING OF NANOSTRUC-TURED FERRITIC ALLOYS: MICROSTRUCTURE AND MECHANICAL PROPERTIES INVESTIGATION—Y. Lin, T.S. Byun (Oak Ridge National Laboratory) | 35 |
| 3 | CERAMIC COMPOSITE STRUCTURAL MATERIAL DEVELOPMENT | |
| 3.1 | EMERGING CONTINUOUS SiC FIBERS FOR HIGH-TEMPERATURE APPLICATIONS—H. Gietl (Idaho National Laboratory), O. Karakoc, S. Harrison (Free Form Fibers), T. Koyanagi, Y. Katoh (Oak Ridge National Laboratory) | 37 |
| 4 | PLASMA-FACING AND HIGH HEAT FLUX MATERIALS AND COMPONENT TESTING | |
| 4.1 | MICROSTRUCTURAL FEATURES IN DUCTILE-PHASE-TOUGHENED TUNGSTEN IRRADIATED INDIVIDUALLY WITH Ni²⁺ AND He⁺ IONS AT 1,000°C—W. Jiang, J. V. Haag IV, L. Kovarik, B. Matthews, W. Setyawan (Pacific Northwest National Laboratory), D. Chen (University of Houston) | 38 |
| 4.2 | SIMULTANEOUS EXPOSURE OF FUSION MATERIALS TO NEUTRON IRRADIATION AND HYDROGEN ENVIRONMENT—W. Zhong, T. Koyanagi, Y. Katoh (Oak Ridge National Laboratory), Y. Hatano (University of Toyama) | 42 |

TABLE OF CONTENTS

| | | |
|------------|---|-----------|
| 4.3 | ANNEALING AND ELEVATED TEMPERATURE TENSILE STUDIES ON W/NiFe DUCTILE-PHASE TOUGHENED W COMPOSITES—R. Prabhakaran, W. Setyawan (Pacific Northwest National Laboratory) | 44 |
| 4.4 | MECHANICAL RESPONSES OF TUNGSTEN IN A DUCTILE-PHASE-TOUGHENED TUNGSTEN HEAVY ALLOY TO ION IRRADIATION SIMULATING FUSION REACTOR ENVIRONMENTS—A. Garcia-Caraveo, S. Doran, T. Rohwer, T. Chen (Oregon State University), L. Shao (Texas A&M University), W. Jiang, J. V. Haag IV, R. Prabhakaran, W. Setyawan (Pacific Northwest National Laboratory) | 58 |
| 4.5 | SECONDARY ION MASS SPECTROMETRY ANALYSIS OF SINGLE CRYSTAL AND IRRADIATED TUNGSTEN SAMPLES—G. Parker (University of Illinois Chicago), T. Misicko (Louisiana Tech University), X-Y. Yu (Oak Ridge National Laboratory) | 69 |
| 4.6 | QUANTITATIVE ASSESSMENT OF Ni⁺ AND He⁺ ION IRRADIATION DAMAGE IN A TUNGSTEN HEAVY ALLOY UNDER THE SIMULATED NUCLEAR FUSION ENVIRONMENT—J. V. Haag IV, B. Matthews, M. Olszta, W. Jiang, D. Edwards, Y. Fu, W. Setyawan (Pacific Northwest National Laboratory) | 72 |
| 4.7 | FLASH POLISHING TECHNIQUES ON TUNGSTEN FOR TRANSMISSION ELECTRON MICROSCOPY OBSERVATION—W. Zhong, Y. Lin, S. Calzada (Oak Ridge National Laboratory) | 75 |
| 5.0 | HYDROGEN AND HELIUM EFFECTS | |
| | <i>No contributions this reporting period.</i> | |
| 6.0 | FUSION CORROSION AND COMPATIBILITY SCIENCE | |
| 6.1 | COMPATIBILITY of WELDED CNA in EUTECTIC PbLi and DEVELOPMENT SLURRY ALUMINIDE COATINGS on FERRITIC and AUSTENITIC STEELS—M. Romedenne, C. De Lamater-Brotherton, W. Tang, B. Armstrong, Y. Zhang, B. Pint (Oak Ridge National Laboratory) | 77 |
| 7.0 | ADVANCED MANUFACTURING | |
| | <i>No contributions this reporting period.</i> | |
| 8.0 | MECHANISMS AND ANALYSIS | |
| 8.1 | DETERMINATION OF FLUORINE DISTRIBUTION IN CrFe ALLOY—G. Parker (University of Illinois Chicago), Y. Li, S. Zinkle (University of Tennessee), Oak Ridge National Laboratory, X-Y. Yu (Oak Ridge National Laboratory) | 83 |
| 8.2 | THE ROLE OF STACKING FAULT TETRAHEDRA ON VOID SWELLING IN IRRADIATED COPPER—Y. Lin, M. Zachman, (Oak Ridge National Laboratory), S. Zinkle, Z. Yu, H. Xu (University of Tennessee) | 86 |

TABLE OF CONTENTS

| | | |
|-------------|---|------------|
| 9.0 | MODELING AND COMPUTATIONAL STUDIES | |
| 9.1 | MECHANISMS OF MOBILITY OF GRAIN BOUNDARIES IN TUNGSTEN—R. Moore (Lehigh University), T. Frolov, R. Rudd (Lawrence Livermore National Laboratory) | 88 |
| 9.2 | PROGRESS IN PREDICTIVE MODELING OF HE BUBBLE ACCUMULATION IN NANOSTRUCTURED FERRITIC ALLOYS—K. Pitike, J. Spencer, W. Setyawan (Pacific Northwest National Laboratory) | 94 |
| 9.3 | FIRST PRINCIPLES STUDY OF BULK AND RADIATION INDUCED DEFECTS PROPERTIES OF TiB₂—Y. Osetskiy, G. Samolyuk (Oak Ridge National Laboratory) | 101 |
| 9.4 | PROGRESS IN PREDICTIVE MODELING OF HE BUBBLE ACCUMULATION IN NANOSTRUCTURED FERRITIC ALLOYS—K. Pitike, J. Spencer, W. Setyawan (Pacific Northwest National Laboratory) | 105 |
| 10 | FUSION SYSTEM DESIGN | |
| | <i>No contributions this reporting period.</i> | |
| 11 | IRRADIATION & TESTING METHODS, EXPERIMENTS AND SCHEDULES | |
| 11.1 | SPECIMEN SIZE AND GEOMETRY EFFECTS ON THE MASTER CURVE FRACTURE TOUGHNESS MEASUREMENT OF EUROFER97 AND F82H STEELS—X. Chen, M. Sokolov, Y. Katoh (Oak Ridge National Laboratory), John Echols (U.S. Department of Energy) | 112 |
| 11.2 | IRRADIATION OF JK2LB ALLOYS FOR ADDITIVE MANUFACTURING OF FUSION COMPONENTS FOR THE INFUSE PROJECT WITH TYPE ONE ENERGY—N. Russell, X. Chen, W. Zhong, Y. Yang (Oak Ridge National Laboratory), B. Goh (Type One Energy), L. Chen (University of Wisconsin, Madison) | 115 |