

INDEX OF NERI PROJECTS

FY 1999 Projects

99-010	Effects of Water Radiolysis in Water Cooled Nuclear Reactors . . . . .	.225
99-018	Application of Innovative Experimental and Numerical Techniques for the Assessment of Reactor Pressure Vessel Structural Integrity . . . . .	.15
99-027	The Secure Transportable Autonomous Light Water Reactor--STAR-LW . . . . .	.19
99-039	Measurements of the Physics Characteristics of Lead-Cooled Fast Reactors and Accelerator Driven Systems . . . . .	.111
99-043	Monitoring and Control Technologies for the Secure, Transportable, Autonomous Reactor (STAR) . . . . .	.23
99-058	Risk Informed Assessment of Regulatory and Design Requirements for Future Nuclear Power Plants . . . . .	.27
99-064	Demand-Driven Nuclear Energizer Module . . . . .	.29
99-072	Mapping Flow Localization Processes in Deformation of Irradiated Reactor Structural Alloys . . . . .	.233
99-074	Development of Improved Burnable Poisons for Commercial Nuclear Power Reactors . . . . .	.151
99-077	The Development of Advanced Technologies to Reduce Design, Fabrication, & Construction Costs for Future Nuclear Plants . . . . .	.33
99-094	Innovative Chemithermal Techniques for Verifying Hydrocarbon Integrity in Nuclear Safety Materials . . . . .	.37
99-095	Fuel for a Once-Through Cycle (Th,U)O ₂ in a Metal Matrix . . . . .	.155
99-097	Modular and Full Size Simplified Boiling Water Reactor Design with Fully Passive Safety Systems . . . . .	.39
99-101	A Novel Approach to Materials Development for Advanced Reactor Systems . . . . .	.237
99-119	A New Paradigm for Automatic Development of Highly Reliable Control Architectures for Future Nuclear Plants . . . . .	.41
99-126	Monitoring the Durability Performance of Concrete in Nuclear Waste Containment . . . . .	.203
99-127	Chemical Speciation of Neptunium in Spent Fuel . . . . .	.207
99-128	Fundamental Mechanisms of Corrosion of Advanced Zirconium Based Alloys at High Burn-Up . . . . .	.159
99-129	Multi-Application Small LWR . . . . .	.45
99-134	Complete Numerical Simulation of Subcooled Flow Boiling in the Presence of Thermal and Chemical Interactions . . . . .	.239
99-153	Advanced Proliferation Resistant, Lower Cost, Uranium-Thorium Dioxide Fuels for Light Water Reactors . . . . .	.161
99-154	STAR: The Secure Transportable Autonomous Reactor System, Encapsulated Fission Heat-Source . . . . .	.49
99-155	Developing Improved Rx Structural Materials Using Proton Irradiation a Rapid Analysis Tool . . . . .	.241
99-164	A Proliferation Resistant Hexagonal Tight Lattice BWR Fuel Core Design for Increased Burnup and Reduced Fuel Storage Requirements . . . . .	.165
99-168	On-Line Intelligent Self-Diagnostic Monitoring for Next Generation Nuclear Power Plants . . . . .	.53
99-188	Nuclear Process Heat for the Clean and Efficient Utilization of the Fossil Resource . . . . .	.57
99-197	Development of a Stabilized Light Water Reactor (LWR) Fuel Matrix for Extended Burnup . . . . .	.169
99-198	Novel, Integrated Reactor/Power Conversion System . . . . .	.59
99-199	Direct Energy Conversion Fission Reactor . . . . .	.63
99-200	Experimental Investigation of Burn-up Credit for Safe Transport, Storage, and Disposal of Spent Nuclear Fuel . . . . .	.211
99-202	An Investigation of the Mechanism of IGA/SCC of Alloy 600 in Corrosion Accelerating Heated Crevice Environments . . . . .	.243
99-217	Deterministic Prediction of Corrosion Damage in High Level Nuclear Waste . . . . .	.215
99-219	A Single Material Approach to Reducing Nuclear Waste Volume . . . . .	.219
99-224	Continuous Fiber Ceramic Composite Cladding for Commercial Water Reactor Fuel . . . . .	.173
99-228	Novel Investigation of Iron Cross Sections via Spherical Shell Transmission Measurements and Particle Transport Calculations for Material Embrittlement Studies . . . . .	.65
99-229	An Innovative Ceramic Corrosion Protection System for Zircaloy Cladding . . . . .	.175
99-233	Interfacial Transport Phenomena and Stability in Molten Metal-Water Systems . . . . .	.247

99-238	High Efficiency Generation of Hydrogen Fuels Using Nuclear Power . . . . .	.69
99-254	Fundamental Thermal Fluid Physics of High Temperature Flows in Advanced Reactor Systems . . . . .	.249
99-269	An Innovative Reactor Analysis Methodology Based on a Quasidiffusion Nodal CoreModel . . . . .	.251
99-276	Radiation-Induced Chemistry in High Temperature and Pressure Water and Its Role in Corrosion . . . . .	.253
99-280	Novel Concepts for Damage-Resistant Alloy in Next Generation Nuclear Power Systems . . . . .	.257
99-281	Advanced Ceramic Composites for High-Temperature Fission Reactors . . . . .	.259
99-306	"Smart" Equipment and Systems to Improve Reliability and Safety in Future Nuclear Plant Operations . . .	.73
99-308	Continuous-Wave Radar to Detect Defects within Heat Exchanger & Steam Generator Tubes . . . . .	.77

FY 2000 Projects

00-023	Study of Cost Effective Large Advanced Pressurized Water Reactor that Employs Passive Safety Features . . . . .	.79
00-047	Design & Layout Concepts for Compact, Factory-Produced, Transportable, Generation IV Reactor Systems . . . . .	.81
00-060	Integrated Nuclear and Hydrogen-Based Energy Supply/Carrier System . . . . .	.85
00-062	Development of Design Criteria for Fluid Induced Structural Vibration in Steam Generators and Heat Exchangers . . . . .	.87
00-069	An In-Core Power Deposition and Fuel Thermal Environmental Monitor for Long-Lived Reactor Cores . . .	.91
00-100	Design and Construction of a Prototype Advanced On-Line Fuel Burn-Up Monitoring System for the Modular Pebble Bed Reactor . . . . .	.95
00-105	Balance of Plant System Analysis and Component Design of Turbo-Machinery for High-Temperature Gas Reactor Systems . . . . .	.99
00-109	Forewarning of Failure in Critical Equipment at Next-Generation Nuclear Power Plants . . . . .	.103
00-123	Isomer Research: Energy Release Validation, Production and Applications . . . . .	.263
00-014	Optimization of Heterogeneous Schemes for the Utilization of Thorium in PWRs to Enhance Proliferation Resistance and Reduce Waste . . . . .	.179

FY 2001 Projects

01-001	Feasibility Study of Supercritical Light Water Cooled Fast Reactors for Actinide Burning and Electric Power Production . . . . .	.105
01-005	High Performance Fuel Design for Next Generation PWRs . . . . .	.183
01-022	Particle-Bed Gas-Cooled Fast Reactor (PB-GCFR) Design . . . . .	.107
01-039	Miniature, Scintillation-Based, In-Core, Self-Powered Flux and Temperature Probe for HTGRs . . . . .	.111
01-069	Generation IV Nuclear Energy System Construction Cost Reductions Through the Use of Virtual Environments . . . . .	.113
01-076	On-Line NDE for Advanced Reactor Designs . . . . .	.115
01-084	Random Grain Boundary Network Connectivity as a Predictive Tool for Intergranular Stress-Corrosion Cracking . . . . .	.267
01-091	Supercritical Water Nuclear Steam Supply System: Innovations in Materials, Neutronics, and Thermal-Hydraulics . . . . .	.119
01-094	Testing of Passive Safety System Performance for Higher Power Advanced Reactors . . . . .	.123
01-124	Reactor Physics and Criticality Benchmark Evaluations for Advanced Nuclear Fuel . . . . .	.273
01-130	Fundamental Understanding of Crack Growth in Structural Components of Generation-IV Supercritical Light Water Reactors . . . . .	.227
01-137	New Design Equations for Swelling and Irradiation Creep in Generation IV Reactors . . . . .	.281
01-140	Development and Validation of Temperature Dependent Thermal Neutron Scattering Laws for Applications and Safety Implications in Generation IV Nuclear Reactor Designs . . . . .	.285

FY 2002 Projects

02-005	Engineering and Physics Optimization of Breed and Burn Fast Reactor Systems . . . . .	.125
02-018	Evaluation of Integral Pressurizers for Generation IV PWR Concepts . . . . .	.127
02-030	Nuclear-Energy-Assisted Plasma Technology for Producing Hydrogen . . . . .	.129
02-042	Oxidation of Zircaloy Fuel Cladding in Water-Cooled Nuclear Reactors . . . . .	.289
02-044	Incorporation of Integral Fuel Burnable Absorbers Boron and Gadolinium into Zirconium-Alloy Fuel Clad Material . . . . .	.293
02-060	Neutron and Beta/Gamma Radiolysis of Supercritical Water . . . . .	.295
02-065	Coupling of High Temperature Lead-Cooled, Closed Fuel Cycle Fast Reactors to Advanced Energy Converters . . . . .	.131
02-068	Experimental Verification of Magnetic Insulation of Direct Energy Conversion Fission Reactors . . . . .	.133
02-075	Innovative Approach to Establish Root Causes for Cracking in Aggressive Reactor Environments . . . . .	.297
02-081	An Innovative Transport Theory Method for Efficient Design, Analysis and Monitoring of Generation IV Reactor Cores . . . . .	.187
02-098	Advanced Extraction Methods for Actinide/Lanthanide Separations . . . . .	.189
02-103	Innovative Low-Cost Approaches to Automating QA/QC of Fuel Particle Production Using On-Line Nondestructive Methods for Higher Reliability . . . . .	.135
02-110	Design of Radiation-Tolerant Structural Alloys for Generation IV Nuclear Energy Systems . . . . .	.299
02-113	Model Based Transient Control and Component Degradation Monitoring in Generation IV Nuclear Power Plants . . . . .	.137
02-131	Improving the Integrity of Coated Fuel Particles: Measurement of Constituent Properties of SiC and ZrC, Effects of Irradiation, and Modeling . . . . .	.191
02-146	Enhanced Control of PWR Primary Coolant Water Chemistry Using Selective Separation Systems for Recovery and Recycle of Enriched Boric Acid . . . . .	.301
02-160	Centralized Hydrogen Production from Nuclear Power: Infrastructure Analysis and Test-Case Design Study . . . . .	.139
02-174	Near-Core and In-Core Neutron Radiation Monitors for Real Time Neutron Flux Monitoring and Reactor Power Level Measurements . . . . .	.141
02-180	Enhanced Thermal Conductivity Oxide Fuels . . . . .	.193
02-189	Use of Solid Hydride Fuel for Improved Long-Life LWR Core Designs . . . . .	.195
02-190	Development of a Supercritical Carbon Dioxide Brayton Cycle: Improving PBR Efficiency and Testing Material Compatibility . . . . .	.143
02-195	Development of Advanced Methods for Pebble-Bed Reactor Neutronics: Design, Analysis and Fuel Cycle Optimization . . . . .	.197
02-196	Hydrogen Production Plant Using the Modular Helium Reactor . . . . .	.145
02-207	Nuclear Reactor Power Monitoring Using Silicon Carbide Semiconductor Radiation Detectors . . . . .	.147