POSTER SESSION

Program	Number	Organization	PI	Title	Agreement #
MATERIALS	MAT-1	General Electric Company	Shenyan Huang	Low-Cost Hip Fabrication of Advanced Power Cycle Components and PM/Wrought in740h Weld Development	FE0031818
	MAT-2	Idaho National Laboratory	Thomas Lillo	Multi-pass Hybrid Laser Arc Welding of Alloy 740H	FWP-B100-19010
	MAT-3	Oak Ridge National Laboratory	Bruce Pint	Materials Qualification and Deployment for High Efficiency Coal Fired Boilers	FWP-FEAA117
	MAT-4	Siemens Corporation	Sudhir Rajagopalan	Welding of Haynes 282 to Steels to Enable Modular Rotors for Advanced Ultra Super-Critical Steam Turbines	FE0031824
	MAT-5	Tennessee Technological University	Ying Zhang	Development of Corrosion- and Erosion-Resistant Coatings for Advanced Ultra-Supercritical Materials	FE0031820
	MAT-6	United Technologies Research Center	Alexander Staroselsk	Optimization of Wire Arc Additive Manufacturing (WAAM) Process to Produce Advanced Ultra-Supercritical Components (AUSC) Components with Increased Service Life	FE0031821
	MAT-7	West Virginia University	Xingbo Liu	Additively Manufactured Graded Composite Transition Joints for Dissimilar Metal Weldments in Ultra-Supercritical Power Plant	FE0031819
	MAT-8	Oak Ridge National Laboratory	Peeyush Nandwana	Development of Functionally Graded Transition Joints to Enable Dissimilar Metal Welds	FWP-FEAA151
	MAT-9	Oak Ridge National Laboratory	Kashif Nawaz	High-Temperature/High-Pressure Heat Exchanger for Natural Gas-Based Modular Power Generation	TCF-19-17765
	MAT-10	University of North Dakota Energy and Environmental Research Center	Gautham Krishnamoorthy	An Integrated Approach to Predicting Ash Deposition and Heat Transfer in Coal-Fired Boilers	FE0031741
	MAT-11	Electric Power Research Institute, Inc.	Tom Sambor	Advanced Thermal-Hydraulic Model of Heat Recovery Steam Generator	HPC4Materials
	MAT-12	Florida International University	Zhe Cheng	Novel High Temperature Carbide and Boride Ceramics for Direct Power Extraction Electrode Applications	FE0026325
	MAT-13	National Energy Technology Laboratory	Madison Wenzlick	eXtremeMAT: Data Assessment Method to Support the Development of Creep-Resistant Alloys	
	MAT-14	Pacific Northwest National Laboratory	Osman Mamun	eXtremeMAT: Data Analysis for Predicting the Performance of Creep Resistant Alloys	
	MAT-15	Los Alamos National Laboratory	Laurent Capolungo	eXtremeMAT: Reduced Order Model for Predicting Creep Performance	
	MAT-16	National Energy Technology Laboratory	David Alman	eXtremeMAT: Overview National Laboratory Collaboration Accelerating the Development of Extreme Environment Materials for Fossil Energy Applications	
	MAT-17	National Energy Technology Laboratory	Michael Gao	NETL-RIC: Applying Machine Learning to Microstructure Optimization	
SENSORS & CONTROLS	SC-1	Clemson University	Hai Xiao	Additive Manufacturing of Circumferentially Embedded Optical Sensor Modules for In Situ Monitoring of Coal-Fueled Steam Turbines	FE0031826
	SC-2	National Energy Technology Laboratory	Jeff Wuenschell	Advanced Sensors and Controls - Experimental Development of Functional Materials for Sensing	FWP-1022433
	SC-3	Siemens Corporation	Anand Kulkarni	Embedded Sensors Integrated into Critical Components for In Situ Health Monitoring of Steam Turbines	FE0031832
	SC-4	West Virginia University	Edward Sabolsky	Advanced Manufacturing of Ceramic Anchors with Embedded Sensors for Process and Health Monitoring of Coal Boilers	FE0031825
	SC-5	National Energy Technology Laboratory	Ting Jia	Advanced Sensors and Controls - Modeling of Functional Materials for Sensing	FWP-1022427
	SC-6	University of Pittsburgh	Peng Chen	Engineering Metal Oxide Nanomaterials for Fiber Optical Sensor Platforms	FE0028992
	SC-7	Georgia Tech Research Corporation	Yuanzhi Tang	Elucidating Arsenic and Selenium Speciation in Coal Fly Ashes	FE0031739
	SC-8	Duke University	Heileen Hsu-Kim	Characterization of Arsenic and Selenium in Coal Fly Ash to Improve Evaluations for Disposal and Reuse Potential	FE0031748
	SC-9	Florida International University	Leonel Lagos	Secure Data Logging and Processing with Blockchain and Machine Learning	FE0031745
	SC-10	Old Dominion University	Sachin Shetty	Blockchain Empowered Provenance Framework for Sensor Identity Management and Data Flow Security in Fossil-Based Power Plants	FE0031744
	SC-11	University of North Dakota Energy and Environmental Research Center	Jun Liu	Incorporating Blockchain/P2P Technology into an SDN-Enabled Cybersecurity System to Safeguard Fossil Fuel Power Generation Systems	FE0031742
	SC-12	Carnegie Mellon University	Rahul Panat	A Novel Access Control Blockchain Paradigm to Realize a Cybersecure Sensor Infrastructure in Fossil Power Generation Systems	FE0031770
	SC-13	National Energy Technology Laboratory	Farida Harun	Advanced Sensors and Controls - Agent-Based Controls Applied to FE application	FWP-1022434
	SC-14	National Energy Technology Laboratory	Eric Liese	Development of Control Strategies for Dynamic Control of a 10 MW Supersritical CO2 Power System	FWP-1022430
	SC-15	Georgia Tech Research Corporation	Comas Haynes	Expedited Real Time Processing for the NETL Hyper Cyber-Physical System	FE0030600

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SIMULATION-BASED ENGINEERING	SBE-1	General Electric Company	Monica Soare	Damage Accumulations Predictions for Boiler Components Via Macrostructurally Informed Material Models	FE0031823
	SBE-2	University of North Dakota Energy and Environmental Research Center	Guatham Krishnamoorthy	An Integrated Approach to Predicting Ash Deposition and Heat Transfer in Coal-Fired Boilers	FE0031741
	SBE-3	North Carolina A&T State University	Ahmed Megri	Alloy for Enhancement of Operational Flexibility of Power Plants	FE0031747
	SBE-4	National Energy Technology Laboratory	David Miller	IDAES - Institute for the Design of Advanced Energy Systems	FWP-1022423
	SBE-5	Siemens Corporation	Anand Kulkarni	Component Level Modeling of Materials Degradation for Insights into Operational Flexibility of Existing Coal Power Plants	FE0031831
	SBE-6	University of California - Riverside	Bryan Wong	Probing Particle Impingement in Boilers and Steam Turbines Using High-Performance Computing with Parallel and Graphical Processing Units	FE0031746
	SBE-7	Southern Research Institute	Mark Patterson	Life Modelling of Critical Steam Cycle Components in Coal-Fueled Power Plants	FE0031811
	SBE-8	National Energy Technology Laboratory	Dirk VanEssendelft	Machine Learning for MFIX	
	SBE-9	National Energy Technology Laboratory	Subhodeep Banerjee	MFiX application to Circulating Fluid Bed Boiler	
TRANSFORMATIONAL POWER GENERATION	TPG-1	8 Rivers Capital, LLC	Adam Goff	Coal-Based Power Plants of the Future	89243319CFE000015
	TPG-2	Allegheny Science & Technology Corporation	Jesse Goellner	Coal-Based Power Plants of the Future	89243319CFE000016
	TPG-3	Barr Engineering	Chad Haugen	Coal-Based Power Plants of the Future	89243319CFE000017
	TPG-4	Consol Pennsylvania Coal Company, LLC	Daniel Connell	Coal-Based Power Plants of the Future	89243319CFE000020
	TPG-5	Echogen Power Systems, LLC	Timothy Held	Coal-Based Power Plants of the Future	89243319CFE000022
	TPG-6	Electric Power Research Institute, Inc.	Horst Hack	Coal-Based Power Plants of the Future	89243319CFE000023
	TPG-7	Nexant, Inc.	John Gulen	Coal-Based Power Plants of the Future	89243319CFE000025
	TPG-8	Reaction Engineering International	Hong-Shig Shim	Development of Miniaturized High-Temperature Multi-Process Monitoring System	FE0031682
	TPG-9	Siemens Corporation	Anand Kulkarni	Environmental Validation of Materials and Design Concepts to Enable Operational Flexibility of Existing Coal Power Plants	FE0031749
	TPG-10	Microbeam Technologies, Inc.	Shuchita Patwardhan	Demonstration of Multi-Gamma Based Sensor Technology for As-Fired Coal Property Measurement	FE0031750
	TPG-11	University of Utah	Kody Powell	Deployment of Dynamic Neural Network Optimization to Minimize Heat Rate During Ramping for Coal	FE0031754
	TPG-12	Lehigh University	Sudhakar Neti	Flexible Coal Power Plant Operation with Thermal Energy Storage Utilizing Thermosiphons and Cementitious Materials	FE0031755
	TPG-13	Barr Engineering	Nicole Nguyen	Mitigation of Aerosol Impacts on Ash Deposition and Emissions from Coal Combustion	FE0031756
	TPG-14	University of Kentucky	Dimitrios Koumoulis	Ash Fouling Free Regenerative Air Preheater for Deep Cyclic Operation	FE0031757
	TPG-15	Electric Power Research Institute, Inc.	Scott Hume	Concrete Thermal Energy Storage Enabling Flexible Operation Without Coal Plant Cycling	FE0031761
	TPG-16	Electric Power Research Institute, Inc.	Andy Howell	Investigation of Technologies to Improve Condenser Heat Transfer and Performance in a Relevant Coal-Fired Power Plant	FE0031762
	TPG-17	Research Triangle Institute	Zachary Hendren	Anti-Biofouling Surface Treatments for Improved Condenser Performance for Coal-Based Power Plants	FE0031764
	TPG-18	Clemson University	Hai Xiao	Test and Validate Distributed Coaxial Cable Sensors for In Situ Condition Monitoring of Coal-Fired Boiler Tubes	FE0031765
	TPG-19	GE Steam Power, Inc.	Ray Chamberland	Plasma Ignition and Combustion Stabilization Technology to Improve Flexible Operation, Reliability and Economics of an Existing Coal Fired Boiler	FE0031766
	TPG-20	General Electric Company	Mustafa Dokucu	Transient Efficiency Flexibility and Reliability Optimization of Coal Fired Power Plants	FE0031767
	TPG-21	Applied Thermal Coatings, Inc.	Jeff Henry	Elimination of Steam Side Scaling on Grade 91 Steel: Improving Efficiency, Reliability, & Flexibility of Existing Fossil Fired Power Plants	FE0031769
	TPG-22	Combustion Research and Flow Technology, Inc.	William Calhoon	Combustion Modeling for Direct Fired Supercritical CO2 Power Cycles	SC0017235
	TPG-23	TDA Research, Inc.	Fei Yi	Direct Combustion of Fine Coal from Coal Waste	SC0018502
	TPG-24	Argonne National Laboratory	Sreenath Gupta	Advanced Ignition System for Enhanced Ignition Stability and Combustion Efficiency	TCF-19-17594

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WATER TECHNOLOGIES	WAT-1	Gas Technology Institute	Yaroslav Chudnovsky	Enhanced Cooling Tower Technology for Power Plant Efficiency Increase and Operating Flexibility	FE0031833
	WAT-2	Infinite Cooling, Inc.	Karim Khalil	Water Recovery from Cooling Tower Plumes	FE0031828
	WAT-3	Oak Ridge National Laboratory	Kashif Nawaz	Enhanced Steam Condenser for Power Generation Applications	TCF-19-17770
	WAT-4	University of North Dakota Energy and Environmental Research Center	Christopher Martin	Wastewater Recycling Using a Hygroscopic Cooling System	FE0031810
	WAT-5	West Virginia University Research Corporation	Golnoosh Khajouei (Student Researcher)	Produced Water and Waste Heat-Aided Blowdown Water Treatment: Using Chemical and Energy Synergisms for Value Creation	FE0031740
RARE EARTH ELEMENTS - CRITICAL MINERALS	REE-1	University of Kentucky	Rick Honaker	Low Temperature Plasma Treatment for Enhanced Recovery of Highly Valued Critical Rare Earth Elements from Coal-Based Resources	FE0031525
	REE-2	University of Utah	Michael Free	Economic Extraction, Recovery, and Upgrading of Rare Earth Elements from Coal-Based Resources	FE0031526
	REE-3	Battelle Memorial Institute	Darwin Argumedo	Recovery of High Purity Rare Earth Elements (REEs) from Coal Ash via a Novel Electrowinning Process	FE0031529
	REE-4	University of North Dakota Energy and Environmental Research Center	Bruce Folkendahl	Economic Extraction and Recovery of REEs and Production of Clean Value-Added Products from Low-Rank Coal Fly Ash	FE0031490
	REE-5	Virginia Polytechnic Institute and State University	Aaron Noble	Development of a Cost-Effective Extraction Process for the Recovery of Heavy and Critical Rare Earth Elements from the Clays and Shales Associated with Coal	FE0031523
	REE-6	Research Triangle Institute	Zachary Hendren	Low-Cost Rare-Earth-Element (REE) Recovery from Acid Mine Drainage Sludge	FE0031483
	REE-7	Wayne State University	Timothy Dittrich	Coupled Hydrothermal Extraction and Ligand-Associated Swellable Glass Media Recovery of Rare Earth Elements from Coal Fly Ash	FE0031565
	REE-8	Ohio State University	Chin-Min Cheng	Concentrating Rare Earth Elements in Acid Mine Drainage Using Coal Combustion Products through Abandoned Mine Land Reclamation	FE0031566
	REE-9	West Virginia University	Paul Ziemkiewicz	At-Source Recovery of Rare Earth Elements from Coal Mine Drainage	FE0031524
	REE-10	National Energy Technology Laboratory (Leidos)	Brian Kail	REE Extraction and Enrichment from Coal Mine Drainage using Basic Immobilized Amine Sorbents (BIAS)	NETL FWP EY19
	REE-11	National Energy Technology Laboratory	Dustin McIntyre	Portable, Laser Induced Breakdown (LIBS) Spectroscopy for Real-Time REE Detection	NETL FWP EY19
	REE-12	National Energy Technology Laboratory	Scott Crawford	Real-Time Fiber Optic Sensors for REE Detection	NETL FWP EY19
	REE-13	National Energy Technology Laboratory	Jinichiro Nakano	Thermal Concentration of Rare Earth Elements from Coal-By Products	NETL FWP EY19
	REE-14	National Energy Technology Laboratory	Christina Lopano	REE Recovery from Powder River Basin Coal Ash using Staged Leaching with Mild Acids	NETL FWP EY19
	REE-15	University of North Dakota Energy and Environmental Research Center	Nolan Theaker	Investigation of Rare Earth Element Extraction from North Dakota Coal-Related Feedstocks	FE0027006
GASIFICATION SY	GAS-1	University of South Carolina	Xingjian (Chris) Xue	Modularization of Ceramic Hollow Fiber Membrane Technology for Air Separation	FE0031473
	GAS-2	TDA Research, Inc.	Gokhan Alptekin	Warm Gas Multi-Contaminant Removal System	SC0008243
	GAS-3	National Energy Technology Laboratory	Justin Weber	Flexible Modular Vortex Gasifier for Deployable Power	ARS FWP

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ADVANCED COAL PROCESSING	ACP-1	H Quest Vanguard, Inc.	George Skoptsov	Efficient Ultra-Rapid Microwave Plasma Process for Generation of High Value Industrial Carbons and 3D Printable Composites from Domestic Coal	FE0031793
	ACP-2	Rice University	James Tour	Conversion of Domestic US Coal into Exceedingly High-Quality Graphene	FE0031794
	ACP-3	Battelle Memorial Institute	Satya Chauhan	A Novel Process for Converting Coal to High-Value Polyurethane Products	FE0031795
	ACP-4	University of Kentucky	Matthew Weisenberger	Coal to Carbon Fiber (C2CF) Continuous Processing for High Value Composites	FE0031796
	ACP-5	George Washington University	Matthew Wagner	Conversion of Coal to Li-Ion Battery Grade (Potato) Graphite	FE0031797
	ACP-6	University of Illinois at Urbana-Champaign	Seyed Dastgheib	Production of Carbon Nanomaterials and Sorbents from Domestic U.S. Coal	FE0031798
	ACP-7	Ramaco Carbon, LLC	Randall Atkins	Coal to Carbon Fiber Novel Supercritical Carbon Dioxide (SCO2) Solvated Process	FE0031800
	ACP-8	Ramaco Carbon, LLC	Randall Atkins	Experimental Validation and Continuous Testing of an On-Purpose High-Yield Pitch Synthesis Process for Producing Carbon Fiber from US Domestic Coal	FE0031801
	ACP-9	Ohio University	Jason Trembly	Direct Utilization of U.S. Coal as Feedstock for the Manufacture of High-Value Coal Plastic Composites	FE0031809
	ACP-10	Oak Ridge National Laboratory	Amit Naskar	High Yield Microwave Plasma Conversion of Coal for Low-cost 3D Printable Composites	FWP-FEAA365
	ACP-11	National Energy Technology Laboratory (Leidos)	Qiuming Wang	NETL Sorbent Technology for the Removal of Heavy Metals from Coal Waste Effluents	
	ACP-12	Physical Sciences, Inc.	Dorin Preda	Efficient Process for the Production of High Conductivity, Carbon-rich Materials from Coa	SC0018837
	ACP-13	Semplastics EHC LLC	Walter Sherwood	Coal as Value Added for Lithium Battery Anodes	FE0031879
STORAGE	STORE-01	National Energy Technology Laboratory	Jocelyn Kate Mackay	Energy Storage for Fossil Energy	