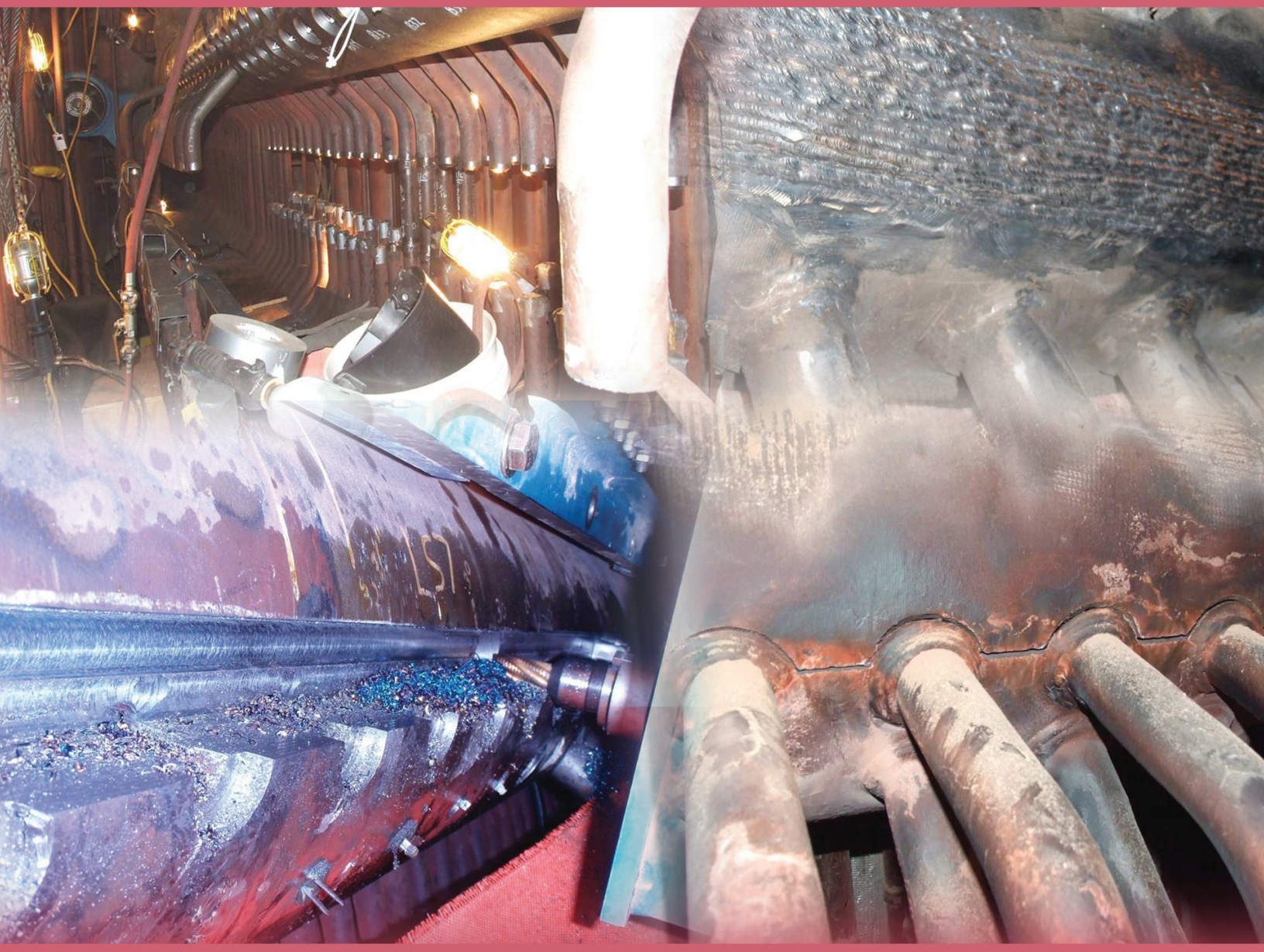
EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Welding and Repair Technology for Power Plants
11th International EPRI Conference

Announcement



June 25–27, 2014
Waldorf Astoria Naples, Naples, Florida

Background

Previous Electric Power Research Institute (EPRI) conferences on welding and repair technology highlighted emerging repair technologies and reviewed many established methodologies for repairing power plant components, including reactor pressure vessels, steam generators, vessel nozzles, piping, headers, valves, and pumps. Favorable response from utility members and vendors prompts the continued offering of this popular event. The 2014 conference will capture emerging and advanced repair technologies for nuclear and fossil pressure retaining components, rotating equipment, and other engineering structures.

Today, emerging issues such as life expectancy of repaired components; avoidance of time-consuming post-weld heat treatments; repair guidelines for aging components; on-line repair options; use and application of advanced alloys; and repair procedures for critical power plant components such as rotors, blades, headers, and piping are increasingly important. EPRI, utilities, original equipment manufacturers, and vendors worldwide have been carrying out related research and application activities. As a result of these issues and efforts, there exists a need to consolidate this experience and identify current limitations and future needs.

Technical Scope

The Welding and Repair Technology for Power Plants Eleventh International EPRI Conference will address the repair of nuclear, fossil, heat recovery steam generator (HRSG), and steam turbine power plant components. Topics for discussion will include repair methods, performance, prior service effects, repair and welding qualifications, materials properties, advanced repair technology, corrosion, and case histories. Although repair and welding technology for the maintenance of existing power plants will be the primary focus of this conference, with the emergence of new nuclear and fossil plant construction, advanced fabrication and welding technologies for new plants will be included. The program—designed for technical exchange among participants—will highlight utility needs and current industry capabilities and experience.

Conference Topics

Nuclear

- Innovative repair methods and case studies
- Stress corrosion cracking (SCC) repair and mitigation in ferritic and austenitic piping
- Repair of dissimilar metal welds (including nozzles and penetrations)
- Alloy 600/690 SCC mitigation and repair techniques
- Weldability of high-chromium nickel base filler metals
- Development of new welding alloys
- Stress improvement technologies and processes
- Temper bead welding of Code components
- Welding of spent fuel casks
- Repair and maintenance of spent fuel and refueling pools
- New manufacturing and fabrication techniques
- Buried piping repair
- Irradiated materials repair

Fossil

- Welding and performance of welds in advanced alloys
- Welding and heat treatment of creep strength enhanced ferritic steels: 23/24/91/92
- New repair techniques
- Performance of overlays for tube corrosion and erosion protection
- Case studies on the repair of boiler, turbine, and HRSG components
- Installation and repair of environmental control equipment
- New welding consumables
- Dissimilar metal welds

Cross-Cutting Topics

- Codes and standards
- Steam turbine rotor and disk repair
- Steam turbine casing repairs
- Training and implementation
- Valve repair and hard-facing applications
- Weld modeling

Contacts

Technical Information

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Accommodations

Waldorf Astoria Naples
475 Seagate Drive
Naples, Florida 34103
Reservations: 1.888.722.1270
Meeting rate: $139/night
www.waldorfastorianaples.com

Target Audience

This forum will provide an opportunity for power station managers, engineers, and maintenance personnel to exchange utility experience and lessons learned. Equipment manufacturers, service vendors, consultants, researchers, and university students in the United States and abroad are encouraged to come to the conference and share current and emerging technologies for welding and other repairs of fossil and nuclear plant components. Conference proceedings will be provided post conference to attendees.

Buried Pipe Workshop
Friday, June 27, 8:00 a.m. – 12:00 noon

- An overview of the document format and content of *User's Guide for the Repair of Buried Piping* (3002000738)
  - Emergent repairs versus preemptive repairs
  - ASME Section XI, Safety Related – Non ASME Section XI and Non-Safety Related
  - Structural repairs verses non-structural repairs
  - Regulatory considerations
  - Operability guidance
- General description of the welded and non-welded repair methods
- Use of the decision trees for selecting appropriate repair methods and configurations

Creep Strength Enhanced Ferritic (CSEF) Interest Group Meeting
Tuesday, June 24, 8:30am-4:30pm
(Note separate registration from conference)

Based on the successful and widely industry supported collaborative projects on grade 91 materials, EPRI is pleased to announce a new CSEF Interest Group. The group's objective is to facilitate peer-to-peer exchange on issues of procurement, fabrication, design, field welding and heat treatment, inspection, and damage detection, and repairs of CSEF steels.

Utilities, EPRI members and non-members, OEMs, service providers, and materials manufacturers are all invited to attend.

Key topics to be discussed in an open forum:

- Review of recent issues in
  - Tubing
  - Pipes
  - Fittings
- Procurement challenges with Gr. 91
  - Materials/components
  - Consumables

Contact Jonathan Parker (jparker@epri.com) for more information

Sponsors

EPRI Welding and Repair Technology Center (WRTC)

EPRI Fossil Materials and Repair Program (P87)

EPRI Boiler Life and Availability Improvement Program (P63)

EPRI Heat Recovery Steam Generator (HRSG) Dependability Program (P88)

Vendor Expo

A vendor exhibition will complement the technical presentations. A limited number of 8- x 10-ft (2.4- x 3.1-m) exhibit booths are available for $1200 each (including one pass to the conference). Specialists in the field of welding, fabrication, and forging as well as maintenance engineers, equipment manufacturers, and service vendors are encouraged to display their equipment and/or capabilities.

Following is a list of 2012 exhibitors. Plan today to participate in the Vendor Expo!

2012 Vendor Participants

Altran Solutions

Applied Technical Services, Inc.

Arc Machines, Inc.

AREVA

AREVA NP GmbH (Germany)

Bohler Welding Group USA, Inc.

Bolttech Mannings

Computer Engineering, Inc.

Consolidated Power Supply

CSI Technologies, Inc.

Elite Pipeline Services

ESI North America

Euroweld, Ltd.

Fronius USA, LLC

Haynes International, Inc.

Iddeal Concepts, Inc.

IMR Test Labs

Liburdi Dimetrics Corp.

Lincoln Electric Co.

Mantacor

MTI Power Services

Olympus NDT

Plymouth Engineered Shapes

Seamoss, Inc.

Stress Engineering Services, Inc.

Structural Integrity Associates, Inc.

Superheat FGH, Inc.

Thermo Scientific Niton Analyzers

Tioga Pipe Supply Co., Inc.

Titanova, Inc.

TRI Tool, Inc.

True North Consulting, LLC

Weldtech Services Corp.

Westinghouse Electric Company LLC

Welding and Repair Technology for Power Plants 11th International EPRI Conference

June 25–27, 2014
Waldorf Astoria Naples, Naples, Florida

Registration Instructions

For more information and to register for this event, go to www.epri.com, and select Events at the top of the page. Select Main Calendar, and locate this conference by its date. Click on the link, and follow the registration instructions. If you have any questions, please contact Stacey Wells.

Mark Your Calendar

Conference Reservation Deadline	May 19, 2014
Hotel Reservation Deadline	June 2, 2014

Registration Fees

(Registration fees include all breaks and lunches for attendees as well as evening functions for attendees and guests.

EPRI funding members $450
Other EPRI-member utilities and U.S. government and university personnel $645
Speakers $450
Others $800
8- x 10-ft (2.4- x 3.1-m) exhibit space
(includes one nontransferable pass to the conference) $1200
Exhibit booth staff (entrance to exhibit hall only) $200
Students $50

Proceedings

Booklets containing all of the abstracts and author information will be distributed on-site. Conference proceedings will be available post-conference.

Student Poster Session

F3	The Cause of Premature Creep Rupture in Fusion Welds of Alloy IN740H	J. N. DuPont and D. H. Bechetti	Lehigh University
F10	Corrosion Fatigue Testing of Weld Overlay Waterwall Coatings	A. Stockdale and J. DuPont	Lehigh University
N10	Application of Cold Metal Transfer Process for Dissimilar Structural Weld Overlays for Nuclear Power Repair	Thomas W. Daniels, Nathaniel McVicker, Boian T. Alexandrov, and John C Lippold	OSU
N8	Evaluation of Solidification Cracking Susceptibility in High Chromium, Ni-base Filler Metals by the Cast Pin Tear Test	B. Alexandrov, T. Luskin, E. Przybylowicz, H. Wang, J. Lippold and S. McCracken	OSU and EPRI
N14	Ductility-Dip Cracking Susceptibility of Several Nickel-Base Alloys Utilizing the Strain-to-Fracture Test	V. C. Kreuter and J. C. Lippold	OSU
F5	Testing for Stress Relaxation Cracking in Ausc Alloys	David C. Tung and John C. Lippold	OSU
N19	Quantification of Boundary Tortuosity in High-Cr Nickel Based Filler Metals Using Fractal Analysis	A.T. Hope and J.C. Lippold; S. McCracken	OSU and EPRI
N16	Friction Stir Welding and Processing of Austenitic Materials for Repair in Nuclear Applications	T. Nelson, N. Kumbhar, and D. Gandy	Brigham Young and EPRI
N18	Effects of Dilution on Fusion Boundary Microstructures in Dissimilar Metal Welds	T. Nelson, N. Kumbhar, and S. McCracken	Brigham Young and EPRI
F7	Modelling Chemical and Microstructural Evolution at Dissimilar Ferritic-Ferritic Interfaces	J. Clark	University of Nottingham
N/A	Numerical Simulation of the Cast Pin Tear Test in High Chromium Nickel-based Filler Metals	H. Wang and B. T. Alexandrov	OSU
N/A	Development of New Generation Cast Pin Tear Test	T. C. Luskin, B. T. Alexandrov, J. C. Lippold, and S. McCracken	OSU and EPRI
N/A	Development of Continuous Cooling Transformation Diagrams for Weld Metal of Creep-Resistant Steels	Joseph Steiner, Boian T. Alexandrov, and John C. Lippold	OSU
N/A	Susceptibility to Hydrogen Assisted Cracking in Creep-Resistant Steel Welds	Joseph Steiner, Xiuli Feng, Boian T Alexandrov, and John C. Lippold	OSU
N/A	Stress-Relief Cracking in Creep-Resistant Steel Welds	Katie Strader, Xiuli Feng, Boian T. Alexandrov, and John C. Lippold	OSU
N/A	Development of CCT Diagrams for the CGHAZ of Creep-Resistant Steels	Katie C. Strader, Boian T. Alexandrov, and John C. Lippold	OSU
N/A	Microstructure Analysis for Creep Strength Steel	Xiuli Feng, Boian T Alexandrov, Katie Strader, Joseph Steiner, and John C. Lippold	OSU
N/A	Cold Metal Transfer Weld Overlays on Carbon Steel in Nuclear Power Repair	Nathaniel McVicker, Boian Alexandrov, and John Lippold	OSU

Are associated with corresponding papers.

Agenda

Wednesday, June 25, 2014

General Session

8:30		Introduction	G. Fredrick	EPRI
8:45		Keynote		
9:30	G1	Design, Materials, and Fabrication Challenges for Next-Generation HRSGs	I. Perrin	Structural Integrity Associates
9:55	G2	National Board Inspection Code, Part 3: Organization, Repair Methodology, and Options	G. Galanes	DTS Inc.
10:20	**Break**			
10:45	G3	Recent Advancements in Field Heat Treatment Improving Constructability and Material Quality	Gary Lewis and John Hainsworth	Superheat
11:10	G4	Influence of the Welding Process to the Dilution Rate of Weld Overlays on Unalloyed Steel Using the Weld Consumable ERNiCrMo3 (Alloy 625)	B. Rutzinger	Fronius International
11:35	G5	The Effect of Modern Power Sources on Welding Consumables	William F. Newell, Jr.	Euroweld, Ltd.
12:00	**Lunch**			

Nuclear Session

1:00	N1	Effects of Preheat in Weld HAZs of Cast Low Carbon Steel Valve Bodies	D. Smith, A. Cockrum, and Greg Frederick	Structural Integrity Associates, Entergy, and EPRI
1:25	N2	Palo Verde Unit 3 Bottom Mounted Nozzle Repair	Dave Waskey and R. C. Folley	AREVA NP and Palo Verde
1:50	N3	Alternative Hardness Test Protocol for Temper bead Welding Procedure Qualification	Steve McCracken and Jon Tatman	EPRI
2:15	N4	Weld Dilution in Alloy 690TT Tube-to-Tubesheet Welds	Dick Smith, Helen Cothron and Greg Frederick	SIA and EPRI
2:30	N5	Development and Characterization of Nickel Alloy Welding Product INCONEL Filler Metal 52MSS	Samuel Kiser, Martin Caruso, Rengang Zhang, and Brian Baker	Special Metals Corporation
3:00	**Reception/Expo Begins**			

Fossil Session - New Developments

F1	Construction Requirements of P15E - Grade P 92 - Material and Lessons Learned	N. Schuster, S. Findlan, and B. Toth	Chicago Bridge & Iron, Inc.
F2	Influence of Chemical Composition and PWHT on Mechanical Properties of P92 Flux Cored Wire Weld Metal	S. Baumgartner[1], H. Pahr[1], M. Schuler[2], R. Schnitzer[1], and N. Enzinger[2]	[1]voestalpine Böhler Welding Austria GmbH and [2]Institute for Materials Science and Welding, Technical University of Graz, Austria
F3	Dissimilar Metal Welding of Alloy 740H	John de Barbadillo, Brian Baker, and Ronnie Gollihue	Special Metals Corporation
F4	The Cause of Premature Creep Rupture in Fusion Welds of Alloy IN740H	J.N. DuPont and D. H. Bechetti	Lehigh University
F5	Microstructure of Inconel 617 Welding Joint Fabricated by Using a High Power Fiber Laser	Zhuguo Li[1], Xia Liu[2], Fenggui Lu[1], Peng Wang[2], Yuming Ding[2], Wenjie Ren[1], and Yixiong Wu[1]	[1]School of Materials Science and Engineering, Shanghai Jiao Tong University; [2]Shanghai Turbine Plant of Shanghai Electric Power Generation Equipment
Reception/Expo Begins			

Agenda (continued)

Thursday, June 26, 2014

Nuclear Session					Fossil Session - Damage Mechanisms			
8:30	N6	Narrow Gap Permanent Canal Seal Plate at HB Robinson	Dave Waskey and Arun Puri	AREVA NP and Duke Energy	F6	*In Situ* Full Field Deformation Monitoring of the Weldments of Heat Resistant Materials	Xinghua Yu,* Yukinori Yamamoto, and Zhili Feng	Oak Ridge National Laboratory
8:55	N7	Welding Technology for Duplex Stainless Steel Structures in Nuclear Plant Service	S. Findlan, M. Phillips, B. Toth, and J. Wirtz	Chicago Bridge & Iron, Inc.	F7	Modelling Chemical and Microstructural Evolution at Dissimilar Ferritic-Ferritic Interfaces	J. Clark	University of Nottingham
9:20	N8	Evaluation of Solidification Cracking Susceptibility in High Chromium, Ni-Base Filler Metals by the Cast Pin Tear Test	B. Alexandrov, T. Luskin, E. Przybylowicz, H. Wang, J. Lippold and S. McCracken,	OSU and EPRI	F8	Welding of FB2-CrMoV Dissimilar Turbine Rotor and Evaluation on Welded Joints	Xia Liu[1], Fenggui Lu[2], Zhuguo Li[2], Yuming Ding[1], Xiaojin Xu[1]	[1]Shanghai Turbine Plant of Shanghai Electric Power Generation Equipment; [2]School of Materials Science and Engineering
9:45	**Break**				**Break**			
10:15	N9	Evaluation of Residual Stresses Induced by Repairs to Small Diameter Stainless Steel Pipe Welds	T. Hicks, W. Mabe, J. Miller, and J. Mullen	Bechtel Marine Propulsion Corporation	F9	Practical Implications of Variables Affecting Steam-Side Oxidation and Exfoliation	J. Shingledecker[1], B. Pint[2], A. Sabau[2], and A. Fry[3]	[1]EPRI, [2]Oak Ridge National Laboratory, and [3]National Physical Laboratory
10:40	N10	Application of Cold Metal Transfer Process for Dissimilar Structural Weld Overlays for Nuclear Power Repair	Thomas W. Daniels, Nathaniel McVicker, Boian T. Alexandrov, and John C. Lippold	OSU	F10	Corrosion Fatigue Testing of Weld Overlay Waterwall Coatings	A. Stockdale and J. DuPont	Lehigh University
11:05	N11	Development of Welding Technology for Dissimilar Thick Wall Pipe Joints Using Alloy 690	T. Matsuoka, D. Abe, H. Yamaoka, and T. Hirano	IHI Corporation	F11	Stress Corrosion Cracking of Ferritic Materials for Fossil Power Generation Applications	Steven J. Pawel and John Siefert	Oak Ridge National Laboratory and EPRI
11:30	N12	Horizontal Joint Leakage Repair in HP Nuclear Shells	M. Wojciechowski and J. Nolan	GE Company Polska and GE USA	F12	New Weld Overlay Materials for Fossil and WTE Superheater and Reheater Tubing Offer Strategic Advantages	Samuel D. Kiser and Martin L. Caruso	Special Metals Corporation
11:55	**Lunch**				**Lunch**			
Nuclear Session					**Fossil Session - Repair**			
1:00	N13	The Study of Influence of Elastic-Viscoplastic Material Model Application in Welding Numerical Analyses with Regard to Assessment of the Weld Overlay Effectiveness	M. Jary, V. Divis, L. Junek, and L. Jurasek	Institute of Applied Mechanics Brno, Ltd.	F13	Cold Weld Repair in the UK	S. Brett	University of Nottingham
1:25	N14	Ductility-Dip Cracking Susceptibility of Several Nickel-Base Alloys Utilizing the Strain-to-Fracture Test	V. C. Kreuter and J. C. Lippold	OSU	F14	Residual Stress Accumulation in High Temperature Alloys Used for Energy Applications	J. Galler, J. DuPont, and J. Siefert	Lehigh University and EPRI
1:50	N15	The Testing of ERNiCrFe-13 for Use in Structural Weld Overlays	Darren Barborak, Patrick Lester, Matthew Keller, and Stijn Vancluysen	AZZ WSI and Tractebel Engineering	F15	Grade 23 Field Experience	Eric Thurston	LG&E-KU Energy

Agenda (continued)

Thursday, June 26, 2014

Nuclear Session					Fossil Session - Repair			
2:15	N16	Friction Stir Welding and Processing of Austenitic Materials for Repair in Nuclear Applications	T. Nelson, N. Kumbhar, and D. Gandy	Brigham Young University and EPRI	F16	Typical and Not-So-Typical Welded Repairs to FD and ID Fans Manufactured from High Strength Low Alloy, Quenched and Tempered Steels	D. Wisner	Duke
2:40	**Break**				**Break**			
3:15	N17	Hot Wire Laser Welding	Bruce Newton	Westinghouse and Lincoln Electric	F17	Research on Repair Program of T23 Waterwall Weldings with Crack of 1000-MW USC Tower Boiler	Wang Chong Bin	Shanghai Boiler Works, Ltd.
3:40	N18	Effects of Dilution on Fusion Boundary Microstructures in Dissimilar Metal Welds	T. Nelson, N. Kumbhar, and S. McCracken	Brigham Young University and EPRI	F18	Thermal Modeling for Robust Post-Weld Heat Treatment of Field Fabricated Pipe Connections	Daniel Purdy and John Shingledecker; Thomas Sambor and Ian Perrin	EPRI; Structural Integrity Associates
4:05	N19	Quantification of Boundary Tortuosity in High-Cr Nickel Based Filler Metals Using Fractal Analysis	A. T. Hope and J. C. Lippold; S. McCracken	OSU and EPRI	F19	Testing for Stress Relaxation Cracking in AUSC Alloys	David C. Tung and John C. Lippold	OSU
4:30	N20	Development and Application of an Advanced Co-free Hardfacing Alloy for Nuclear Application	D. Gandy[1], J. Siefert[1], R. Smith[2], T. Lolla[2], S. Babu[3], D. Novotnak[4], and L. Lherbier[4]	[1]EPRI, [2]Ohio State University, [3]University of Tennessee, and [4]Carpenter Powder Products	F20	Weldability Studies on Grade T23 and T24 Steel Welds for Fossil Power Application	B. Alexandrov, K. Strader, J. Steiner, X. Feng, T. Wyan, E. Suma, and J. Lippold	OSU
5:00	**Adjourn**				**Adjourn**			

Friday, June 27, 2014

Buried Pipe Workshop		General Session - Valves and Casings			
8:00	8:00–12:00	G6	Case Studies on the Repair of HP Shell Cracks	M. Wojciechowski and J. Nolan	GE Company Polska and GE USA
8:25		G7	New Hardfacing Alloy to Resist Erosion and Wear in Coal-Fired Boiler Applications	Darren Barborak, Bingtao Li, and George Lai	AZZ WSI
8:50		G8	Experiences in Valve Hardfacing Disbonding	Daniel Purdy, John Shingledecker, and John Siefert	EPRI
9:15		G9	Understanding Failures in Grade 22 and Grade 91 Steel Hardfacing in Modern Fossil Power Plants	T. Lolla[1], J. Siefert[2], D. Purdy[2], S. S. Babu,[3] and D. Gandy‡	[1]OSU, [2]Electric Power Research Institute, [3]The University of Tennessee
9:40		**Break - Adjourn for some members**			
10:00		Track 1 Hardface Cracking and Disbonding Supplemental Project - Dan Purdy (**Funders Only**)		Track 2 T23/24 Supplemental Project - John Siefert (**Funders Only**)	
12:00	**Adjourn**				
12:30		**Adjourn**			

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