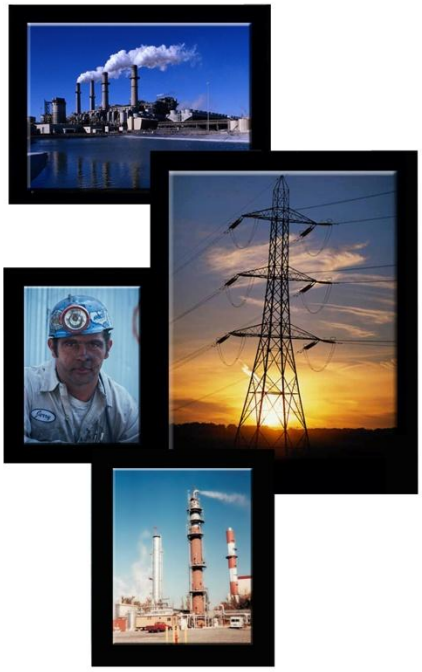
U.S. DEPARTMENT OF STATE
Foreign Service Institute



FOREIGN SERVICE OFFICERS' COAL AND POWER TRAINING COURSE

Organized by

U.S. Department of Energy
Office of Fossil Energy
National Energy Technology Laboratory
Pittsburgh, PA
July 15-19, 2013

Draft Agenda as of June 11, 2013

MONDAY, JULY 15, 2013

(Participants: Please wear business casual attire.)

8:00 AM **Registration Opens**
The Ritz Carlton – Pentagon City
1250 South Hayes Street; Arlington, VA 22202; P 703.415.5000

8:30 AM **Welcome, Orientation, and Course Overview**
Venkat K. Venkataraman, Senior Advisor & Project Manager, Project Financing & Technology Deployment Division, Office of Major Demonstrations, Strategic Center for Coal, NETL

9:00 AM **Opening Address**
TBD, Office of Fossil Energy, U.S. Department of Energy (DOE)

9:30 AM **Welcoming Remarks**
Ambassador Carlos Pascual, Special Envoy and Coordinator for International Energy Affairs, U.S. Department of State (DOS)

9:45 AM **Break and Group Photo**

10:15 AM **Fossil Fuel Formation and Coal Preparation**
Mark Klima, Associate Professor, Mineral Processing and Geo-Environmental Engineering, Pennsylvania State University

11:00 AM **Coal Mining Overview**
Cas Bruniany, Director of International Sales (Americas), Joy Global

11:30 AM **Coal Mining Environmental Issues: Reclamation of Mineland Hazards**
Barry E. Scheetz, Professor of Materials, Civil and Nuclear Engineering, Pennsylvania State University

12:00 PM **Lunch** *(Mall Food Court located nearby)*

1:00 PM **Electricity 101 & an Introduction to Advanced Power Generation**
Thomas Sarkus, Division Director, Project Financing & Technology Deployment Division, Office of Major Demonstrations, Strategic Center for Coal, NETL

1:45 PM **Pulverized-Coal and Fluidized-Bed Combustion**
Steve Moorman, Manager, Business Development and Advanced Technologies, Babcock & Wilcox Company (B&W)

2:15 PM **Break**

2:30 PM **Shale Gas Fundamentals**
John R. Duda, Director, Strategic Center for Natural Gas and Oil, NETL

3:15 PM ***International Fossil Fuel Panel Discussion***
International Energy Challenges
TBD

3:40 PM **International Shale Plays**
Sean Ruthe, Manager, Unconventional Gas Technical Engagement Program (UGTEP) for Europe, China, and South America; Office of Energy Programs, Bureau of Energy Resources (ENR); U.S State Department

4:05 PM **Worldwide Carbon, Capture, Utilization, and Storage**
Victor Der, ~~Chief Representative~~General Manager – The ~~North~~ Americas, Global CCS Institute

4:30 PM **International Coal Trade**
Ellen Ewart, Manager of Global Coal Market Research, Wood Mackenzie

4:55 PM **International Oil and Gas Market**
James Burkhard, Managing Director, Global Oil Group, IHS Cambridge Energy Research Associates (CERA)

5:20 PM **Questions & Answers**
(*Open Evening*)

TUESDAY, JULY 16, 2013

(Participants: Please wear casual attire, flat soled shoes, no high heels or open toed shoes.)

7:30 AM Bus departs The Ritz Carlton – Pentagon City *(Please be punctual.)*

10:30 AM Arrive in Cumberland, MD

10:45 AM **Welcome; Orientation; Tour**
AES Corporation's Warrior Run Power Plant
Host: James Erdman, Team Leader, AES Corporation
11600 Mexico Farms Road, SE; Cumberland, MD 21502

(Discussion Topics: Electric Power Generation, U.S. Utility Deregulation, Circulating Fluidized Bed Combustion Technology, Waste Coal Utilization, Cogeneration, Environmental Control, and Waste Disposal)

AES Warrior Run is a 180-MW_e (net), coal-fired electric generating facility located in the Allegany County Industrial Park in Cumberland, MD. AES Warrior Run is a world-class power plant based on circulating fluidized bed combustion (CFBC) — a Clean Coal Technology (CCT). Emissions from the power plant are below EPA's New Source Performance Standards (NSPS) and are considerably lower than typical coal-fired plants in operation today. One of the newest coal-fired power plants in the United States, it achieved commercial operations on February 10, 2000. All of the electricity generated by the plant is sold under a long-term wholesale agreement. As a cogenerator, steam from the power plant is also used for the on-site production of food-grade liquid carbon dioxide (CO_2). (Advanced processes for CO_2 capture and sequestration are being developed to mitigate CO_2 emissions from fossil fuel power generation. This visit will serve as an introduction to a presentation later in the course.) The Warrior Run plant annually burns up to 650,000 tons of coal and up to 150,000 tons of limestone, both of which are mined in western Maryland. As part of a coal supply contract with Arch Coal, Arch uses the combustion by-products from the Warrior Run plant to reclaim surface mines in the Georges Creek Basin, from which some of the coal burned at the plant is mined.

12:00 PM **Lunch** (*Provided by AES Corporation)*

1:00 PM Depart for Vindex Energy Corporation's Cabin Run Mine

1:45 PM Arrive Vindex Energy Corporation's Cabin Run Mine
18710 Cabin Run Rd, SW, Frostburg, MD 21532

Tour Vindex Energy Corporation's Cabin Run Mine
Host: Ron Hamric, International Coal Group, Inc.
rhamric@archcoal.com

Vindex Energy Corporation is an operating subsidiary of International Coal Group, Inc. International Coal Group, Inc. is a wholly owned subsidiary of Arch Coal, Inc.

2:45 PM Depart for Pittsburgh

6:00 PM Arrive at the Sheraton Station Square Hotel
300 West Station Square Drive; Pittsburgh, PA 15219; P 412.261.2000
(*Open Evening*)

WEDNESDAY, JULY 17, 2013

(Participants: Casual attire is recommended, as there is a lot of coal dust at this facility which can get on your clothes and is difficult to remove. Please wear flat soled shoes, no high heels or open toed shoes. No back packs, oversized bags, or cameras are permitted in the plant.)

8:00 AM Depart Sheraton Station Square Hotel

9:30 AM Arrive at FirstEnergy Company's Bruce Mansfield Power Plant
Host: Christopher Cox
FirstEnergy
128 Ferry Hill Road; Shippingport, PA 15077

Welcome and Orientation

Christopher Cox, Outage Team, Bruce Mansfield Plant, FirstEnergy

10:00 AM **Environmental Issues 101**
Nitrogen Oxides (NO_x), Sulfur Dioxide (SO_2) and Particulates
Lynn Brickett, Division Director, Existing Plants Division, Office of Coal & Power R&D, Strategic Center for Coal, NETL

11:00 AM **Overview and Tour of Bruce Mansfield Power Plant**

(Discussion Topics: Electric Power Generation, U.S. Utility Deregulation, Pulverized Coal Combustion Technology, Environmental Control, and By-Product Utilization)

FirstEnergy's 2742-MW_e Bruce Mansfield Power Plant has one of the largest wet sulfur dioxide (SO_2) scrubbers in the United States. The plant features three 914-MWe pulverized coal-fired boilers manufactured by Foster Wheeler, which are equipped with Babcock & Wilcox low-NOx burners. The plant has also installed a $300 million selective catalytic reduction (SCR) system. FirstEnergy is the holding company for Ohio Edison, Cleveland Electric Illuminating Company, Toledo Edison, and Pennsylvania Power. FirstEnergy also operates an on-site Forced Oxidation Gypsum (FOG) facility to produce wallboard quality gypsum – an innovative productive use of a former waste material. Gypsum from scrubber by-products is a cheaper, better quality material with which to manufacture wallboard than naturally occurring gypsum. Scrubber wastes from the plant are sent to an adjacent wallboard manufacturing plant operated by the National Gypsum Company. The process reduces the amount of scrubber sludge transported from Bruce Mansfield Station to its Little Blue Run disposal site, significantly extending the disposal site's life and reducing costs. The National Gypsum Company facility, one of the largest, single-line gypsum wallboard plants in the world, produces over 600 million square feet of wallboard annually. Use of these scrubber materials eliminates solid wastes that would otherwise have to be landfilled and further benefits the environment by avoiding operation of a gypsum mine elsewhere. This visit highlights some of the environmental advances achieved in today's coal-fired power plants, including the positive economic and environmental benefits achievable through by-product utilization.

1:00 PM **Working Lunch** (*Provided by FirstEnergy Company)*

1:15 PM **Gas Turbines**
Richard A. Dennis, Gas Turbines Technology Manager, Office of Coal & Power R&D, Strategic Center for Coal, NETL

2:00 PM Depart for First Energy's Springdale Power Plant

3:30 PM **Tour FirstEnergy's Springdale Power Plant**
Host: Anthony Hallo, Production Manager
Operating Company: FirstEnergy
198 Butler Street Extension; Springdale, PA 15144

FirstEnergy's Units 1 and 2, two 44-MW_e, simple-cycle gas combustion turbines at Springdale were originally home to an oil-fired power plant that was retired in 1983. The units, which began operation on December 1, 1999, generate peaking power for sale in the competitive marketplace in markets in Pennsylvania and the eastern United States. This $46-million generating facility is located at the site of the former Springdale Power Station, once the flagship of the Allegheny Energy generating fleet. The quick start-up time for the new General Electric LM6000 units permits power generation when demand for electricity is high. The 88 MW_e of capacity is enough electricity to light nearly 40,000 homes. The units are capable of using either natural gas or fuel oil for generation and are remotely operated. FirstEnergy also has a $235-million combined cycle generating plant with a capacity of 540 MW_e at the Springdale site. This newer facility includes two natural gas-fired combustion turbines and a steam turbine manufactured by Siemens Westinghouse Power Corporation. Now known as FirstEnergy Units 3, 4, and 5, they began generating power for sale into competitive markets in June 2003.

5:00 PM Depart FirstEnergy's Springdale Power Plant

6:30 PM Arrive Sheraton Station Square Hotel
(*Open Evening*)

THURSDAY, JULY 18, 2013

(Participants: Please wear casual attire and comfortable walking shoes.)

8:00 AM Depart for Alcoa Corporate Center

8:30 AM **Breakfast** (*Provided by Alcoa, Inc.)*

Overview of Alcoa Global Energy Operations
Host: Rick Bowen, President of Alcoa Energy
Operating Company: Alcoa, Inc.
201 Isabella Street; Pittsburgh, PA 15212

Alcoa Inc. is the world's third largest producer of aluminum, behind Rio Tinto Alcan and Rusal. From its operational headquarters in Pittsburgh, Pennsylvania, Alcoa conducts operations in 31 countries. Alcoa is a world leader in the production and management of primary aluminum, fabricated aluminum, and alumina combined, through its active and growing participation in all major aspects of the industry: technology, mining, refining, smelting, fabricating, and recycling. Alcoa's products are used worldwide in aircraft, automobiles, commercial transportation,

packaging, building and construction, oil and gas, defense, and industrial applications. Alcoa Power Generating, Inc. is a subsidiary of Alcoa, Inc., headquartered in Pittsburgh with projects producing hydroelectric power.

9:50 AM Depart for Range Resources' Marcellus Shale Pad

10:20 AM **Tour of Range Resources' Marcellus Shale Pad**
Host: Scott Roy
Operating Company: Range Resources
3000 Town Center Boulevard; Canonsburg, PA 15317

Range Resources is an independent oil and gas company operating in the Southwestern and Appalachian regions of the United States. In 2004, Range pioneered the Marcellus Shale, which is now believed to be among the largest known natural gas fields in the world.

The site visit to Range will include an active drilling location, as well as a completed and producing well pad - both sites are in Washington County, Pennsylvania.

12:20 PM Depart for Consol Energy's Headquarters

12:30 PM **Lunch** (*CONSOL Energy Inc. Café)*

1:00 PM **Overview of CONSOL Energy's Coal, Natural Gas, and Water Treatment Operations**
Host: Steven Winberg
Operating Company: CONSOL Energy Inc.
100 Consol Energy Drive; Canonsburg, PA 15317

CONSOL Energy, a publicly owned Pittsburgh-based producer of coal and natural gas, is one of the leading diversified energy companies in the United States of America. CONSOL's premium Appalachian coals are sold worldwide to electricity generators and steelmakers, and their Natural Gas Division has grown from a pure-play coalbed methane producer to a full-fledged exploration and production operation. CONSOL is a leading producer in the Marcellus Shale and they conduct an active exploration program in the Utica Shale.

2:00 PM **Unconventional Natural Gas Issues**
Kathryn Klaber, CEO, Marcellus Shale Coalition (MSC)

2:30 PM Depart for MarkWest Energy Partners, L.P. Houston Processing Facility

3:00 PM **Tour MarkWest Houston Processing Facility**
Host: Robert McHale
Operating Company: MarkWest Energy Partners, L.P.
800 Western Avenue; Washington, PA 15301

MarkWest Energy Partners, L.P. is a publicly traded master limited partnership formed in January 2002. MarkWest is engaged in the gathering, processing, and transportation of natural gas; the transportation, fractionation, storage, and marketing of NGLs; and the gathering and transportation of crude oil.

The Houston Processing Facility is part of their Liberty Segment which provides fully integrated natural gas midstream services in the liquids-rich areas of the Marcellus Shale. They are the largest processor of natural gas in Marcellus, with fully integrated processing, fractionation, storage, and marketing operations.

5:00 PM Depart for Sheraton Station Square Hotel

6:00 PM Arrive at the Sheraton Station Square Hotel

7:00 PM Evening Reception (*TBD*)

FRIDAY, JULY 19, 2013

(Participants: Please wear casual attire, with flat soled shoes, no high heels or open toed shoes.)

7:45 AM Check out and depart Sheraton Station Square Hotel

8:30 AM Arrive at NETL, Building 922, Conference Center A

8:50 AM **NETL Welcome & Overview**
TBD, Strategic Center for Coal, NETL

9:10 AM **Integrated Gasification Combined Cycle (IGCC)**
Jenny Tennant, Gasification Technology Manager, Office of Coal & Power R&D, Strategic Center for Coal, NETL

9:30 AM **CO_2 Capture and Storage**
Traci Rodosta, Carbon Storage Technology Manager, Office of Coal & Power R&D, Strategic Center for Coal, NETL

9:50 AM **Break (Group Photo)**

10:00 AM **NETL International Activities**
Scott Smouse, Advanced Combustion Technology Manager, Strategic Center for Coal, NETL

10:30 AM **Energy and Water Nexus**
Dr. David Miller, Computational Science Division, Office of Research and Development, NETL
and
TBD

11:30 AM **Transmission & Distribution Overview: Technology & Regulatory Issues**
Keith Dodrill, Program Analysis and Support Team, Project Management Center, NETL

11:50 AM **Lunch**

12:50 PM **Smart Grid Overview**

Steven J. Bossart, Team Leader, Program Analysis and Support Team, Project Management Center, NETL

1:10 PM **Coal Bed and Coal Mine Methane**
Morgan Mosser, Project Manager, Existing Plants Division, Office of Coal and Power R&D, Strategic Center for Coal, NETL

1:30 PM **Alternative Fuels – Coal, Natural Gas, and Biomass to Liquids**
Gary Stiegel, Director of Major Projects Division, Strategic Center for Coal, Strategic Center for Coal, NETL

1:50 PM ***Non-Fossil Power Generation Panel Discussion***
Introductory Remarks and World Energy Demand
Peter C. Balash, Deputy Director, Office of Strategic Energy Analyses & Planning, NETL (Moderator)

2:15 PM **International Nuclear Power Generation**
Ron Lewis, Vice President of New Plant Product Strategy & Development, Westinghouse Electric Company

2:40 PM **Nuclear Power: Post-Fukushima Initiatives**
Roy Brosi, Director of Strategic Industry Initiatives, FirstEnergy Nuclear Operating Company

3:05 PM **Hydro Power Generation**
Chris Mertes presenting for Norman Bishop, Senior Vice-President, Hydropower and Renewable Energy, and Co.

3:30 PM **Closeout Question & Answers**

4:00 PM Bus departs for the Ritz Carlton – Pentagon City, Washington, DC