



## **Alternative Ironmaking** **Dr. Joseph J. Poveromo** **Short Course:** 27 Nov 2011, Fiesta Americana Condesa All Inclusive Resort, Cancun, Mexico

Learn about alternative (to the blast furnace) ironmaking as it applies to:

- hot metal processes to feed oxygen converters or electric arc furnaces,
- direct reduction processes to feed electric arc furnaces or to produce DRI/HBI to feed blast furnaces, oxygen converters, etc,
- Direct reduction or hot metal processes to process waste oxides from either EAF mini-mills or fully integrated plants.

Accordingly, this course will present an overview of these direct reduction and alternative ironmaking processes and the products they produce.

Developments in alternative ironmaking have been international in scope and participation, and have been associated with a high level of activity in research, process and project development, plant construction, and start-up of direct reduction and alternative ironmaking processes. An important focus is to supply virgin iron units to feed the growth of electric furnace flat rolled steel production worldwide. This course will focus on the following areas: successful projects/processes; processes still under development and new approaches; and use of products.

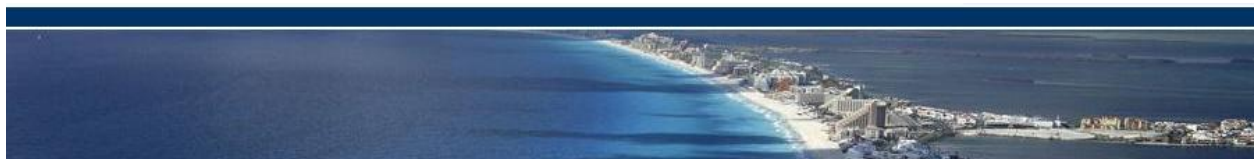
Participants are encouraged to raise questions relevant to their facilities and related to the topics of the course. Dan will be available for discussions during the networking breaks and after the course.

### **Who Should Attend**

This course would be beneficial to those engaged in the production, sale and use of direct reduced iron, pig iron and scrap; managers and engineers from electric furnace and blast furnace-based steel companies, suppliers of iron ore, coal and natural gas; steel company, engineering company, academic and research institute personnel engaged or interested in ironmaking process development.

### **Course Outline**

This alternative ironmaking course is designed to develop a better understanding of methods, approaches and economics related to selection and development of alternative ironmaking processes and the utilization of the products from these processes.





## Topics include:

- Summary of Direct Reduction Processes
  - categorized by
    - Reductant type: coal-based gas-based
    - Vessel: Rotary kiln, Rotary hearth, Fluid bed, Shaft furnace
    - Iron bearing material: fines, lump ore, pellets
- Summary of Hot Metal Processes
  - categorized by
    - Reductant type: coal-based, gas-based
    - Vessel: Rotary kiln, Rotary hearth, Fluid bed, Shaft furnace
    - Iron bearing material: fines, lump ore, pellets
- Obstacles to Alternate Hot Metal Process Development
  - Fundamental Technical Challenges
  - Engineering, Scale-up, Maintenance
  - Competing Process Routes
  - Competing Alternate Iron Materials
  - Changing Economic Conditions
  - Need for Long –Term Financial Backing
  - Need for Strategic Partner
- Overview of direct reduced and alternate iron products
  - Definitions – DRI, HBI, pig iron, hot metal, residuals, gangue
  - Product Chemistry; Fe, acidic gangue, basic gangue, impurities
  - Material Handling
  - Energy Attributes
  - Standard Operating Practices
  - Steel Plant Operations – blast furnace, BOF, EAF, induction furnace
  - Steel Products – flat, long, specialty; vs. metallic type

## The participants will also receive:

- ◆ CD with course material
- ◆ Certificate of completion
- ◆ A copy of instructor's recently published articles related to alternative ironmaking
- ◆ Lunch and refreshments

## Course Instructor Joseph J. Poveromo



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Joseph J. Poveromo received his Ph.D. degree in Chemical Engineering in 1974 at the Center for Process Metallurgy, State University of New York at Buffalo (SUNYAB). Earlier he had received a BS degree in Chemical Engineering from Rensselaer Poly.



He then joined Bethlehem Steel's Homer Research Laboratories where he advanced to the position of Research Consultant. In 1993 he established his consultancy, Raw Materials & Ironmaking. From 1993 through 2008 his principal client was the Quebec Cartier Mining Company (now ArcelorMittal Mines Canada) for whom he served as Director - Technology, International. He consults for a number of steel, natural resource, technology provider and consultancy companies on a global basis.

Dr. Poveromo is a Distinguished Member of the Iron and Steel Society (now AIST) of AIME. He has received a number of Iron & Steel Society Awards including the T. L. Joseph Award in 1998 for his long-standing contributions to ironmaking technology.

**REGISTRATION:** <https://www.flogen.com/FraySymposium/registration.php>

