Eco-Efficiency in Mining: Process Integration and Optimisation with a Reduced Ecological Footprint

When: Tuesday November 20th 2012

Where: Sheraton Santiago Hotel & Convention Center, Chile

Instructors: Joachim Vogdt, Suzanne Lynch-Watson and Roberto Valle

Language: English

TECHNICAL BACKGROUND

The term `Eco-efficiency´ refers to the challenges faced by the mining industry in terms of increasingly difficult ore reserves, rising energy costs and more stringent environmental requirements, and the need for the industry to respond with new and innovative ways to improve current performance. Basically Eco-efficiency is "Generating More Value with Less Resources" (WBCSD).

A mine is essentially a series of operations that are inter-connected and therefore inter-related with the performance of one operation affecting the performance of another. Getting the most out of an operation requires an integrated, multi-disciplinary approach, from Greenfield and initial design to final closure and beyond. Therefore it takes the skills of those in many areas to create an efficient operation which maximises revenue, minimises costs and has minimal environmental impacts.

This course introduces the attendee to the concept of Total Process Integration and Optimisation for optimising the entire process from the mine to the processing plant and beyond, using real case studies as examples. The consequences for water, carbon and overall ecological footprint of mining projects are also assessed using real case studies. It also provides tools for implementing this methodology in new and existing plans, and for conducting environmental assessment/reduction strategies including Energy Efficiency Audits, Carbon Footprint Studies and integrated water and mine waste management.

PARTICIPANTS

Participants will be from the mining industry, either working in operations, design or consulting. Participants may be engineers or operators from a range of disciplines – mining, mineral processing, environmental – from senior managers to recent graduates.

LEARNING OUTCOMES

Increasingly, the pressure is on those in operations, design or consulting to provide ways of improving plant operating efficiency while at the same time reducing the impact of the environment. The workshop will provide the participants with tools and knowledge to understand and implement the following:

Total Process Integration and Optimisation (PIO): a method for optimising the entire operation from the mine (drill and blast), through the processing plant (crushing, milling, classification, fine grinding) to downstream processes. It includes assessing and benchmarking the operation to identify areas where gains in efficiency can be realised.

Environmental Sustainability Considerations: these include general Eco-Efficiency issues (such as ecological, water and carbon footprint), minimising acid mine drainage, waste processing, energy efficiency audits, carbon emission reduction and mine closure.

Application of PIO and Eco-efficiency in different Design Stages of a Mining Projects, "From Greenfield to Mine Closure": Critical decisions are taken early in the design process of a mining projects, including selection of major equipment, and those related to waste disposal and water management. Case studies will illustrate and enable the participants to understand how these decisions influence not only environmental sustainability, but also profitability of projects.

SPECIFIC OBJECTIVES

The purpose of this one-day workshop is to provide a forum in which participants can learn and discuss more about the tools, knowledge, and techniques required for Total Process Integration and Optimisation, including Assessment of Environmental Aspects. It is presented by specialists in the areas of process optimisation and environmental audits and includes real case studies and examples that will guide the participants through the process. Active participation is encouraged in the form of discussion which gives attendees the opportunity to contribute their own experiences and also hear about the experiences of others.

CONTENT AND PROGRAMME

Eco-Efficiency in Mining: Process Integration and Optimisation with a Reduced Ecological Footprint		
Time	Topic	Presenter
08:30 - 10:30	**Introduction and Course Overview**	PTI/IASA
	PIO – Process Integration and Optimisation: General Concepts -Fundamentals of PIO (Mine-to-Mill) -Traditional Approach vs PIO -Process Benchmarking/Methodology -Potential economic and environmental benefits of PIO -"Brownfield" vs "Greenfield" projects.	PTI
10:30 - 11:00	**Morning Tea**	
11:00 – 12:30	PIO Case Studies: First Case Study – "Brownfield" project Covering the method, results, recommendations, implementation and final outcomes.	PTI
	Second Case Study: "Greenfield" project Optimising as part of palnt design and commissioning	PTI
12:30 - 1:30	**Lunch**	
1:30 - 3:00	**Mine Waste Management and Processing:** -Minimising of Acid Mine Drainage -Sensor based sorting and other alternatives of metal recovery -Industrial and domestic waste management	IASA
	Mine Water Management / Mine Closure	IASA
3:00 - 3:30	**Afternoon Tea**	

3:30 - 5:00	**Energy efficiency and Carbon Footprint:** -Energy efficiency audit -Pre-feasibility of carbon reduction measures (case samples) -Carbon footprint studies of mining projects (case samples)	IASA/PTI
	Eco-Efficient Mining Process: Current and Future Developments	PTI

METHODOLOGY

Each session will be presented using PowerPoint presentations. The speaker will lead the session and cover the topic in sufficient detail for everyone to gain a good base understanding. Case studies will be presented for each topic, and participants are encouraged to ask questions or share their own experiences.

COURSE MATERIALS

The standard course materials include a course binder in black and White containing the printed PowerPoint presentations and CD or flash drive with course notes will be provided to the participants. Some printed material in the form of published case studies or other relevant material may be handed out on the day. Metso PTI/IASA will notify Gecamin in advance if any of these are to be included.

EQUIPMENT

Course presenters do not require any additional equipment apart from the standard equipment which includes lavalier or wireless lapel microphone, laptop, data projector, screen white board and a set of markers. Students will need to bring their own paper and writing utensils if they wish to take notes.

INSTRUCTORS

Joachim Vogdt, Environmental Engineer (M.Sc.)
General Manager IASA Group
Joachim Vogdt is the General Manager of the Engineering and Environemtnal Consulting Group IASA (including subsidiary companies Proambiente, Proceanic, progresa, IASA Australia and Germany). He received his degree as an Environmental Engineer, M.Sc. at the Polytechnic Institute of Virginia & State University, USA. He has 20 years of experience in waste water treatment design, industrial solid waste management, contaminated site evaluation and environmental audits, including mine operations and mine closure projects. As a part time researcher, he has also cooperated in several investigation projects of the IAR RWTH Aachen and KIT Research Centre (Germany), all related to sustainable development, resource efficiency, integrated waste and wastewater management.

Suzanne Lynch-Watson
General Manager – Consulting, Metso PTI
Suzanne Lynch-Watson is the General Manager of Consulting at Metso Minerals Process Technology & Innovation in Australia. She received her BE (Chem, Hons 1) from the University of Qld. She worked initially in engineering design and construction for 10 years and gained experience in mineral processing and oil & gas design projects at all stages from prefeasibility through to commissioning. She has spent the past 13 years working as a comminution specialist. Her role with Metso PTI is to manage a group of consultants located all over the globe, to provide consulting services to clients in the mining industry, including conducting mine to mill projects which focus on optimising the whole comminution chain from the pit to the final concentrate. This involves site work to assess and sample plants, data analysis including simulation and benchmarking, and training.

Roberto Valle

Manager Latin America – Metso PTI

Roberto Valle manages the PTI centres in Peru, Chile and Mexico. He received his BE (Met. Eng. Hons 1) from the University of Trujillo, Peru. In addition, he obtained an MBA and a specialisation in Project Management in ESAN University, Peru. He worked initially as a process engineer, operations, researching and process development for different mining companies. Apart from his industrial experience, he took part in delivering several training courses related with Process Technology in Brisbane Australia, Metso York Industries, Pennsylvania-USA and in Sorocaba Brazil. He is responsible for all the process integration and optimisation projects as well as the PTI products and systems in Latin America.