

Field Trip Report

Prepared by: Dr. Sachin V. Jangam and Hafiz Bin Osman

Minerals, Metals and Materials Technology Centre (M3TC)

Dates: Aug 10 - Aug 13, 2011

Place: Palembang, Indonesia

Purpose: To visit coal mine and coal drying facility at Sriwijaya University

Supervisor: Prof. A. S. Mujumdar, M3TC and ME Department,
National University of Singapore

August 2011

Report - Field trip to Sriwijaya University, Palembang, Indonesia

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Details of the person visited –

Dr. Sachin V Jangam (Research Fellow)

Mr. Hafiz Bin Osman (Research Engineer)

Schedule of the trip

Date	Time	Activity
Aug 11, 2011	07.30-20.30	Visit to a coal mine at Bukit Asam (Tanjung Enim)
Aug 12, 2011	08.30-09.45	Talk by Dr. Sachin Jangam (Overview of Coal Drying project and various projects under M3TC) followed by discussion
	09.45-10.30	Talk by Dr. M Faizal (Overview of research at Sriwijaya University by Energy group) followed by discussion
	11.00-11.45	Discussion with Rector of Sriwijaya University
	12.00-15.30	Visit to Laboratories at Sriwijaya University Campus at Indralaya DME coal drying pilot plant Coal blending machine and other equipment Solar cell Biodiesel pilot plant Bioethanol Pilot plant
	15.30-14.30	Informal discussion with Dr. Faizal about possible collaborative activities

Coal Mine:

During our field trip we visited a coal mining project (MTBU Coal Mining Project) of a mining company named PT Pamapersada Nusantara at Tanjung Enim, Sumatera, Indonesia. This particular mine is an open-pit type with availability of various grades of coal. The mine produces more than 5 grades of coal with the moisture content varying from 14 to 34% and calorific values from 5300 to 7000 Kcal/kg. However, the current production mainly involves bituminous and anthracite coal with very high heating values. The company mainly produces up to 12 million tons per year (in 2010); however the total coal reserve is up to 6 billion tons and can be dugged for at least next 600 years.

A part of the mine we visited was mainly bituminous and sub-bituminous coal reserves (current production) and Anthracite reserves (no current production). The process mainly consists of recovering the surface coal and transport to the coal washing/treatment zone where the recovered coal undergoes various chemical and physical treatments. After this the coal undergoes mechanical dewatering. The dewatered coal is then stored at three locations in open area. The coal is then transferred from these storage locations to the nearest port by trucks/trains. The coal mine we visited was around 90 m deep from the sea level and up to 130 m deep from the ground level. Following are some of the pictorial views of coal mine at Tanjung Enim.



Views of a coal mine



Mechanical dewatering pump



Truck which can carry up to 100 tons of coal



Open coal storage (coal pile)



Self ignition at the coal storage area

Visit to Sriwijaya University

The visit to Sriwijaya University was mainly to understand the DME coal drying facility and for a discussion regarding possible collaborative activities with the university. It started with a lecture by Dr. Sachin Jangam at the university's Bukit Besar campus. Dr. Sachin Jangam gave the detailed information about the M3TC centre, the ongoing projects with M3TC and details about the coal drying project. This was followed by a discussion with the present audience (almost 30). Dr. Faizal later gave an overview of various research activities conducted by RUSNAS PEPT at Sriwijaya University. Following is the list of ongoing projects at Sriwijaya University.

- Coal liquefaction
- Coal blending
- Biodiesel
- Coal gasification

- Coal dewatering
- Bioethanol gen 2
- Solar energy
- Wind energy
- Wave energy
- Micro-hydro energy

This was followed by a short meeting with the rector of Sriwijaya University, Mrs. Badia Perizade, who showed lot of interest in collaboration with a centre such as M3TC for technology transfer from academia to industry. We also presented number of drying related books/journals and a copy of e-book on coal dehydration to Dr. Faizal.



Presentation at Sriwijaya University (Bukit Besar Campus)



Group pictures with audience which included professors and research students



Discussion with rector of Sriwijaya University, Palembang

Visit to Sriwijaya University (Inderalaya Campus)

The visit to Inderalaya campus was to understand the drying facilities developed by RUSNAS PEBT research group along with other experimental set-ups. We visited Chemical Engineering department at Inderalaya campus. The facility included following equipment.

- DEM coal drying pilot plant
- Coal blending equipment
- Coal gasification equipment
- Solar cell (1kW capacity)
- Bioethanol pilot plant
- Biodiesel pilot plant

Almost all units are of pilot scale with most of the equipment already under testing with few to be installed in a coming month. The visit was concluded with a discussion with Dr. M Faizal about the possible collaboration between M3TC and Sriwijaya University. This may include carrying out pilot scale studies using the drying equipment fabricated at M3TC and comparison with DME coal drying technique used by Sriwijaya University. All the experiments will be carried out at Sriwijaya University, Indonesia. The equipment developed at M3TC will be taken to Sriwijaya University at mutual agreement.



DME coal drying facility at Sriwijaya University



Coal blending equipment



Pilot scale biodiesel



Bioethanol production plant



Biodiesel samples

Acknowledgement – We are thankful to Dr. M. Faizal of Sriwijaya University for arranging a visit to coal mine and a visit to his university.