

TECHNICAL VISIT TO KIBING GROUP (M) SDN. BHD., NEGERI SEMBILAN

NEGERI SEMBILAN BRANCH



Ir. Dr Oh Seong Por

On 29 November, 2018, the Institution of Engineers Malaysia, Negeri Sembilan Branch (IEMNS) organised a technical visit to Kualiti Alam Sdn. Bhd., in Ladang Tanah Merah A3 Division, Bukit Pelandok, Negeri Sembilan. There were 45 participants from engineering consultant firms, industry sectors, universities and IEMNS office.

Kualiti Alam belongs to a group of companies called Cenviro which stands for “clean environment” and is a subsidiary of Khazanah Nasional Berhad. Since 1998, it has been operating the nation’s pioneer waste management centre in Negeri Sembilan. Over the years, the company has been relentlessly innovating and this has resulted in the establishment of the best integrated environmental solutions for scheduled waste. It has been granted to handle 76 types of 77 scheduled waste listed under Environment Quality Regulations 2005 for collection, treatment, recycling, recovery and final disposal. To this date, it has the capacity to dispose 100,000 tons of scheduled waste annually.

The IEMNS delegates, led by its chairman, Ir. Dr Oh Seong Por, arrived at 9.30 a.m. and was welcomed by Kualiti Alam’s acting Head of Operation, Encik Mohd Rizal bin Zambros and its Engineering Manager, Ir. Hazlin bin Harun. The delegates were ushered into the meeting hall where Encik Mohd Rizal, supported by process engineer Encik Shakirin Abdul Aziz, briefed them about the company profile, operation and services. There are 3 core scheduled waste processing plants, namely Scheduled Waste to Energy Plant (SWTE), Vertical Secured Landfill (VSLF) and clinical waste treatment centre.

The SWTE is the nation’s first plant where scheduled waste is incinerated and heat energy released is recovered to generate electricity. It was fully commissioned in 2018, three years after the idea was conceived. Figures 1 and 2 illustrate the major components of the SWTE plant and the process flow respectively. Scheduled waste with acceptable calorific value is fed into the rotary kiln-stoker combustion chambers. The incineration process generates heat, raising temperatures up to 700-900 degrees Celsius. The combusted waste leaves the stoker and enters secondary combustion chamber where temperature is raised again and maintained at 1100-1200 degrees Celsius. This is to

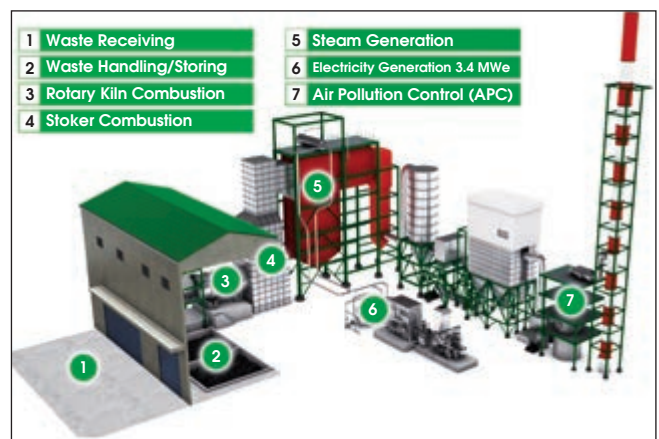


Figure 1: Major Components of SWTE Plant

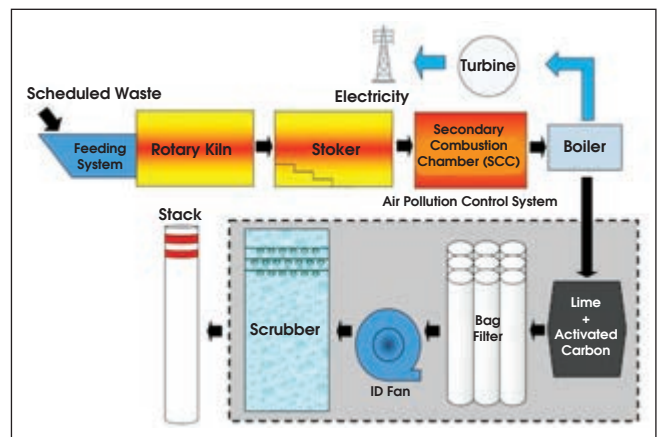


Figure 2: Process Flow of SWTE

ensure complete combustion as required by the regulation for the total destruction of organic matters. The hot flue gas is recovered to reheat steam to superheated level of 20 tons/day with pressure and temperature sustain at 32 bar and 350 degrees Celsius respectively. The superheated steam is capable of turning the steam turbine to generate electric power of 3.4 MW/day or 102 MW/month, sufficient to power 9,500 houses. Flue gas leaving the reheater is properly filtered and purified in the air pollution control system which comprises of series of lime-activated carbon purifiers, air bags and scrubber.



Emergency Response Command Centre

VSLF is an innovative technique to increase the space to the existing landfill. It is a green geogrid wall reinforced with soil and built along the 1.7km perimeter of the existing secured landfill. Properly compacted waste masses are stacked vertically within the geogrid wall. Once the layer is filled, the wall is raised higher, creating additional empty space for the next layer of landfill. According to Encik Rizal, the vertical wall can be raised to 24m high. This increases the landfill lifespan to 30 years from an initial 15 years, allowing more scheduled waste to be collected, processed and put to final disposal. To prevent moisture that may percolate from the waste mass and to protect the environment at the landfill, new technology using double liner system has been applied to capture leachate. Figure 3 shows the green geogrid wall of vertical secured landfill.

Besides the processing plant, the delegates also visited the Environmental Preservation & Innovation Centre (EPIC), a human development capacity building where innovative and reliable solutions are being developed to manage waste and renewable energy. The building is erected based upon green design concepts such as proper orientation and shape to tap on natural wind ventilation, thus minimising dependency on air conditioners and a solar panel to generate electricity for the internal lighting system.

Delegates were also allowed to visit the Emergency Response Command Centre. This is actually an in-house fire station, manned by trained ex-firemen and is equipped with complete firefighting assets such as a fire engine and



Solar Panel Unit at EPIC



Exchange of souvenirs between Ir. Dr Oh Seong Por and Encik Rizal

rescue vehicle. The unit was formed following a fire incident in the premises in 2015. The aim is to provide fast response to combat fire outbreak and to prevent fire hazard, not only within the Kualiti Alam facility but also the neighbouring community.

The visit ended with an exchange of souvenirs between Ir. Dr Oh Seong Por and Encik Rizal, followed by group photography session in front of the EPIC building. ■



Geogrid Wall of VSLF



EPIC Building