

Technical Visit to Transformers Manufacturer, AM SGB Sdn. Bhd.

ELECTRICAL ENGINEERING TECHNICAL DIVISION



reported by
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To the layman, a transformer is an electrical device that changes alternating current (AC) voltages from one level to another within the power networks. It is an important component in the transmission, distribution and utilisation of electrical energy. Without it, there would be a lot of wastage of energy in the system.

For a better appreciation of transformers and how they are made, the Electrical Engineering Technical Division (EETD) arranged for a visit to one of the largest transformer manufacturers in the region, AM SGB Sdn. Bhd., on 12 March, 2015. Its factory is in the Arab-Malaysia Industrial Park in Nilai, Negri Sembilan. EETD committee member, Ir. Faridon bin Talib, led the group of 15 IEM members.

It started with a briefing by an official of AM SGB Sdn. Bhd., who said the company was incorporated in 1994 and commenced production in early 1996. Initially the intention was to manufacture small rating oil distribution transformers up to 5000 kVA to meet Tenaga Nasional Berhad's (TNB) demand.

Now, with the installation of a state of the art production facility, it can produce power transformers up to 40 MVA. To further improve quality and reliability for the benefit of its customers, AM SGB Malaysia opened a new manufacturing facility to make cast resin coil and transformers. It is the only manufacturer of its kind within the ASEAN region.

With this development, Malaysia is taking a unique leadership position in ASEAN as far as the transformers are concerned. So far the company has delivered close to 25,000 units of various ratings of transformers for use in the region that include Africa, Asia, Australia Oceania and Middle East.

After the briefing, the visitors were divided into three groups which would visit the following facilities separately.

1. Insulation area: This was where we were



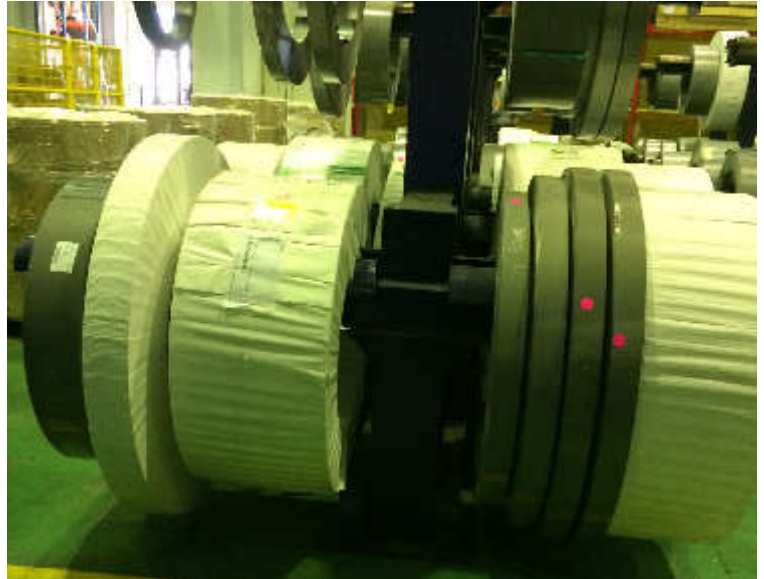
At the core cutting, stacking and assembly area.



Insulation area. IEM participant listening to the briefing on types of insulation papers.

introduced to the various types of insulation papers and the insulation process.

2. Coils and Accessories: Here, we saw the process of making coils. With the help of



At the core cutting, stacking and assembly area.



Cast resin transformer ready for delivery



Transformers are ready for testing



Exchanging tokens

modern machinery and high quality materials, high quality transformers were produced.

3. Core Cutting and Stacking: In this area we were exposed to the core cutting method with different sizes of silicon sheet steel. An optimum core design was achieved with the use of high quality cold rolled, grain oriented electrical sheet steel, step-lap cutting procedure and modern lamination methods without using internal bolts.
4. Distribution Assembly Area: Here, the various parts such as HV coils, LV coils, core, tank cover etc, were assembled to form the active parts.
5. Dryer: The active parts were dried in the dryer to remove any moisture in the assembly and insulation material. It takes roughly 48 hour to do this.
6. Tanking and Oil Filling: After drying, the active parts were inserted into the tank and bolted. Oil filling was completed through the "oil bleeding process" to remove any air and bubble in the transformer oil. The time required for oil settlement was roughly 24 hours for a distribution transformer and 48 hours for a power transformer.
7. Testing Area: To comply with the Quality Standard, AM SGB follows strictly all testing requirements

before delivery to customer. Testing was done as per International Standards IEC60076, ANSI AS, Oil & Gas (PTS, DEP). Some of the tests performed were:

- Routine test
 - Impulse test
 - Partial discharge testing
 - Sound ranging chamber
 - Oil testing
8. Cast Resin Factory: The cast resin factory used the latest and most modern state of the art technology. Its coil machine was connected to SGB in Germany where any error would be detected and corrected immediately. According to the company spokesperson, cast resin transformers have the following operational advantages:
 - High impulse voltages and controlled safety.
 - Thermal withstand capability makes overload possible.
 - Expansion and contraction of coils in service is tolerated, even for short circuits.
 - Long service life is guaranteed.

The visit ended with a certificate presentation ceremony, an exchange of souvenirs and a light lunch. ■