The Institution of Engineers, Malaysia

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Talk on
"Quality of Life – A sum of many parts – of Cars, Life and an Aeroplane"

Organised by the Mechanical Engineering Technical Division, IEM

BEM Approved CPD/PDP Hours: 2 **Ref No : IEM17/HQ/394/T**

Date : **12th October 2017 (Thursday)**
Time : **5.30 pm – 7.30 pm (*Refreshments will be served at 5.00 pm)***
Venue : **C&S and TUS Lecture Room, 2nd Floor, Wisma IEM, Petaling Jaya, Selangor**
Speaker : **Mr. S. Khim Wong**

SYNOPSIS

This presentation aims to provide a glimpse of an Automotive Engineer's view in the development of a motor vehicle and what it was like to work in the North American and Global automotive industry. A car consists of about 30,000 parts. Different modules like the body, engine, transmission, seats, electrical, electronics ETC were assembled within 40 to 80 seconds at each assembly station. During design, development, testing and manufacturing, each car component must meet the functional and durability standards. Failures can result in costly production stoppage and recalls that can bankrupt a company. The fuel tank has changed from a fuel storage unit to a fuel system that include the dynamics of Filling, Storage, Gauging, Venting, Fuel Delivery, Vapour Management and Safety. Fuel tanks for the automobile were originally made of steel, since the 1967 more stringent environmental and safety regulations forces the change of fuel formulation which became more corrosive. Plastic fuel tanks became popular due to its resistance to corrosion, lighter weight, design and packaging flexibility, crash resistance and lower cost. The first plastic fuel tank made of polyamide PA (Nylon) was introduced in the 1962 Ford Consul in Germany. Further development and lower cost lead to the use of polyethylene (HDPE) on the Alpine A110 rally racing car in 1971 and mass production started in 1974 at Volkswagen and on the Citroen 2CV in 1976. Plastic fuel tanks was introduced in North America in the 1980s. By 1990 it has gained80% market share in Europe and 20% in North America. It was introduced to Japan in early 1990s. Air pollution has harmful effects on human health. Pollution from burning fuel and fuel vapour are major contributors to air pollution problems. As polyethylene (HDPE) is made from petroleum, hydrocarbon (HC) molecules from fuel can permeate through the wall of the plastic fuel tank. In1988, fluorine was introduced in the Renault 21 as a barrier to reduce fuel vapour emissions from more than 6gm/24hr to 2gm/24hr. re. CARB In 1990, the plastic fuel tank industry in North America faced a 'death penalty' when new emission regulations (for implementation in 1995) from California called for vapour emission limits be changed from 2 grams (about half a tea spoon) to 0.2g/24hrs (one tear drop). Technologies of that time cannot meet this new emission regulations, therefore, the plastic fuel tank industry had to innovate or die. Innovations resulted in six-layer blow moulding and enhanced fuel tank system architecture with On-board Refueling Vapour Recovery (ORVR) system help to meet the challenge. By early 2000, ithas gained about 80% market share in North America with similar growth rates in Asia.

BIODATA OF SPEAKER

S. Khim Wong earned his bachelor degree in Mechanical Engineering from North East London Polytechnic/University of East London, England. His professional work experience started with Ford Motor Company in England and at British Gas Research Center. In 1978 he joined Tan Chong Motors/APM Holdings and started a factory making car air conditioners. During this time, he traveled often to Japan for training and business. Khim joined the North American automotive industry in 1989 as plastic fuel tanks began to replacesteel tanks. He worked on new manufacturing processes and fuel tank system development. In 2003 he was a member of the team that won the Solvay Innovation Award for the development of a Fuel tank system to meet the 0.054g/24hr evaporative emission limit. In 1996, he was in Japan helping Honda design and developed their first plastic fuel tank for a preprototype vehicle (senkosha) which was later launched in a production. He has written a number of technical specifications including one published by The Society of Automotive Engineers International, SAE J2587_200510 Optimized Fuel Tank Closure, where he was chairman and co-author. In 2005 Khim was the first employee of his company in China. He established the supplier base and was the technical consultant and trainer. By 2016, his company has eight factories in China and India. His work experience in Asia, Europe, and The Americas gave him a Global prospective of different work ethics and social cultures.

Ir. Dr. Kannan M. Munisamy
Chairman, Mechanical Engineering Technical Division, IEM

ANNOUNCEMENT TO NOTE

FEES

(Effective 1st October 2017)

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