

How I Became a Marine Engineer (Part 5)

Date Published : 19 July 2010

Author: Cheng Huang Leng

Establishment of the Singapore Polytechnic Instrumentation & Control Laboratory

In the 1970s, Singapore was being rapidly transformed into an industrialised nation. The need for technicians who understand automatic control using pneumatics, hydraulics and electronics (and later on computers) became pressing. To address this need, Instrumentation and Control was introduced as a subject to all engineering students at the Poly. I was tasked to set up the Instrumentation and Control Laboratory as a common facility. I started from scratch – a bare workshop space and as indicated earlier, very little money from our Government. The money was used to set up the infrastructure comprising some basic instruments and control equipments, benches and chairs, an air compressor, compressed air supply piping, electrical wiring and water piping. The rest of the laboratory equipment used for the 50 experiments developed came from parts that were cannibalised from condemned equipment. Parts that could not be used were sectioned to reveal the internal mechanisms and used as teaching aids. Most of the donations came from Mobil and Keppel Shipyard. We also received some items from Shell, Esso, SMC Pneumatics and Yokogawa.

I am proud to claim that one of the key changes I made was to require every marine engineering student to learn through the experiments. Each student was required to work independently instead of as a member of a group so that none could get away as “passenger”. To understand the learning point e.g. how to hook up a float to give a high level alarm, the student had to figure out what to do with the help from instructions and information given in the instruction sheets and WITHOUT my help. He was allowed to repeat the experiment till he felt confident to ask me for a one-shot on the spot oral test. My test could be to ask the student to (using the level alarm example) to hook up the circuit for a low level alarm. Through the demonstration, I would score the student who did it correctly, could explain what he did and why and that he complied with safety requirements.

To me, the best part of the process was that other students in the laboratory could witness the test and listen to the questions and answers that followed. In other words, I allowed them to copy! This stems from my belief that copying is the most efficient way to learn and in fact common practice in

industry; except that they disguise what they do by calling it, “reverse engineering”, “benchmarking” and similar euphemisms. The catch I had for a student who wanted to be tested on the experiment that he just witnessed was that he had to answer a different question e.g. to hook up two floats to provide a high level alarm and a low level alarm. And I would give any student who was able to do this without prior practice a good score!

The other innovation I implemented was to require every student to produce a one page handout of an instrument e.g. a pressure, level, flow, temperature sensor, transmitter, controller etc. I would provide the product brochure and the student had to make a sketch of the instrument with explanatory notes on how it works. I believed that each student would understand at least the instrument that he was assigned to. The result was that my class of 160 students covered a very wide variety of instruments and I hope that they all benefited from the exercise.

Secondment to Neptune Orient Lines

I have a M.Sc in Shipbuilding and have built shipyards and ships on paper as part of my project work. I have seen a lot of ships, sailed in three but never built any. I certainly lacked the practical knowledge of building a ship. The opportunity to be involved in building one came in 1976. NOL was in an expansion mode, had ordered a lot of ships and needed superintendents. Mr. Soe Aung was then NOL’s Technical Manager and at the same time a member of the Singapore Polytechnic Board of Governors. I sounded him out of my need for practical shipbuilding experience and he was quick to see a win-win solution. Again, through the support of my Head of Department, Mr. M K Das Gupta, a 12 month secondment to NOL was arranged.

Thus on 1 April 1976 (a Thursday), I joined NOL’s Fleet Management Department, Newbuilding Section. The next day Soe Aung called his number two, Mr. “Waterloo” Cheong Fook Kuen instructing him to arrange for me to leave for Japan and to meet him on Sunday. Getting the air ticket on short notice was not a problem. Possessing a passport that had expired was the problem. Fortunately, Personnel Manager Chong Ah Fatt had excellent connections with the Immigration Department and I got mine renewed within 12 hours and on 4 April I flew to Tokyo armed with the technical specifications for two container ships (Neptune Pearl and Neptune Coral) to be quoted by IHI.

The hull, machinery and electrical specifications came in 3 volumes filling a stack of A4 sheets to about 10 cm thick. I read them all during the 6 hour flight. The guy seating next to me was suitable impressed. He thought I was mugging for an exam on arrival!

It was my first trip to Japan and at a time when Japan was Number One in shipbuilding. I had studied Japanese shipbuilding methods and shipyards for my master degree at Newcastle and I wanted to discover for myself the answer to this question: "In 1976, the Japanese yard worker is paid at least 3 times the Singapore worker and yet Japan could build ships faster and cheaper than Singapore – Why?"

The first part of the answer was in their technical specifications. They could describe the ships they offered to build in detail – right down to the number of spare washers and fuses! We thought everything we needed was covered BUT much to our chagrin, the main engine (a Sulzer 12RND90M - 1st engine of this series made by IHI Aioi Engine Works, with an output of 42,000 HP with bore cooled cylinder liners) would come without an engine indicator! Toh Ho Tay could not believe it and put forward such a convincing argument that IHI "surrendered" to our appeal.

..... To be Continued in Part 6.....