

One-Day Course on the Design of Oil & Gas Fixed Offshore Platform

OIL, GAS AND MINING TECHNICAL DIVISION

reported by



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In Malaysia, most oil and gas reservoirs are located offshore, from 50m to over 1,000m under sea level. Clearly, it will require cunning structural engineering to extract the hydrocarbon from these reservoirs.

For reservoirs in shallow water (less than 300m), the preferred method is using fixed offshore platforms (Figure 1).



Figure 1: Fixed offshore platform (photo obtained from <https://commons.wikimedia.org>)

Designing an offshore structure requires a lot of technical knowledge and skills. Unfortunately, since the drop in global oil price three years ago, the number of young structural engineers being recruited is almost zero. As a result, there will be a generation gap in structural engineers when the oil price picks up again.

Realising this, IEM's Oil, Gas & Mining Technical Division (OGMTD) organised a one-day course on "The Design of Oil & Gas fixed Offshore Platform", aimed at providing exposure and basic knowledge on how to design an offshore platform.

The course was held on 12 August, 2017, at Wisma IEM. Dr Venkatesh Rajagopalan, the Regional Manager of Oglænd Industries, who has more than two decades' experience in the offshore industry, was invited to present the course (Figure 2). The course was chaired by Ir. Shazlan Rahman, a committee member of the IEM OGMTD.



Figure 2: Dr Venkatesh making the presentation

Dr Venkatesh started with an overview of the Oil & Gas industry, including how the industry started 150 years ago and how the technology had evolved throughout the years. He then went through the various types of oil and gas structures, explaining the roles of these structures in the upstream, midstream and downstream sections of the industry.

He then discussed the components of fixed offshore platforms (Figure 3, Page 34). In general, an offshore platform comprises three parts:

1. Topsides: Where the equipment, utilities, office and accommodation are located.
2. Jacket: Its main function is to support the topsides and to protect it against waves.
3. Foundation: Usually made of steel piles.

For each of the structural components, Dr Venkatesh discussed the analyses which must be performed during the in-service and pre-service conditions.

In-service condition is where the structures have been completely installed and are in operation. The main analyses that are carried out for this condition are static analysis, fatigue analysis, and dynamic analysis.

On the other hand, pre-service condition is the condition of the structure during installation. Some of the analyses carried out are load-out analysis, transportation analysis and lifting analysis.

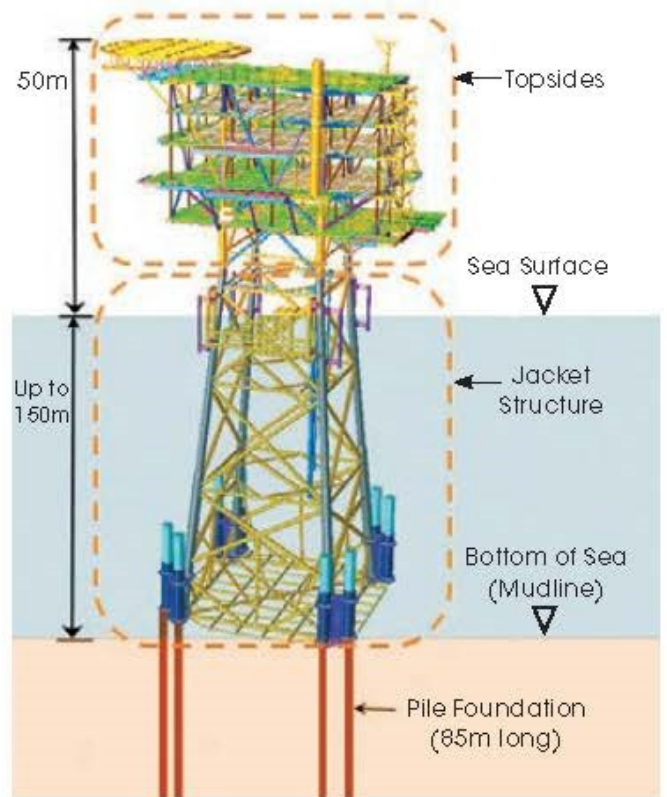


Figure 3: Components of a fixed offshore platform

For each in-service and pre-service condition, Dr Venkatesh discussed the loading that needed to be accounted for, such as gravity load, environmental load and accidental load. He also explained the design codes



Figure 4: Ir. Shazan presenting Dr Venkatesh with a token of appreciation

that should be considered such as the American Petroleum Institute (API) standards and American Institute of Steel Construction (AISC).

The course ended with Ir. Shazan presenting a souvenir and a certificate to Dr Venkatesh as a token of appreciation (Figure 4). IEM OGMTD hopes the course will inspire young structural engineers to join the Oil & Gas industry. ■