

## Engineering Analysis of Drilling and Production Equipment

Engineering calculation and analysis of drilling and production equipment to API Q1/6A/16A/17D and ASME BPVC.

**Client:** MTQ

**Time:** 2013 – now

**Location:** Singapore & Bahrain

Since 2013, **Neptune** Subsea Engineering (NSE) have been providing the engineering design verification and analysis services for API-rated drilling and production equipment manufactured by **MTQ** divisions in Singapore and Bahrain.

NSE's engineering analysis process fully complies with the quality management programs as per both API Q1 and ISO 9001. This includes maintaining a highly-qualified and highly-experienced team of engineers with extensive track records of working with API products and ASME BPVC pressure vessels. From the start of each project, NSE work closely with the client to understand the design parameters and operating conditions specific to the product. Required design inputs and outputs are advised to the client following relevant design codes for the product (e.g. API 6A, 16A and 17D). NSE then carry out 3D CAD modelling and finite element analysis (FEA) to ensure structural integrity of the equipment under all loading scenarios. Classical calculations, following the design codes and best engineering practices, are also utilised in parallel with FEA. A detailed engineering analysis report is provided for every piece of equipment, which forms an important part of the product quality control process. NSE also provide engineering supports to the client during their API monogram audits.

API-rated equipment analysed by **Neptune**:

- ✚ Clamps & clamp hubs
- ✚ Adapter spools
- ✚ Adapter flanges
- ✚ Multiple-way studded blocks
- ✚ Crossovers
- ✚ Blind flanges
- ✚ Test flanges
- ✚ Double-studded adapters
- ✚ Drilling spools
- ✚ Associated bolting, gaskets and connectors



Figure 1: Examples of API-rated drilling and production equipment analysed by Neptune.

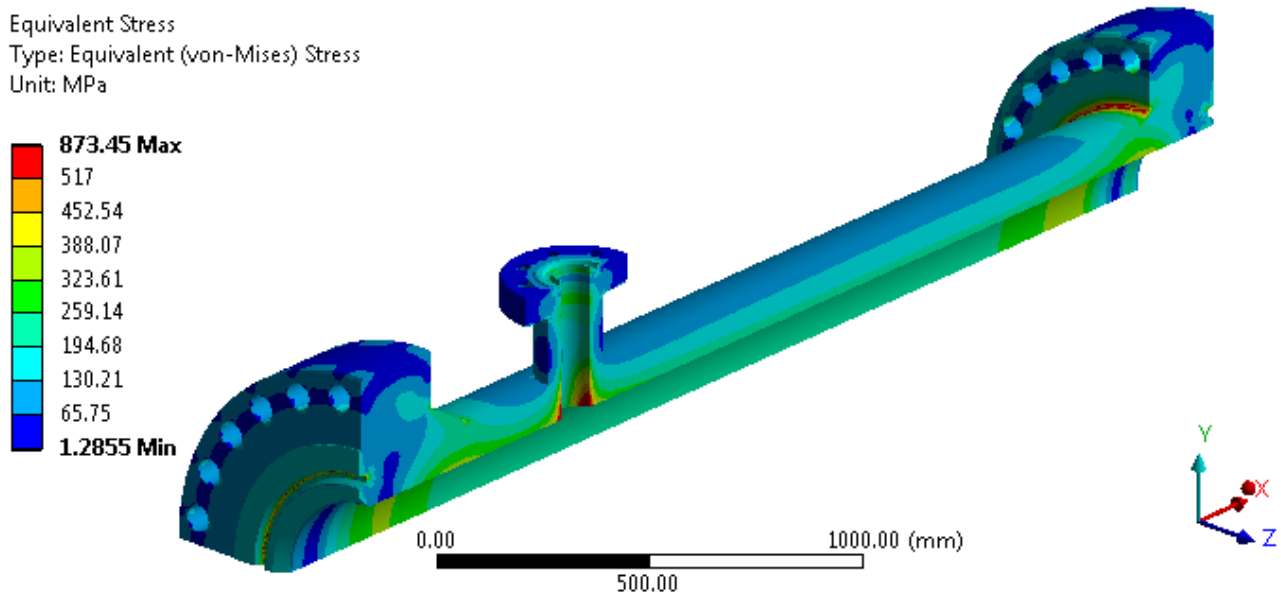


Figure 2: Example of Finite Element Analysis of a Mud Cross Assembly with API Flange Connections. Plot of Equivalent (Von -Mises) Stress as a Result of 10,000psi Working Pressure & Bolt Pretension Loads.