

BW Offshore (KL) Sdn. Bhd.

Oil and Gas

Malaysia



ANSYS®

CAD-IT

CONSULTANTS

Overview

BW Offshore is one of the world's leading FPSO contractors and a market leader within advanced offshore loading and production systems to the oil and gas industry. BW Offshore has 25 years' experience and has successfully delivered 13 FPSO projects and 50 turrets and offshore terminals. BW Offshore's technology division Advanced Loading and Production (APL) is a market leader and has delivered solutions for production vessels, storage vessels and tankers in a wide range of field developments. BW Offshore has as a global network with offices in Europe, Asia Pacific, West Africa and the Americas with a combined work force of about 1,200 employees.

BW offshore (KL) Sdn. Bhd. is a part of the global network of the BW offshore group. The Kuala Lumpur office provides a backbone support for the design and analysis of APL products and services which include the flagship Submerged Turret Production (STP), Submerged Turret Loading (STL), Bow Loading System (BLS) and Stern Discharge System (SDS).

Detail of APL products are found in www.apl.no.

Testimonial

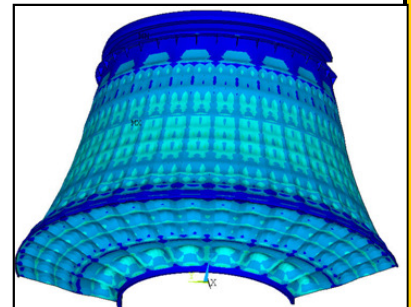
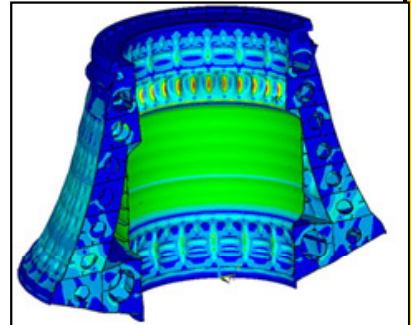
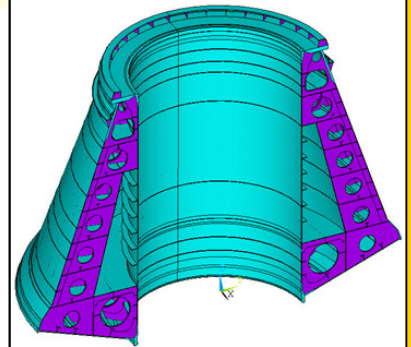
BW Offshore technology division APL has been using ANSYS in the design analysis of APL products for more than a decade.

In certain circumstances, ANSYS provide a competitive edge to design structures that operate in an extreme offshore environment, in which conventional calculation will only provide an ultra conservative design.

BW Offshore uses ANSYS because of its versatility and its price to available features is incomparable in the market.

Tasks in BW Offshore have never been so fulfilling without ANSYS. Thank you!

Tiew Kee Yoon
Senior structural engineer



Status Quo

The Submerged Turret Production buoy is usually submerged to a much deeper water depth during various stages in its life cycle. The water pressure due to the water depth could be quite severe, which in some cases can result in buckling of the STP buoy cone. To prevent the buckling of the structure below a certain water depth, conservative third party classification offshore codes are used to design the buoy, which may result in a very heavy structure. Traditional linear buckling analysis formulation according to codes leads to thicker plates.

Solution

To design a light and economical structure, ANSYS is used for nonlinear buckling analysis of the STP buoy. The pressure is applied onto the wet surfaces of the buoy and buckling analysis is carried out to determine the mode shapes of the structure. With guideline from the classification codes, geometry imperfection of structure due to welding and assembly is applied. The STP buoy structure is then analyzed for nonlinear buckling with a nonlinear material model and incremental loading. The result - a lighter buoy and a more competitive product. Noteworthy features in ANSYS includes and not limited to selection of buckling modes, ease of application of initial imperfections and easy identification of critical areas for buckling.

Benefits

By using ANSYS, we have successfully demonstrated the STP buoy to survive much deeper water without buckling, which the conventional method using the conservative buckling codes has failed to achieve. The effort translated in a tremendous saving, in term of cost and time. And this also means we could deliver our product in time and on schedule, which is of upmost important. It helps us to deliver a product which is fit for its intended purpose.