

Concrete Floating Storage and Offloading Unit (FSO)

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ABSTRACT

Floating Storage and Offloading Units are usually based on modified tankers. The FSO concept represents an optimized, purpose-built solution, but is still based upon wellproven technology and standard components. Compared to a conventional storage vessel, the rotational symmetric concrete floater offers several advantages which result in favourable economics and reduced risk. The unit is well suited also for other applications, such as floating production and LNG storage. The floater must be designed to sustain accidental events such as a ship collision. This is the issue of a Masters degree study performed at NTNU in collaboration with Olav Olsen as, which is the company behind the solution.

The study aims at investigating the mechanical behaviour and strength of the SFO concept when subjected to ship impact and contains the following tasks:

- Literature survey, including relevant code recommendations: DnV, Norsok etc in order to assess realistic impact loading
- Global "rule of thumb" hydrostatic calculations of collision between ship and concrete tank
- Analytical calculations of load actions from concentrated loadings/intensities on cylindrical shell structures
- Nonlinear analysis of impact on concrete tank, by means of DIANA
- Design of concrete tank to sustain impact loadings evaluated in relation to alternative compartment solutions

