Abstract

During the last years, several Floating Storage and Regasification Units (FSRU) have been ordered. The FSRU’s are one of the latest dynamic segment in a market becoming difficult for upstream investors because of LNG price. However, FSRU’s may be a good solution to find equilibrium between supply and demand since on the one hand it is a shortcut for countries which expect to become LNG importers quickly and on the other hand some existing LNG fleet might be removed in case of being converted to FSRU projects.

Bureau Veritas is a leading Classification Society on this market with approximately half of the in service FSRU in his register. As an example of this dynamic market, Bureau Veritas has recently received a request for Classification of a FSRU with a capacity of 263,000 cum. Before this order, the former world largest FSRU, confirmed also under Bureau Veritas Classification, has a capacity of 173,400 cum and is currently under operation by Excelerate in the Guanabara LNG import terminal in Brazil.

The large capacity of 263,000 cum allows the unit, to receive the cargo from all the LNG Carriers in service, including from the largest which have the size of the QMAX (Qatar Max). In particular, the tanks of this FSRU will be the largest tank allowing operation at all filling levels.

This increase of size represents a real significant step forward for the industry, with several new developments and innovations implemented on the project, in particular for the liquid motion inside the tanks which may violently impact the cargo tank and deform the membrane containment system.

The paper is presenting a general overview of the new developments and innovations and of the independent analysis carried out by Bureau Veritas within the scope of the Classification of the Unit. These studies include hydrodynamic, liquid motion, structural, and fatigue, and mooring analyses.

1. Introduction

Bureau Veritas has in his register more than half of the total fleet of in service Floating Storage and Regasification Units (FSRU). In addition, last year was received a request for Classification for a FSRU with a capacity of 263,000 cum. Before this order, the largest in service FSRU had a capacity of 173,000 cum, and was also under Bureau Veritas Classification. Consequently, the new one will replace the actual one and will become the largest ever built FSRU. This new FSRU will be capable to receive the cargo of all the in service LNG Carriers, including the cargo of the QMax vessels (Qatar Max). Rising such a capacity increment for a FSRU, constitutes a major step forward for the LNG industry. It justified that a particular attention was paid to the liquid motion inside the tanks during the design review.

The independent analysis carried out by Bureau Veritas within the scope of Classification of the unit, and includes are presented hereafter:
- Hydrodynamic analysis
- Liquid motion analysis
- Structural analysis
- Fatigue assessment
- Mooring analysis