ABS
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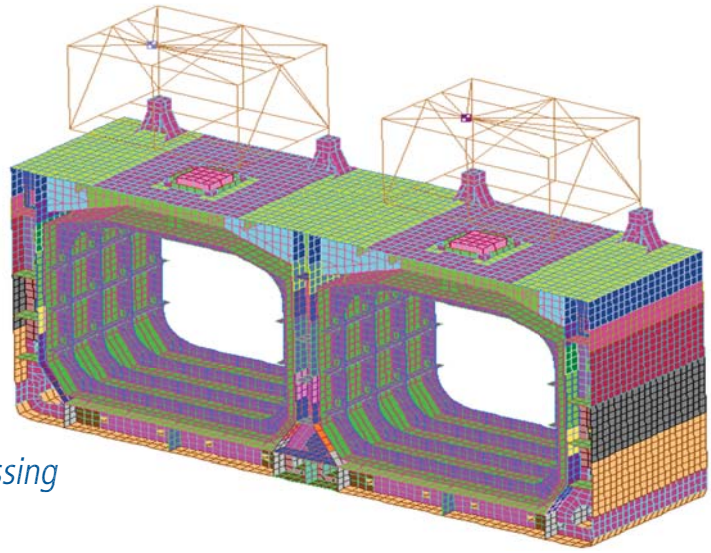
Guide for FLGT Structures Addresses Design Challenges



As floating offshore liquefied gas terminals (FLGTs) take on new dimensions with increased hull size and heavier topsides, ABS released the *Guide for Building and Classing Floating Offshore Liquefied Gas Terminals*.

Besides providing guidance on the size and weight design challenges, the Guide includes information about tank sloshing forces in partial filling mode, offloading operations, shallow water load effects and critical interfaces between the hull and topside structure and between the hull and position mooring system.

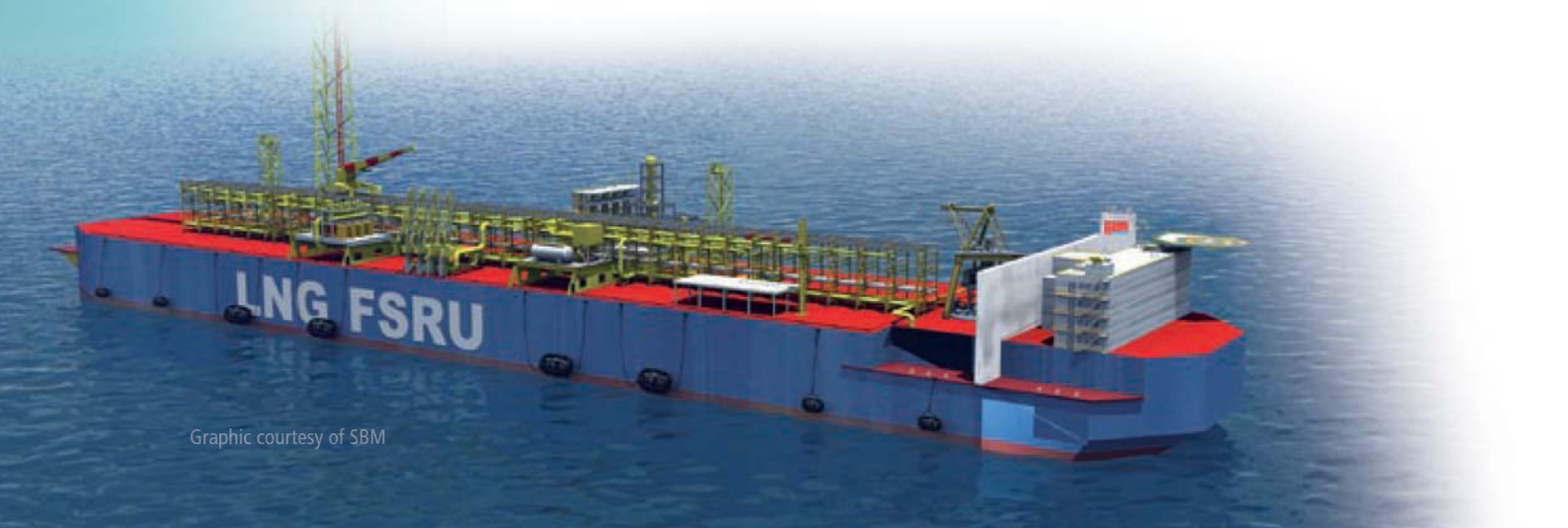
The ABS Guide contains safety criteria for topside process facilities in addition to the hull structure and the containment systems. Requirements are specific to each type of facility based on the class notation requested. Various options are provided as to the scope of class requested. While full ABS classification of the processing facility is the most comprehensive approach, owners can request a targeted review that covers the interface with the fire extinguishing system, hazardous areas, the excess gas disposal system or other safety systems.

Due to complexities related to terminal size, an overall risk assessment is required for each structure. Risk assessments are used to consider a number of hazardous events listed in the Guide for each type of facility. It is most effective to have ABS involved in a project early on to participate in various risk studies which become increasingly complex as the design becomes more fully developed.

Requirements for ABS survey during construction at the yard or site, as well as at the facilities of major equipment suppliers, are provided as well as criteria for annual and special periodic surveys throughout the life of the terminal. The continuous survey program incorporates the use of risk-based inspection techniques.

The requirements are based on:

- Extensive ABS experience in the classing or design review of oil and gas production facilities and gas carriers
- Established safe practices incorporated in industry recommended practices and ASME, ANSI, IEC, IEEE, ISO and NFPA standards as modified



Graphic courtesy of SBM

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The ABS *Guide for Building and Classing Floating Offshore Liquefied Gas Terminals* is available for free download from the ABS website at www.eagle.org. Navigate to Resources, Rules and Guides, Downloads, Publication #169.

Complementing the Guide is the ABS Eagle FLGT software, the first software designed to evaluate floating liquefied gas terminals. The standalone software's architecture easily interfaces with FEMAP as a postprocessor and NASTRAN as a solver.

The easy-to-use proprietary software provides tools for evaluating FLGTs with consideration to buckling, yielding, ultimate strength and fatigue strength. A key highlight of the floating terminal structural criteria is the consideration of low cycle fatigue which factors in the cyclic and more frequent loading and discharge nature of a floating terminal as compared to a trading gas carrier.

FLGTs with single center cargo tanks or two cargo tanks abreast arranged along the centerline of the hull are supported by the software and Guide. The requirements also can be applied to the classification of units with ship-shaped or barge-shaped hull forms, each incorporating membrane or independent prismatic tanks.

ABS Eagle FLGT Features and Benefits

- Covers both membrane and independent tank types except Moss type
- Automates iterations necessary to determine chock support of independent tank type configurations
- Applies prescriptive requirements, seakeeping studies, structural strength and fatigue analysis
- Provides calculations for evaluating structures considering buckling, yielding and fatigue strength
- Takes into account low cycle fatigue due to frequent loading and discharge

For more information:
Email: ABSFLGT@eagle.org
www.eagle.org

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