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# FLNG Projects Economics Improvement Based on Reliability Assessment

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## Abstract

With about 30 FLNG projects in planning, appraisal or FEED stage, the offshore industry is now diving in a new era. Even if the current oil price crisis is massively impacting new projects, gas projects remain a priority as it is considered by most of the energy analysts as the energy of the future for both, economical & environmental reasons. As no feedback is currently available, most of the operators are now looking towards the first units to be on stream to valid economic models based on unstable assumptions. This paper aims at demonstrating how reliability techniques such as RAM assessment can allow operators to adjust their economic model, ensure optimum return on investment and design reliable and safe installations. By using straight from concept stage of an FLNG project an adapted RAM tool coupled with an efficient RAM assessment based on experienced people, it will be possible to ensure design has been conducted effectively with respect to production performance and maintenance & repair strategy. Later on, by incorporating on a regular basis operational data comining from industy return on experience, companies will be able capitalize properly they experience and re-use it for future projects.

The paper will first give an overview of the (F)LNG market outlining the main challenges. Then, based on recent projects, it will detail the reliability methodology applied to ensure the profitability of such innovative installations. This section will focus on the key parameters and assumptions to be considered in order to assess production availability of the full FLNG installation in the most appropriate manner. Finally, after having pointed out the ins and outs of these analyses, a case study will be developed to quantify the benefit of the proposed approach.

## Introduction

RAM analysis is a modeling technique that has its origin in the military sector involving the V-1 missile team during World War II (MIL-HDBK-338B, 1998 [1]). It was here that it became first understood that an improvement in the reliability of individual components and reconfiguring the system to improve reliability resulted in an increased likelihood of success. Reliability was then quickly adopted in