OTC 18781

Second LNG Joint Sponsor Project

Caroline J. Deetjen and Gøran Andreassen, Det Norske Veritas (USA)

Abstract

More than 12 proposed LNG Regas facilities have been cancelled or rejected in US – not necessarily due to business prospects but to the public's environmental and safety concerns. Some 17 terminals have been approved, some with difficult conditions to be met, and most of them are facing significant risk of cancellation due to public and political opposition. The build or not build debate is safety and security driven and features elaborated theories and hypotheses of what can go wrong. In public hearings, it is not uncommon that raised critical concerns are unanswered, or answered only speculatively due to lack of knowledge.

Consequence studies conducted by Sandia Laboratories, Quest, ABS and DNV in 2004 brought more science to the table, but can not longer be considered as a first step. In 2006, DNV initiated a new joint sponsor project to refine and improve earlier studies. The study will equip stakeholders with better knowledge when debating public safety and security issues related to LNG Regas facilities.

This study will address 1) Probabilistic hole size distribution; 2) BLEVE effects; 3) Marine accident secondary effects. One of the most important parameters when safety and security is validated is LNG Carrier hole size from marine accidents. Today's risk analyses normally consider maximum hole size as documented by Sandia and DNV. The refined study will utilize non-linear analyses, finite element methods and international accident statistics to provide probabilistic hole size distributions to use risk analyses for more realistic results. Finite element methods will be used to identify factual cargo containment strength to verify that ship cargo tanks will burst before pressure necessary to accommodate fireballs (BLEVEs). Industry perspective is that LNG Carriers can not accommodate a BLEVE, the Study will document if this is the case. The study will also address future use of Qmax carriers, significantly larger than today's fleet.

The increased knowledge will ensure the industry has the ability to be proactive with respect to LNG safety, better educate the public and governmental entities, and safely meet the growing natural gas demands of the future. The work should be completed by 1Q 2007.

Introduction

Opposition groups, regulators and the general public all question the scientific basis of LNG carrier safety assessments with respect to the selection of hole sizes and elimination of boiling liquid expanding vapour explosion (BLEVE_ effects. They also question the validity of safety estimates presented in current proposals for the application of LNG facilities, despite the fact that the extremely well regulated LNG industry has suffered relatively few industry related incidents. Ironically, this success has worked against the LNG industry by limiting the number of historical incidents to those that occurred when the industry was in its infancy. As a result, the opposition and public outcry fuel concern by citing events that occurred over 50 years ago. While the understanding of LNG handling and operation continues to increase, the accelerated pace of growth and dynamic changes all along the supply chain raise and increasing number of challenges and unresolved issues. It is by addressing these challenges and allaying the fears surrounding LNG that planned LNG projects around the world will be able to leap ahead and meet the increasing LNG demand.

In June 2004, a joint sponsor project (JSP), entitled LNG Marine Release Consequence Assessment, was published by Det Norske Veritas (DNV). The project consisted of a study aimed at identifying the potential hazard zones for a range of maritime LNG release scenarios. One conclusion from the study was that the flawless historical record of LNG shipping and the technical advances in the shipping industry supported the notion that a large scale release of LNG from a ship is unlikely to occur. The study went on to present potential hazard ranges for defined maximum credible scenarios. The JSP report has been broadly recognised by regulators, developers and experts and has become an important factor in bringing a better balance to the LNG safety and security debate.

The first JSP was supported by the following