
LNG Safety

and the Lack of Public Education

by Michael P. Pearson and Blaine Yamagata
Partners of Jackson Walker L.L.P.

After more than two decades of limited importance, liquefied natural gas (LNG) has re-emerged as a crucial source for satisfying the future energy demands of the United States. While there are numerous factors that will affect whether LNG will achieve its potential as an energy source, one significant element for ensuring deliveries of LNG to U.S. consumers is the

timely construction and operation of new onshore and offshore LNG re-gasification terminals to supplement the five import terminals currently in operation in the United States.

The safety of the existing and planned LNG terminals, as well as the vessels that deliver the LNG, is increasingly the focus of public concern. While a discussion of the safety of terminals and vessels is both legitimate and

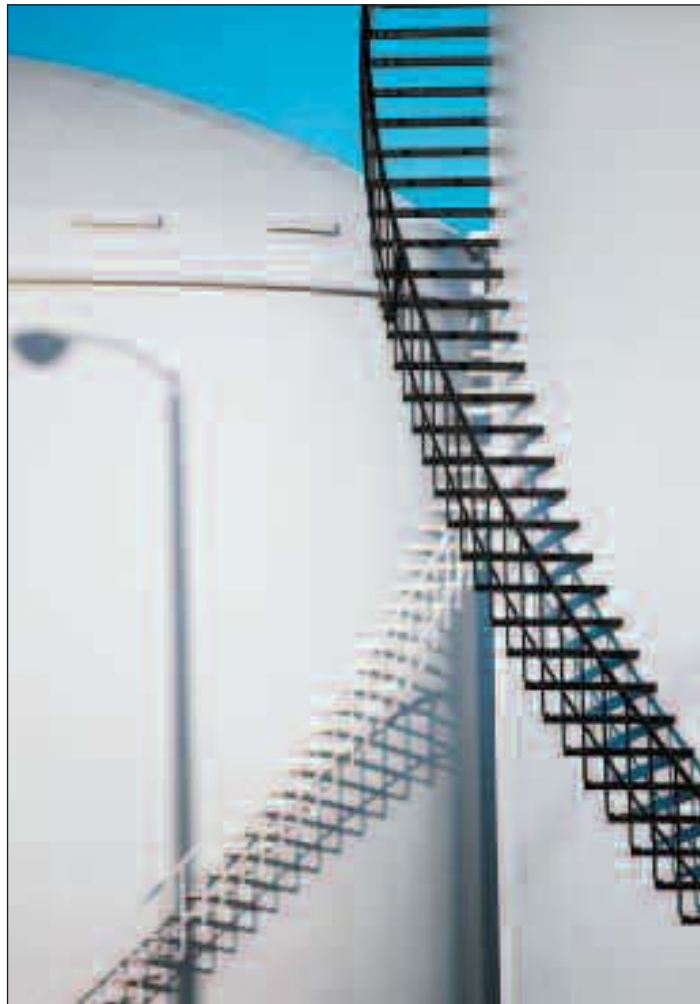
necessary, the diversity of technical and scientific studies used to assess terminal and vessel safety, as well as the failure to communicate to the public in understandable terms the results of those analyzes, make it difficult to reach broad consensus regarding the safety of LNG. Unless issues of safety can be presented to the public on the basis of understandable, agreed-upon principles, those proposing new terminals will be subject to



continuing challenges from those who rely on anecdotal views or pieces of information extracted from various LNG reports to support claims that LNG terminals and vessels pose unacceptable risks. In these circumstances, some terminal projects may become embroiled in regulatory and judicial proceedings that will delay or defeat their construction and operation, resulting in delays in the availability, or perhaps the loss, of additional LNG-related gas supplies for the U.S. market. Now is the time for government, industry, and the public to focus on a consistent and understandable set of tools for assessing the safety of domestic LNG projects.

The demand for natural gas in the United States is increasing. The Energy Information Administration's "2005 Annual Energy Outlook" predicts that demand will increase by thirty percent over the next ten years. According to the National Petroleum Council, that demand cannot be satisfied solely by increasing production in existing supply areas such as the Outer Continental Shelf or the Rocky Mountains, bringing gas from Alaska, Canada, or Mexico, or importing LNG. Rather, all of these sources of supply, including LNG, will be required to meet the demand for increased supplies.

Among the issues challenging this country's ability to import LNG is the question of the location of re-gasification terminals. While new onshore and offshore LNG terminals have been approved by government regulators for locations along the Gulf Coast of the United States, proposed terminals on the East and West Coasts, as well as certain proposed termi-

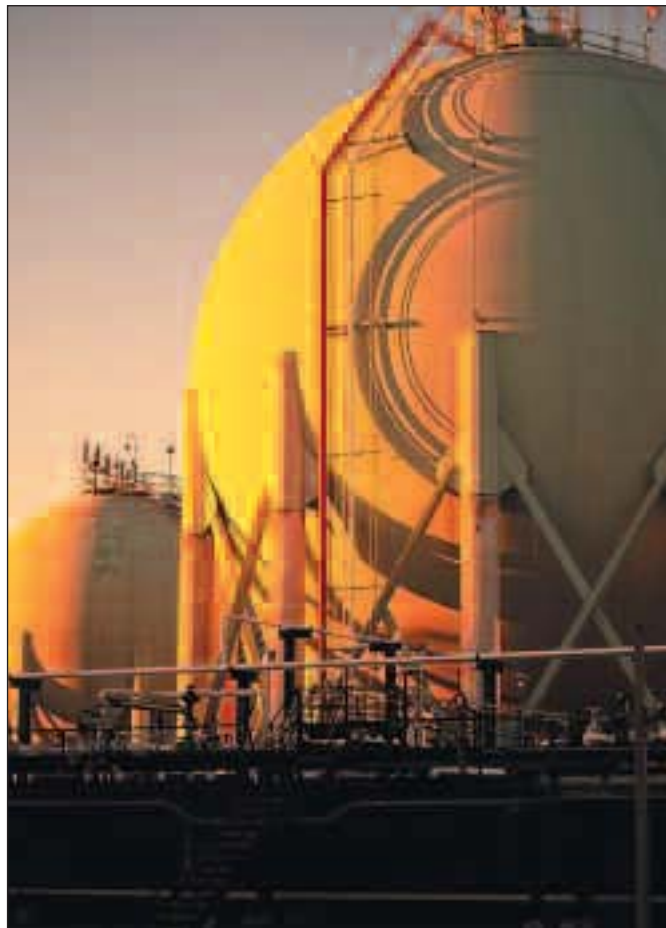


nal locations on the Gulf Coast, have yet to be approved. The location of import terminals increasingly is being challenged, especially when the proposed location is near populated areas. Of primary concern to the public are the risks of an LNG spill, primarily thermal radiation and flammable gas dispersion. LNG spills at import terminals, or from the ships delivering the LNG to the terminals, can be either accidental or the result of intentional, even terrorist, acts. In either event, the ignition of LNG from a spill is a legitimate concern of those who might be located near the spill. To date, however, the impact of a spill appears not to be generally or easily understood by the public. Moreover, the diverse, highly detailed,

and complex studies and analyzes relied on by regulators for assessing a spill impact, while each apparently scientifically sound, have not allayed the public concern. Further, while the LNG industry has a laudable safety record spanning many decades, including 30,000 shiploads of LNG traveling over 62 million miles with no fatalities due to LNG spills, it is unclear whether public concern over safety is eased by recitation of that safety record. Rather, the public is being told by opponents of LNG terminals that accidents happen, pointing to the 2004 explosion at the liquefaction plant at Skikda, Algeria, or the devastating LNG explosion in Cleveland, Ohio, that occurred in the 1940s. Moreover, opponents of LNG terminals dismiss the enviable safety record of the LNG industry as having been established at a time when the threat of international terrorism was not a significant factor.

Import terminal developers presenting their proposals to regulators are now submitting, as a part of each application, analyzes of the safety and security of each proposed terminal. The purpose obviously is to demonstrate that risks to the public posed by a specific terminal are manageable. These case-specific studies are supplemented by non-case-specific studies addressing LNG spills. The latter studies include two released in 2004. One, a government-sponsored study conducted by Sandia National Laboratories. And one prepared by the Department of Energy and other agencies following the terrorist attacks of September 11, 2001. This study was commissioned by the Federal Energy Regulatory Commission (FERC) in 2004 and has been used by that agency to assess the risks associated with vapor and thermal radiation hazards

resulting from spills at land-based terminals and from ships delivering LNG to those terminals. Generally, these detail-oriented studies set forth methods for assessing the impacts of LNG spills. Each of the studies, however, reaches somewhat different conclusions about the impacts of LNG spills. Together with case-specific studies, which focus on the specific



conditions affecting a proposed terminal site, these generic studies provide reviewing agencies a significant amount of data for assessing LNG spill risks.

The diverse studies regarding how the risks of an LNG spill should be assessed, together with the incompatibility of certain elements of the studies, create the potential for a lack of


consistency in analyzing the risks of thermal radiation and gas dispersion resulting from an LNG spill. Parts of the same studies are now being cited by both proponents and opponents of LNG import terminals to support their respective positions. Compounding the issue is the fact that the analyses rely on complex modeling, the results of which are not easily explainable to the general public. The complexity and potential lack of consistency are made even more acute since the FERC is responsible for authorizing the construction and operation of onshore re-gasification terminals, while the Coast Guard and the Maritime Administration, pursuant to authority delegated by the Secretary of Transportation, are responsible for licensing the construction and operation of offshore LNG terminals.

The lack of consistency and complexity of the risk analysis for each terminal project potentially will have two adverse consequences for ensuring adequate supplies of LNG for this country. First, it creates the potential for lengthy administrative and judicial proceedings as a part of the approval process. For example, in the Northeastern U.S. and California, import terminals are being challenged on the basis of spill risks that include unfounded claims of danger to the public or that rely on selective use of existing data to support an overall theme that LNG is inherently dangerous and a threat to the public. While no less of concern to projects located on the Gulf Coast, where new re-gasification terminals are being approved more quickly, the more expeditious approval of Gulf Coast terminals may not necessarily be the most economically efficient result. If the points of entry for LNG primarily are located along the Gulf Coast, there will have to be adequate pipeline capacity to deliver the re-gasified LNG to the growing markets of the East and West Coasts. If adequate pipeline capacity will not be avail-

able, consumers must be prepared to bear the additional costs for such new pipeline capacity. Moreover, even if adequate pipeline capacity exists, there will still be additional costs incurred to deliver the gas to distant locations where demand exists. Those costs will have to be borne by consumers in the areas where the gas is to be delivered.

The second, and potentially more far reaching consequence of inconsistent studies and a failure to explain in understandable terms the risks of an LNG terminal, is the adverse impact on public confidence in the process for deciding where to locate LNG import terminals. If the public is presented with competing claims and no understandable explanation about the risks of an LNG terminal, there will be no confidence that the regulatory process can correctly assess the risks of an LNG spill. If the public remains uneducated about the risks of a project because of either a lack of information or misinformation, proposed projects will either ultimately fail or be presented with prolonged regulatory proceedings.

The LNG industry certainly has an important role in educating the public and guiding the debate about the risks associated with LNG. While the basic characteristics of LNG that make it a safe source of energy are set forth in great detail in the various applications filed with agencies to construct and operate LNG terminals, a comparable effort has not been made by the industry to inform the public. For example, it is doubtful that the general public knows that the density of LNG vapor is less than air and disperses rapidly in air; that only certain mixtures of air and LNG vapor are flammable; that the lowest temperature at which LNG will ignite spontaneously (the "auto ignition temperature") is approximately 1100° F., which is higher than the auto ignition temperature of other fuels such as LPG, gasoline, or diesel; and that if LNG vaporizes from a liquid to a gaseous state, becomes mixed



with air, and begins to burn, a flame will not likely generate an explosion if unconfined but will, instead, burn back to its source. Nor is the public generally aware that vessels delivering LNG to domestic ports must provide the Coast Guard with a 96-hour advance notice of arrival and provide information about the vessel and its crew, thus allowing the Coast Guard to conduct a terrorism risk assessment of each vessel. Thus, as a group, LNG vessels are scrutinized more closely than most other vessels. Because there generally has been a failure on the part of industry to convey even these most basic of facts to the public, however, the populace near proposed terminals remains ill informed about the reality of the risks of an LNG terminal.

It is not enough, however, for the industry alone to take up the task of explaining to the public in understandable terms the nature of the risks posed by LNG. There will always be a portion of the public that will be skeptical of the LNG industry, believing that its explanations are merely intended to promote its own interests. Government at all levels – federal, state, and local – must also assume a role in becoming informed about the risks of LNG and explaining those risks in understandable terms to the public. For example, the federal government has been able to explain in concise, understandable terms that this country will begin experiencing a mismatch between demand and available supplies of natural gas in the coming years. A comparable effort is needed to explain the risks of LNG. The government studies demonstrating that risks associated with LNG are manageable and acceptable are positive first steps, but they are not enough. The public as a whole simply does not have an appetite to read and digest the hundreds of pages of the various studies that address the risks associated with LNG. Until the risks of LNG are articulated in terms that

are clear and understandable to the public, the full promise of LNG as a source of energy supply for this country will not be realized.

Over the past several years, natural gas supplies available for export as LNG have been identified in many countries that do not need the gas for their own domestic consumption. Supplies will be available from numerous countries, including those located in the Middle East, Africa, Australia, and South America. Coupled with improved liquefaction and transportation efficiencies that have decreased costs substantially, LNG thus has become a viable source of gas supply for U.S. markets. The U.S. cannot assume that such supplies will be available to it indefinitely, however. Other countries in Asia and Europe will compete for the new supplies. In many of those regions of the world, the growth in demand for gas equals or exceeds the demand in the U.S. If the U.S. does not have adequate and timely import terminal capacity, other countries that are able to build import terminals on a timely basis may well be better positioned to secure LNG supplies on a long term basis. While this country desires long-term, stable sources of LNG, exporting countries likely will closely monitor the ability of U.S. LNG terminal developers to begin receiving LNG supplies on a timely basis. If this country is unable to build and operate LNG import terminals as supplies become available, it risks losing supplies to other importers.

Michael P. Pearson and Blaine Yamagata are partners in the Houston, Texas, office of Jackson Walker L.L.P. Mr. Pearson specializes in energy transactions, and Mr. Yamagata specializes in energy regulatory matters, including, in particular, permitting and regulatory approvals associated with on-shore and off-shore LNG re-gasification facilities.