



# LNG Safety and Quality Assurance



- Threat Assessment/Hazard Analysis Studies
- Vapor Dispersion/Thermal Radiation Analysis
- Facility Recommissioning
- Regulatory Compliance
- Feasibility Studies
- Live LNG Demonstrations
- LNG Video Development

Liquefied natural gas (LNG) is the best option for the U.S. to respond to the deficit between energy demands and domestic production. Current energy costs have given remote, stranded gas reserves a greatly increased value. LNG export/import projects provide the sophisticated but unfamiliar cryogenic technology to bring stranded gas to the market; however, they also require careful investment and engineering decisions combined with the highest level of safety and risk management. Long-term commitment of billions of dollars must be based on sound market analysis and project feasibility supported by compelling risk assessment, code compliance, and project execution. Third-party ability to demonstrate and communicate objective risk evaluation to regulators, members of the media, and key stakeholders is an absolute necessity.

## Our Approach

LNG is generally perceived by the public as being extremely hazardous. The hazard of the material is relatively moderate compared with other fuels and chemicals. However, careful consideration and respect must be given to the amounts of LNG handled. LNG and its low temperatures are unfamiliar and require unique designs.

LNG safety is a result of the integration of good site selection, careful design, hazard identification/characterization/hazard mitigation, risk assessment and risk management. There is an obligation to present an accurate and honest picture of the risks to stakeholders that creates both understanding and a feeling of good faith and trust.

A key element in meeting safety objectives is an effective quality assurance program, which consists of two parts. The first part, quality control, is the inspection of the materials and fabrication to the required specifications. The second part, quality assurance establishes the inspection requirements, evaluates and retains inspection documentation, resolves problems and organizes the documentation such that there is an assurance that the inspections are complete and acceptable for the facility to be certified.

Given that safety and quality assurance continue to be pressing issues in the natural gas industry, ICF International provides clients with key technologies to improve the performance and reliability of their facilities. We provide such services as inspections, design reviews, hazard and risk analyses and management, safety audits and procedures, quality assurance reviews/plans, security evaluations, audiovisual materials, and public demonstrations.

## Featured Solutions

### LNG Receiving Facility Hazard/Threat Analysis.

ICF performed threat assessment/hazard analysis studies for many of the proposed LNG Receiving Terminals throughout the United States. Specific tasks included performing vapor dispersion and thermal radiation calculations, preparing the Resource Report 13 Spill Containment report for the Environmental Impact Statement (EIS), fire and hazard drawings, and the Matrix and wording for Resource Report 13.

### Texas LNG Facility.

ICF refurbished and recommissioned the 9 MMscf/d liquefaction and storage facility producing a 99.9 percent methane product for LNG vehicle fuel.

### LNG Initial Projects and Expansions.

ICF performed vapor dispersion and thermal radiation calculations, prepared the Resource Report 13 Spill Containment report for several Environmental Impact Statements (EIS) along with security assessments supported with threat analyses, fire and hazard drawings, and content and wording for Resource Report 13.

### Offshore LNG Project.

ICF performed marine accident analyses, "spill on water", vapor dispersion and thermal radiation calculations, prepared the Resource Report 13 Spill Containment report for Environmental Impact Statement, and reviewed Resource Report 13 sections on fire and hazard, regulatory compliance, and emergency shutdown (ESD) systems.

### LNG Safety and Informational Audiovisual Materials.

For various clients, ICF directed, performed demonstrations, and reviewed production of LNG safety and informational audiovisual materials. These materials were prepared for elected officials and the general public and used for Web site promotion of LNG facilities.

### LNG Site Development (Feasibility).

ICF performed duties and served as advisors to several LNG facility owners regarding LNG site selection, sizing, layout, and process concept.

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## About ICF International

ICF International (NASDAQ: ICFI) partners with government and commercial clients to deliver consulting services and technology solutions in the energy, climate change, environment, transportation, social programs, health, defense, and emergency management markets. The firm combines passion for its work with industry expertise and innovative analytics to produce compelling results throughout the entire program life cycle, from analysis and design through implementation and improvement. Since 1969, ICF has been serving government at all levels, major corporations, and multilateral institutions. More than 2,500 employees serve these clients worldwide. ICF's Web site is [www.icfi.com](http://www.icfi.com).

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