

PHMSA Research, Technical and Policy Perspectives



Working Group #5
Liquefied Natural Gas Facilities
Thach Nguyen

Pipeline Research and Development Forum
February 19-20, 2020



U.S. Department of Transportation
**Pipeline and Hazardous Materials
Safety Administration**

"To protect people and the environment by advancing the safe transportation of energy and other hazardous materials that are essential to our daily lives."



Program Area: Liquefied Natural Gas

- Program Objective: Research will examine standards and develop technology and solutions for the reduction of risk at every type of LNG facility during the design, construction, and operation phases.
- PHMSA's Research Portfolio:
 - 3 completed and 5 ongoing research projects
 - \$2.1M PHMSA + \$240K Resource Sharing



Completed LNG Research

Researcher	Title	PHMSA	Cost Share	Completed
Technology & Management Systems, Inc.	Modeling and Assessing a Spectrum of Accidental Fires and Risks in a LNG Facility	\$213,030	\$220,539	03/04/2007
Gas Technology Institute	Statistical Review and Gap Analysis of LNG Failure Rate Table	\$418,058	N/A	11/28/2016
CH-IV International	Comparison of Exclusion Zone Calculations and Vapor Dispersion Modeling Tools	\$217,810	N/A	05/08/2017
Totals:		\$848,898	\$220,539	

NOTE: PHMSA cancelled this below project due to inability to obtain a comprehensive relevant data set

Review of Control System Testing Frequency

Main Objective: Understanding the potential negative unintended consequences in overly conservative testing intervals. In addition, it will provide information on typical practices across other industries and recommendations in other internationally recognized codes and standards



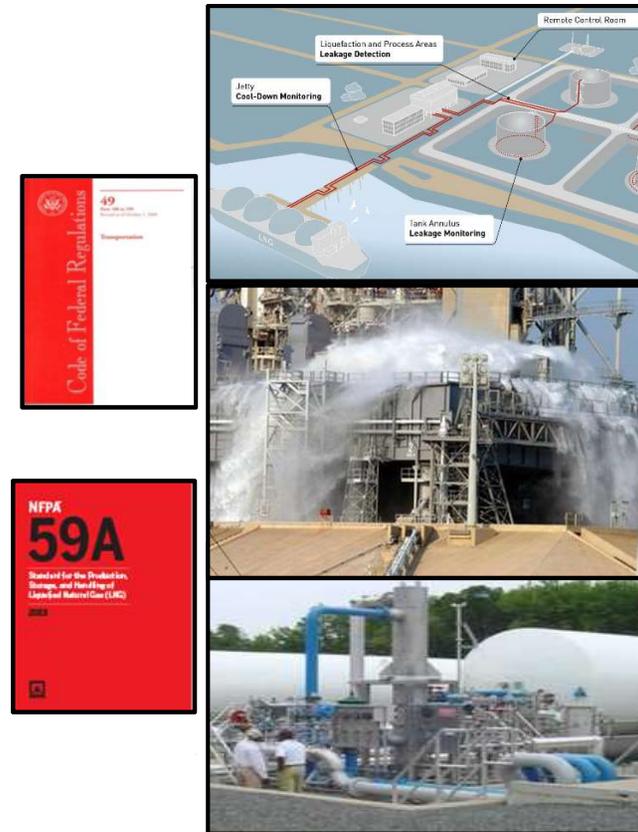
Ongoing LNG Research

Researcher	Title	PHMSA	Cost Share	Start	Months	% Comp.
Gas Technology Institute	<i>"Consistency Review of Methodologies for Quantitative Risk Assessment"</i>	\$858,587	N/A	Aug 2018	24	75
Gas Technology Institute	<i>"Performance Gap Comparison of Process Safety Management Consensus Standards and Regulatory Requirements for LNG Facilities"</i>	\$295,529	N/A	Aug 2018	18	98
Gas Technology Institute	<i>"Evaluation of the Efficacy and Treatment of Hazard Mitigation Measures for LNG Facilities"</i>	\$319,707	\$80,000	Sep 2019	16	25
Blue Engineering and Consulting Company	<i>"Develop a Risk-Based Approach and Criteria for Hazard Detection Layout"</i>	\$269,952	\$67,488	Sep 2019	18	22
Blue Engineering and Consulting Company	<i>"Develop an Evaluation Protocol for Non-LNG Release Hazards - Modeling"</i>	\$391,564	\$96,891	Sep 2019	22	18
Total:		\$2,135,339	\$244,379			



Research Portfolio Observations

- Strong focus on the siting requirements and active mitigation measures
- Results can support policy development and potential changes to standards
- The research portfolio is relatively new leaving other facility operations open for gap analysis



PHMSA LNG Program

Current Initiatives and Projects

- Federal Coordination on FERC-Jurisdictional LNG Projects
- Subpart B Siting Review
- Subpart C Design Review
- Special Permit Reviews for LNG Facilities (49 CFR §190.341)
- Petitions for Part 193 Finding or Approval by the Administrator (49 CFR §190.9)
- Evaluation of hazard modeling software
- LNG R&D Projects



Current Rulemakings in Process

- This rulemaking will address the Executive Order 13868 provision for updating the safety regulations for LNG facilities.
- This rulemaking will propose amendments to the Pipeline Safety Regulations in Part 193 for LNG facilities.
- These amendments will includes updates to incorporated industry standards.
- This rulemaking will address risks associated with today's LNG facilities including permanent, small scale LNG facilities as required by Section 27 of the Pipes Act of 2016.



National Pipeline Research and Innovation Test Site
At
U.S. DOT Transportation Technology Center
Pueblo, Colorado

CONCEPTUAL VIEW



- Additional Study Areas Identified by Industry
- Fiber optics technology
 - Pipeline material aging
 - Welds on specialty materials
 - Compressor emissions
 - Pressure cycling for fatigue
 - Physical & cyber security

Considerations for projects at TTC

- What project(s) would lend itself well to being conducted at TTC?
 - Near real-world scenarios, can't be performed elsewhere, and/or could benefit from TTC intermodal capabilities
- What are examples of challenges associated with project that would need to be addressed?
 - Confidentiality of data for some aspects, overall security
- Who would be good to provide input for conceptual, types of equipment, and operational needs for launching and maintaining a world class research and test facility
- Other considerations?



Submitting Research Gap Ideas

Anyone, Anywhere and Anytime via <https://primis.phmsa.dot.gov/matrix/>

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Pipeline Technical Resources
[Return to Pipeline Safety Community](#)

Home	Alt MAOP	Cased Crossings and GWUT	Class Location	CRM	DIMP	GT IM	HL IM	High Volume EFV
Low Strength Pipe	LNG Facility Siting	OQ	Pipeline Construction	Public Meetings	R&D	RMWG	Underground Natural Gas Storage	

Research & Development: Identifying Pipeline Safety Research Gaps

Submit Research Gap Suggestions by [following this link](#).

R&D Menu

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1. BACKGROUND

The Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) sponsors Research & Development (R&D) projects focused on providing technological and knowledge solutions that will increase the safety and reliability of the Nation's pipelines. Historically, research gaps are identified and road mapped at public events, held periodically as funding and program actions allow. Although hundreds of attendees usually participate at each event, many stakeholders cannot attend since they either don't have the means or availability.

PHMSA is using this Special Notice to solicit research ideas on a year-round basis to reach the widest set of stakeholders and identify a larger more diverse portfolio of research. The input from this Special Notice will also generate a pool of research ideas for potential future research solicitations.

PHMSA will use submitted research gaps to formulate a research strategy for its Pipeline Safety Research Program.

2. RESEARCH PROGRAMMATIC AREAS/ELEMENTS

The Pipeline Safety Research Program organizes program planning, execution, and tracking around the following subject areas.

Threat Prevention

This area addresses excavation activity damage prevention to all pipeline types and improving sub-surface locating/mapping. Research also addresses preventing or monitoring for other threats whether they are coming from corrosion, outside force damage, etc.

Leak Detection

Research in this area addresses leak detection or monitoring on hazardous liquid and natural gas pipelines, including sub-surface, surface, and airborne-based sensors and deployment platforms. Research also addresses approaches to lessen release volumes from leak/rupture incidents.

Anomaly Detection/Characterization

This area aims to improve the capability to identify and locate critical pipeline defects, and to characterize the severity or interacting nature of such defects. Research in this area includes solutions from within or outside the pipe.

- Regulations
- Advisory Bulletins
- Interpretations

Research & Development Program
Server Version: 3.00.112 Server Time: 01/29/2020 03:04 PM UTC User: Robert Smith

Research Gap Suggestions

Pipeline Safety Gap Suggestion Form

Name of Person Submitting: Email of Person Submitting:

Email address will be used by PHMSA only for verification and follow-up purposes, and will not be released to the public or any other organization.

Stakeholder Type:
[select from choices below]

Gap/Project Title (required):

Main Objective Statement (required):

Identify Major Scope Items for Investigation:

Identify Relevant Subject Matter Experts, Stakeholders, or End User Involvement suggested in Project Scope:

Cost Estimate: Time Estimate (months):

PHMSA Program Element:
[select from choices below]



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Thank You!/Research Contacts

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Visit us at <https://www.phmsa.dot.gov/> and search “Research”

