Quarterly Report – Public Page

Date of Report: 2nd Quarterly Report - March 31, 2024 Contract Number: 693JK32410009POTA Prepared for: U.S. DOT Pipeline and Hazardous Materials Safety Administration Project Title: LNG Knowledge Development – Consequences of Catastrophic Failure of LNG Storage Tanks Prepared by: Simpson Gumpertz & Heger Inc. Contact Information: Onder Akinci, <u>noakinci@sgh.com</u>, +1 (713) 265-6423 For quarterly period ending: March 31, 2025

1: Items Completed During this Quarterly Period:

| Item | Task | Activity/Deliverable | Title |
|------|------|--|----------------------------------|
| # | # | | |
| 8 | 2 | Development of Primary Container | LNG tank failure scenario slides |
| | | Failure Scenarios | |
| 10 | 5 | Updated Basis of Assessment (BoA) | Submit Updated BoA |
| 11 | 5 | 2nd Quarterly Status Report and Progress | Submit 2nd quarterly report |
| | | Presentation Slides | |

2: Items Not Completed During this Quarterly Period:

The project is on time.

| Item | Task | Activity/Deliverable | Title |
|------|------|----------------------------------|---------------------------------|
| # | # | | |
| 4 | 1 | PHA Support and Coordination | PHA report |
| 9 | 2 | FE Modeling of Typical LNG Tanks | FE models of LNG tanks shown in |
| | | | slides |



3: Project Financial Tracking During this Quarterly Period:

4: Project Technical Status -

We continued work in the second quarter by updating the research project basis of assessment (BoA) document. We developed guidewords and scheduled a Hazard Identification and Characterization (HAZ-ID-C) workshop that will involve project team members, emergency responders, and technical advisory panel (TAP) members. We started to develop finite element (FE) models of selected representative LNG tanks for analyzing their response to selected hazard scenarios. We scheduled and conducted our second TAP meeting on 5 March 2025 to provide an update on progress, review the BoA, and discuss plans for the HAZ-ID-C workshop. We updated our BoA based on the feedback and comments received from PHMSA and TAP members. The HAZ-ID-C workshop will be conducted on 3 April 2025.

[Item 8] [Task 2] [Development of Primary Container Failure Scenarios] [LNG tank failure scenario slides]

We developed a list of potential primary container failure scenarios based on our literature review, feedback from the TAP members, and our BoA. Our list considers hazards specific to larger volume (50,000 to 200,000 m³) atmospheric LNG storage tanks and smaller volume (~1,000 m³) higher pressure (70 to 250 psig) LNG storage tanks. The failure scenarios were organized within flow charts that were included in the BoA and second TAP meeting slides. These primary container failure scenarios and subsequent hazard pathways will be a major topic of discussion during the upcoming HAZ-ID-C workshop. We will use findings from the HAZ-ID-C workshop to help prioritize failure scenarios for further assessment.

[Item 10] [Task 5] [Updated BoA] [Submit Updated BoA]

We collected feedback from PHMSA and the TAP on our comprehensive draft BoA that summarizes our project scope, literature review, and technical approach. During this quarter, we revised this document based on the comments received and discussions during our 2nd TAP meeting.

[Item 11] [Task 5] [2nd Quarterly Status Report] [Submit 2nd quarterly report]

This task includes project management, administration, and progress reporting. We discussed the project objectives, methodology, testing program, and analysis approach with the project team and members of the TAP. Monthly progress reports were shared on PRIMIS, and the second quarterly report was developed.

5: Project Schedule -

The project is on schedule. HAZ-ID-C will be performed on 3 April.

[Item 4] [Task 1] [PHA Support and Coordination] [PHA report]

We developed the technical approach, guidewords and terms of reference for the HAZ-ID-C. This workshop will be attended by industry experts from our TAP and will be conducted on 3 April 2025. HAZ-ID-C is a critical part of our research to get feedback from industry representatives. Due to coordination requirements and availability of key attendees the workshop got postponed. The other tasks will progress in parallel, and this delay does not affect the overall project schedule.

[Item 9] [Task 2] [FE Modeling of Typical LNG Tanks] [FE models of LNG tanks shown in slides]

We started efforts to develop FE models of the representative LNG tank configurations that were selected, including small volume and high-pressure LNG tanks (gross capacity up to 1,000 m³), medium size (50,000 to 100,000 m³ gross capacity) single containment steel tank (and conceptual full containment steel-steel tank), and large (150,000 to 200,000 m³ gross capacity) full containment steel-concrete tank based on the feedback from TAP members. Modeling efforts will accelerate after completion of the HAZ-ID-C workshop which will further refine the priority of release scenarios for assessment with FE models.