

	Develop an Evaluation Protocol for Non-LNG Release Hazards – Modeling	03903-QRP-003
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Develop an Evaluation Protocol for Non-LNG Release Hazards – Modeling

Agreement #693JK31910009POTA

Quarterly Status Report – Q3

Public

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In Collaboration with: Gas Technology Institute



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1 Items Completed During this Quarterly Period

On June 5, 2020, BLUE and PHMSA signed contract Modification No. 002 (Mod. 002) for research project “Develop an Evaluation Protocol for Non-LNG Release Hazards – Modeling” (Project), PHMSA Agreement #693JK31910009POTA (Agreement). The Agreement Mod. 002 included additional tasks to the scope of work; as a result, both the project duration and its budget were revised. The performance period for the research project is now 27 months, from September 30, 2019 through December 31, 2021. The current quarter closes on June 30, 2020. The PHMSA Agreement Officer’s Representative (AOR) for this project is Mr. Thach Nguyen.

Table 1-1 shows the items and deliverables completed to date; the items in gray were completed during earlier quarters, while the items in green were completed during this Quarter.

Table 1-1. Items Completed

Item No.	Task No.	Activity	Deliverable	Due Quarter No.	Completion %
1	1	Conduct kick-off Team meeting to review scope, tasks, deliverables and schedule, and to gather initial insights.	Kick-Off meeting minutes	1	100%
2	8	1st Quarterly Status Report	Submit 1st quarterly report	1	100%
3	2	Review literature on model evaluation and validation requirements; develop Model Evaluation methodology	Model Evaluation methodology report	2	100%
4	8	2nd Quarterly Status Report	Submit 2nd quarterly report	2	100%
3a	2a	Review literature on model evaluation and validation requirements; develop Model Evaluation methodology Revised to include Source Term models	Revised Model Evaluation methodology report	3	100%
7	8	3rd Quarterly Status Report	Submit 3rd quarterly report	3	100%

2 Items Not Completed During this Quarterly Period

There were no items and deliverables that were scheduled to be completed during this Quarter that were not completed during this Quarter.

3 Project Financial Tracking During this Quarterly Period

The contract for this research project is fixed-price. The current project financial tracking is shown in Figure 3-1. Work for the project is currently on schedule and projected to remain on schedule.

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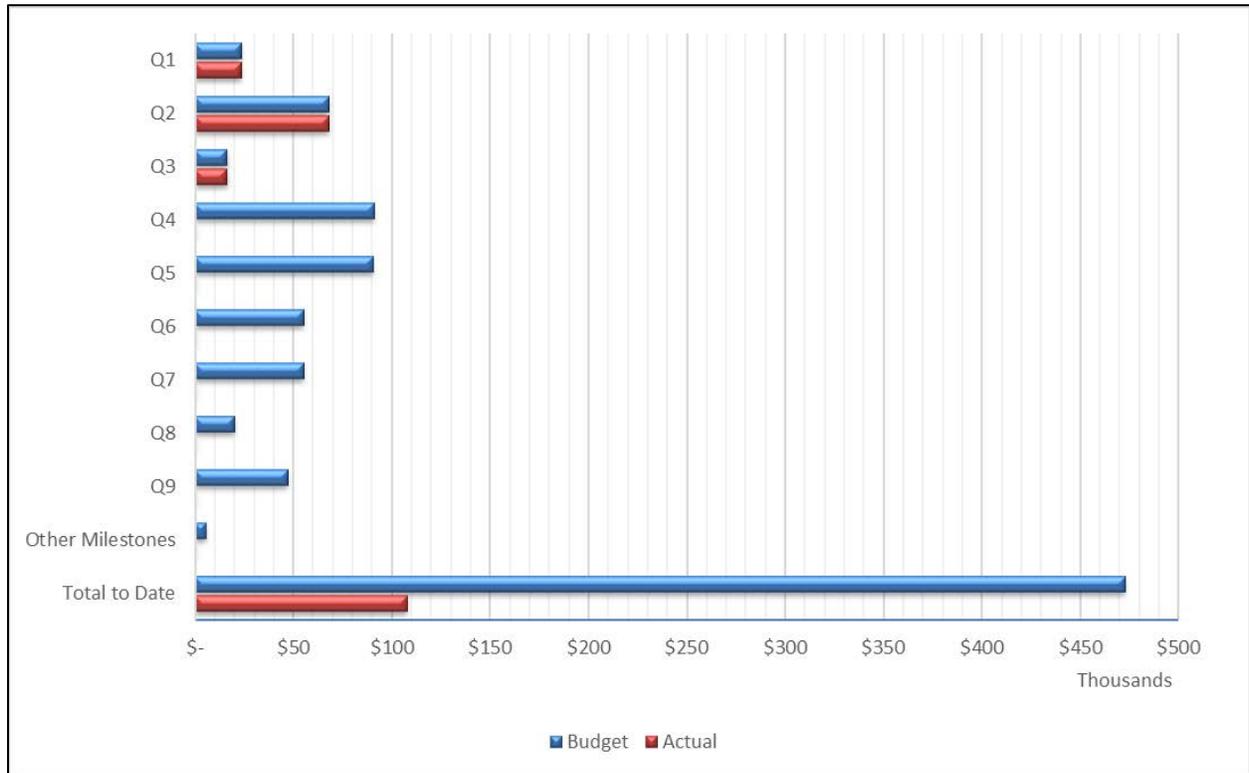


Figure 3-1: Project Financial Tracking

4 Project Technical Status

4.1 Task 1 – Technical Advisory Panel

Ms. Patricia Outtrim (Outscan LLC) was reintroduced as a TAP member. Ms. Outtrim was originally a TAP member for this project, before retiring from Tellurian and being replaced by Ms. Helena Le.

4.2 Task 2 – Model Evaluation Methodology

A report for Task 2 was submitted in Q2, consistent with the original project schedule. Task 2 was reopened as Task 2a in Q3, in order to include the new scope of work, that is, the evaluation of source term models. BLUE extended the literature review on existing model evaluation protocols and validation databases to include source term examples; the report was then updated with the new findings and distributed to the TAP for review and comment; no comments were received on the revised report. The final version of the Task 2a report was uploaded to the project’s page on June 26, 2020.

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4.3 Task 3 – Uncertainty Quantification (UQ) Protocol

Work on Task 3 is ongoing; this task is led by GTI. GTI is reviewing publicly available literature and developing a preliminary UQ methodology, using the dispersion modeling as the test case. The schedule for completion of Task 3 was revised to the end of July 2020 as part of Mod. 002, to allow for the completion of Task 2a by the end of June.

4.4 Task 4.1 – MVD for the Dispersion of non-LNG Flammable Releases

Work on Task 4.1 is ongoing; the schedule for completion of Task 4.1 was revised to the end of July 2020 as part of Mod. 002, to allow for the completion of Task 2a by the end of June. A draft report for the flammable vapor dispersion model validation database will be distributed to the TAP in early July for review and comment.

4.5 Task 8 – Project Management

A phone call with the project TAP was held on April 17, 2020. The meeting minutes are attached as Attachment #1 to this report. The next TAP call will be held in July 2020, to discuss Tasks 4.0 and 5.1.

An abstract was submitted for presentation at the 2020 Mary Kay O’Connor Process Safety Symposium, to be held at Texas A&M University in October 2020. The topic of the abstract is “Towards a comprehensive model evaluation protocol for LNG hazard analyses”. The abstract was accepted for podium presentation (which will be virtual due to COVID-19 restrictions). A full manuscript will be prepared and an oral presentation given, which will satisfy the requirement to “Prepare & Present Paper at public event or publish paper in journal/magazine” (item 21 in **Error! Reference source not found.**).

The Q3 report was submitted on June 26, 2020.

5 Project Schedule

The project team’s efforts to advance the project schedule are summarized below:

- The project is on schedule;
- The overall schedule shown in Figure 5-1 remains on track per the schedule revisions in Mod. 002;
- The project team remains highly engaged and stable (with no changes in personnel).

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Task #	Description	Quarter											
		Q4 '19	Q1 '20	Q2 '20	Q3 '20	Q4 '20	Q1 '21	Q2 '21	Q3 '21	Q4 '21			
1	Kick-Off and Technical Advisory Panel Selection	█											
2	MEP Methodology	█	█	█	█								
3	Uncertainty Quantification Protocol		█	█	█	█							
4	Model Validation Databases												
4.0	Source Term												
4.1	Non-LNG Flammable Dispersion		█	█	█	█							
4.2	Toxic Gas and Vapor Dispersion			█	█	█	█						
4.3	Vapor Cloud Explosions												
4.4	BLEVEs												
5	Model Evaluation Protocols												
5.0	Source Term												
5.1	Non-LNG Flammable Dispersion												
5.2	Toxic Gas and Vapor Dispersion												
5.3	Vapor Cloud Explosions												
5.4	BLEVEs												
6	Develop Recommendations for Model Evaluation												
7	Draft and Final Report												
8	Project Management	█	█	█	█	█	█	█	█	█	█	█	█

Figure 5-1: Project Schedule

5.1 Future Activities

Project team resources in Quarter 3 will be focused on completing Tasks 3 ‘Uncertainty Quantification Protocol’, Task 4.1 “Model Validation Database for Non-LNG Flammable Dispersion”, and Task 5.1 “Model Evaluation Protocol for non-LNG Flammable Dispersion”, as well as continuing work on Task 4.2 “Model Validation Database for Toxic Gas and Vapor Dispersion”.

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Attachment #1 - TAP Meeting Minutes, April 17, 2020