

Static Liquefaction: Lessons Learned, Risks Still Taken, Ethical Decision Making



Monday, June 6, 2022

Purpose

- Identify the major uncertainties with respect to static liquefaction
- Identify how risks and consequences associated with static liquefaction are identified
- Identify what needs to be learned reduce uncertainties associated with static liquefaction and its consequences
- Identify elements for a future activity related to static liquefaction by the National Academies of Sciences, Engineering, and Medicine

Static Liquefaction: Lessons Learned, Risks Still Taken, Ethical Decision Making

This meeting will explore the causes and consequences of static liquefaction. Several recent and notable disasters involving mine collapse of tailings dams, like those at Brumadinho in Brazil, and Fundão in Brazil, or water reservoir dams such as the Edenville dam in Michigan have raised questions about static liquefaction failures and how they might be avoided. Presentations and discussions will span a range of technical and societal topics, including a more comprehensive view of the long-term consequences of static liquefaction failures and the associated ethical uncertainties faced by geotechnical engineers, dam owners, regulators, and the affected public. An important objective of the meeting is to identify areas in which the National Academies might contribute to inform responsible decision making.

12:00–12:15

Introductions, descriptions of session objectives

Allen Marr, Chair, COGGE

12:15–12:30

A poet talks about mining coming to town

Sara Robinson, former industrial chemist and minerals mining executive

12:30–12:45

Moderated discussion with attendees

Moderator: Allen Marr

- When do engineers hear the viewpoints as expressed in these poems?
- How do such viewpoints influence current engineering practice?
- How should such viewpoints influence current engineering practice?

12:45–1:35

Static Liquefaction—what is it and why should we study it further?

Two speakers will describe static liquefaction and the difference between earthquake-induced and static liquefaction.

*Steve Kramer, University of Washington: **Static Liquefaction—Fundamentals and Examples***

*Robert Bachus, Geosyntec: **Liquefaction—Failure, Flow, Rehabilitation***

1:35–2:00

Moderated discussion

Moderator: Youssef Hashash, COGGE Member

- What are the major uncertainties in static liquefaction?
- What do we need to do or learn to reduce these uncertainties?

2:00–2:20

Break

2:20–3:15

Short panelist presentations: Lessons learned and risks still taken

Moderators: Pedro Arduino, COGGE Member; Oladoyin Kolawole, COGGE Member

Scott Olson, University of Illinois Urbana-Champaign

Irfan Alvi, Alvi Associates, Inc.

TBD

TBD

- What do you do to understand and engineer for static liquefaction—how do you address uncertainties?
- What steps are taken to understand consequences of the occurrence of static liquefaction? How far “downstream” do consequences affect engineering decisions related to static liquefaction
- What is one key challenge you would like to see the NASEM address (i.e., what keeps you up at night)?

3:15–3:45

Moderated discussion

Moderator: Allen Marr

- How can risks associated with static liquefaction be reduced?
- What are the questions that can help engineers identify the risks with which they should be concerned?
- Who should be involved and how?
- How can the National Academies of Sciences, Engineering, and Medicine help?

3:50–4:00

Closing Remarks

Moderator: Allen Marr

Inspiration from today’s discussion

Sara Robinson

4:00

END OF OPEN SESSION