Large-Scale Fire Testing

Data Analysis Guide Overview

Feb. 13, 2019

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

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Agenda

- Goals and objectives
- Data analysis guide overview
- Topic areas
- Flow chart discussion
- Meeting schedule
- Next steps

Goals and objectives

The core goal of this process is to *enable the safe and transparent installation of energy storage systems in NYC.* To accomplish this, the key objective of this document is *to develop a framework for the application of large-scale test data.*

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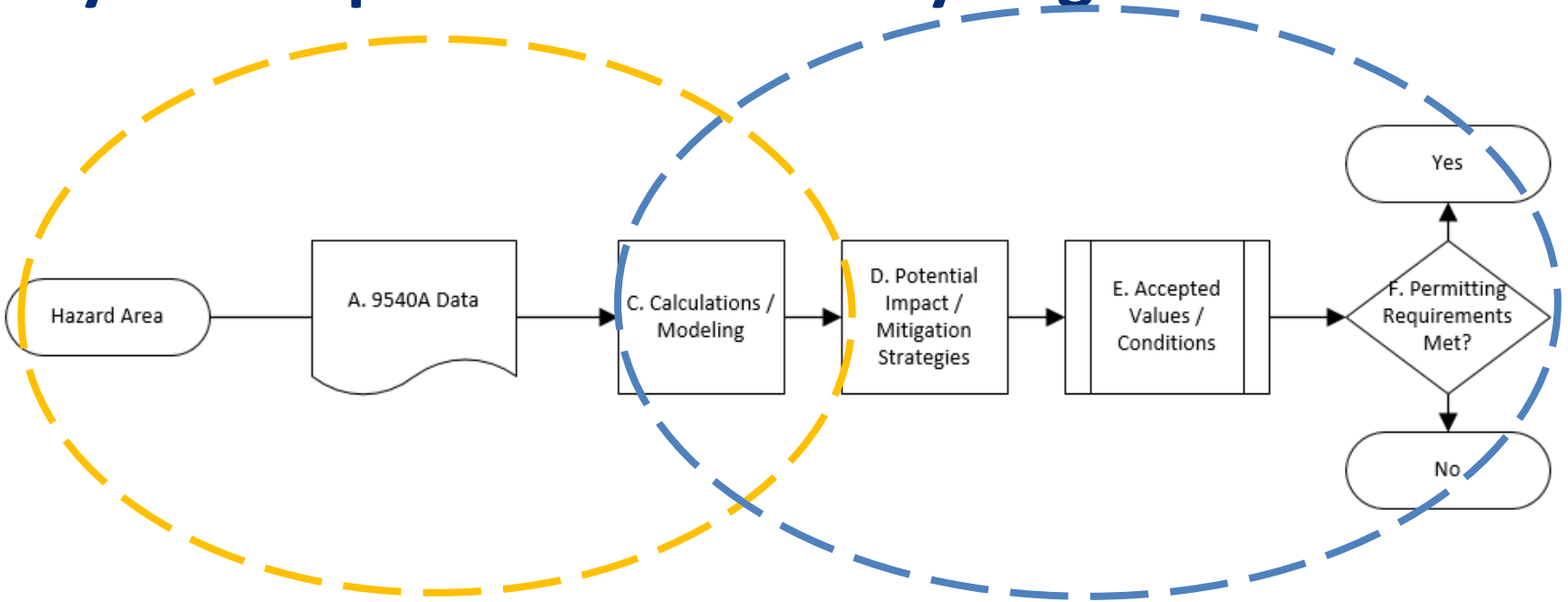
It is understood that, in NYC, large-scale fire testing will be conducted using the methodology outlined in UL 9540A.

Why develop a UL 9540A analysis guide?



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Process

Chapter 1 - General

Chapter 2 - Large-Scale Fire Testing Overview, Considerations for AHJs

Chapter 3 - Data Analysis and Permitting Requirements

- Thermal runaway
- Fire spread
- Explosion
- Toxicity
- Performance-based design

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Topic areas (“buckets”)

Fire Hazard Topic Areas

THERMAL RUNAWAY

- Test methodology
- Initiation method
- Preventative controls

FIRE SPREAD

- Unit spacing
- Fire and smoke detection
- Fire suppression

EXPLOSION

- Deflagration hazards
- Ventilation and exhaust requirements
- Threat to nearby people and buildings

TOXICITY

- IDLH levels
- Ventilation requirements

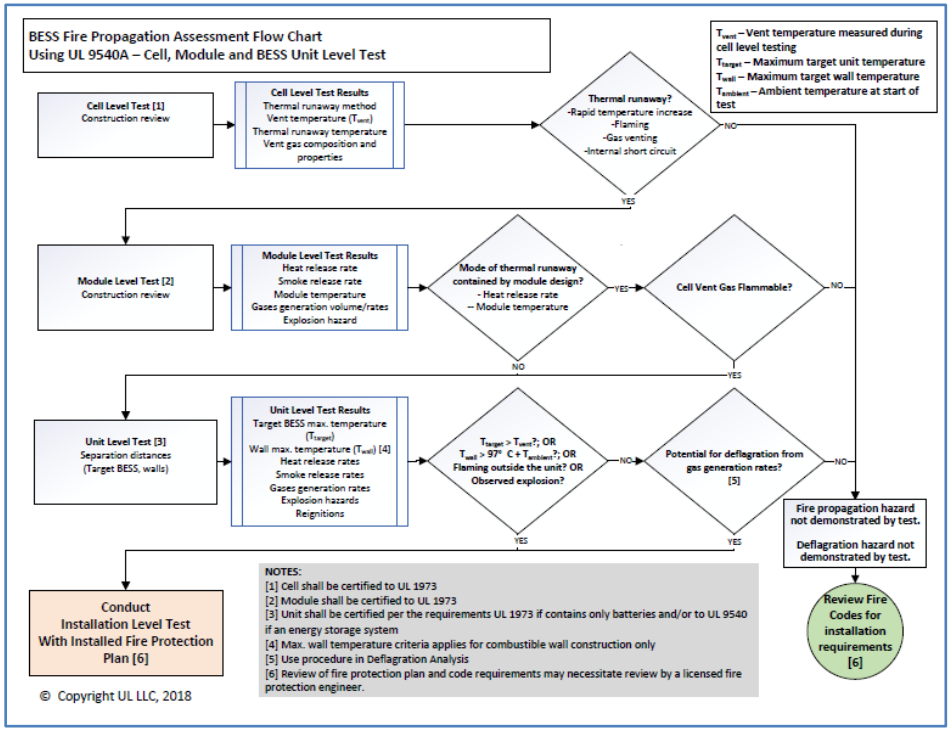
PERFORMANCE-BASED DESIGN

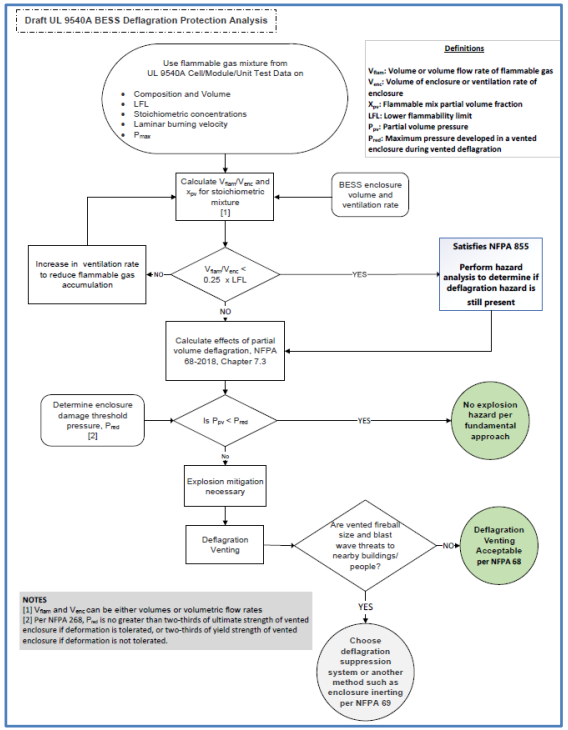
- Modeling to take into account varying installation environments, system sizes, sprinkler systems, etc.
- Validated models
- Definition of worst case scenario

Example acceptance criteria for explosion

Criteria	Conditions for Acceptance	Relevant Data, Calculations and Outputs
1. Ventilation / Exhaust Requirements	Ventilation / exhaust system must demonstrate ability to maintain LFL below 25% within *[ACCEPTANCE CRITERIA HERE]* time.	• Vent gas composition • Gas release rates
2. Deflagration Protection or Venting	If determined necessary by large-scale testing, deflagration or venting will be provided in accordance with NFPA 68 or 69.	• Pressure measurements and calculations • Deflagration venting calculations
3. Threat to Nearby People / Buildings	Vented fireball size and blast wave must be below *[ACCEPTANCE CRITERIA HERE]* in pressure and distance from source given worst credible scenario, defined as *[ACCEPTANCE CRITERIA HERE]* for amount of system engaged in a period of time.	• Acceptable pressure / temperature / radiation exposure levels • Pressure, heat flux, temperature measurements • Threat profiles • CFD modeling

UL Flow charts





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Participant groups

Each Topic Area will involve:

- **AHJ representatives and decision makers:**
  - DOB and FDNY
- **Core SME Team:**
  - This group will help to frame the discussions around each topic area and serve as expert advisors to the AHJs and the Guide development process.
- **Industry SMEs:**
  - Industry professionals with expertise in the topic based on practical experience and who may contribute data or case studies to support the discussions.
- **Stakeholders**

SMEs are invited to share data and case studies for topic areas at SmartDGHub@cuny.edu **.**

Weekly recurring meetings

Each Topic Area will consist of a 3-week cycle of meetings:

Week 1:

A. Topic Area Groundwork Meeting
   Who: AHJs, Core SME Team

Week 2:

B. Topic Area "Deep-dive" Meeting
   Who: AHJs, Industry SMEs

C. Industry Stakeholders Meeting

Week 3:

D. Topic Area Acceptance Criteria Meeting
   Who: AHJs, Core SME Team

E. CUNY to Distribute Material for Next Topic Area

March 2019						
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April 2019						
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

A	Topic Area Groundwork Meetings
B	"Deep-dive" Meetings
C	Industry Stakeholders Meetings
D	Acceptance Criteria Meetings
E	CUNY to Distribute Material for Next Topic Area

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Weekly recurring meetings – topic order

Each Topic Area will consist of a 3-week cycle of meetings:

- March 4th Cycle: Explosion
- April 3rd Cycle: Toxicity
- April 24th Cycle: Thermal runaway
- May 15th Cycle: Fire spread
- June 5th Cycle: Performance-based design

February 2019						
Su	Mo	Tu	We	Th	Fr	Sa
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March 2019						
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April 2019						
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May 2019						
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June 2019						
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July 2019						
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A	Topic Area Groundwork Meetings
B	"Deep-dive" Meetings
C	Industry Stakeholders Meetings
D	Acceptance Criteria Meetings
E	CUNY to Distribute Material for Next Topic Area

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Next Steps

- Industry SMEs should e-mail SmartDGHub@cuny.edu to be involved in topic area discussion if you have data or case studies you are willing/able to share with the AHJs in order
  - Please reach out by February 22 with your interest in participating
- CUNY will send out invitations for next meetings to appropriate level participants
- CUNY will post all stakeholder information on www.SmartDGHub.org

- Any questions? Reach out to SmartDGHub@cuny.edu