

The Future of Residential Fuel Gas Detection

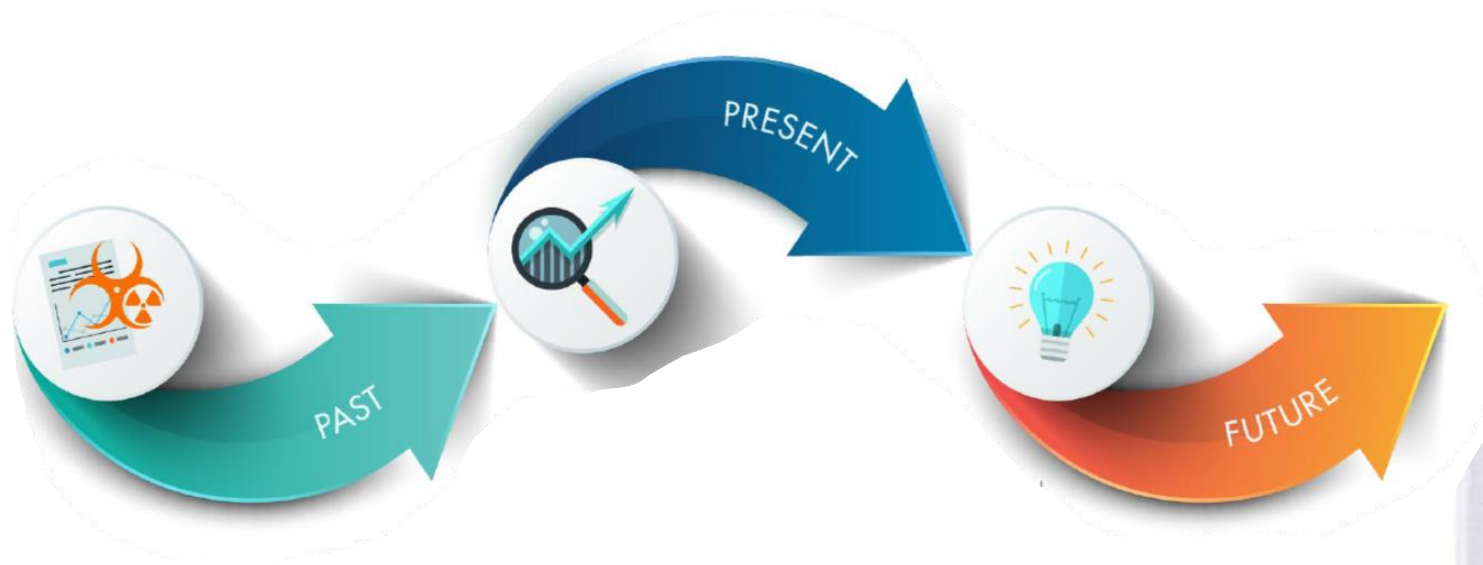
A Layers-of-Protection Approach to Pipeline & Consumer Safety

Bob Wilson, Northeast Gas Association

Rick Trieste, Con Edison

2022 Spring Operations Conference





NFPA 715

Standard for the Installation of Fuel Gases Detection and Warning Equipment

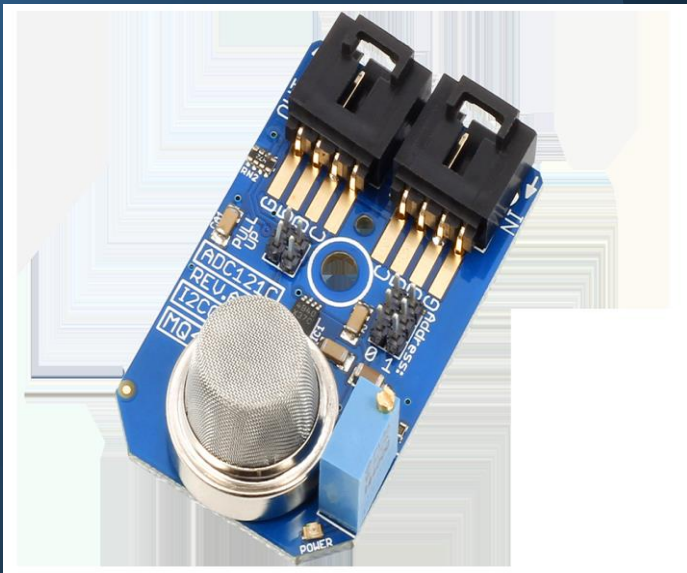
UL-1484

Standard for Residential Gas Detectors

Update



Fuel Gas Detector History.....



- Can be purchased at home improvement stores
- International products are also available
- Prices range from \$9 - \$100+
- Regulations do not exist for use of residential methane detectors (recent changes in NYC LL 157)
- Lack of public awareness & industry advocacy
- Historic concerns with performance

Low customer adoption

Fuel Gas Detector History.....

Comprehensive Industry Adoption Approach

- Evaluation of device response to varying levels of methane.
- Effects of common household chemicals on “false positive” detection and alarms including contaminants such as, hairspray, bleach and disinfectant spray.
- Impacts on performance from common household environmental changes such as temperature and humidity.
- Evaluation of proper placement to ensure detection if a release occurs - **NFPA 715 Developed !!**
- Evaluation of existing UL Standards and recommendations for improvements including lowering the detection threshold from 25%LEL to 10% LEL - **UL 1484 Updated !!**
- Consumer behavior studies and public awareness improvements.

Fuel Gas Detector History.....

- **GTI/OTD Evaluation of Residential Methane Detectors Phase I - 2010** Devices from five manufacturers were tested. The goal was to determine whether these commercially available combustible gas detectors were susceptible to giving false positive responses to an assortment of typical household chemicals.
- **GTI/OTD Evaluation of Residential Methane Detectors Phase II – 2015** Additional testing of a dozen devices, focus on household chemicals and detection thresholds, nation-wide in-home pilot testing.
- **GTI/OTD Consumer Behavior Study – 2020** Research conducted to better understand human behaviors associated with odor as a warning agent and alarm reactions.
- **NYSEARCH RMD Program** – facilitated a greater industry-wide understanding of detector / sensor technologies
- **NYSEARCH Gas Dispersion Testing / Modeling** – First comprehensive look/ research conducted in the U.S. to better understand optimum placement of detectors.
- **Con Edison RMD Program** help set the stage for practical use of sensor integration into smart metering situations, changing the way the industry views methane detection as a pipeline safety layer of protection.
- **NFPA Fire Research Foundation Gexcon Study** – Computational fluid mechanics / modeling of fuel gas dispersion in buildings to better understand detector optimal placement and varying detection thresholds – bu



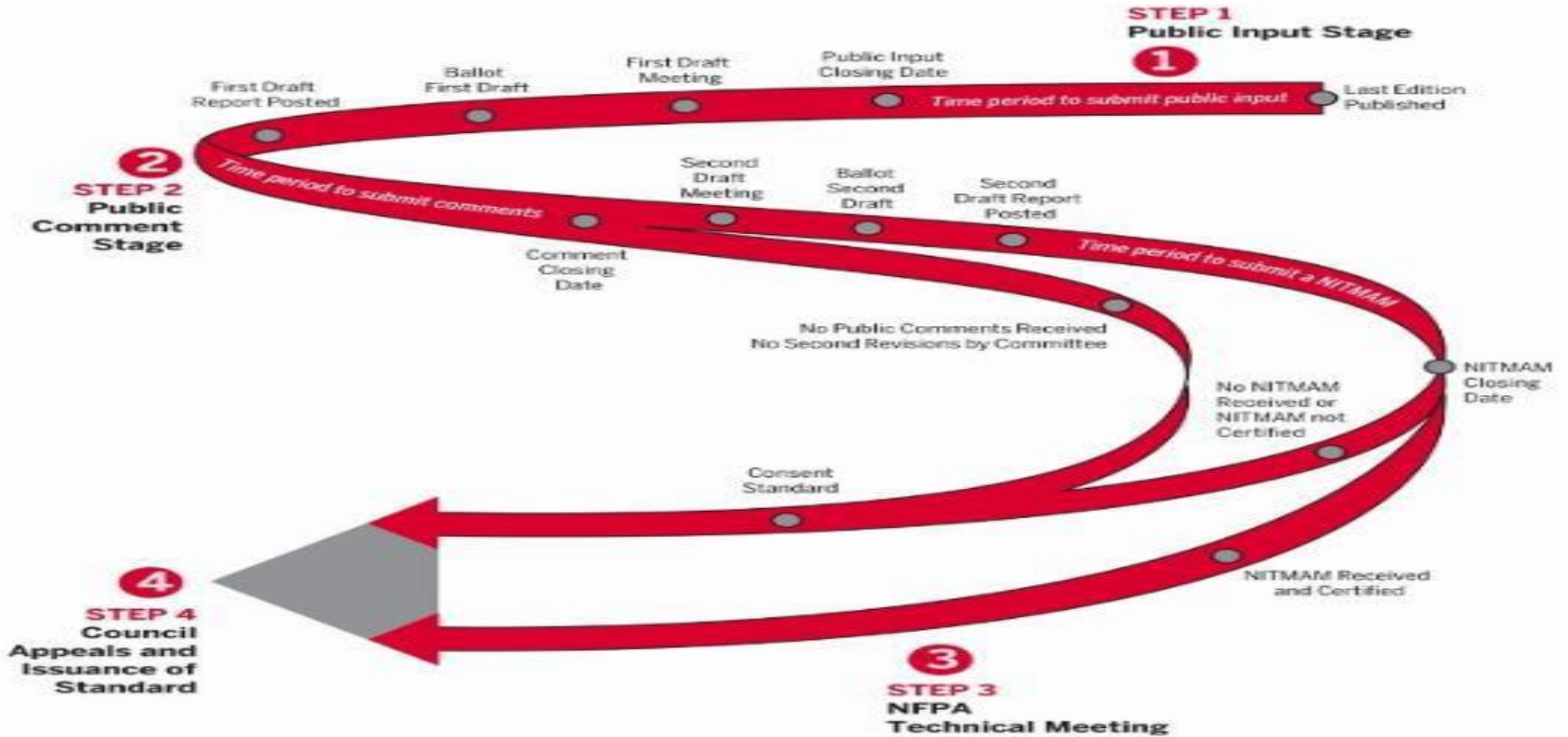
FWE-AAA NFPA 715 TC

Technical Committee Fuel Gases Warning Equipment



IT'S A BIG WORLD. LET'S PROTECT IT TOGETHER.®

The Standards Development Process



UL 1484 Minimum Detection Threshold Updated



UL's Collaborative Standards Development System (CSDS)

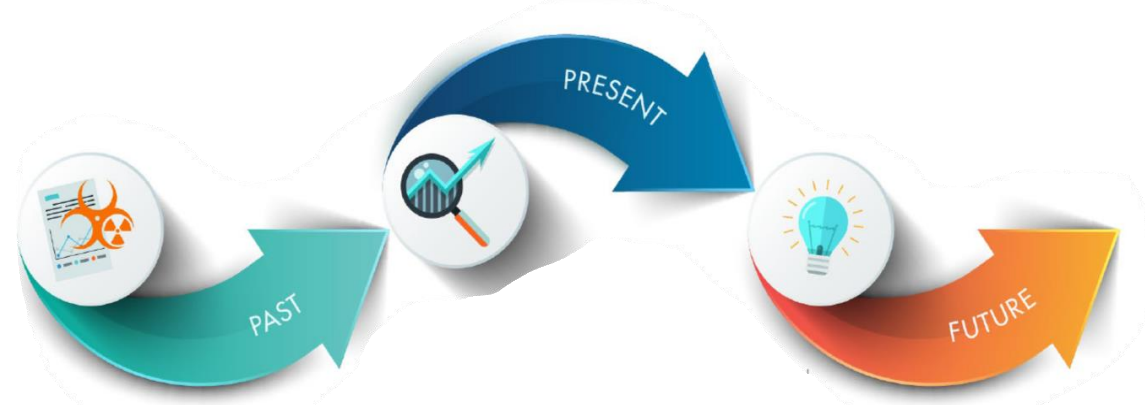
- UL is pleased to announce the adoption of ANSI/UL 1484-2022 as the American National Standard for *Residential Gas Detectors*. Each member of the STP who participated by voting and/or commenting is to be congratulated for their role in accomplishing this important achievement.

The following summarizes the milestones associated with this ANSI approval of UL 1484:

Announcements in Standards Action:	December 10, 2021
Date of Ballot:	December 10, 2021
Notification of Right to Appeal for Continuing Objectors:	January 27, 2022
Date of ANSI/UL Designation:	February 23, 2022
Anticipated Publication of ANSI/UL Material:	February 2022

Detection Threshold Updated from 25% LEL min to 10% LEL min

Human Behavior Challenges



Change these Thoughts...	Into these Cognitions...
I don't know much about /never heard of natural gas or RMDs	I am familiar with what natural gas is, how it works, and that there are separate devices to detect NG leaks
I don't know what this smell is	This is definitely a natural gas leak
If a NG smell is not very strong or does not persist, there is no danger	Just because NG smells are faint or go away, there may still be danger
It takes a while for NG to turn into something dangerous	If NG accumulates it can ignite and explode in an instant, when you least expect it.
Nothing has ever happened to me with NG, so it is not that dangerous	I need to be aware of what natural gas is.
My appliances are all in good working order, so there is really no danger	Just because your appliances are working doesn't mean there is not a leak
Other detectors (like CO) also detect natural gas, so I am covered	Other detectors do not detect natural gas, I need a separate device
If I can smell a natural gas leak, I don't need a RMD	Natural gas leak danger can exist before I smell it.

Public Awareness Program Opportunities

Comprehensive Industry Adoption Public Awareness Approach Considerations

- Consider embedding enhanced levels of device awareness in public awareness campaigns
- Integration strategy can generally include other safety devices such as use of Smoke/Fire Alarms, CO Detectors and *Fuel Gas Detection...*
- Build on existing CPSC and NFPA Public Awareness approaches for CO and smoke/fire alarm devices
- ***Messaging needs to re-enforce actions to be taken in the event of an odor OR alarm, smell gas act fast messaging enhancements***
- Begin the process of crafting appropriate language and strategy to reflect NFPA 715 publication.
- Work with other industry groups to ensure consistency in messaging
- Measure effectiveness of messaging in the spirit of continuous improvement



Questions Discussions

AMI Capable Natural Gas Detectors Advance Safety in New York City

Rick Trieste

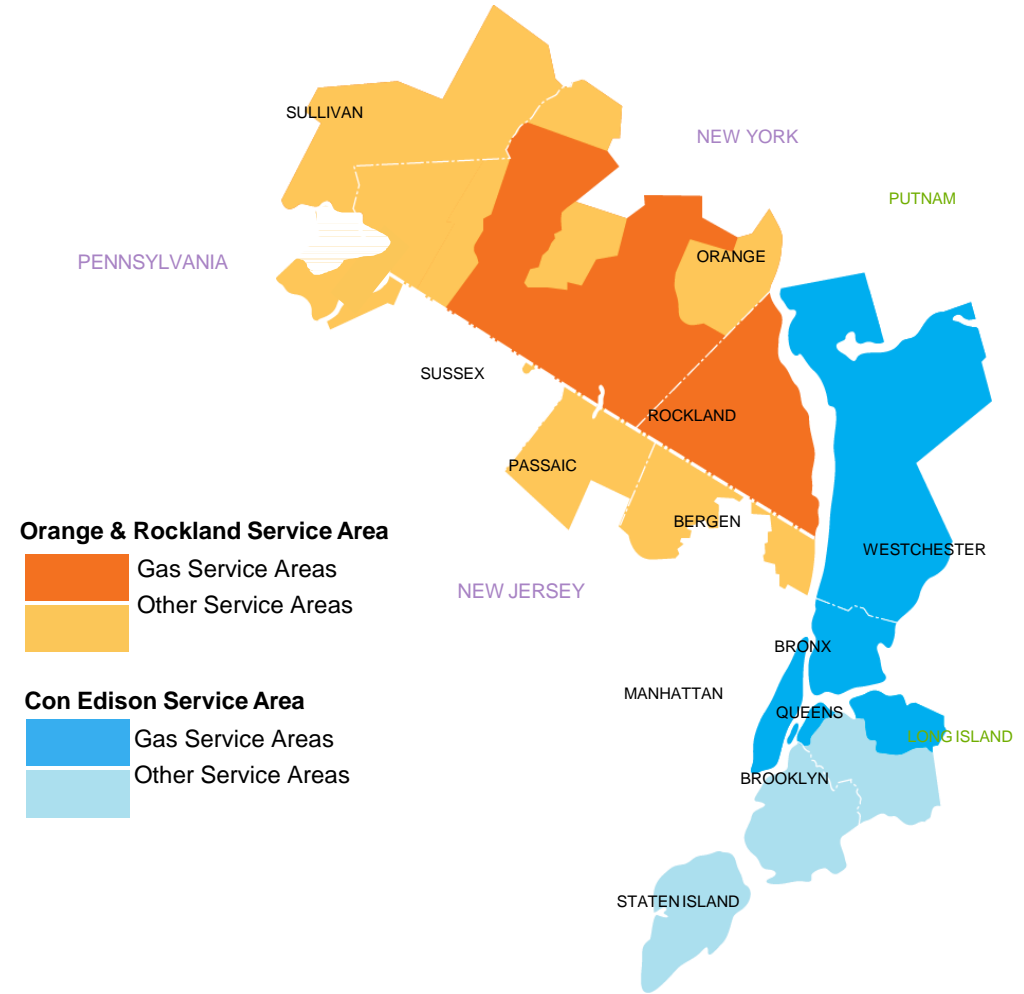
Department Manager R&D

Con Edison

April 2022

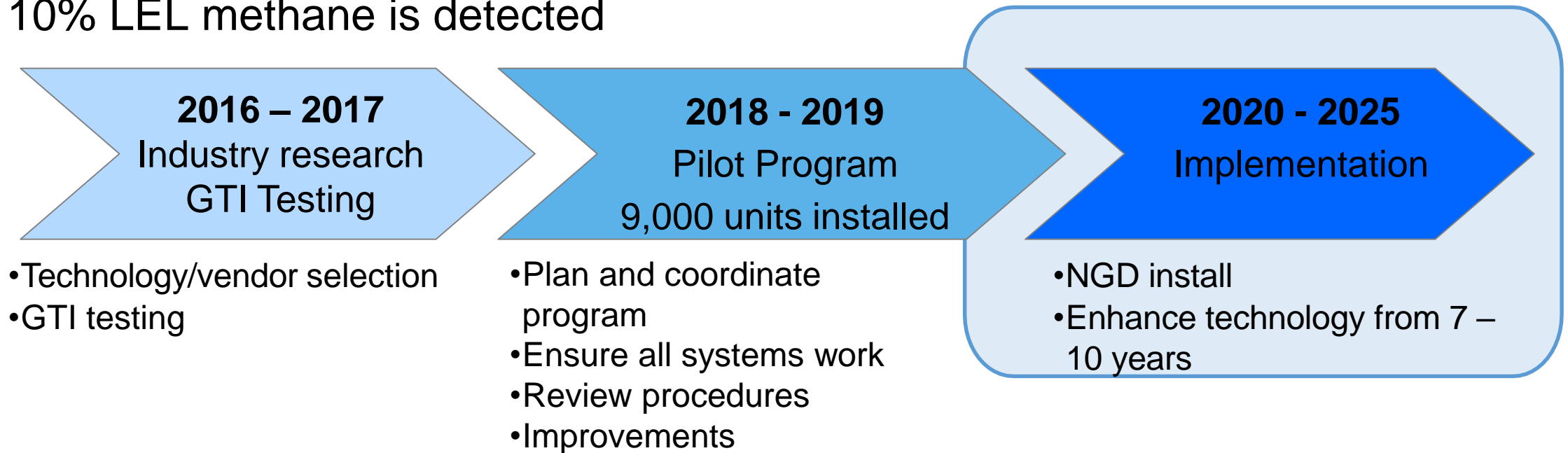
Consolidated Edison Company of NY

- Founded in 1823 as NY Gas Light Company
- Longest listed stock on the NYSE
- Provides Electricity, Gas and Steam to NYC and Westchester county
- Serves 3.6 million electric and 1.2 million gas customer meters in NYC & Westchester County
 - ~375,000 gas services
- Peak gas load 1,565 MDT
- Con Edison, Inc. also owns Orange & Rockland Utilities



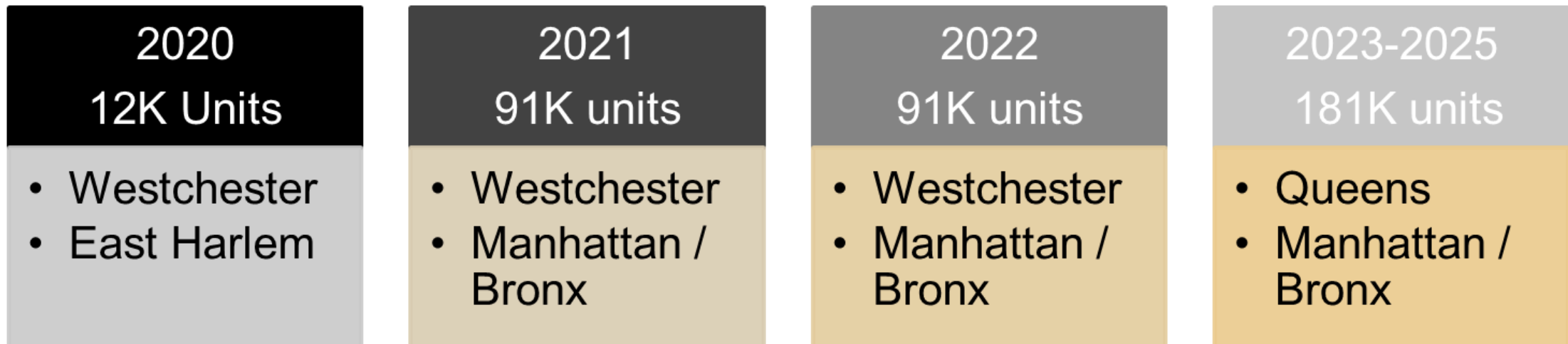
AMI NGD Program Overview

- Install at gas indoor Point-of-Entry (POE)
- Leverage AMI enabled sensor and network through back office software integration
- Creates alarm ticket in the Gas Emergency Response Center (GERC) when 10% LEL methane is detected

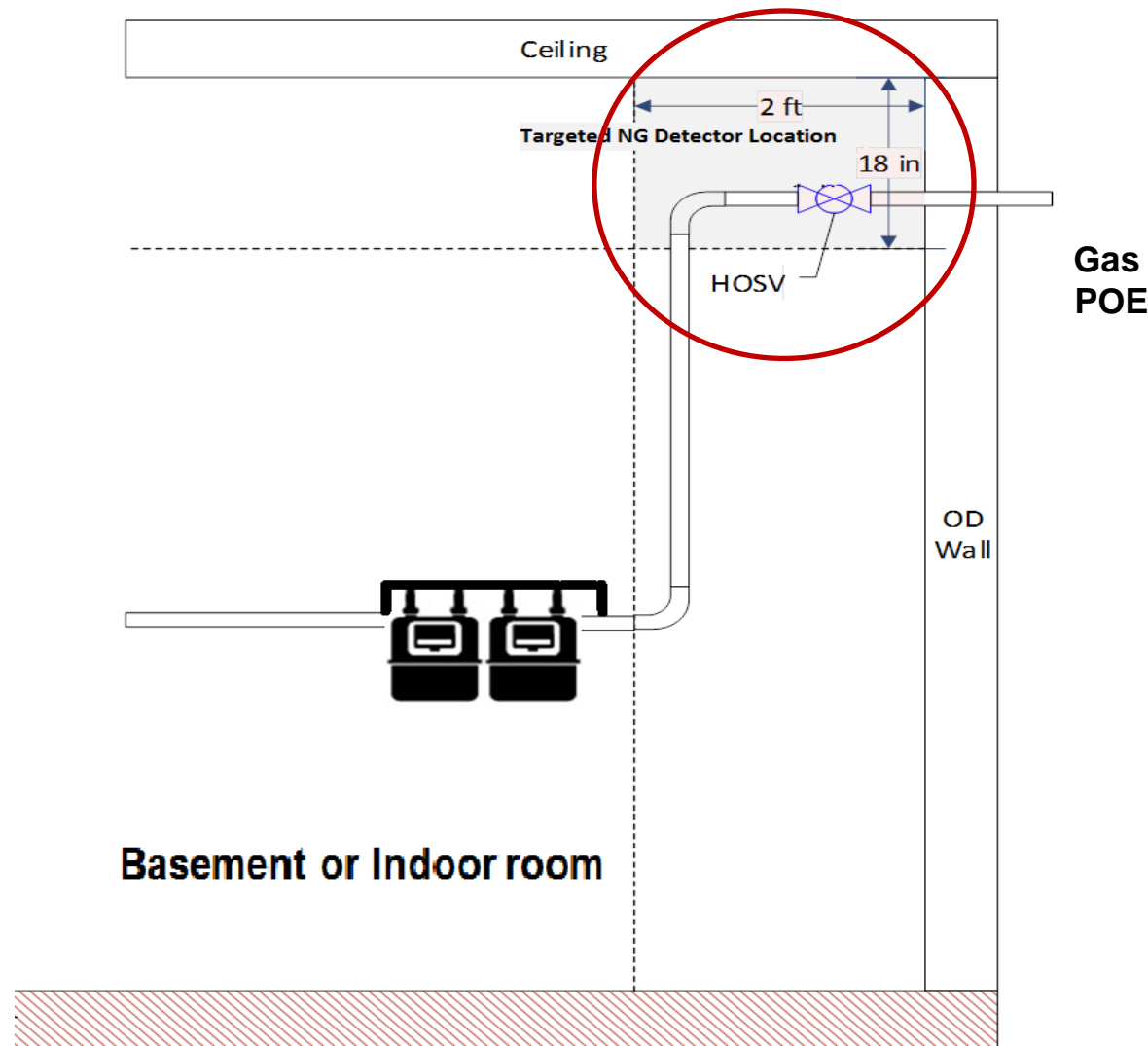


Mass Deployment Schedule

- Mass deployment started 9/14/2020
- 5-year program for ~375K services
- Follows AMI deployment



Installation



- Install near the gas POE
- Near the ceiling above the POE or head of service valve (HOSV)
- Future plans - evaluating adding sewer trap criteria

Installation




Warning Tag

 **WARNING**

This device detects the presence of **NATURAL GAS**, which can **IGNITE** or **EXPLODE**, CAUSING **SERIOUS INJURY** or **DEATH**. NEVER IGNORE ANY ALARM.
DO NOT TAMPER WITH THIS DEVICE OR ITS BATTERY OR MOVE OR RELOCATE THE GAS DETECTOR FROM WHERE IT IS INSTALLED.
 Doing so could disable this device, cause it to malfunction, and/or result in serious injury or death.
 A yellow blinking light indicates that the Gas Detector may not be functioning properly or that its battery may be running low. **CONTACT CON EDISON IMMEDIATELY AT THE PHONE NUMBER BELOW IF YOU OBSERVE A YELLOW BLINKING LIGHT.**

Read and follow the other Important Safety Information & Warnings for this Gas Detector available at:
conEd.com/NaturalGasDetector
 or by scanning this QR code:



EVACUATION PROCEDURE

If at any time you **SMELL NATURAL GAS** or **THE ALARM ON THIS DEVICE SOUNDS**:

1. **EVACUATE IMMEDIATELY** and take others with you.
2. Do **NOT** use a phone, light a match, or turn on or off any light switches, flashlights, or appliances. Doing so could **IGNITE** a **FIRE** or **EXPLOSION**.
3. **CALL 911** once you are safely outside the premises.
4. Do **NOT** reenter until told to do so by authorities.



Natural Gas Detector
 For information or questions, call
1-800-75-CONED (1-800-752-6633).
 Mira el otro lado para español.
 中文請見其他標籤
 다른 한국어 태그 참조
 См. другую метку с русским текстом
 বাংলার জন্য অন্য ট্যাগ দেখুন

Response and Coordination with Fire Departments

- Solicited Fire Dept. feedback and input
- Developed emergency response protocols
- Integrated response with Fire Depts.
- Created new leak type – GLA



Impact of Widescale Consumer Adoption of NGDs on Emergency Response – Leaks from Stoves

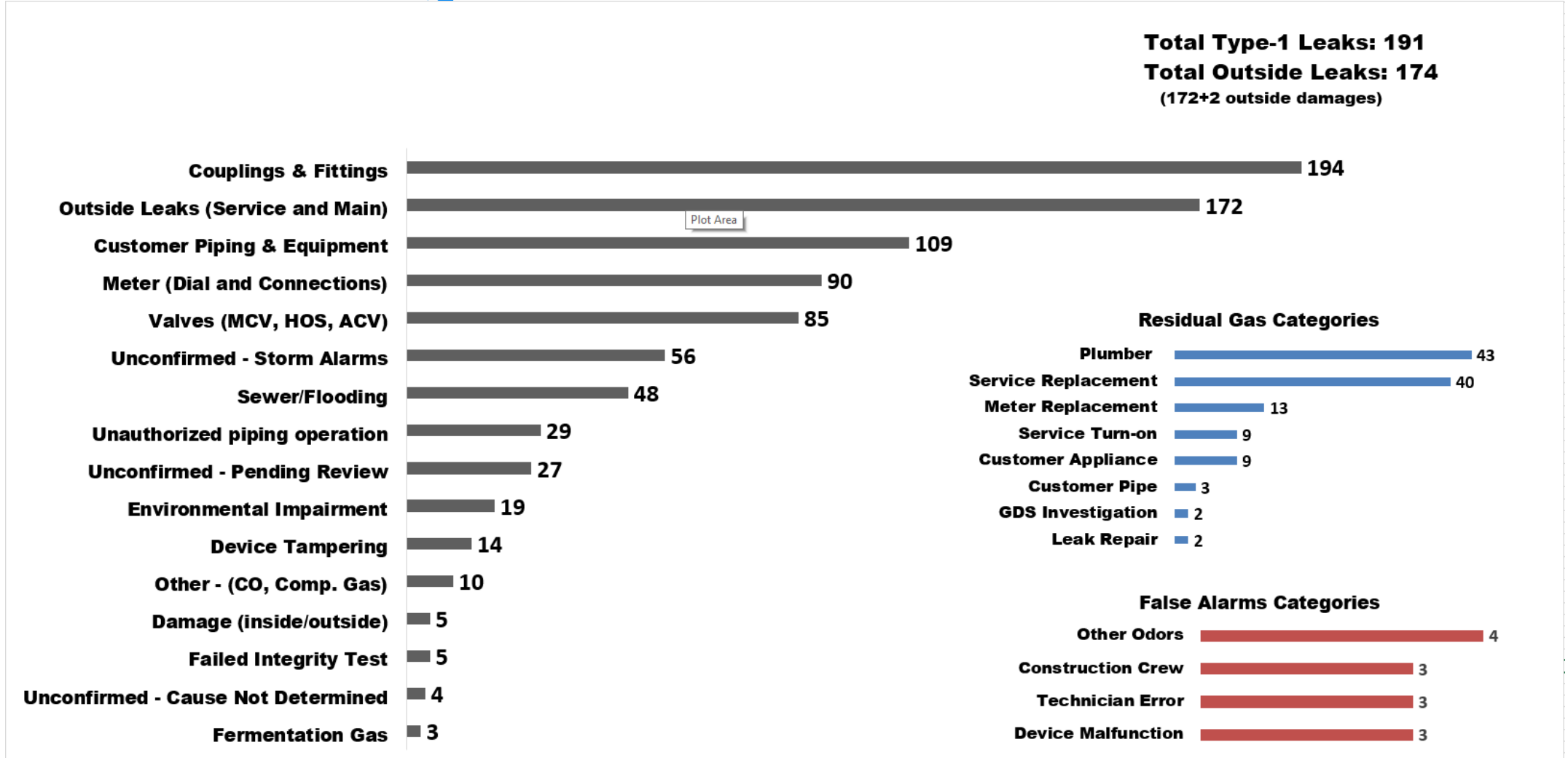
- Con Edison had 2 NGD give-away programs to consumers
- Report of customer leak calls from NGD give-away units
 - Universal – 0/62,000 (20% LEL units)
 - New Cosmos – 2/10,500 (10% LEL units - both were leaks on stoves)
- Scaling New Cosmos give-away data to appliance leaks
 - .19 alarms per 1,000 NGD
- Low call volume may be due in part to consumer self corrections

Note: Per year estimate assumes 1 meter per 1.05 million residential customer

AMI Capable NGD - Alarms & Reliability As of February 2022

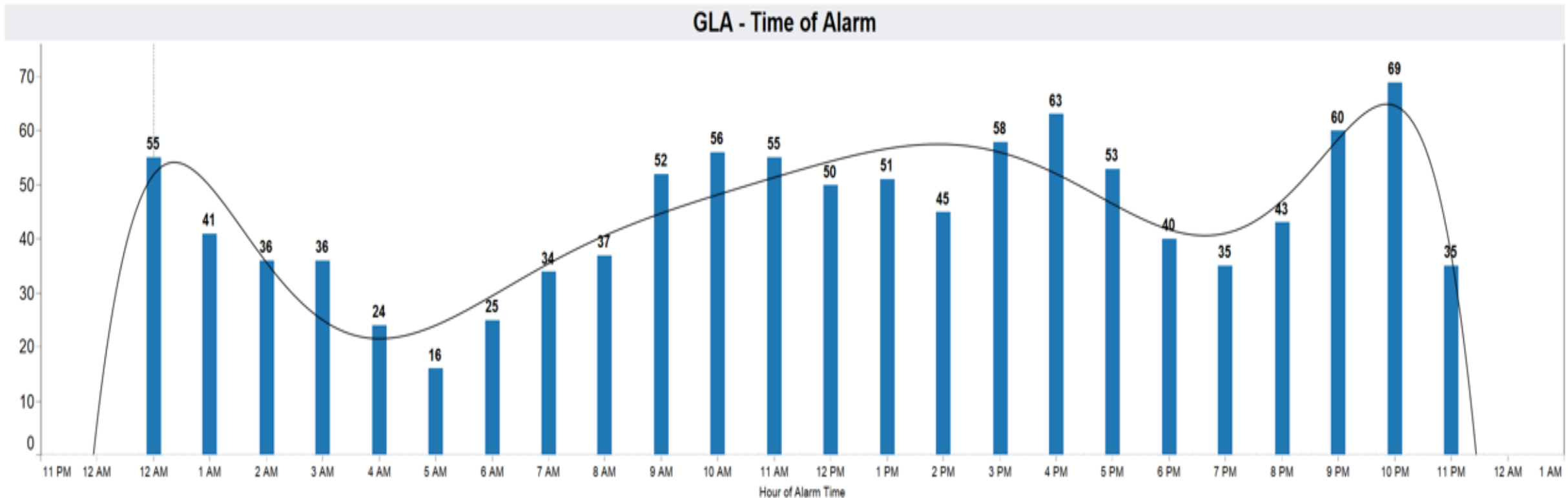
- Started mass deployment 9/2020
- ~102 K detectors installed system-wide
- 1,004 GLAs to date

AMI Capable NGD - Alarms & Reliability As of February 2022



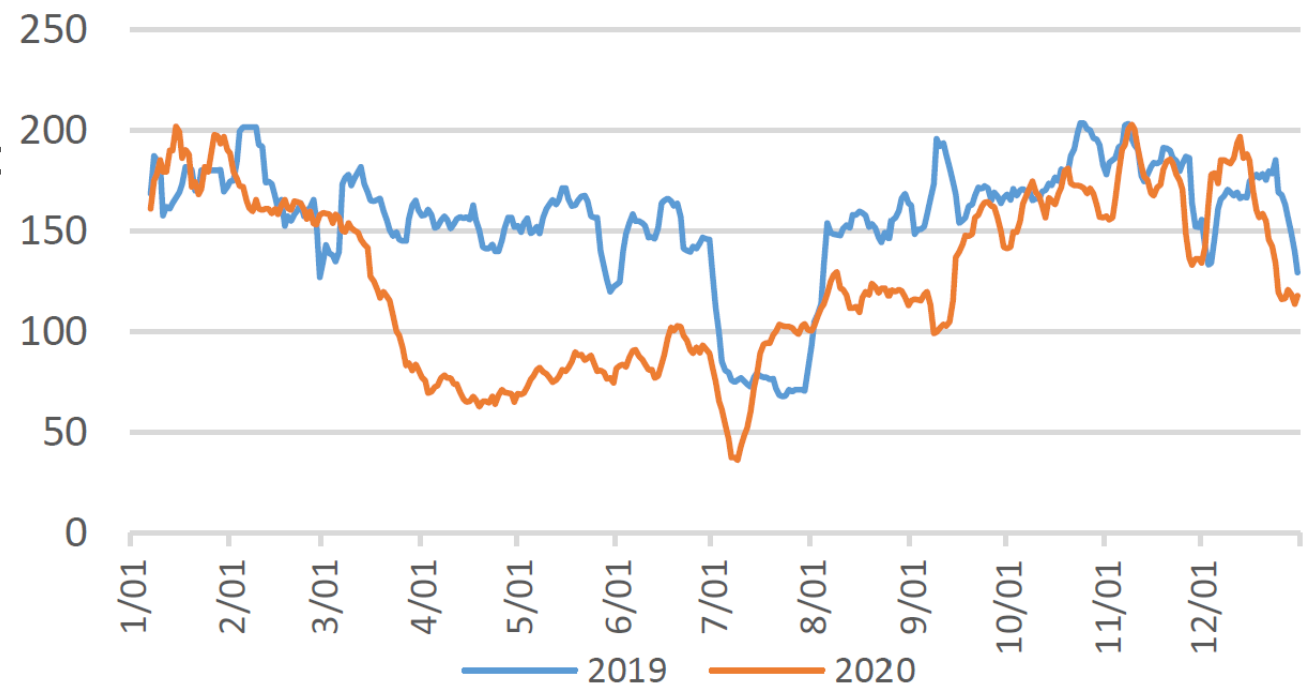
Impact of AMI NGDs on Emergency Response – Hours of Alarms

- Unlike a nose, a detector does not sleep!



Impact of AMI NGDs on Emergency Response – Consumers vs GLAs

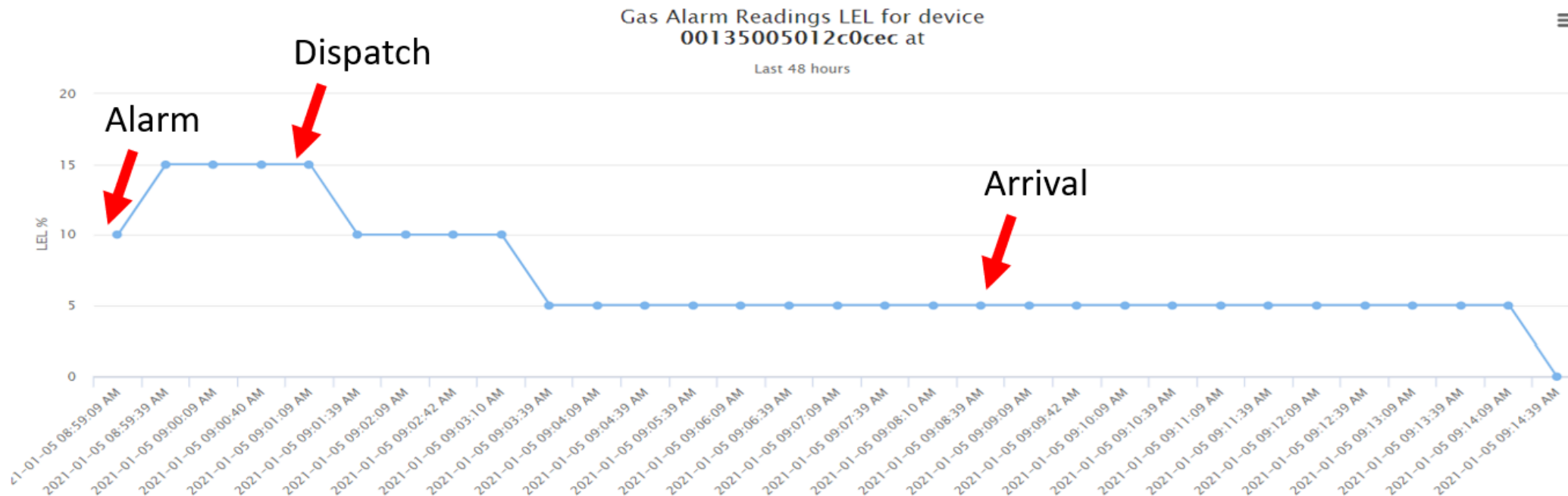
- Receive ~50,000 inside gas leak calls per year
- Inside gas leak calls “No leak found” 2019: 39% ; 2020: 34%
- NGD False alarms - .05% (~1 alarm per 2,000 NGDs for program)
- 1,004 GLAs are from gas POE area –
 - ~1 alarm per 100 NGDs
 - Full deployment GLA est. - ~3,675



Inside gas leak calls 7 day rolling average

Control Room Alarm Dashboard - Example 1

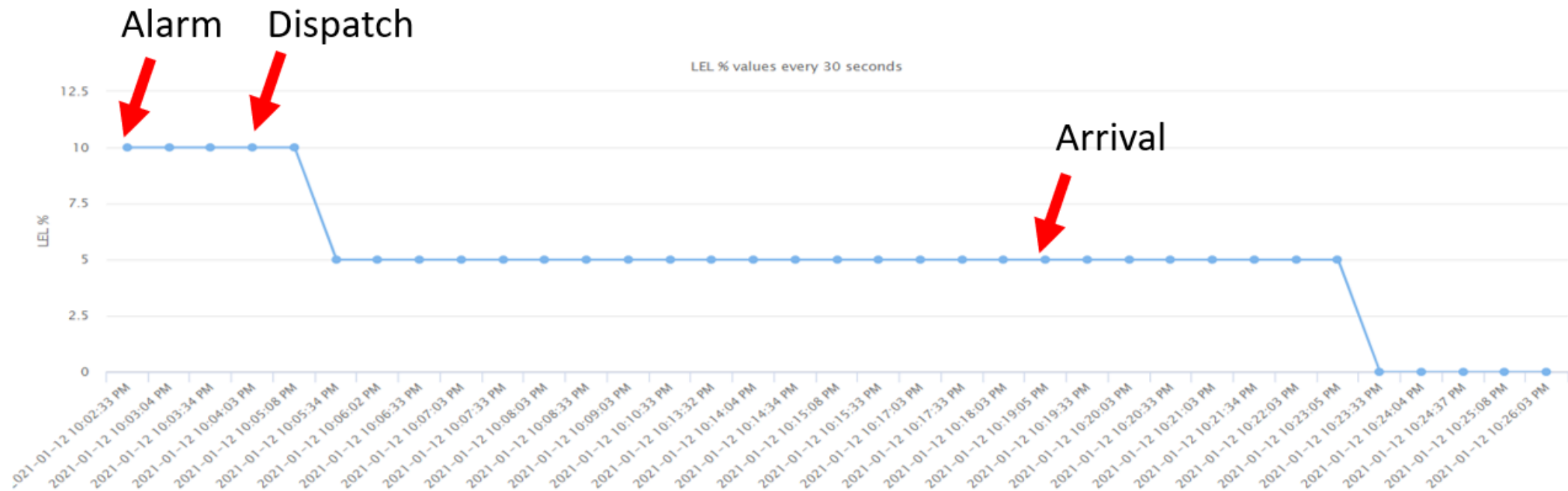
- Alarm: 8:59 AM, Dispatch: 9:01, Arrival: 9:08 AM



- Alarm Cause: unauthorized piping operation of a coupling by a plumber

Control Room Alarm Dashboard - Example 2

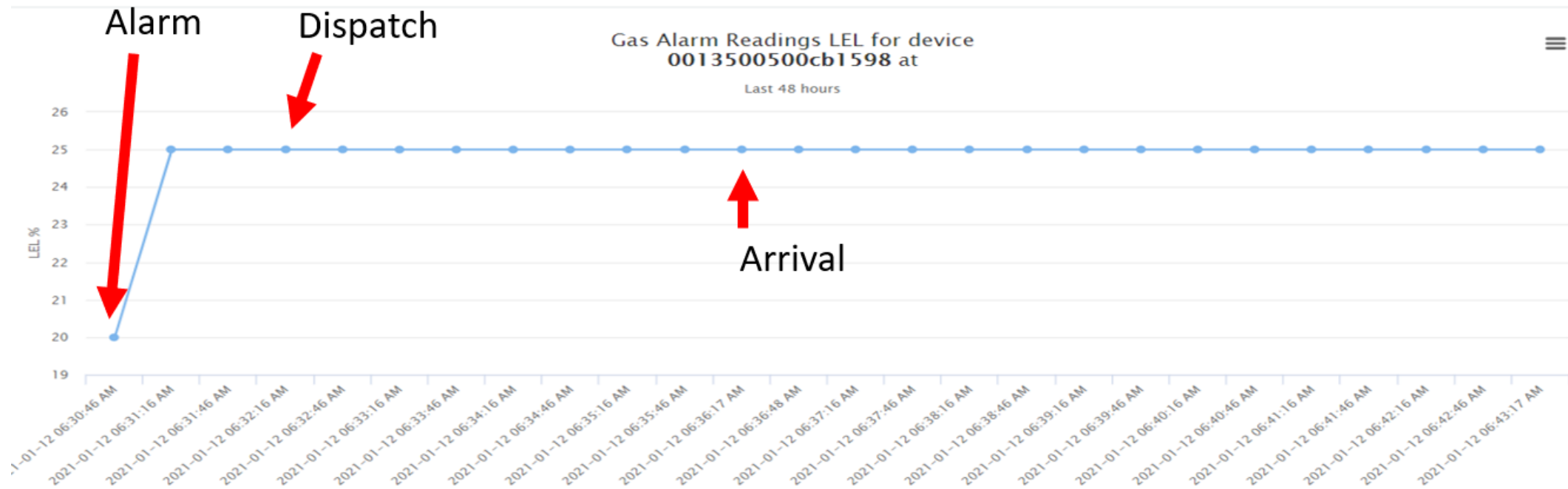
- Alarm: 10:02 PM, Dispatch: 10:04 Arrival: 10:19



- Alarm source: leak at the gas meter

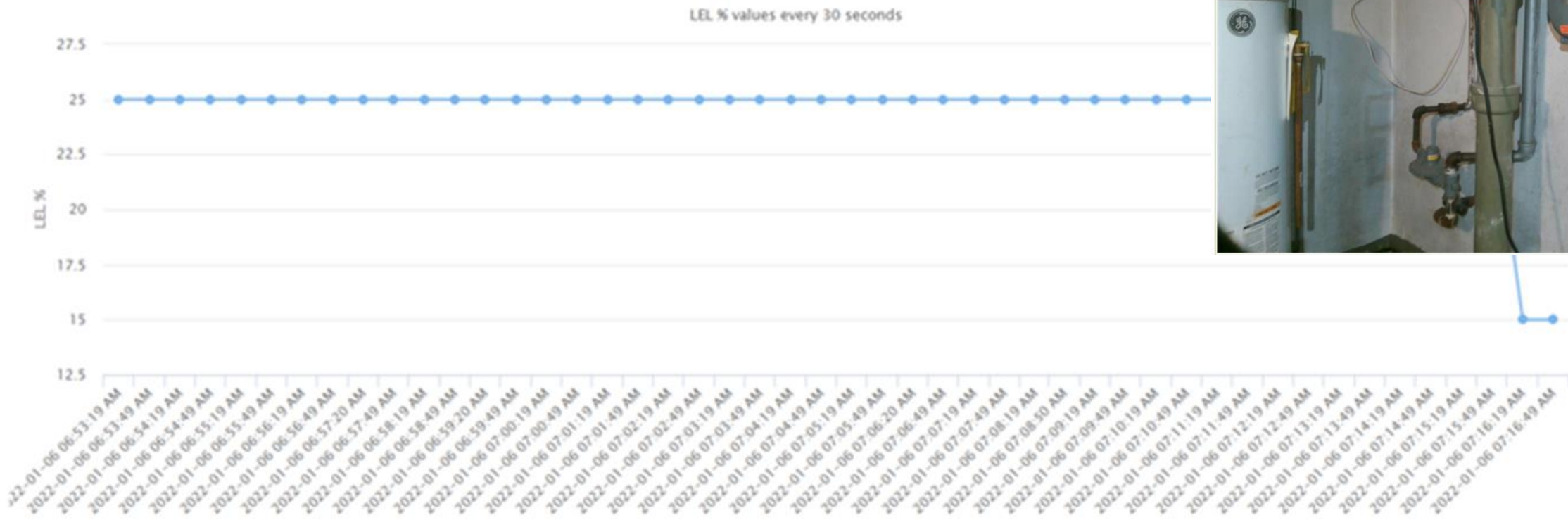
Control Room Alarm Dashboard - Example 3

- Alarm: 6:31 AM, Dispatch: 6:32, Arrival: 6:36



- Alarm Cause: Building Fire - unable to determine the source

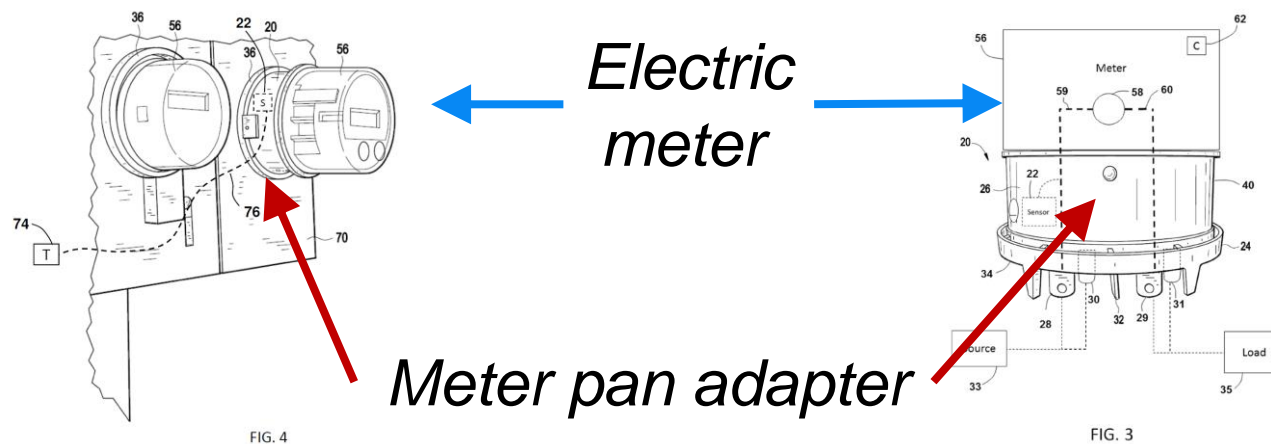
Control Room Alarm Dashboard - Example 4



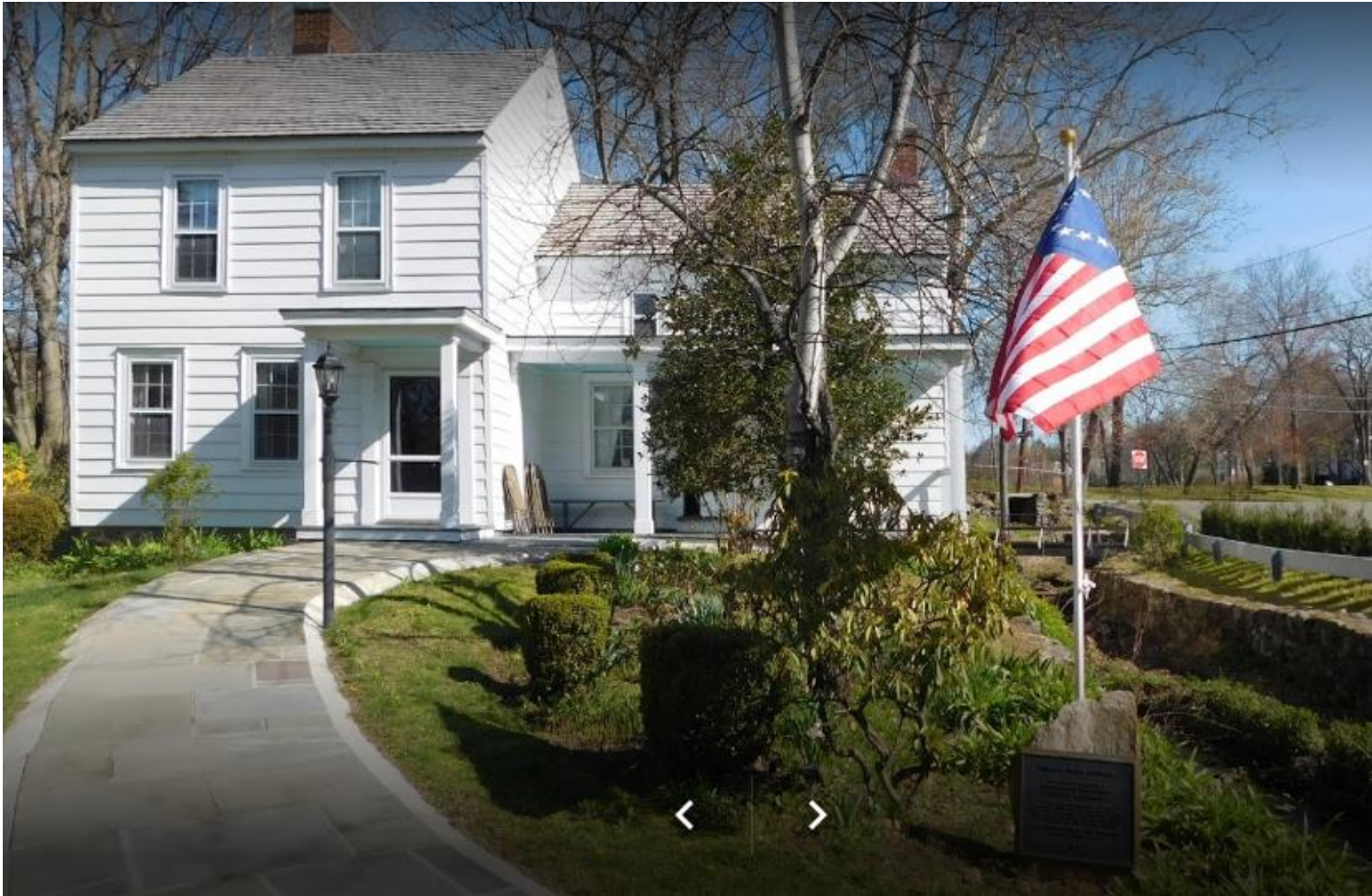
- Alarm Cause: Broken $\frac{3}{4}$ " pipe to H/W/H. FD measured 2.5% gas in air, Con Ed crew measured .3%

Future NGD Project – Outside Detector

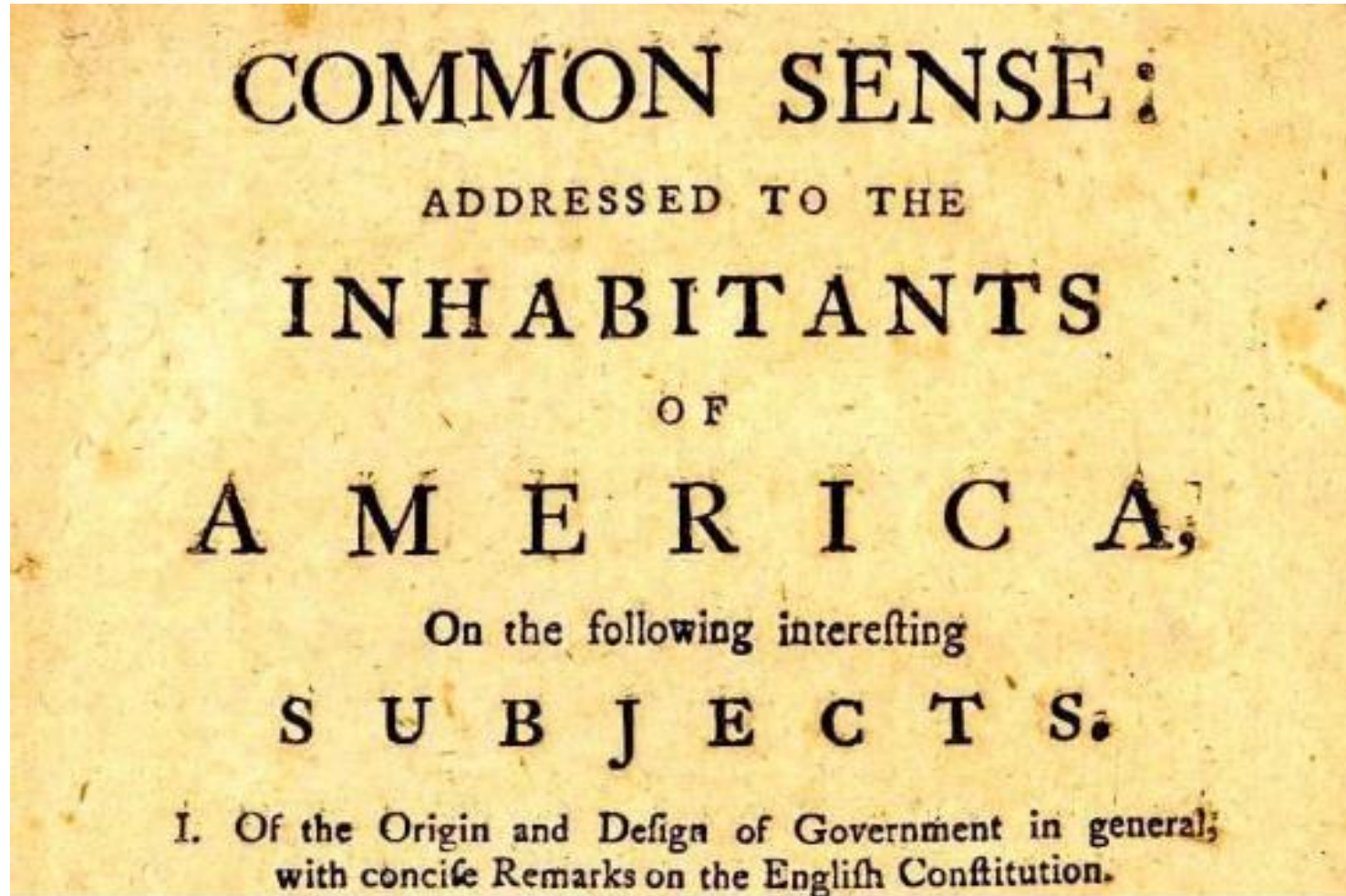
- Develop a gas detector in an electric meter pan adapter powered by electric meter to monitor outside atmosphere in vicinity of outdoor gas meter sets
- U.S. Patent Application Serial No. 16/653025
- Non-Provisional filed October 15, 2019
- Title: ***System for Measuring a Parameter with an Electric Meter***



GLA 9th Alarm – Thomas Paine’s Cottage – New Rochelle NY



Residential Natural Gas Detectors are simply that





Questions Discussions