

Attachment #10.1  
Return to Agenda


# ESS Emergencies

*Anthony Natale ConEdison*



# Anthony Natale

- **CERTIFICATIONS:**

- Fire Instructor I, II - ProBoard Certified New York State Office of Fire Prev & Control
  - Incident Command System Instructor FEMA Cert E-449
  - Incident Command System 100, 200, 300, 400, 700 & 800a
  - All Hazards Liaison Officer – FEMA Certification
  - Incident Management Level 3 New Jersey Division of Fire Safety
  - HazMat On-Scene Incident Commander New Jersey Division of Fire Safety
  - Hazardous Material Technician II (120 hr.) New York City Fire Department
  - Firefighter 1 New Jersey Division of Fire Safety
  - Advanced Exterior Industrial Brigade - NFPA 1081 Texas A&M
  - Interior Structural Industrial Brigade NFPA - 1081 Texas A&M
  - Refrigeration Operating Engineer New York City Fire Department
  - Underground Storage Tank System Operator A/B NYS DEC
  - NFPA 18 Technical Committee Member
  - NFPA 855 Technical Committee Member
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# Agenda



APS OVERVIEW



LESSON  
LEARNED



ESS DESIGN  
IMPROVEMENTS



IMPROVING  
SAFETY

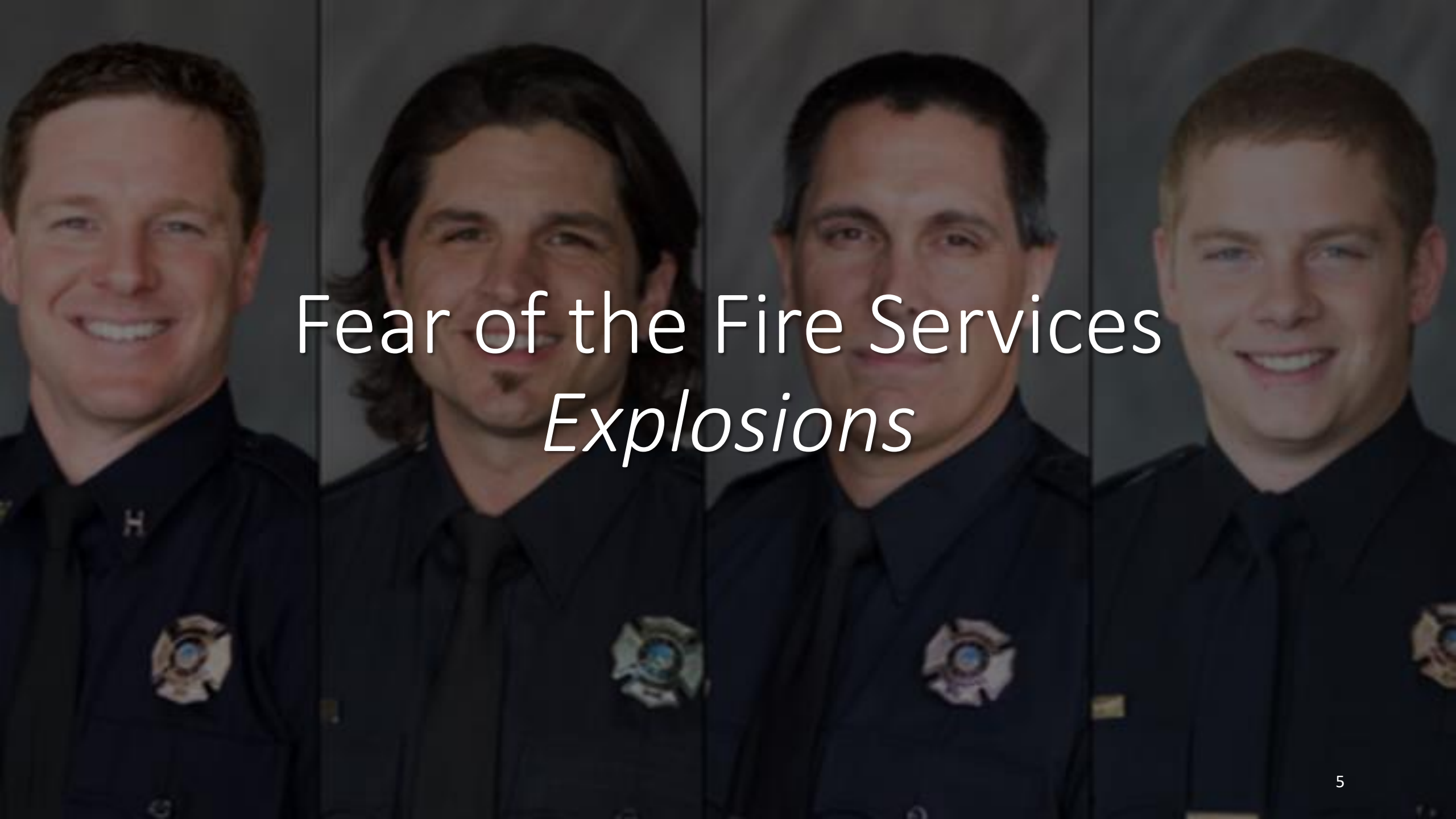


# APS Incident

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McMicken Substation



A photograph of four firefighters in dark blue uniforms, each with a Maltese cross badge on their chest. They are standing in a row against a grey background. The image is dimmed to serve as a background for the text.

# Fear of the Fire Services *Explosions*

# Fires & Explosions



## ESS Overview

- 378 LI Modules – LG Chem
- 8 HVAC Units
- Smoke Detection
- NOVEC 1230 Clean Agent
- No Sprinkler
- No Ventilation System
- No Deflagration Venting
- In Service Two Years



*Event Timeline*

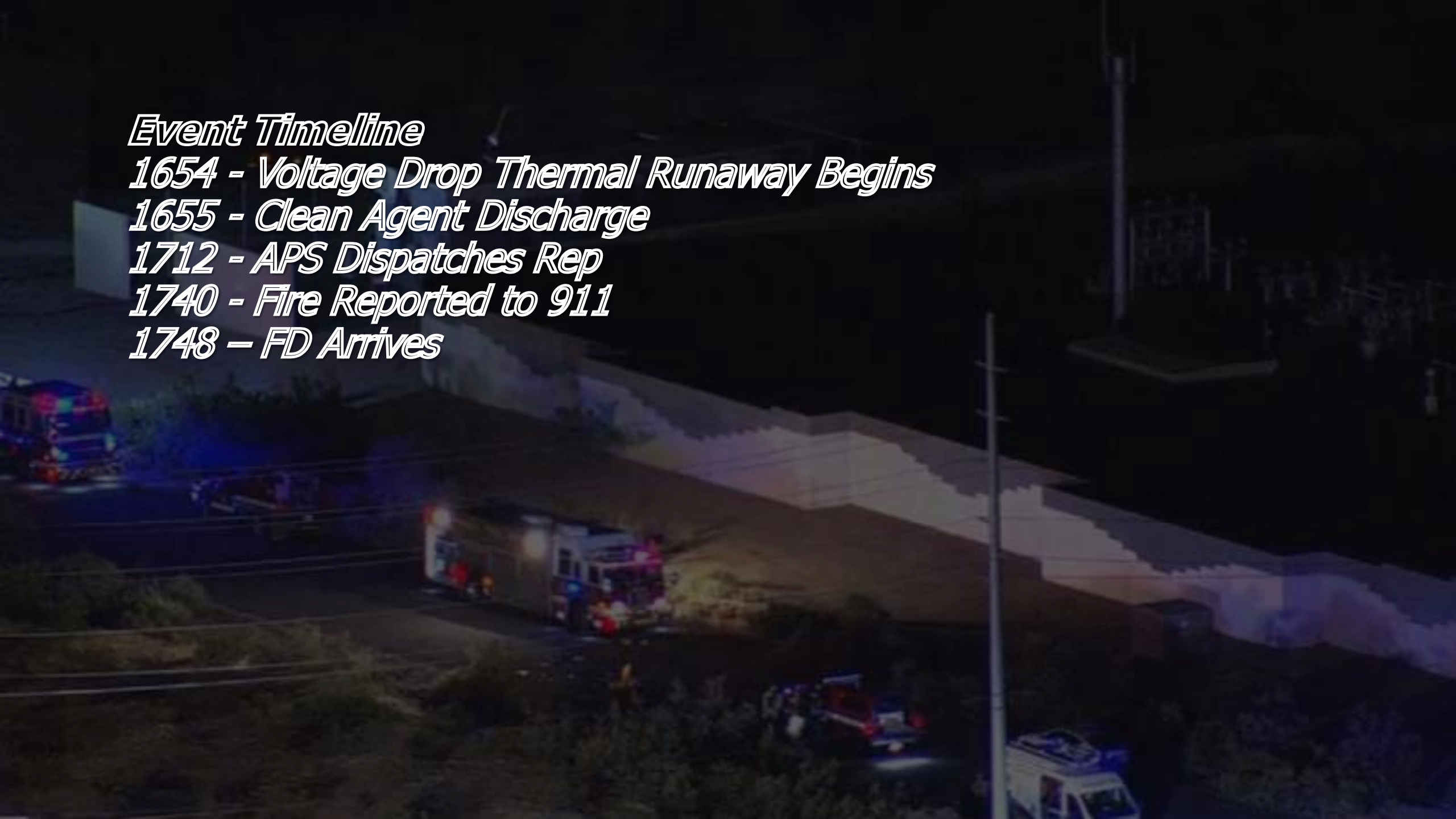
*1654 - Voltage Drop Thermal Runaway Begins*

*1655 - Clean Agent Discharge*

*1712 - APS Dispatches Rep*

*1740 - Fire Reported to 911*

*1748 - FD Arrives*







## FD Conducts Size-Up *2 Hours & 14 Minutes*

- 360 TIC
- No External Flam Readings
- Precautionary Line

1  
0

# ESS Door is Opened

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- Clean Agent has Discharged
- White Vapor Cloud Hugs Floor
- Consistent Flow
- No Internal TIC Readings
- Flammable Gas Detected





1  
1

*Explosion w/Fireball  
2 Minutes After Door  
is Opened*

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Door Hits Nozzleman





**Blast Scope**

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Blast Wave  
*Carries Officer 75 Feet*

PPE Ripped Off  
*Helmets Face-  
Pieces SCBA's*

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6

# Exposure 1

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1/7

## Exposure 2

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**⚠ DANGER** **⚠ PELIGRO**  
High Voltage  
Alto Voltaje  
Keep Clear  
Manténgase alejado  
No Touch  
No Tocar  
No Open Doors  
No Abrir Puertas

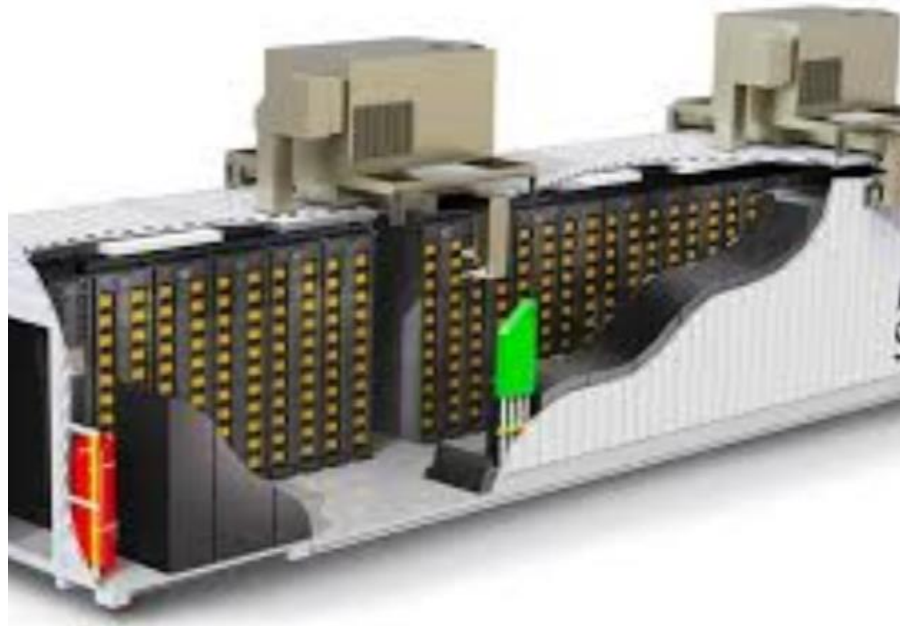
1  
8

# Exposure 3

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Rack 17    Rack 15    Rack 13



# Vertical Cascade

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# Lesson Learned

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Clean Agent

UEL to Explosive Range

No Flam Detection or Purge

Remote FACP

FD / APS Response Policy



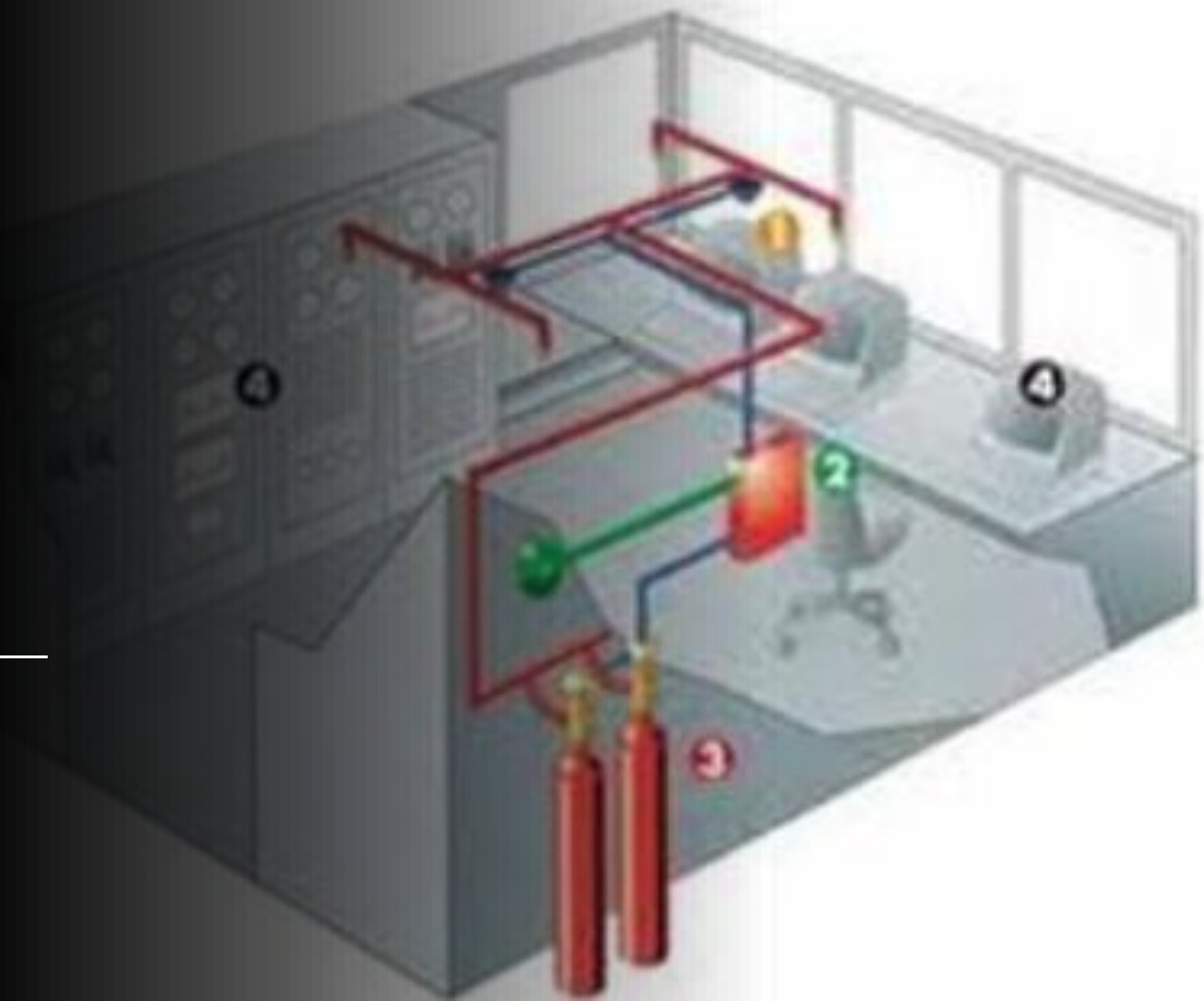
X10  
105°

**APS SOLAR BATTERY SITE EXPLOS**  
INVESTIGATION STILL UNDERWAY, CAUSE UNKNOWN



# Clean Agents NOVEC / FM200

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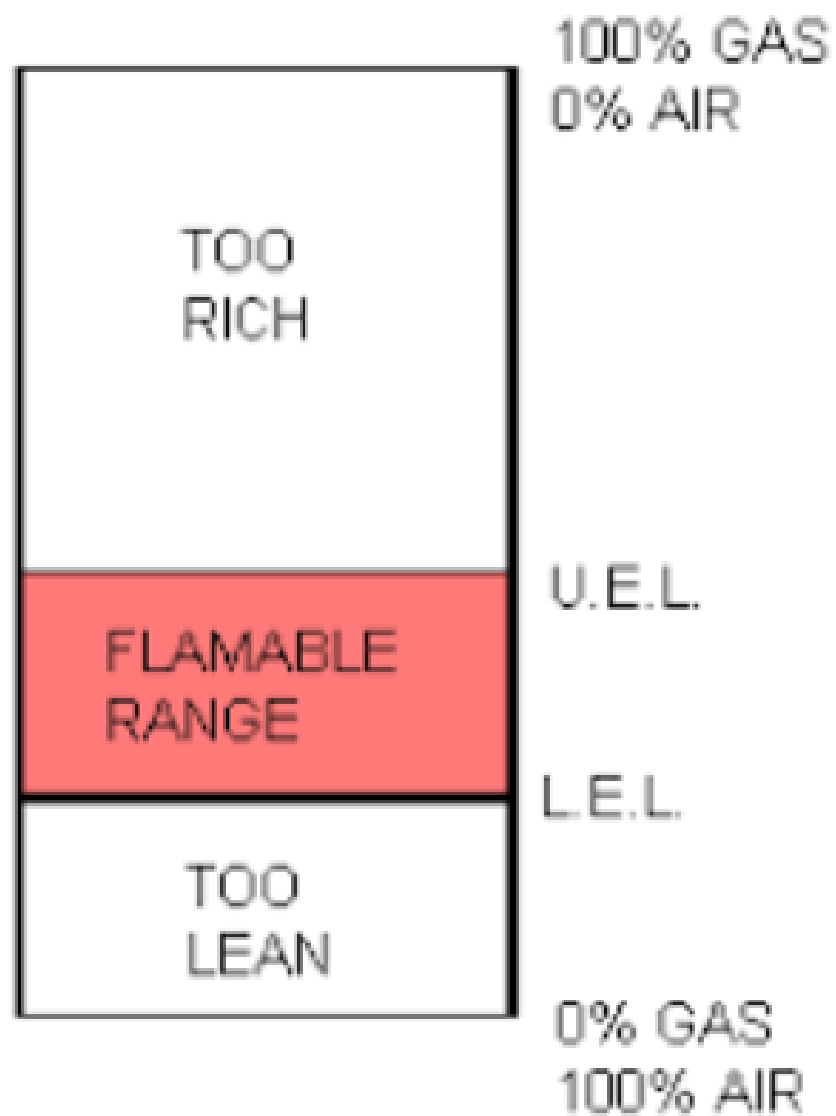
# Fire Consumes Gas



# Off-Gassing without Flame *Explosion*



# UEL to Explosive Range

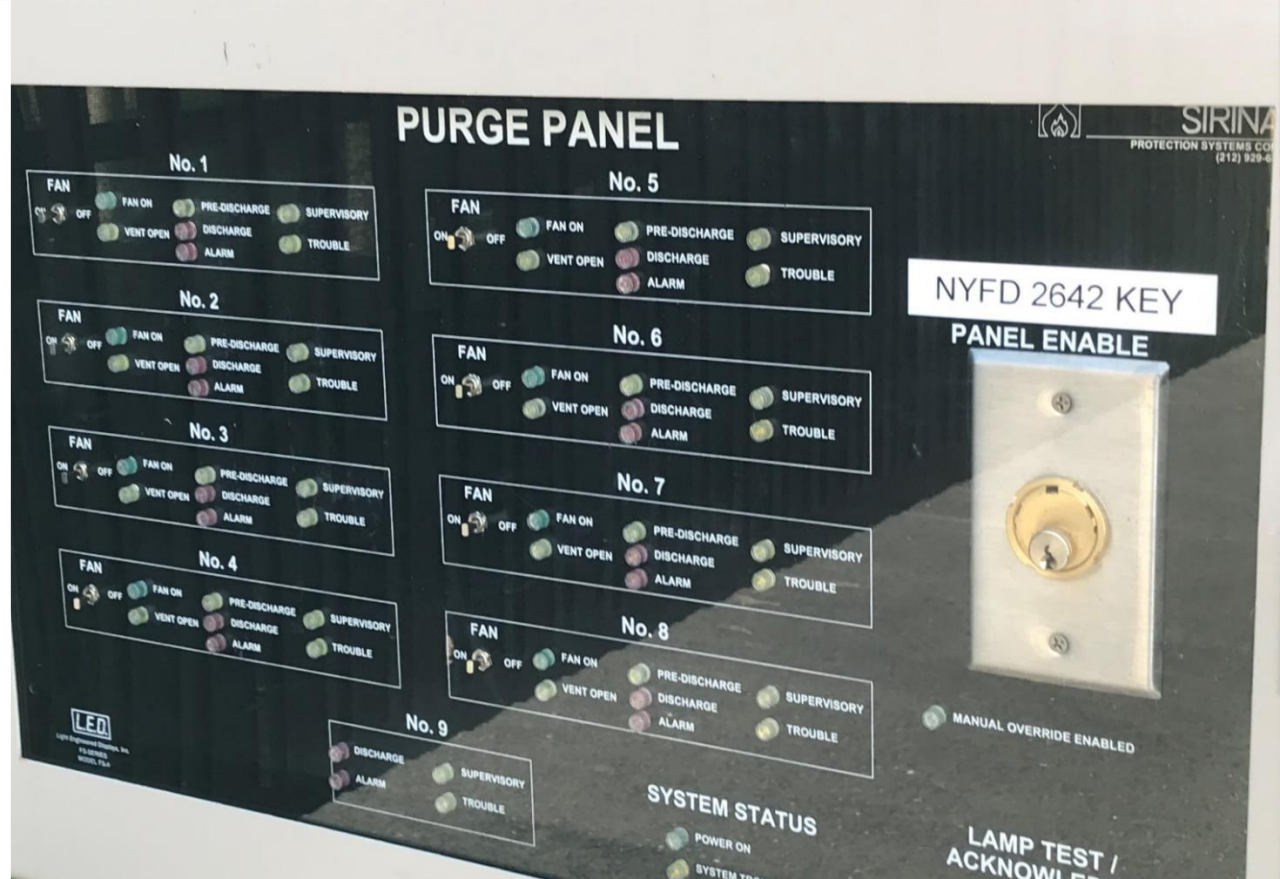






## Flam Detection & Purge





Remote FACP



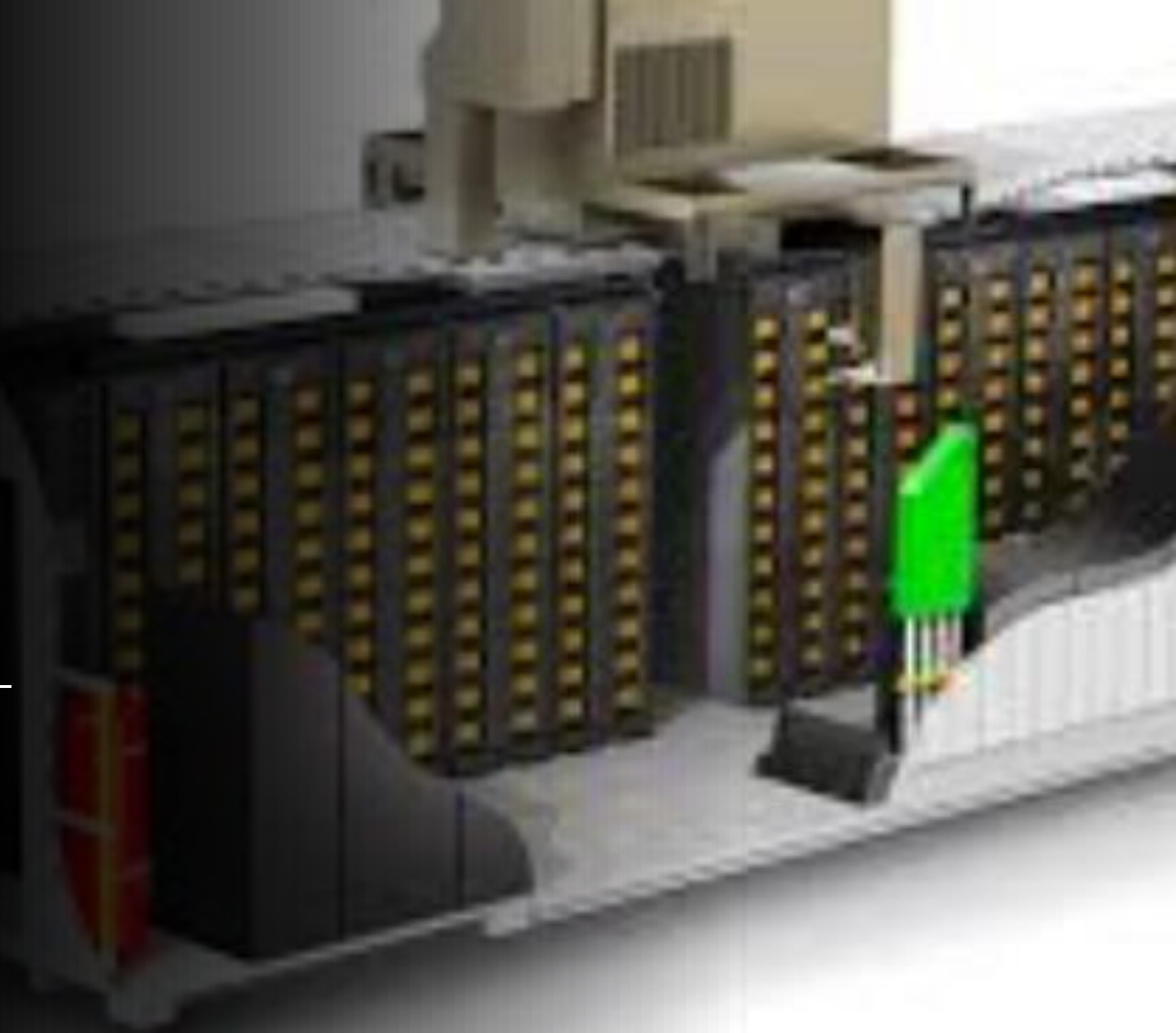
Develop a Response Policy  
Low Frequency High Hazard Event



# ESS Design Improvements

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Engineering in Safety



# Deflagration Venting

UL9540a

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Sprinklers  
Containment NOT  
Suppression

*Manual Extinguishment  
Required*

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**Deep Seated Fire**

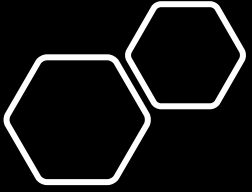
**Entry Required  
for Suppression**





Garage Door Concept  
Spring Loaded





# Attack Without Entry

*Big Water*





Quick Disconnect





# Improving safety

Next Steps

# ESS Emergency Response Plan

Site Overview

Batteries & Systems


Detection & Suppression

Hazards

- Electrical
- Flammable Gas

Response Tactics

- Staging
- Suppression Agents
- Safe Standoff Distances



# Response to Green Energy Emergencies Course

# Suppressing Lithium-Ion Fires R&D Project

