



**Responder, LLC**

Strengthening Safety Cultures



**Manny Ehrlich, EdM**  
**Managing Director**  
**973.809.6700**



**Presentation: National Academy of Sciences**  
**NOVEMBER 10, 2021**

***COMMENTS REGARDING LNG-  
RESPONSE AND  
TRANSPORTATION***

# LIQUIFIED NATURAL GAS



# LIQUIFIED NATURAL GAS

## NFPA 704

| Diamond                                                                           | Hazard                                                                                          | Value |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------|
|  |  Health       | 3     |
|                                                                                   |  Flammability | 4     |
|                                                                                   |  Instability  | 0     |
|                                                                                   |  Special      |       |

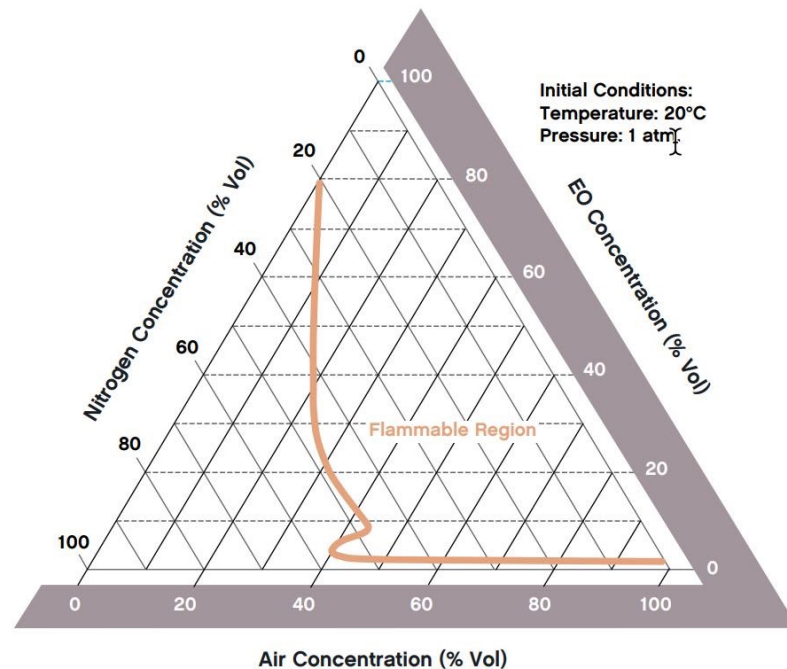
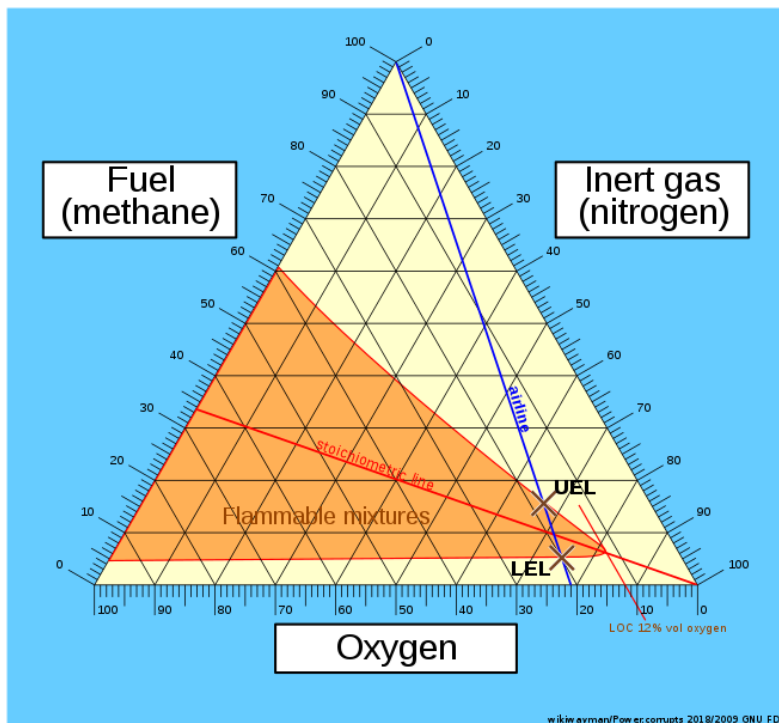
(NFPA, 2010)

# MY LEVEL "A" LOOK

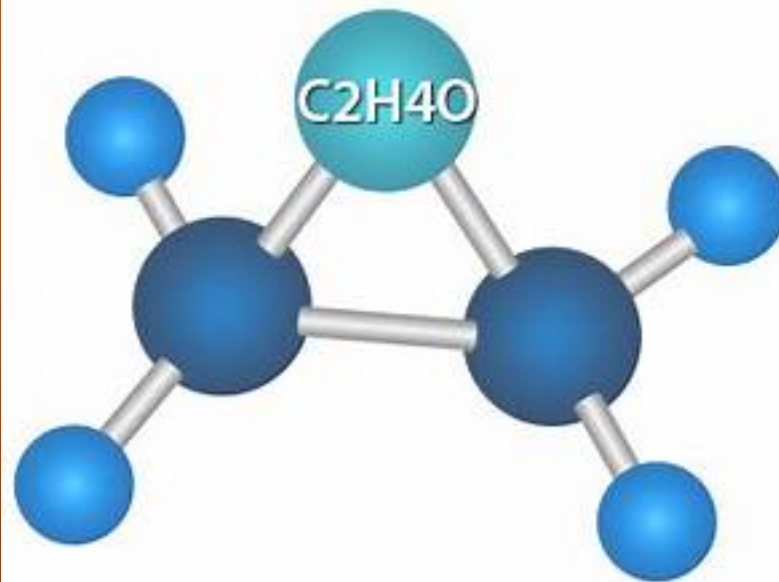
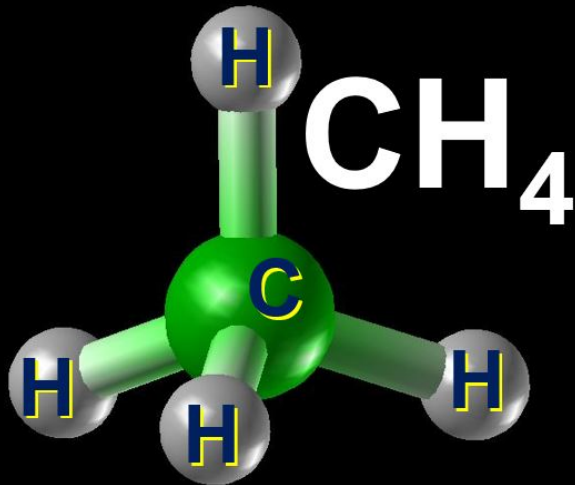




# FLAMMABILITY- $\text{CH}_4$ - EO



# Methane



ETHYLENE OXIDE



## TOXICOLOGICAL PROPERTIES – CH<sub>4</sub> & C<sub>2</sub>H<sub>4</sub>O

| PROPERTY   | METHANE  | ETHYLENE OXIDE  |
|------------|----------|-----------------|
| AICGH TWA  | 1000 PPM | 1 PPM           |
| CARCINOGEN | NO       | SUSPECTED HUMAN |
| MUTAGEN    | NO       | YES             |



| Event Location | DATE     | mTONS-AN | DEATHS | INJURIES |
|----------------|----------|----------|--------|----------|
| 1-Texas City   | 04/16/47 | 2086     | 581    | 4000     |
| 2-West, TX     | 04/13/13 | 240      | 15     | 200      |
| 3-Tianjin      | 08/12/15 | 800      | 173    | 798      |
| 4-Beirut       | 08/04/20 | 2750     | 220    | 6000     |



| Event Location | Damage<br>M\$                          | mTONS-AN | Displaced<br>Personnel | Homes<br>Destroyed |
|----------------|----------------------------------------|----------|------------------------|--------------------|
| 1-Texas City   | \$117 Million<br>\$1.1 Billion<br>2/19 | 2086     | 2000                   | 500                |
| 2-West, TX     | \$250 Million                          | 240      | 800                    | 530                |
| 3-Tianjin      | \$10 Billion                           | 800      | 6000                   | 17,000             |
| 4-Beirut       | \$15 Billion                           | 2750     | 300,000                | 70,000             |

**THANK  
YOU**

**MANNY EHRLICH**  
**MANAGING DIRECTOR**  
***manny@responderllc.me***

---



2858 LAKELAND PARKWAY  
SILVER LAKE, OH. 44224  
973.809.6700