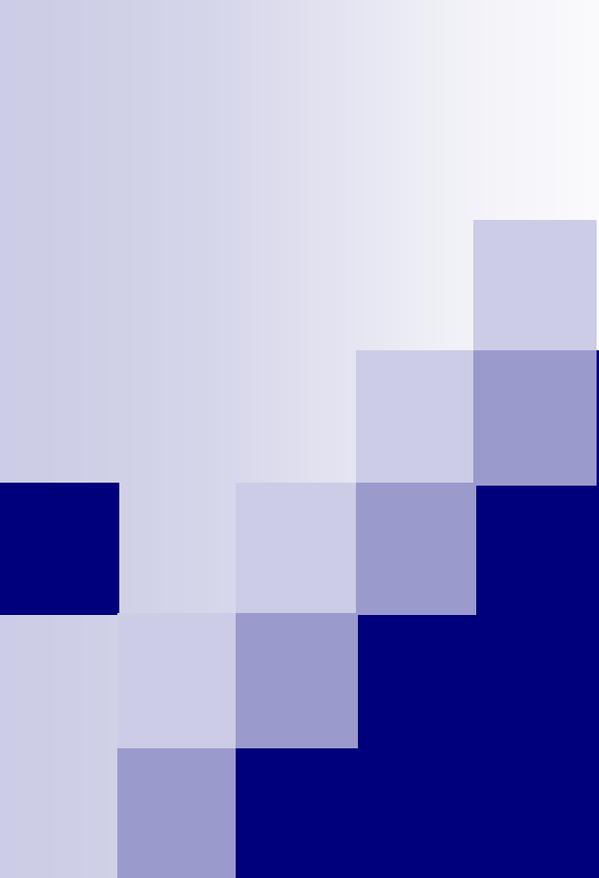


# Ammonia Emergency Response Training

For  
NIEHS TRX Attendees

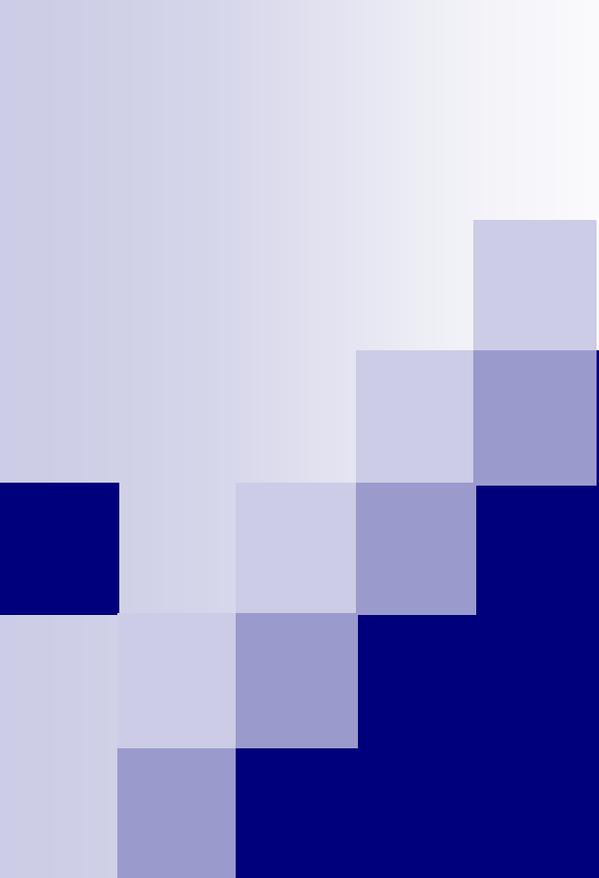


# Midwest Consortium Carol Rice -Director

Lakeshore Technical College  
Cleveland, WI  
Rich Hoerth – Dean of Public  
Safety

# Why are YOU here?

- A. I thought my boss would be in another session.
- B. Sounded like the best chance to nap
- C. I've failed to find a good hiding place, yet!
- D. My boss IS here!
  - (That's why I'm here, I'd rather be site-seeing)



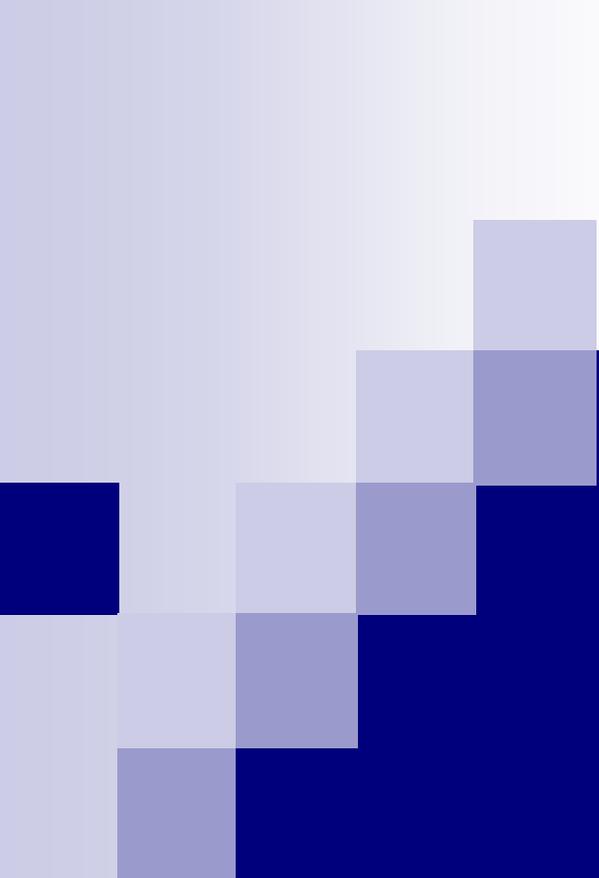
# Wayne's Goal for Today

Determine who is physically fit to lead a Level A response to a simulated ammonia leak.

(Was this misrepresented in the description?)

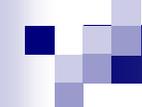






# Or, how about:

Discussion on how LTC presents Ammonia ER with an interactive discussion on ways to improve it AND apply it “back home”

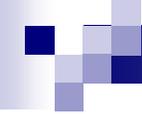


# 24 Hour Technician Level – Ammonia Emergency Response

Technician competencies relating to ammonia.

(Local OSHA (Wisconsin) OK with content and format)

Emergency Response Plan must reflect the  
“ammonia only” response



# FOCUS

- Refrigeration facilities
  
- Other markets
  - Producers
  - Manufacturing
  - Agriculture
  - Power plants
  - HazMat Teams – Public & Private



# Potential Clients

- Food processors
- Dairy industry
- Cold storage

# Look for these





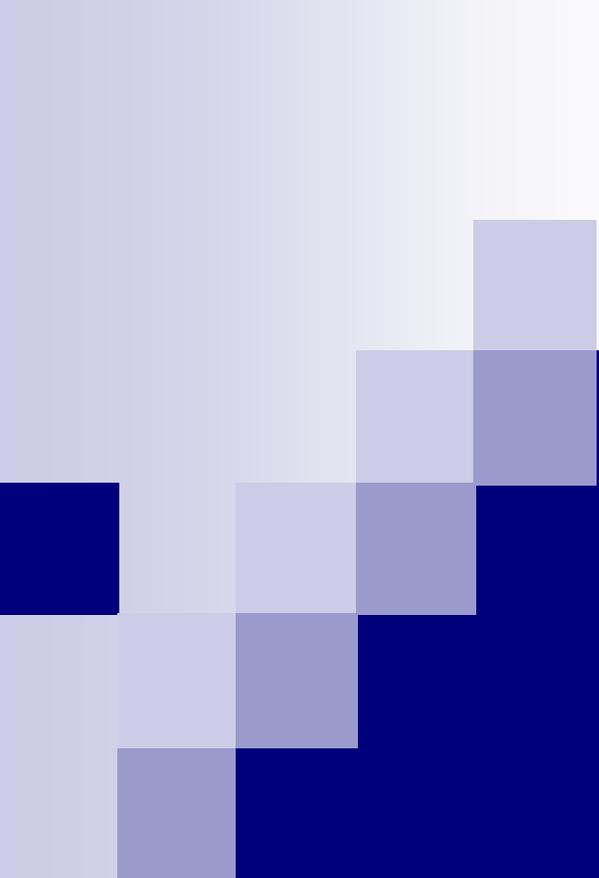
Condenser

**ARTA, Inc.**



# Students

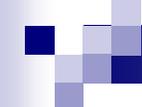
- Refrigeration technicians
- Maintenance employees
- Supervisors
- Associates
- Engineers (NOT real people but they count for NIEHS purposes)

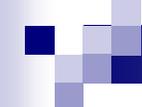


# LTC's Outline

# DAY 1

- 45 min - Introduction and Welcome
  - Why are we here?
  - Paperwork
  - HAZWOPER-29CFR1910.120
  - Technician competencies
- 30 min - Hazard Recognition(Chemistry)
  - Chemical and physical characteristics of ammonia

- 
- 30 min - Hazard Recognition for Ammonia
    - Placards and labels
    - Containers
    - MSDS
    - Literature and resources
    - Haz Rec Exercise
  - 45 min - Health Hazard Recognition
    - Ammonia Toxicology
  - 30 min - Medical Concerns
    - Medical surveillance
    - Heat stress and field monitoring

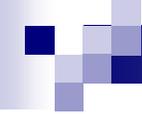
- 
- 60 min - Air Monitoring
    - LEL/Oxygen
    - Electrochemical sensors
    - Metal oxide sensors
    - Photoionization
    - Colorimetric tubes
    - Badges
    - What's`new
  - 60 min - Air Monitoring Lab

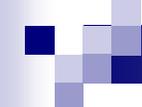
- 70 min - Respiratory Protection
  - OSHA Standard - 1910.134
  - Air Purifying Respirators (APRs)
  - Supplied Air Respirators (SARs)
  - Self-contained Breathing Apparatus (SCBA)
  - Escape units
- 90 min - Respiratory Protection Workshop
  - SCBA
  - Air lines
  - APRs and fit testing



# DAY 2

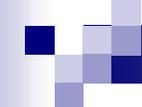
- 60 min - Personal Protective Equipment
  - Levels of protection
  - Selection of PPE
  - Exercise
- 120 min - PPE Workshop
  - Dressout in Levels D,C,B,&A

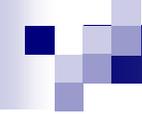
- 
- 40 min - Decontamination
    - Decon plan
      - Line
    - Work zones
  - 20 min - Work Practices
    - Physical hazards
    - SOPs
    - Confined spaces
    - Lockout/tagout
  - 30 min - Refrigeration Systems

- 
- 60 min - Controlling Ammonia Releases
    - Technologies and techniques
    - Video(s) and critique
  - 130 min - Round-Robin Exercise
    - Repairing a leak in Level A
    - Decon
    - Debriefing

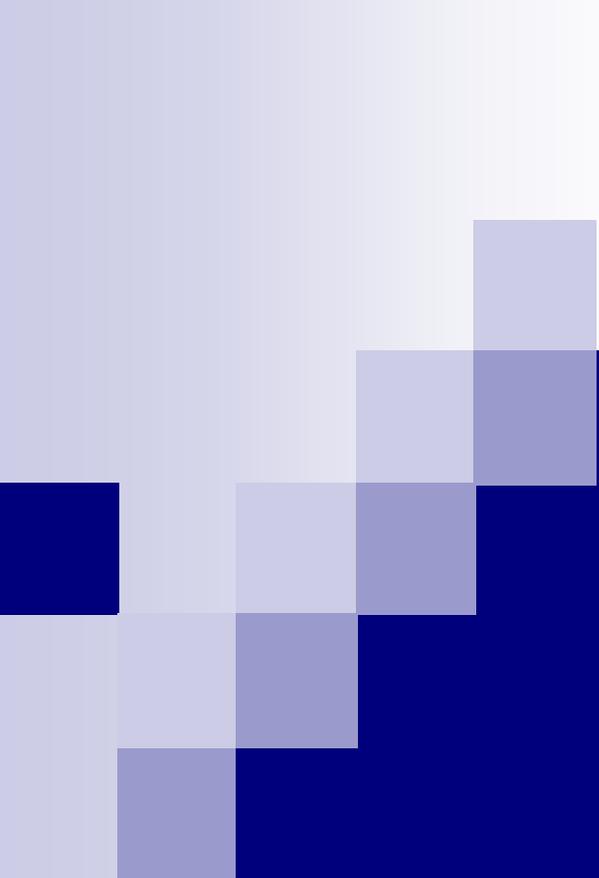
# DAY 3

- 150 min - Emergency Response
  - SARA- federal, state, and local response
  - Emergency response plans
  - Incident command system (ICS)
  - Response operations
    - size-up
    - strategy/tactics
    - entry
    - termination

- 
- 90 min - Emergency Response  
Tabletop Exercise
  - 90 min - Simulation of an Ammonia  
Leak
    - Team organization
    - Size-up
    - Entry
    - Control
    - Decon
    - Termination/Critique
  - 60 min - Final Exam

- 
- 90 min - Simulated Ammonia Incident -  
B
    - Response
    - Termination
  - Course Closing

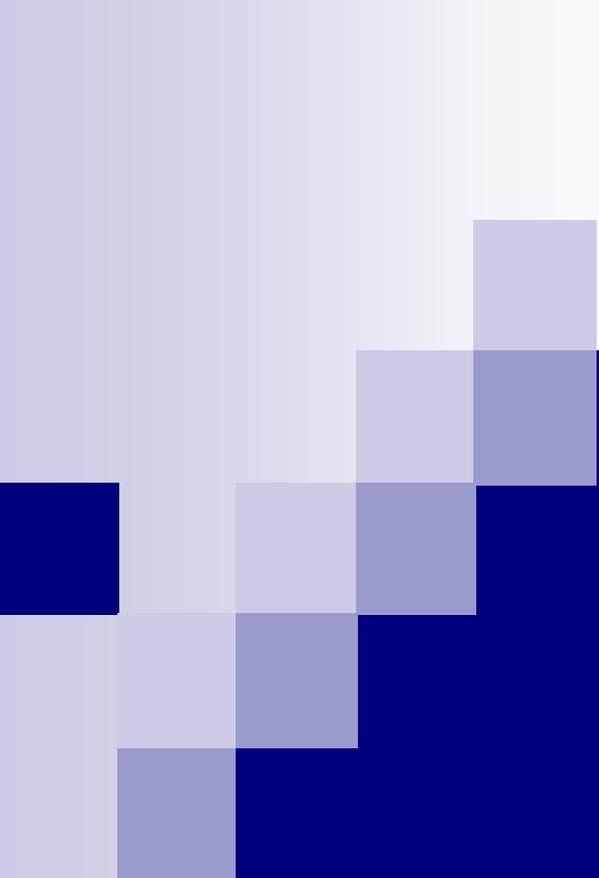
- 
- Any memorable experiences with ammonia?
    - That I won't have to report to the authorities
  
  - What is 50 ppm, OSHA's PEL, like?



# Ammonia Monitoring

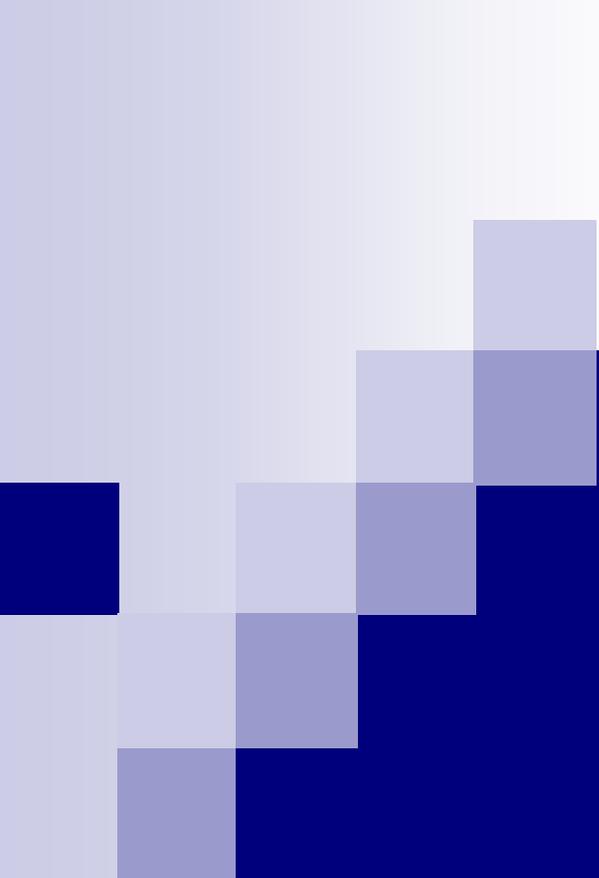
# Typical ER real time monitors

- 4 gas – without an ammonia cell
- EC ammonia specific
- MOS – non-specific
- PID/FID
- Colorimetric tube
  - Chip
- Badge
  - TWA

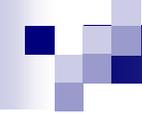


# Monitoring Lab

HO

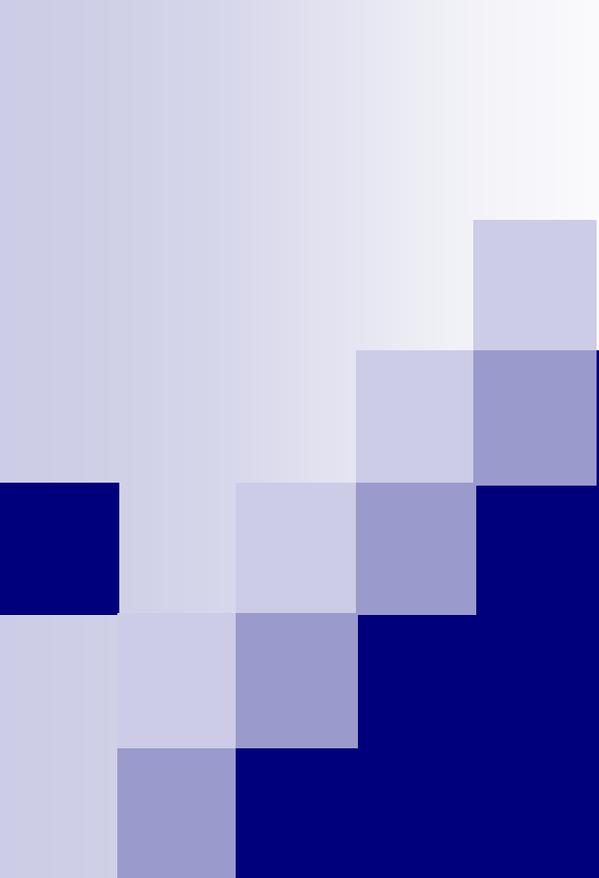


PPE



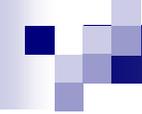
# Content

- Respiratory Protection
- CPC
  - Levels of Protection
    - Ammonia is one of a few (?) chemicals that OSHA reports a Level B to Level A requirement for: 5000 ppm
- Video on LOP and CPC
- Selection exercise



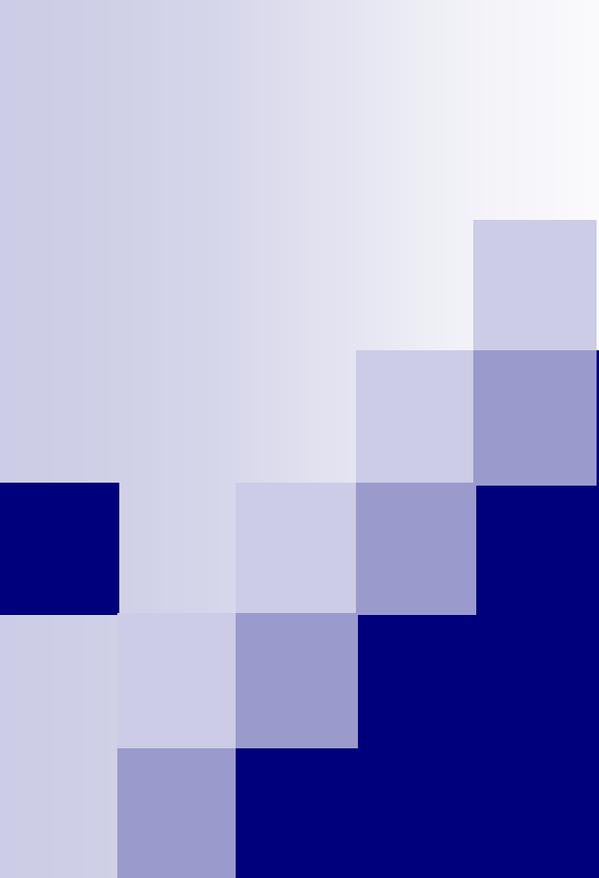
How many want to do  
a Level B dressout  
exercise now?

How many want to watch?



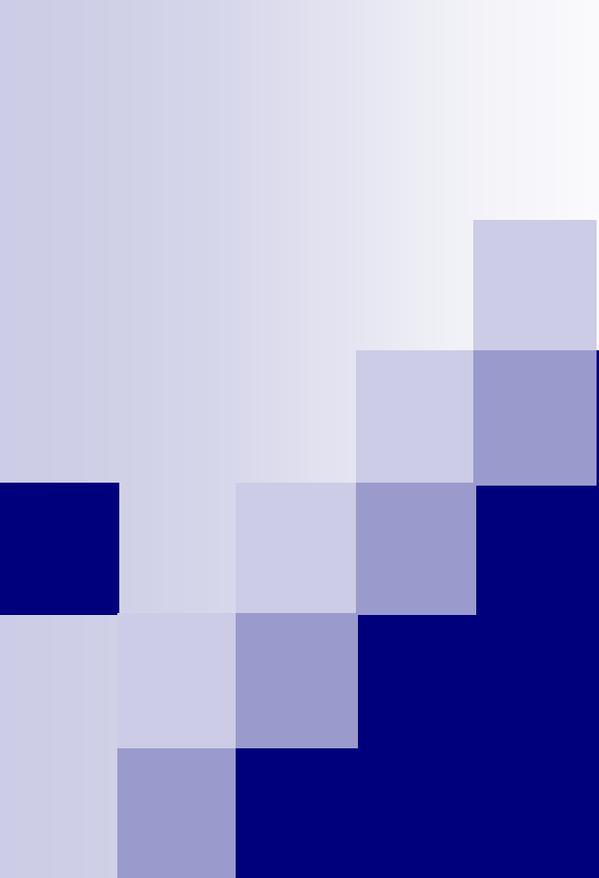
# Practical Applications

- All over the board
  
- Factors Affecting Response Levels:
  - Who
  - Company's safety environment
  - Training
  - \$\$\$\$\$\$



# Ammonia Decon

- 
- Wet vs dry vs none stories
    - Water vs fan (Wayne's World)



# Ammonia Videos

# Wayne's favorite

- “Valuable Lessons Learned Regarding Anhydrous Ammonia”
  - Satellite teleconference – 2 hr
  - 12/5/90
  
  - Hands-on with live ammonia

# Others

- Anhydrous Ammonia
  - Emergency Film Group (1994)
  - fair

- 
- Ammonia Safety – Emergency Response Procedures
    - International Institute of Ammonia Refrigeration – IIAR
    - Good , but not for ER, rather EAP
    - They have a series of videos I have not seen



- PPE

- Decon

- Elaborate - how

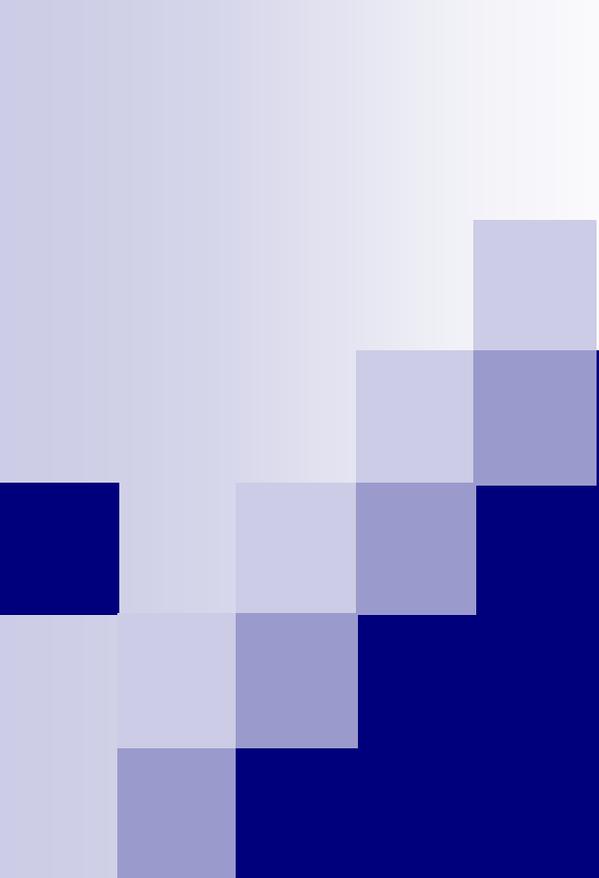
- Shaving cream – why

- IC



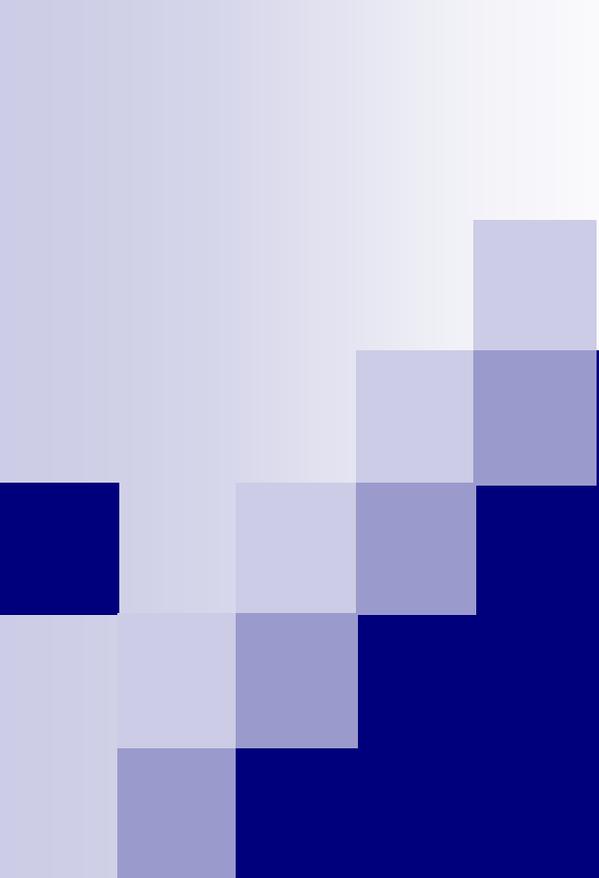
## ■ Others

- Phillip's 1960s
- Russian firefighters



# Ammonia Table Top Exercise

HO



# Ammonia Exercises



# Ideas

- Engine room - realistic
  - Noise
  - Hazards







ITRI AMMONIA  
HGD AMMONIA

AMMONIA





- Empty rooms/garages

- Ammonia “rack”

- Semi Trailers

- Smoke

- Access



American  
**FOGSTORM™**  
1200 HD  
High Output Professional Fog Machine



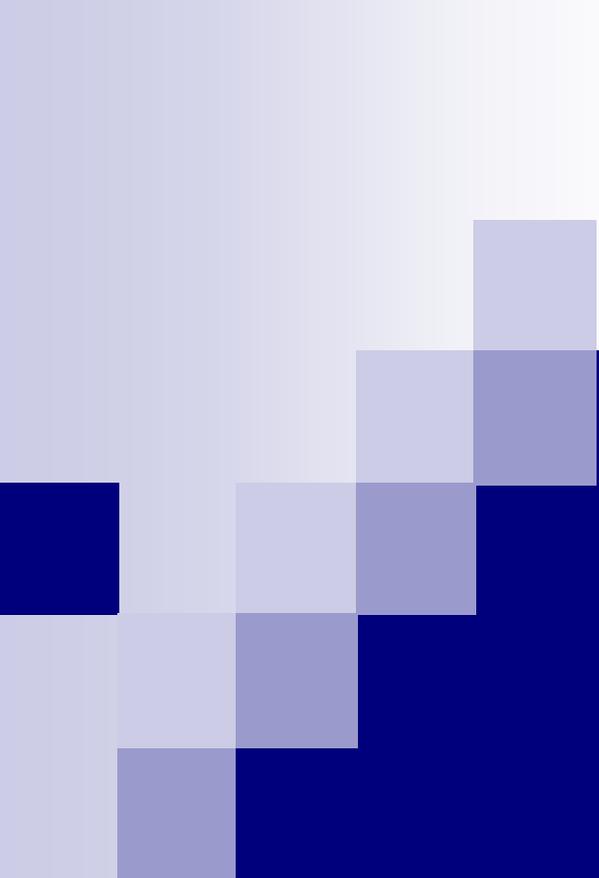






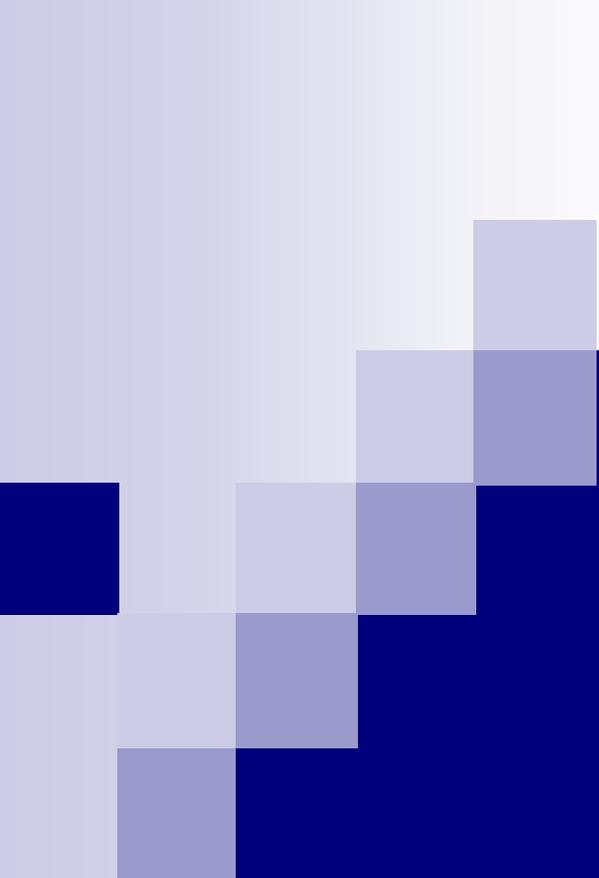
# WARNING

- Don't get caught in a PSM cluster
  - Diagrams have mistakes and are not current (despite what the client says)



# Resources

- 
- Clients or potential clients
  - Refrigeration contractors
  - Ammonia producers/suppliers
  - IIAR



# Q&A