Growing Pains

Fire Safety for the Budding Marijuana Industry

March 22, 2017 | Raymond B. Buzal, P.E. | Senior Regional Director

Agenda

- From Seed to Sale
- From Basement to Boardroom
- Grow Operation Hazards
- Extraction Hazards
- New Fire Safety Regulations

Decriminalization

Marijuana Industry

- Grow and extraction
  - Unlicensed operations
  - Licensed operations
  - Takeovers
- Basement
- Warehouses
- Strip malls

Marijuana Industry

- Connect with other agencies in the jurisdiction
  - Political offices (mayor, council)
  - Tax offices
  - Health Department
  - Law Enforcement
  - Business Licensing
  - Building Department
  - Zoning Department

Marijuana Industry

- Licensed facilities:
  - Grow Operations
  - Marijuana Manufacturing
  - Laboratories
  - Retail Sales
- Unlicensed facilities:
  - Residential Occupancies
**Marijuana Industry**
- Unlicensed residential
  - Electrical leads
  - Lighting ignition sources
  - Open blasting
  - Refrigerator explosions
  - Security

**Marijuana Industry**
- Unlicensed residential
  - Reactive enforcement
  - Public education

**Marijuana Cycle**
- Clone/Seedling
- Grow
- Flower/Bud
- Harvest/Trim
- Process/Extraction
- Retail

**Cloning/Seeding**
- Most cloned
- Some seeded

**Cloning/Seeding**
- Each plant
- Entire life
- Accountability
Grow Operations

- Plants are moved to different rooms through their life

Another grow room

Another grow room.

Large grow operation, young plants.

Large grow room.
Grow Operations

- Lights may be on a timer
- At some point, a room may be dark at all times.

Grow Operations

- Plants can be grown on multi-level racks

Flower/Bud

- These rooms often have netting to support branches
- Lighting can change

Flower/Bud

- Going for the waxy stuff on the bud which holds the THC, CBDs and terpenes.
### Grow Operation Hazards

- **Lighting**
  - Heat source
  - Extension cords
  - Electrical loading

- **HVAC**
  - Increase electrical load
  - Filters

### Grow Operation Hazards

- **Electrical**
  - Illegal tapping
  - Overloaded circuits
  - Fans cooling panels
  - Unpermitted electrical work

### Grow Operation Hazards

- **Room subdivision**
  - Plastic sheets to subdivide
  - Unpermitted construction
  - Sprinkler extensions
  - Egress from rooms
  - Aisles

### Grow Operation Hazards

- **Fire Operations**
  - Movable grow racks
  - Electrical cords
  - Fertilizing tubes
  - Movable light hangars
  - Multiple small rooms
  - Hazmat

- **Mutual Aid considerations**

### Grow Operation Hazards

- **Fertilization**
  - What chemicals are being used
  - What is the delivery system
  - Where is the holding tank
  - HUMPS/HMIS
  - MAQ
Grow Operation Hazards

- Fertilization

Grow Operation Hazards

- Fumigation

Grow Operation Hazards

- Carbon Dioxide Enrichment
  - Elevated CO2 increase crop yields
  - Typical range 1,500 ppm or less
  - OSHA 8 hr limit for human occupancy is 5,000 ppm
  - CDC IDLH is 40,000 ppm
  - Potential asphyxiation hazard to occupants in the grow room and adjacent occupants in multi-tenant buildings

Grow Operation Hazards

- Carbon Dioxide Generators
  - Unvented fuel fire appliances
    - Potential elevated CO2 levels
    - Potential elevated CO levels

Grow Operation Hazards

- Compressed or Liquefied Carbon Dioxide
  - Potential elevated levels
Grow Operation Hazards
• Carbon Dioxide Enrichment

Harvest/Trim
• Buds are harvested and dried
• Remainder of plant is destroyed
• Accountability

Harvest/Trim
• Buds are dried

Drying

Drying.

Most of the plant is waste.

Processing
• Sticky wax holds the cannabinoids
• Processing them removes them from the bud.

Cannabinoids
Processing

- Product is separated
  - Bud and bud trim
- Both are usable product

Trimming the bud.

Automatic bud trimming.

Trim from buds for extraction.

Processing

- Trimmed bud, ready for sale.

Processing bud for joints.

Freezer storage.

Processing

- Bud and bud trim storage
Extraction

- Use of a solvent in an open or closed system
- Processed bud & bud trim produce hash oil

Extraction

- Types of extraction methods
  - Liquified Petroleum Gas (Butane and Propane)
  - Carbon Dioxide
  - Flammable Liquids (Distillation or boil off)
  - Cold water extraction/Dry Ice/Food Based/Rosin Technique

Extraction

- Types of extraction methods
  - Closed loop
    - Open blasting
Extraction

- Typical extraction equipment
- How does it work?
- Is it listed and labeled?

Extraction Room Hazards

- LPG Fuel
- Electrical
- Ventilation
- Gas detection
- Combustibles
- Exiting
- Sprinklers
- Engineered Equipment

Extraction Room Hazards

- LPG Fuel
- Storage and transfer per NFPA 58.
Marijuana Fire Code Regulations

- Colorado guidelines
- Denver guidelines
- NFPA 1, chapter

www.nfpa.org/marijuana
Thank You, Questions?
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