

# **Chemical Screening in Emergency Management: An Overview of DOE O 151.1C**

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# Chemical Screening in Emergency Management

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## OUTLINE

- # Operational Emergencies
  - Characterize *Emergency Management Response*
  - Define *Operational Emergency*
- # Role of Chemical Screening in DOE Emergency Management Hazardous Materials Programs
  - *Identify* Hazardous Chemicals
    - **Health Hazard Ratings**
  - *Exclude* Small Quantities

# Manage/Mitigate Emergencies

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## # *Simple Response*

- Single or few functional response units (fire, medical, HAZMAT, etc.) required

## # *Emergency Management Response*

- Supplement initial functional response units
- Multiple functional units and response skills
- Interfaces, coordination, communication
- Offsite response activities

# Operational Emergency Definition

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Major unplanned or abnormal events or conditions, which . . .

- Involve or affect *DOE facilities/activities*
- Cause or have the potential to cause *serious health, safety or environmental impacts*

# Operational Emergency Definition *(con'd)*

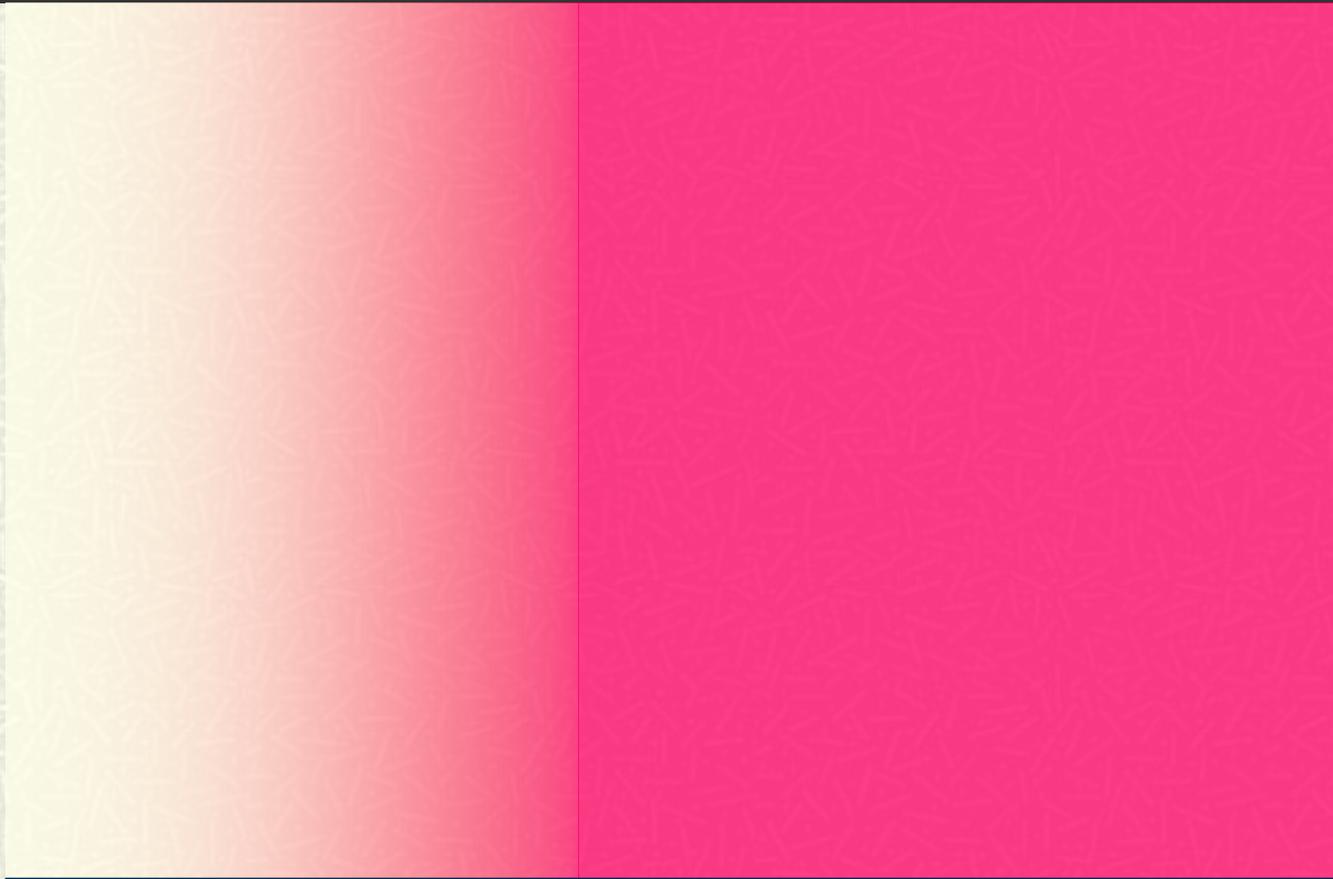
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- Require resources from *outside* the immediate/affected area or local event scene to *supplement initial response*

**AND**

- Require time-urgent notifications to initiate response activities at *locations beyond the event scene*

# Health Impacts from Chemical Spills/Releases



**Local Impacts**



**Widespread Impacts**

# Mitigate/Manage Chemical Spills/Releases



**Local Impacts**  
Simple Response



**Widespread Impacts**  
Emergency Management

# Mitigate/Manage Chemical Spills/Releases

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**IF . . .**

- *Emergency Management* is needed
  - *Not* just *emergency response* functional units (fire, medical, HAZMAT, etc.)

**THEN . . .**

- It's an *Operational Emergency*

# Mitigate/Manage Chemical Spills/Releases



Local Impacts  
Simple Response



Widespread Impacts  
Emergency Management

# Develop an Emergency Management Hazardous Materials Program

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1. Identify for further analysis hazardous material inventories that may produce *Operational Emergencies* for the facility/activity
2. Analyze in an Emergency Planning Hazards Assessment (EPHA) to determine potential impacts; identify *Operational Emergencies* to be included in the **technical planning basis**
3. Implement an emergency management program that is **“commensurate with the hazards”**

# Develop an Emergency Management Hazardous Materials Program

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The **SCREENING PROCESS**  
identifies for further analysis  
hazardous material inventories  
that may produce  
***Operational Emergencies***

# Chemical Screening Process

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DOE screening *process*:

1. **Identify materials** – Potential to produce impacts and require response measures consistent with the *Operational Emergency* definition

**AND**

2. **Exclude small quantities** - Impacts can be managed effectively by building- or activity-specific safety and response personnel and resources (*Little or no potential for Operational Emergencies*)

# Chemical Screening Process

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## *Step 1: IDENTIFY materials*

- Exclude materials from further consideration based on:
  - Common use by public
  - Dispersibility
  - Health Hazard

# Chemical Screening Process

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## IDENTIFY materials

### # Common Use by the Public

- Exclude if commercially available, packaged for distribution and use by the general public
- Examples:
  - Solvents, inks, adhesives, paints, cleaners
  - Lubricants, fuels, resins
  - Proprietary goods (Windex, WD-40, Weed-B-Gone)

# Chemical Screening Process

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## IDENTIFY materials (*con'd*)

### # Dispersibility

- Exclude non-dispersible materials
- Examples:
  - Monolithic solids
  - Non-aerosol size particles ( $>10 \mu$ )
  - Liquids with low vapor pressure ( $<1$  mmHg)

# Chemical Screening Process

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## IDENTIFY materials *(con'd)*

### # Health Hazard

- *Exclude materials that do NOT represent a severe acute health hazard . . . NFPA 704 **Health Hazard Rating 0, 1, or 2***
  - Identifies materials that represent a severe acute health hazard . . . NFPA 704 **Health Hazard Rating 3 or 4**

# NFPA 704

## Health Hazard

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Health Hazard: The capability of a material to cause, *under emergency conditions*, personal injury due to contact with or entry into the body via inhalation, ingestion, skin or eye contact.

- Based on the “inherent physical and toxic properties” of the material
- Does not consider chronic or repeated long-term exposure to low concentrations

# NFPA 704

## Health Hazard Ratings

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- **Health Hazard Rating - 4:**
  - (Possibly) *lethal*
- **Health Hazard Rating - 3:**
  - (Possibly) *serious or permanent injury*
- **Health Hazard Rating - 2:**
  - (Possibly) *temporary incapacitation or residual injury*
- **Health Hazard Rating - 1:**
  - (Possibly) *significant irritation*
- **Health Hazard Rating - 0:**
  - *Offer no hazard beyond that of ordinary combustible materials*

# Sources of Health Hazard Ratings

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- # NFPA-assigned values
- # Values assigned by others using NFPA guidelines
- # Project C Paper (Options for determining health hazard ratings)
- # Assign locally (e.g., SRS system)
- # **If no value available, go to Step 2**

# Chemical Screening Process

## *Step 2: EXCLUDE small quantities*

- *Exclude* small quantities of materials identified in *Step 1* that can be managed effectively by safety and local response personnel and resources
  - OSHA defined concept of “Laboratory Scale” quantities (“**easily and safely manipulated by one person**”)
  - Threshold quantities defined locally in accordance with 29 CFR 1910.1450(b)
  - Consensus agreement that below these quantities there is **little or no potential** for *Operational Emergencies*
  - Exception for “extraordinary toxic hazards”

# Chemical Screening Process

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## EXCLUDE small quantities

- # Values that reflect the *intent* of the Order are *approximately*:
  - 5 gallons for liquids
  - 40 pounds for solids
  - 10 pounds for compressed gases
- # *Exception* for materials with high acute toxicity and dispersibility (“*extraordinary toxic hazard*”):
  - 1 pound

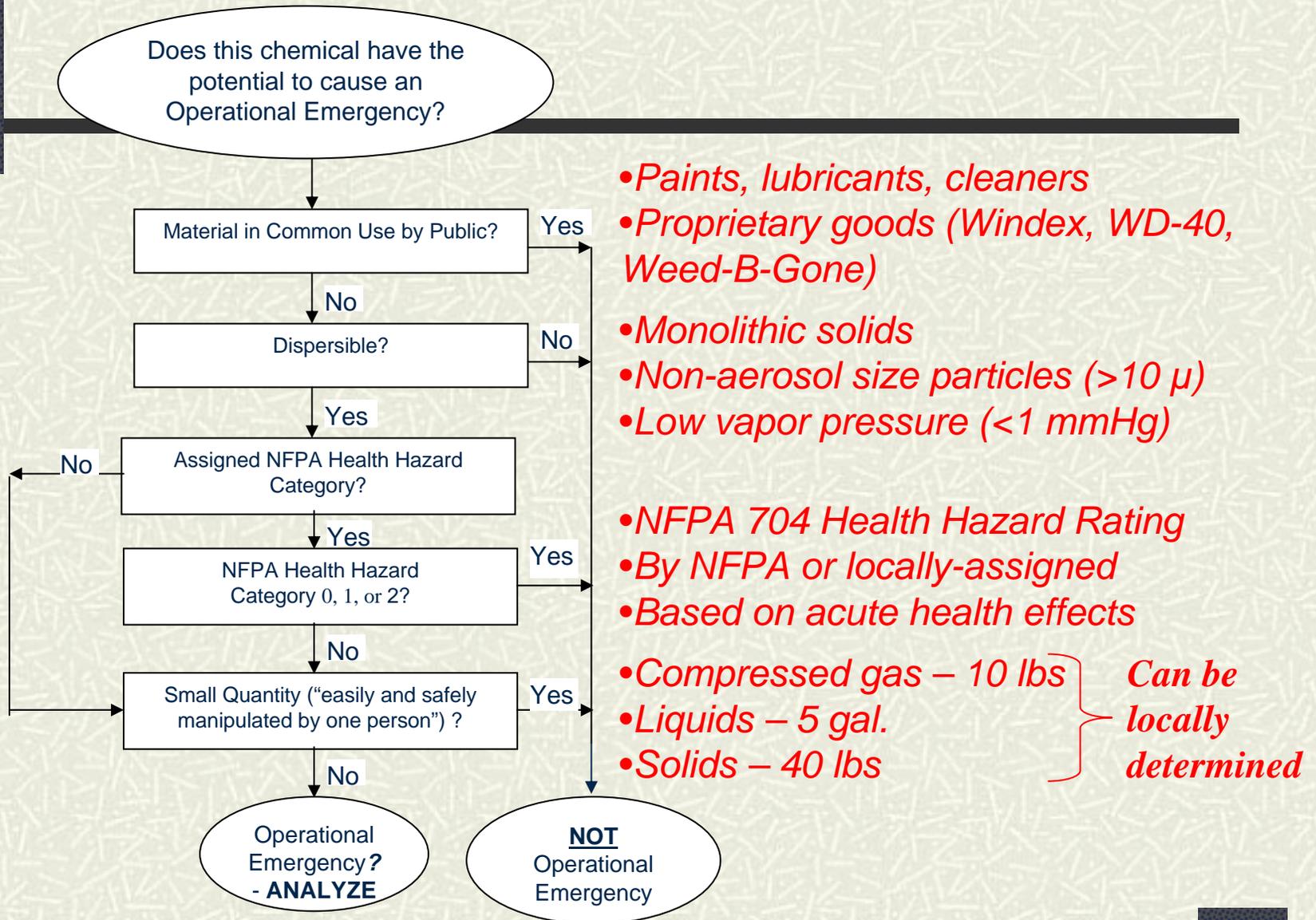
# Chemical Screening Process

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## Small quantity *exception* . . .

- # Individual containers that are being used, and small numbers of such containers kept in ready storage within or very near an end-user facility, may be *screened out*.
- # However, *larger numbers* of such containers (capacity totaling greater than about 5-10 times the applicable lab scale threshold) in *warehouses or other storage locations* should be examined; if there are *plausible scenarios* (excluding extreme malevolent acts and catastrophic releases) that could release the contents of multiple containers, the material should be retained for analysis.

# Chemical Screening Process



# Chemical Screening in Emergency Management

**IDENTIFIED  
Chemical Hazards**

Quantities  
easily and  
safely  
manipulated

Analyze  
in EPHA

Offsite  
Resources  
(Federal, Tribal,  
State, Local)

Site-wide  
Resources  
(Supplement)

Facility &  
Local  
Resources  
(Initial)

**Operational Emergencies  
(possible)**

Local Impacts  
Simple Response



Widespread Impacts  
Emergency Management

# Chemical Screening in Emergency Management

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## SUMMARY

# Chemical Screening in DOE Emergency Management is a tool to....

- Relegate materials in small quantities to workplace health and safety programs
- Make best use of emergency management resources by *focusing on chemical hazards posing greatest potential for producing **Operational Emergencies***

# Chemical Screening in Emergency Management

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## SUMMARY *(con'd)*

- # **“Screened-in”** → *Analyze* in EPHA to determine *Operational Emergency* potential
- # **“Screened-out”** → *Don't analyze* (Little or no *Operational Emergency* potential)

# Chemical Screening in Emergency Management

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## CAUTION

Use of the screening process described here is not intended to avoid analyses of hazardous materials that have the potential to harm workers or the public, but to allow emergency management resources to be focused on analyzing materials that, because of their quantity, toxicity and dispersibility, have the potential to harm people who are outside the immediate workplace where the materials are used or stored.