

# Homeland Security Suite (HoSS)

*Chemical  
Biological  
Radiological*



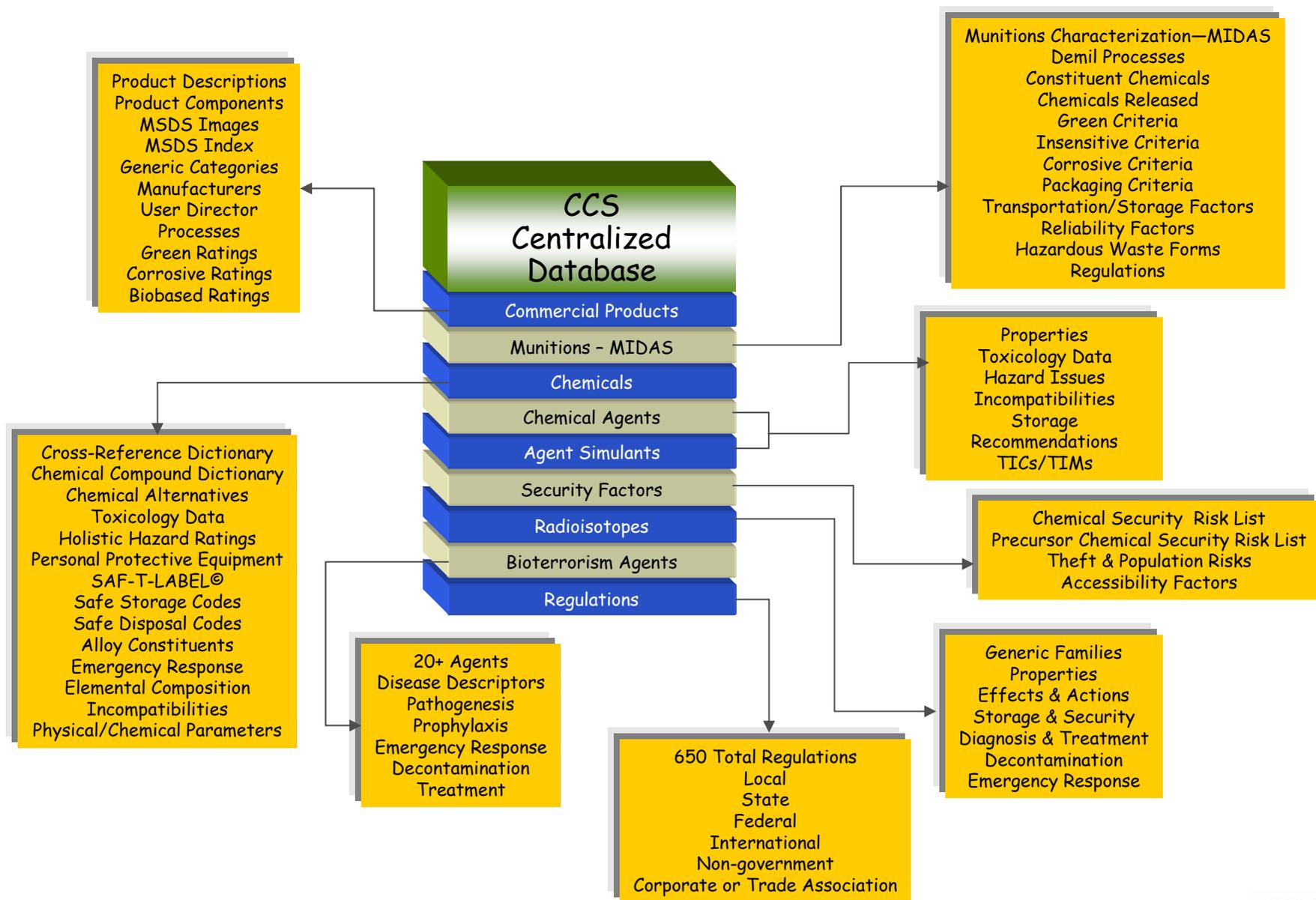
CCS  
Chemical Compliance Systems

**Heartland Security 2007 Conference**

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Minneapolis, MN

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**CHEMICAL COMPLIANCE SYSTEMS, INC.**  
Lake Hopatcong, NJ

# The CCS Relational Chemical and Product Database (R-CPD)



# CCS Capabilities

## ISO 14001 EMS

ISO 14001 draws regulatory data (Air, Water, etc.) to expedite compliance, highlight conformance and reduce wastestreams

Web-based ISO 14001 System reduces implementation time and cost by 300-400 manhours



CENTRALIZED CHEMICAL HAZARD and ENVIRONMENTAL MANAGEMENT SUITE [C-CHEMS]

CHEMICAL HOMEMLAND SECURITY SYSTEM [C-HoSS]

BIOLOGICAL HOMEMLAND SECURITY SYSTEM [B-HoSS]

RADIOLOGICAL HOMEMLAND SECURITY SYSTEM [R-HoSS]

Secure Web Access Options

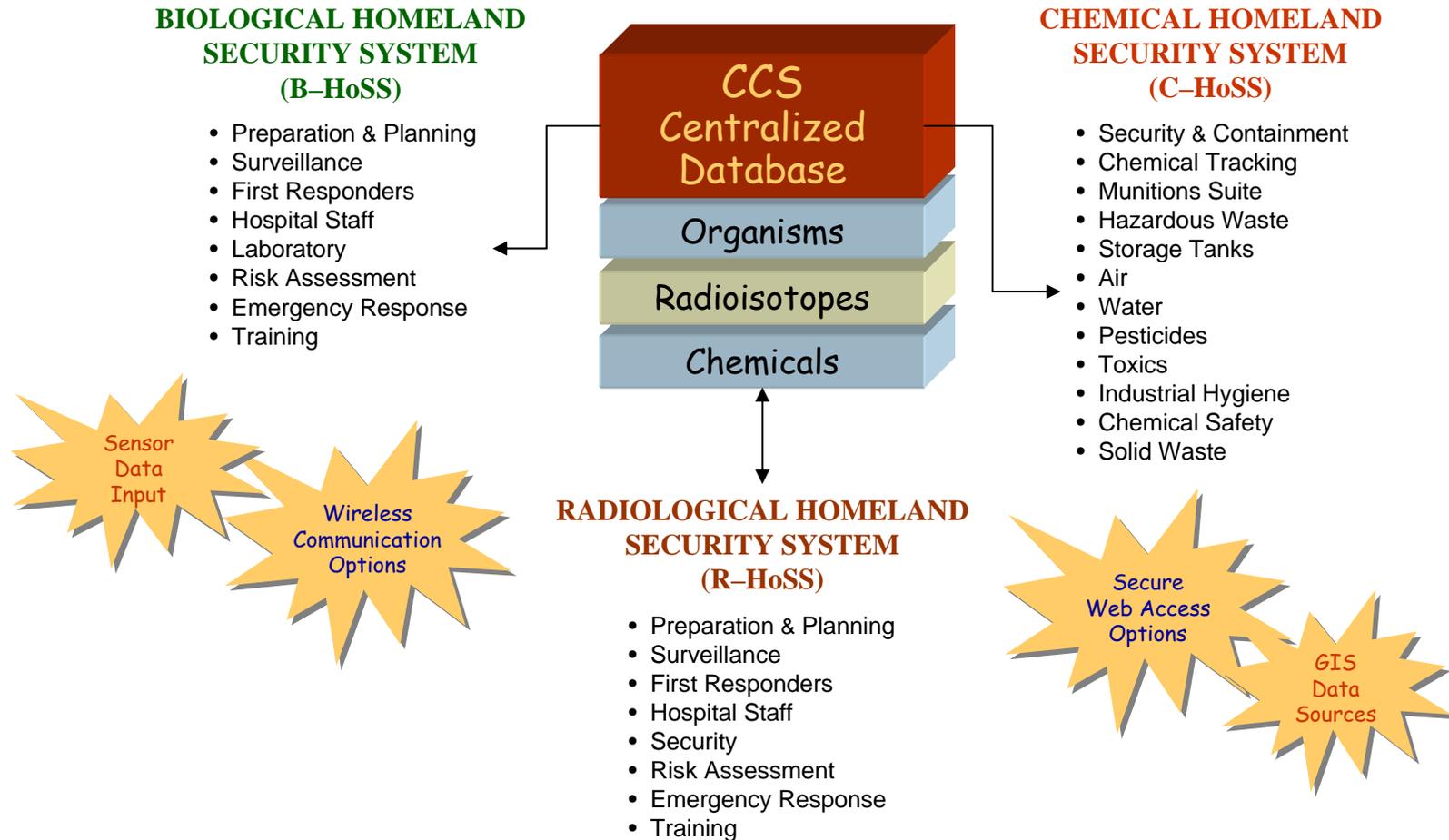
GIS Data Sources

Sensor Data Input

Wireless Communication Options

MUNITIONS ANALYTICAL COMPLIANCE SUITE [MACS]

# CCS Homeland Security Systems (HoSS)



# Biological Homeland Security System (B-HoSS)

## Preparation & Planning

Community  
Healthcare  
Local/State/Federal

## Training

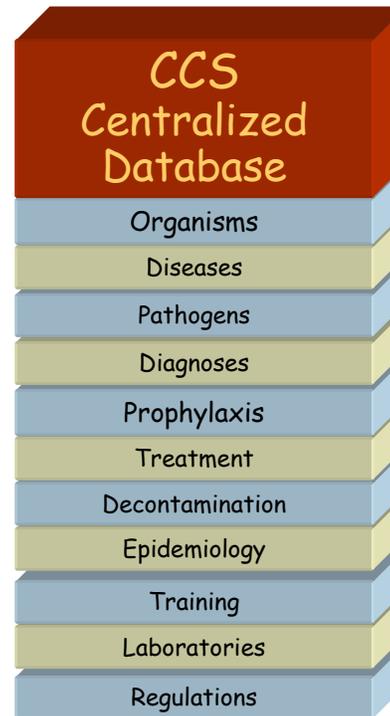
First Responders  
Military  
Healthcare

## Emergency Response

Local  
Regional  
National

## Risk Assessment

"What If" Scenarios  
Experiment Analyses



## Surveillance

Data Input  
Illness Recognition  
Exposure Routes

## First Responders

Observed Features  
PDA Utility  
BEST

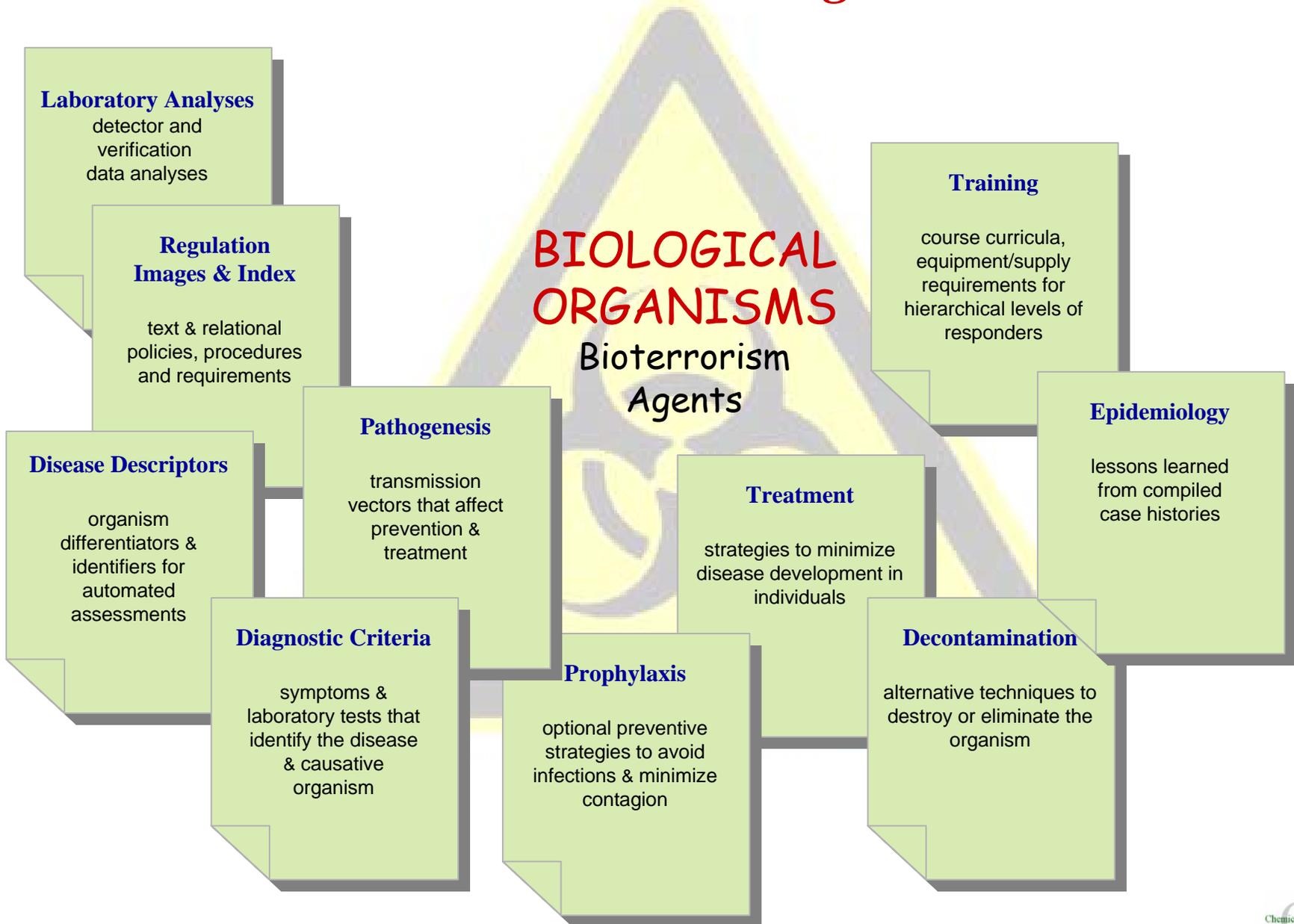
## Hospital Staff

Information Retrieval  
Diagnosis  
Treatment

## Laboratory

Testing  
Biosafety/Training  
Regulations

# *The CCS Relational Biological Database*



# Radiological Homeland Security System (R-HoSS)

## Preparation & Planning

Community  
Healthcare  
Local/State/Federal

## Training

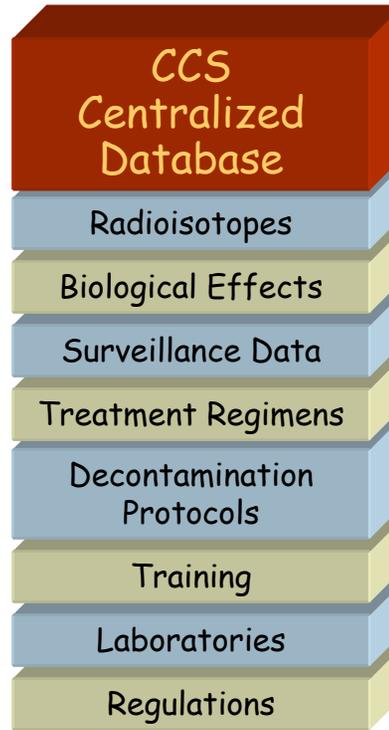
First Responders  
Military  
Healthcare

## Emergency Response

Local  
Regional  
National

## Risk Assessment

"What If" Scenarios  
Experiment Analyses



## Detectors

Data Input  
Illness & Burn Treatment  
Exposure Routes

## First Responders

Observed Features  
PDA Utility  
Data Transfer

## Hospital Staff

Information Retrieval  
Diagnosis  
Treatment

## Security

Testing  
Radiological-Safety/Training  
Regulations

# *The CCS Relational Radiological Database*



## **RADIOLOGICAL** Terrorism Prevention & Treatment

### **Detection & Measurement**

data compilation

### **Emergency Response**

hierarchical control &  
clean-up strategies

### **Decontamination**

alternative  
techniques to remove  
radiological agents

### **Treatment**

strategies to minimize  
exposure & treat  
exposure effects

### **Training**

course curricula  
equipment/supply  
requirements for  
hierarchical levels  
of responders

### **Lessons Learned**

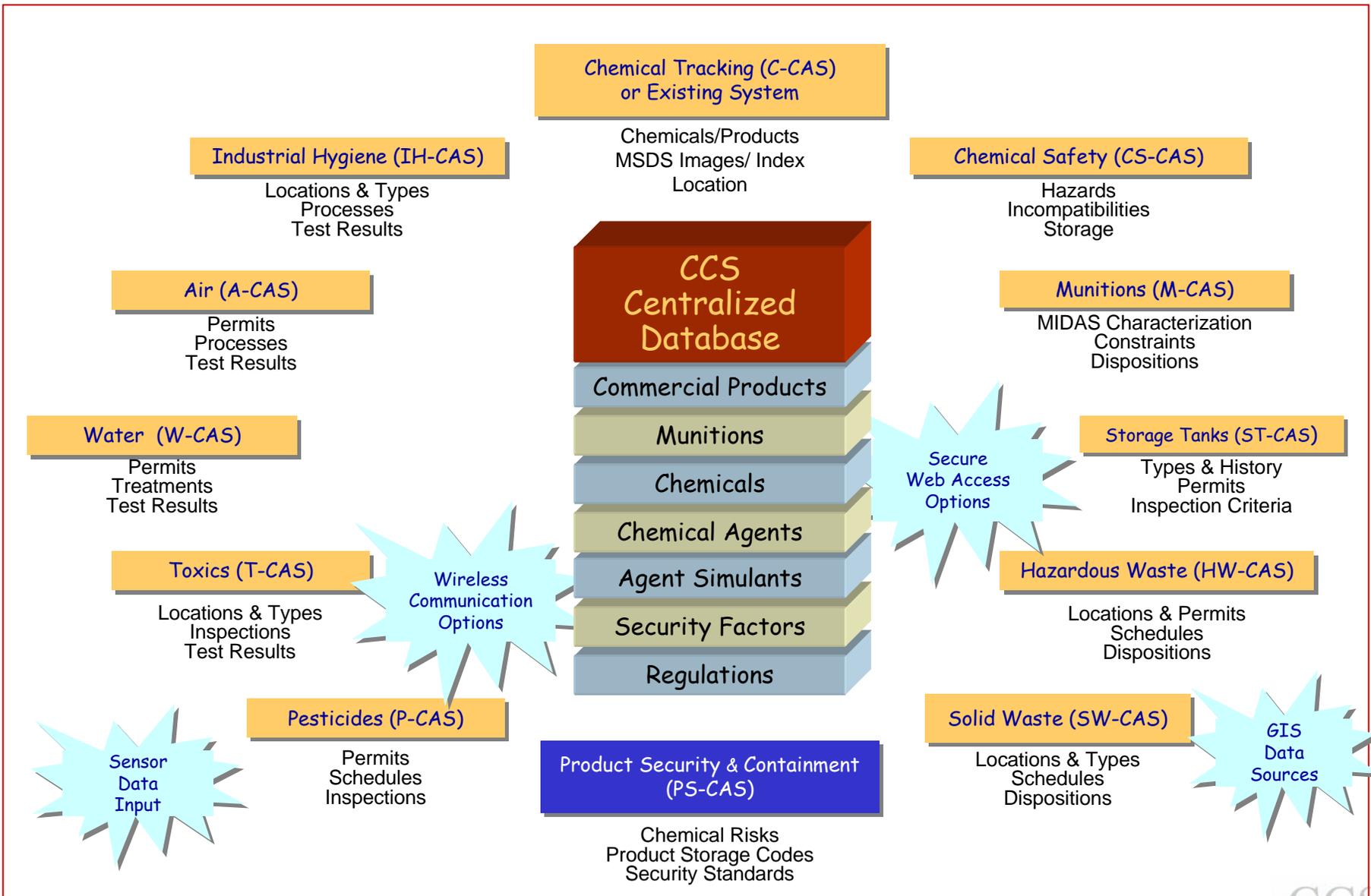
compiled from  
case histories

### **Regulation Images & Index**

text & relational  
policies, procedures  
& requirements

# Chemical Homeland Security System (C-HoSS)

## Centralized & Relational Databases



# *Regulated Hazardous Chemicals*

## Acute Hazard Orientation



**CPSC Specialty Regulated Substances**

**Canada Export Control Lists**

**DEA Essential Chemicals**

**DEA Precursor Chemicals**

**DOC Export Restrictions**

**EU Black/Gray Lists**

**IATA Air Transport Forbidden**

**IATA Passenger Transport Forbidden**

**IATA Regulated Substances**

**UK The Red List (Water)**

**UN/FAO Prior Informed Consent**



***Precursor  
Chemical Security  
Risks List***

# *C-HoSS*

## *Generic Chemical Hazard Classes*

- Explosives
- Chemical Agents
- Extreme Toxins
- Neurotoxins
- Radioactives
- Corrosives
- Flammables
- Water Reactives
- Oxidizers
- Persistent Bioaccumulative Toxins
- Priority Pollutants
- Hazardous Air Pollutants

# *Hazard Class Ranking Data Elements*

## **PROPERTIES**

- Structure
- Chemical
- Physical

## **TOXICOLOGY DATA**

- Human
- Animal
- In Vitro

## **HAZARDS**

- Protection
- Decontamination
- Persistence
- Use

## **INCOMPATIBILITIES**

- Chemical
- Conditions
- Containers

## **STORAGE RECOMMENDATIONS**

- Container
- Conditions
- Distances
- HSAS<sup>a</sup> Variables

<sup>a</sup> HSAS = Homeland Security Advisory System

# *Toxic Industrial Chemicals/Toxic Industrial Materials* *(TICs/TIMs)*

## Selected Examples

**Industrial Feedstocks:** Acrylamide, Chlorine, Hydrogen Chloride, Phosgene

**Carbamate Insecticides:** Baygon, Mobam, Temik, Zectran

**Organochlorine Insecticides:** Aldrin, Dieldrin, Endrin, Lindane, Heptachlor

**Organophosphate Insecticides:** Disulfotan, Mevnpfos, Parathion, Methylparathion

**Insecticide Synergists:** Piperonyl Butoxide

**Fungicides:** Pentachlorophenol, Hexachlorobenzene, Maneb, Naban, Zineb

**Fumigants:** Calcium Cyanide, Methyl Bromide, Phosphine

**Seed Disinfectants:** Methylmercury Acetate, Methylmercury Cyanide

**GOALS:** [1] Identify all chemicals with severe to extreme acute toxicity  
[2] Identify all chemicals in product classes with similar mechanisms of action

# *Incompatible Chemical Database*

(CCS Published Book)

CHEMICAL CLASS	CHEMICAL	INCOMPATIBLE CHEMICAL	I.C. CLASS	INTERACTION HAZARD
<b>Corrosives</b>	Acetic Acid Nitric Acid Chlorine	Hydrogen Peroxide Acetylene Aluminum Powder	Oxidizer Flammable Metal	Explosion Explosion Spontaneous Fire
<b>Flammables</b>	Acetone Benzene Carbon Disulfide	Chloroform Chlorine Potassium	Carcinogen Corrosive Flammable	Explosion Explosion Violent Explosion
<b>Reactives</b>	Nitrotoluene Nitroethane Acrylonitrile	Sulfuric Acid Hydrocarbons Bromine	Corrosive Combustible Corrosive	Explosion Explosion Explosion
<b>Products</b>	Toilet Bowl Cleaner Bleach Paint Solvent	Metal Powders Ammonia Chloroform	Metals Product Carcinogen	Explosion Poisonous Gas Explosion

# *Chemical Security Procedures*

## Security Procedure Phases

### Phase I

#### **Vulnerability Assessment**

*Identify chemical hazards, security risks, mortality risks*

### Phase II

#### **Countermeasures Implementation**

*Reduce vulnerabilities*

### Phase III

#### **Verification Audit**

*Independently confirm countermeasure adequacy*

### Phase IV

#### **Management System Integration**

*Integrate chemical security procedures into line management functions*

# *C-HoSS Security Criteria & Standards*

- Chemical Hazard Class Rankings (*by Hazard Class*)
- Chemical Hazard Grades (1–4) (*within each ranking*)
- Product Concentration Grades (1–4)

Chemical Hazard Factor (CHF) = Ranking × Grade × Concentration

- Theft Risk Grades (1–4) (*per product*)

Chemical Security Risk Factor (CSRF) = Ranking × Grade × Concentration × Theft Risk

- Population at Risk Grades (1–4)

Chemical Mortality Risk Factor (CMRF) = Ranking × Grade × Concentration × Theft Risk × Population Risk

- Accessibility Factor Levels (*Storage Constraint Levels and Descriptors*) (0.5–4.5)

CMRF ÷ Accessibility Factor (AF) = Vulnerability Factor (VF)

# *C–HoSS*

## *Capabilities vs. Chemical Security Procedures*

### SECURITY PROCEDURE PHASES

### C–HoSS CAPABILITIES

#### PHASE I

##### **Vulnerability Assessment**

*Identify chemical hazards, security risks, mortality risks*

Chemical Hazard Factor Report  
Chemical Security Risk Factor Report  
Chemical Mortality Risk Factor Report  
Chemical Vulnerability Risk Factor Report

#### PHASE II

##### **Countermeasures Implementation**

*Reduce vulnerabilities*

Accessibility Factor (Storage Constraint) Report  
(per chemical/material)

#### PHASE III

##### **Verification Audit**

*Independently confirm counter measure adequacy*

Chemical Vulnerability Factor “Report Card”  
(to the local fire department)

#### PHASE IV

##### **Management System Integration**

*Integrate chemical security procedures into line management functions*

Integration of C–HoSS w/ chemical tracking system  
Daily C–HoSS correlation w/ Homeland Security Advisory System

# *CCS Database Security & Privacy*

1. Hardware Barriers
  2. User Authorization Controls
  3. Firewalls
  4. Intrusion Detection
- 
5. Digital Certification
  6. Encryption
- } Reduce System Performance  
30–35%

*For more information,  
please contact . . .*

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Chemical Compliance Systems

