

Chemical Homeland Security System

C-HoSS



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The CCS "Core" Database System

2,500
CHEMICAL COMPOUND DICTIONARY
 Tabulation of 2,500 specific chemicals within 58 compound categories

2,125,000
COMPENDIUM OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES
 A compilation of acute and chronic health effects for 140,000 chemicals

340,000
CHEMICAL CROSS REFERENCE DICTIONARY
 A cross-referencing system of CAS numbers and their associated synonyms

6,900,000
ITEM INDEX & PRODUCT DESCRIPTIONS
 Unique identifiers for over 75,000 chemical product items

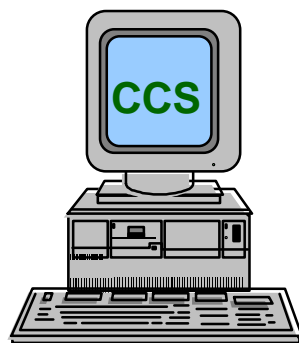
6,400
CHEMICAL DISPOSAL CODES
 Disposal and compatible chemical family storage classifications for 3,200 chemicals

350,000
LIST OF LISTS
 Reference listings for 4,650 regulated hazardous chemicals and associated data found on 300 local, state, federal and international lists

265,000
MANUFACTURERS
 Detailed information for 8,200 manufacturers of chemical products

3,000,000
PRODUCT COMPONENTS
 Specific descriptors for more than 300,000 product components

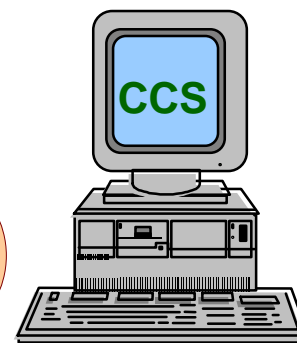
80,000
RATING INFORMATION OF CHEMICAL HAZARDS
 A rating classification covering health, fire, reactivity, environmental, protective equipment, etc., for 3,200 chemicals



Master Chemical Reference Data
 (2,915,000 References)

2,500
CAMEO
 Information data for responders to hazardous chemical emergencies (firefighting, health, first aid, etc.)

375,000
PRODUCT USER DIRECTORY
 Dictionary listing of organizations that use each of the 75,000 unique items



Master Product Reference Data
 (10,960,000 References)

60,000
MSDS IMAGES
 Mode 4 TIF multi-page images of manufacturer MSDSs

6,400
SAFE CHEMICAL STORAGE CODES
 Chemical hazard and compatible family storage classifications for 3,200 chemicals

1,100
CHEMICAL HAZARD RESPONSE INFORMATION SYSTEM
 Comprehensive source of preventive, precautionary and response data

1,050
OIL & HAZARDOUS MATERIALS TECHNICAL ASSISTANCE DATA SYSTEM
 Information relating to spill response and harmful effects

413
GENERIC CATEGORIES
 Product classification codes derived from federal/state commodity lists that categorize similar products

670
PROCESS CODES
 Dictionary of USN, DA and MD categories used to track HM usage and HW generation

360,000
MSDS INDEX
 Searchable parameters for each of our 60,000 imaged MSDSs

Comprehensive Chemical Hazard Evaluation Criteria

ACUTE HEALTH

LD50 (O/D) S/E Irritation pH TLV
LC50 Stench IDLH PEL

CHRONIC HEALTH

Carcinogenicity Organ Effects (Neurotoxicity)
Reproduction Effects Bioconcentration Factor

FIRE

Flash Point Boiling Point

SPECIAL

Radioactive Water-reactive
Oxidizer Corrosive

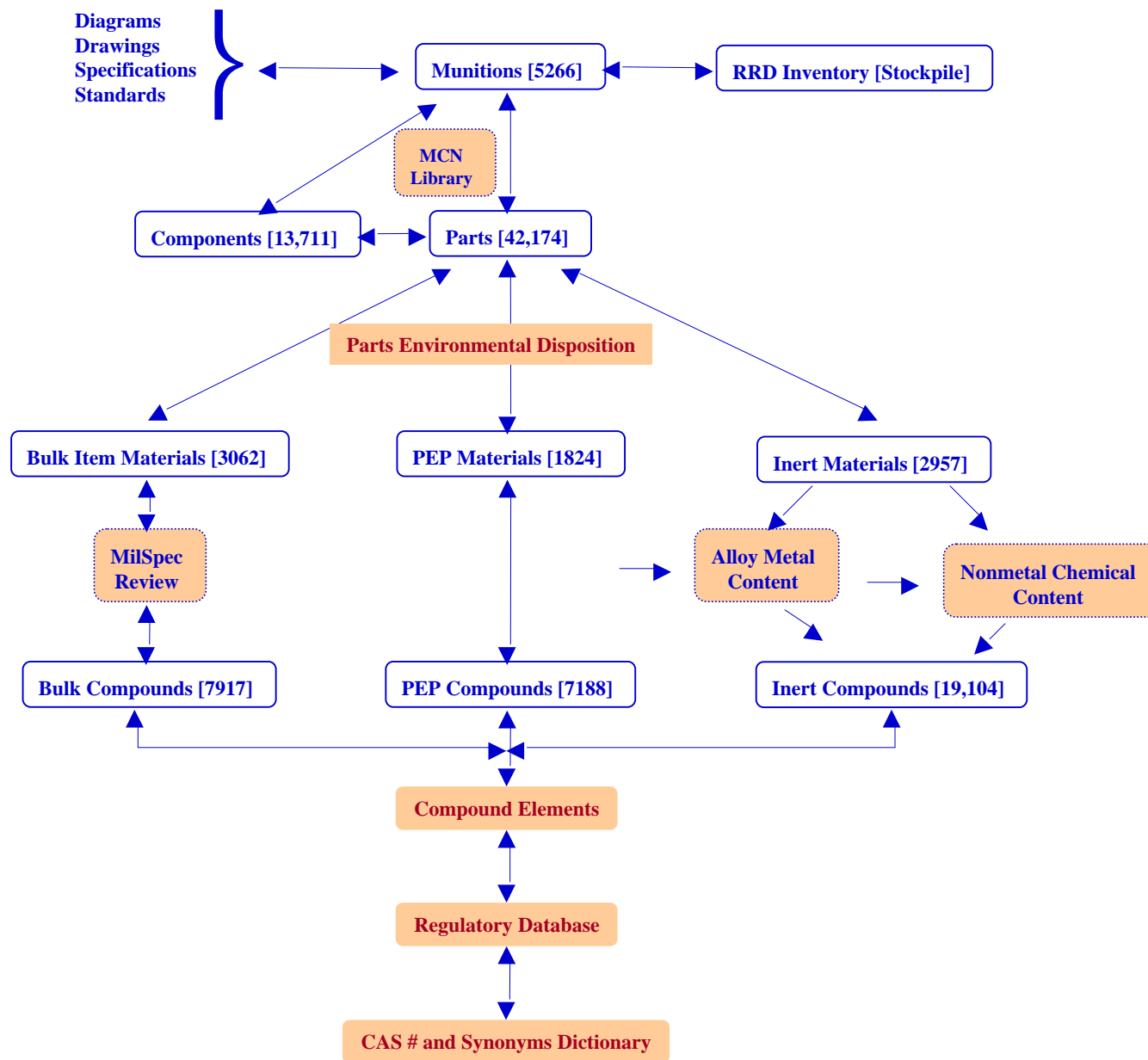
REACTIVITY (NFPA)

Explosivity Shock Sensitivity
Stability Heat/Pressure Sensitivity

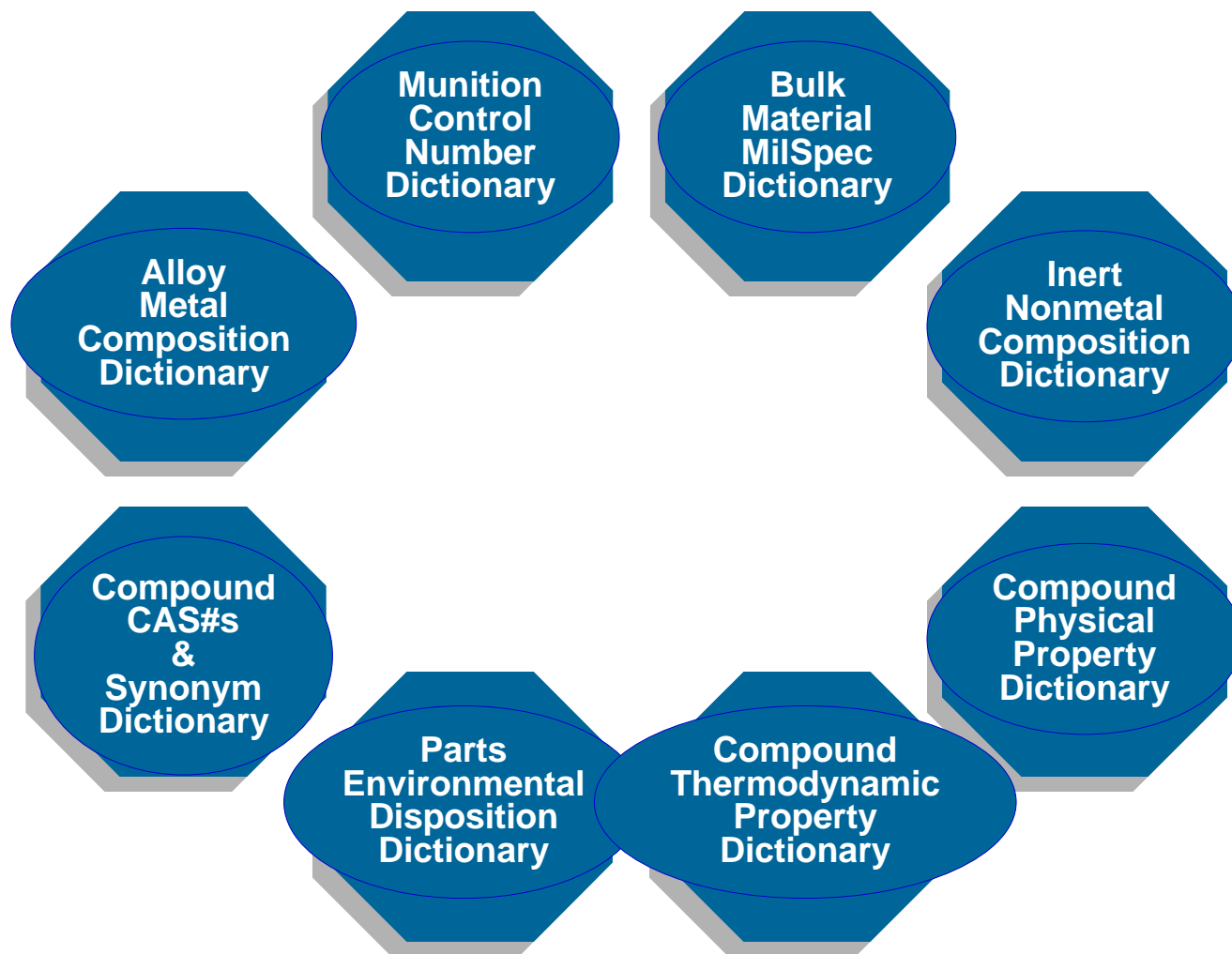
ENVIRONMENTAL (AIR-WATER-SOIL)

Vapor Density Volatilization Biological Exposure Index Persistence Groundwater Mobility Factor
Odor Index Vapor Pressure Biological Oxygen Demand (BOD) Hydrolysis Ambient Aquatic Life Advisory Concentration -AALAC
Fish LD50 Water Solubility Chemical Oxygen Demand (COD) Photolysis Maximum Contaminant Level-MCL
Specific Gravity Adsorptivity Total Oxygen Demand (TOD) Biodegradation Maximum Contaminant Goal-MCLG

Enhanced MIDAS Database Library

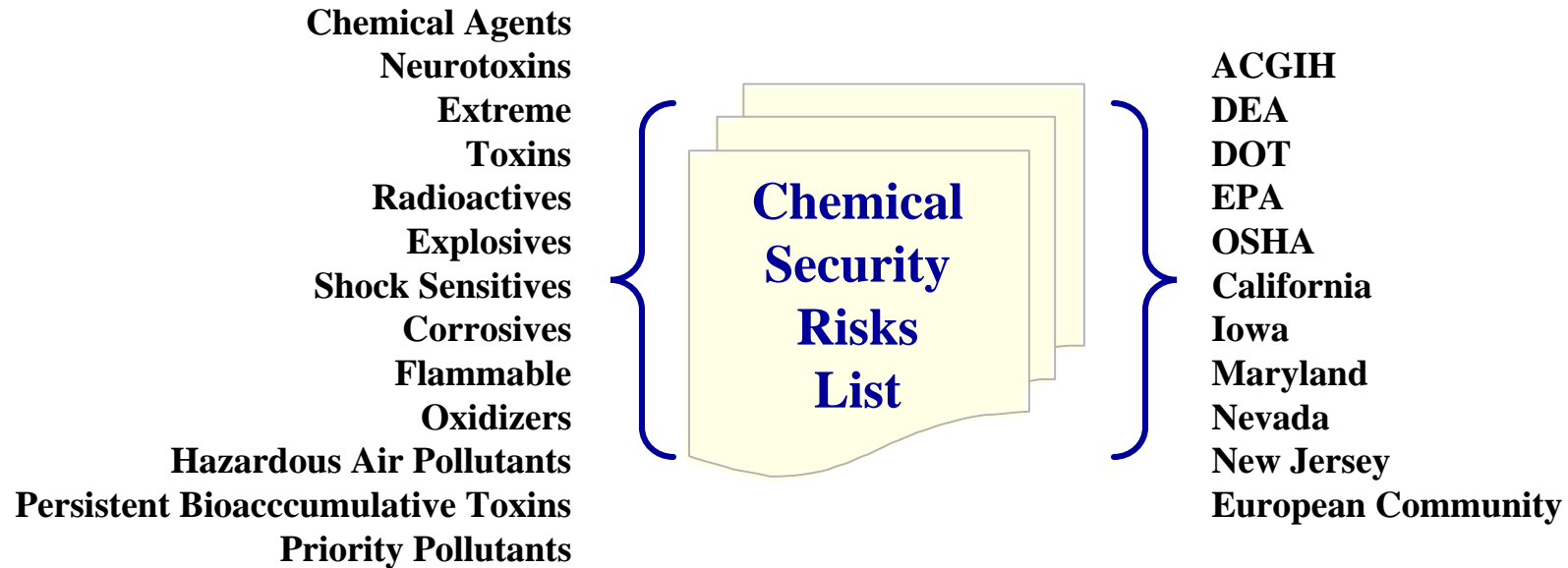


MACS-1 / MIDAS Munitions Reference Databases



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

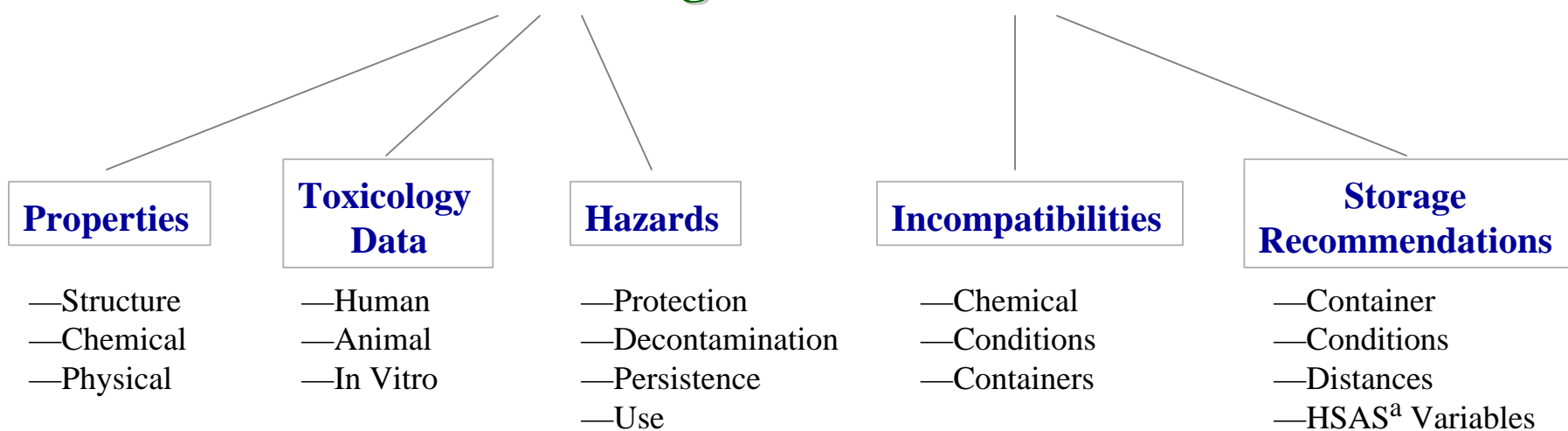
UK The Red List (Water)

UN/FAO Prior Informed Consent



**Precursor Chemical
Security Risks List**

Chemical Agents and Simulants



^a 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: Disulfotam, Mevinphos, 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

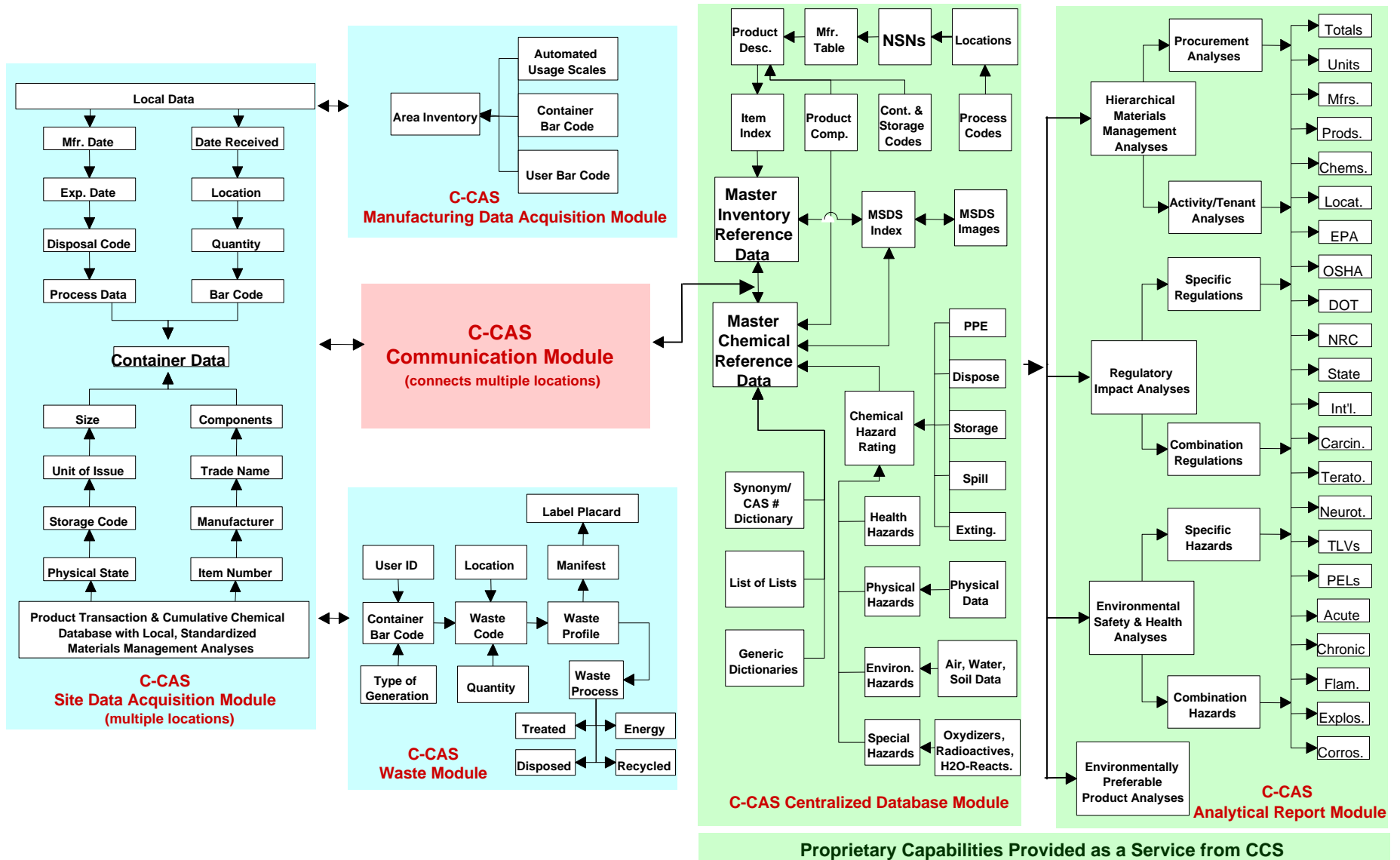
Incompatible Chemical Database

Chemical Class	Chemical	Incompatible Chemical	I.C. Class	Interaction Hazard
Corrosives	Acetic Acid Nitric Acid Chlorine	Hydrogen Peroxide Acetylene Aluminum Powder	Oxidizer Flammable Metal	Explosion Explosion Spontaneous Fire
Flammables	Acetone Benzene Carbon Disulfide	Chloroform Chlorine Potassium	Carcinogen Corrosive Flammable	Explosion Explosion Violent Explosion
Reactives	Nitrotoluene Nitroethane Acrylonitrile	Sulfuric Acid Hydrocarbons Bromine	Corrosive Combustible Corrosive	Explosion Explosion Explosion
Products	Toilet Bowl Cleaner Bleach Paint Solvent	Metal Powders Ammonia Chloroform	Metals Product Carcinogen	Explosion Poisonous Gas Explosion

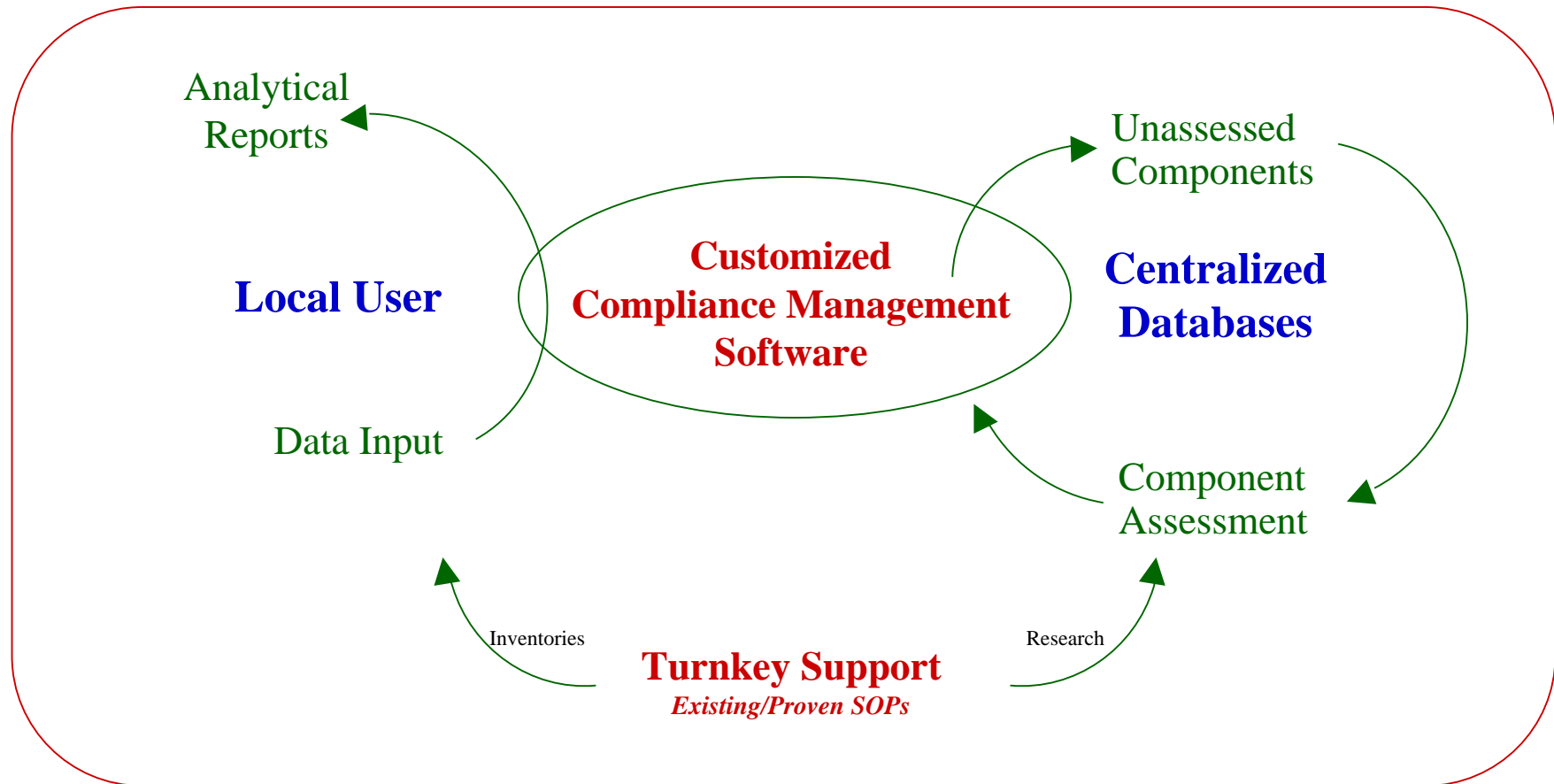
Safe Chemical Storage Codes

Code #	Chemical	Code #	Chemical
PK26	Acetaldehyde	RD26	n-Hexane
PR29	Acetylene	YL10	Hydrogen chloride
PR01	Ammonia	YL07	Iodine
LG22	Aniline	RD23	Isopropyl alcohol
LG06	Arsenic	GN04	Lead
RD26	Benzene	LG24	Malathion
PK26	Benzine	LG07	Mercuric chloride
YL07	Bromine	YL27	Methyl chloroform
LG04	Cadmium	RD26	Methyl methacrylate
RD27	Camphor	RD26	Naphthalene
RD09	Carbon disulfide	YL12	Nitric acid
LG27	Chordane	WH23	Phenol
YL11	Chromic acid	RD06	Phosphorous (yellow)
LG23	Coal tar creosote	LG03	Potassium arsenate
GN26	Cottonseed oil	GN02	Potassium permanganate
GN01	Cupric nitrate	GN08	Soda lime
RD26	Cyclohexane	LG02	Sodium dichromate
RD27	1,2-Dichlorobenzene	RD26	Styrene monomer
GN22	Dimethylformamide	YL11	Sulfuric acid
PK21	2,6-Dinitrotoluene	RD26	Toluene
RD23	Ethyl alcohol	RD26	Turpentine
WH20	Formic acid	RD26	Xylenes

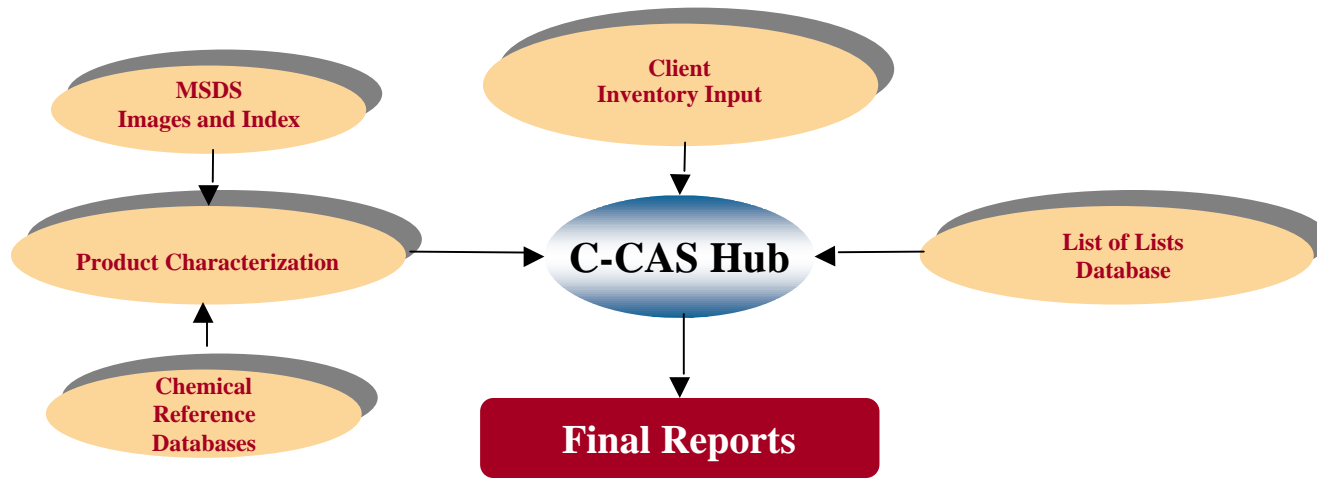
Chemical Compliance Analytical System (C-CAS)



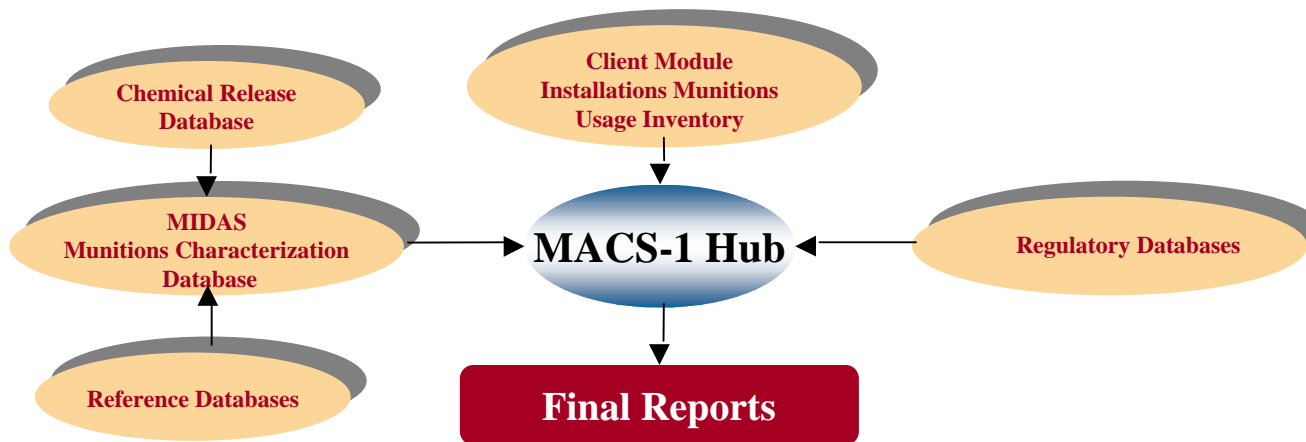
The CCS Approach for Total Systems Customization and Maintenance



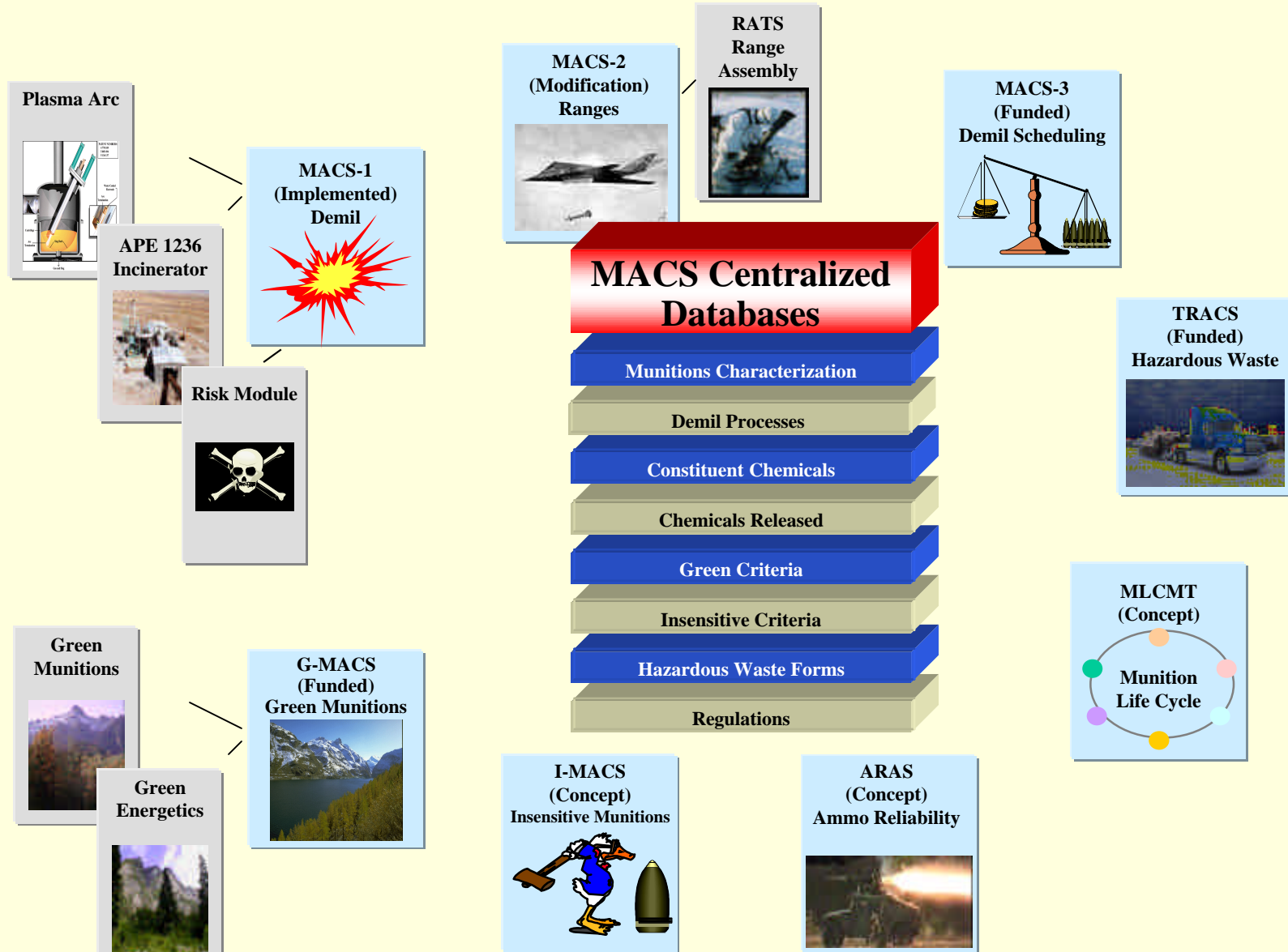
Chemical Compliance Analytical System (C-CAS) Derivative Systems



Munitions Analytical Compliance System for Demil (MACS-1)



Munitions Analytical Compliance Systems (MACS)



C-HoSS Security Criteria and Standards

- Chemical Security Hazard Rankings (by Hazard Class)
- Chemical Hazard Grades (1-4) (within each ranking)

Chemical Hazard Factor (CHF) = Ranking × Grade

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

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

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

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

Chemical Security Product Storage Codes

- Based Upon CSRF
 - Codes = AF Levels ^a
-

CSRF = 30, or CHF = 6^b = AF Level 1

CSRF = 70, or CHF = 12 = AF Level 2

CSRF = 110, or CHF = 18 = AF Level 3

CSRF = 150, or CHF = 24 = AF Level 4

^a AF Levels will be calculated at 1/2 step intervals.

^b Whichever is lower for a hazardous material.

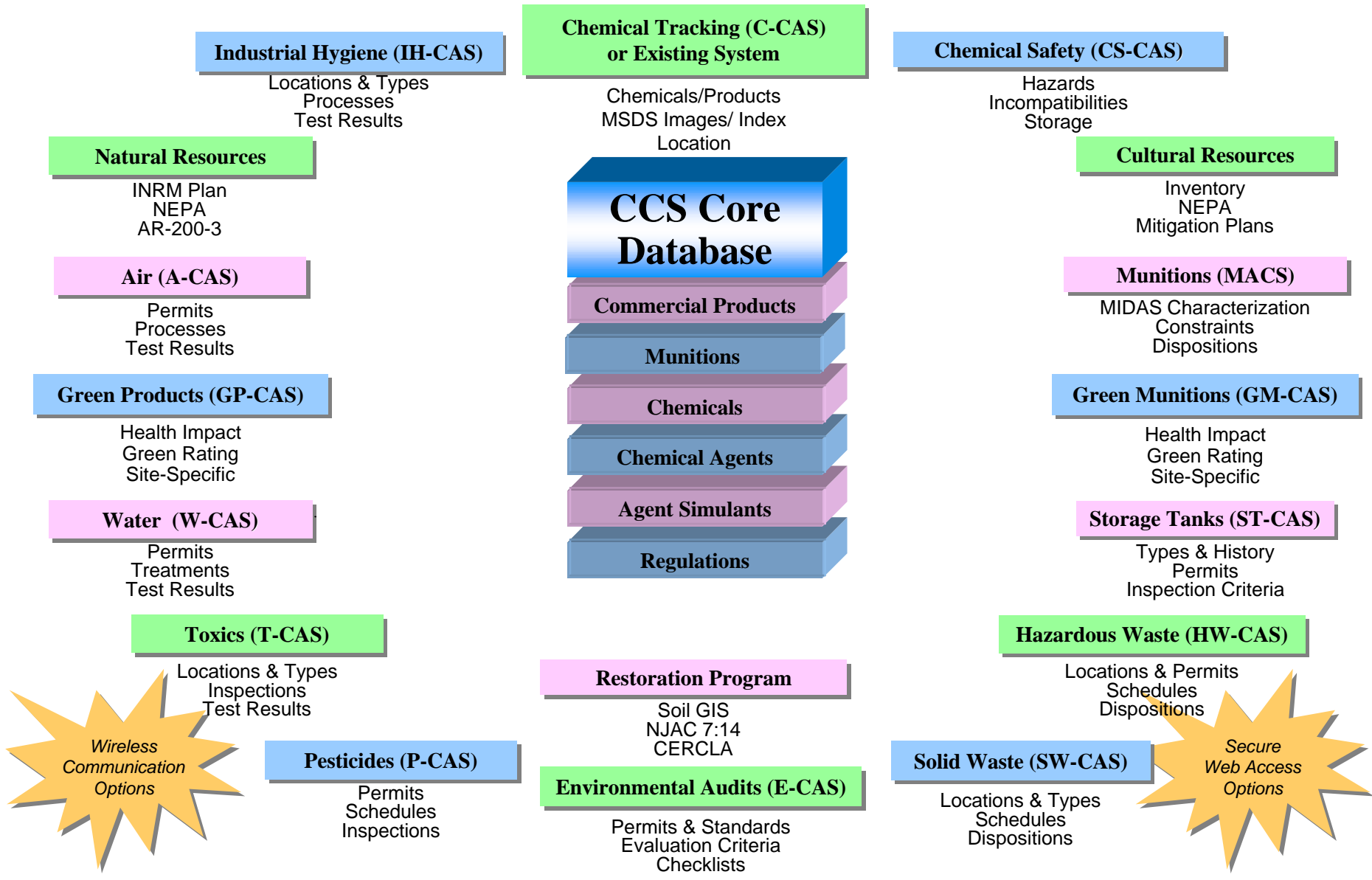
Chemical Security Criteria and Homeland Security Advisory System (HSAS) Correlation

HOMELAND SECURITY ADVISORY SYSTEM (HSAS)				
SEVERE	HIGH	ELEVATED	GUARDED	LOW
Red	Orange	Yellow	Blue	Green

<i>If</i> CSRF =	> 24	> 50	> 100	> 150	> 175
	or	or	or	or	or
CHF =	> 12	> 20	> 28	> 32	> 40
 <i>Then AF Increases</i>	2 Levels	1.5 Levels	1.0 Levels	0.5 Levels	0 Levels

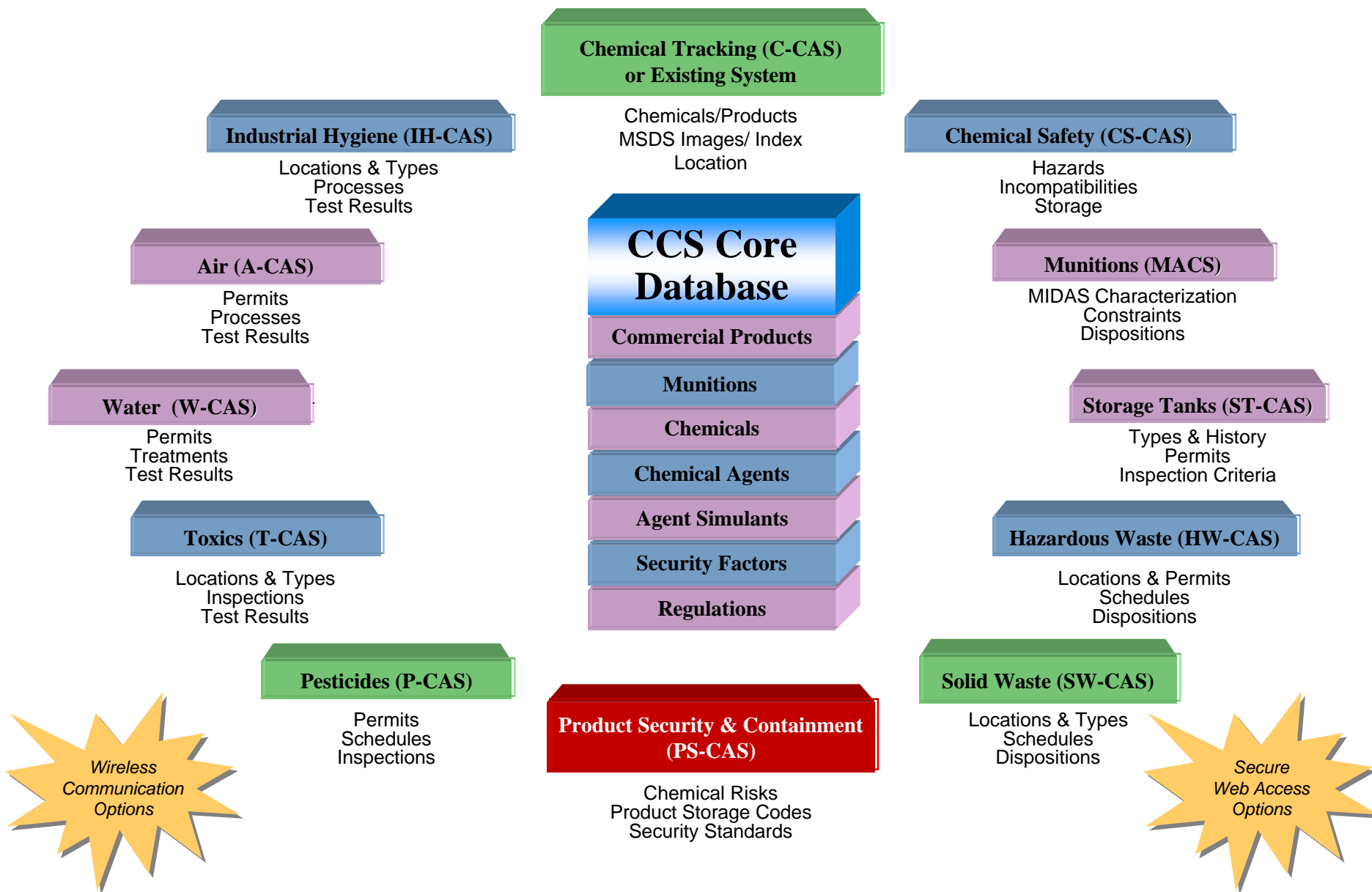
Centralized Chemical Hazard and Environmental Management System (C-CHEMS)

Centralized and Relational Databases

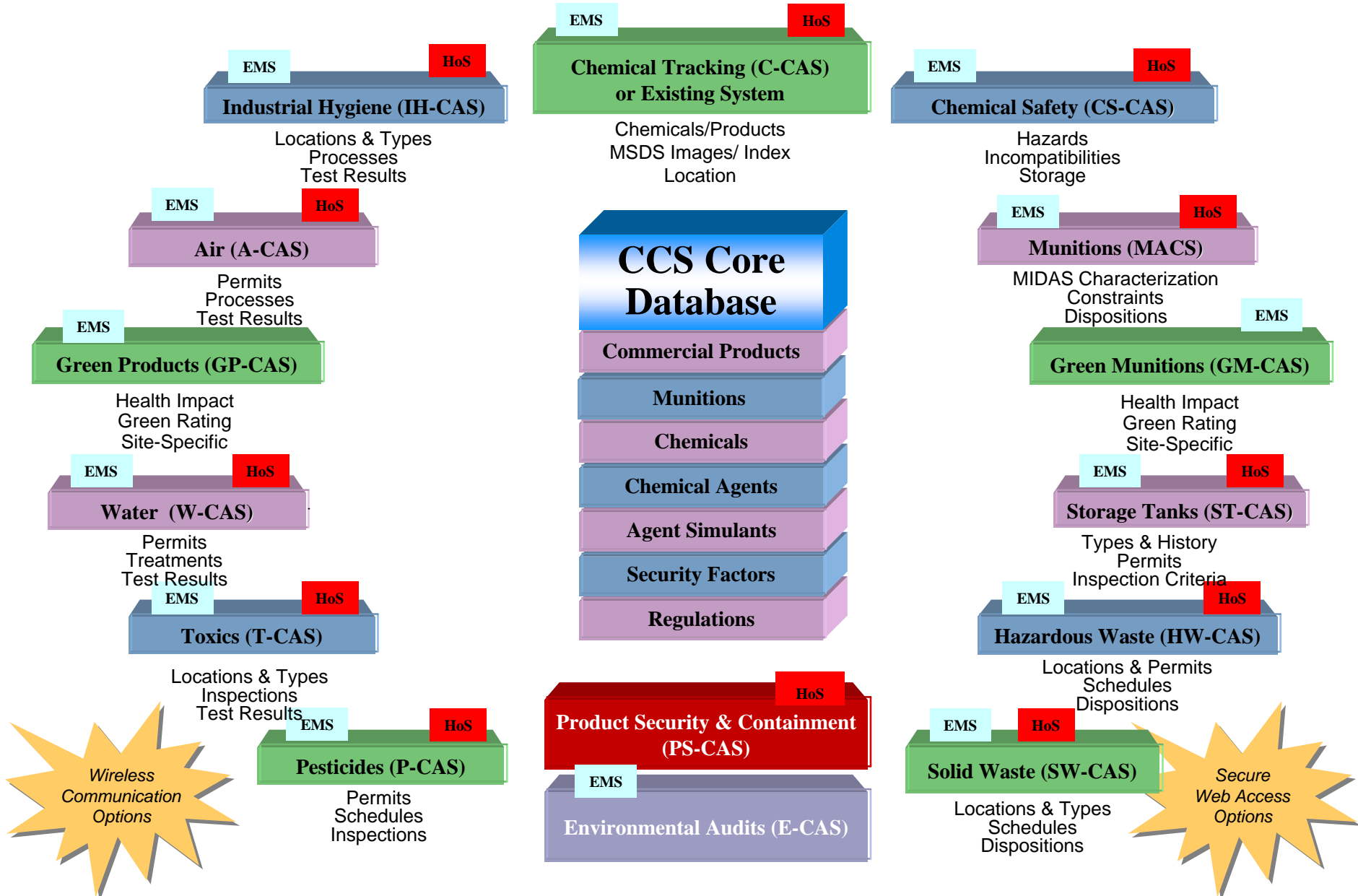


Chemical Homeland Security System (C-HoSS)

Centralized and Relational Databases



Chemical Homeland Security System (C-HoSS) and Chemical Hazard and Environmental Management System (C-CHEMS)



C-HoSS Security Risk Assessment Analytical Reports

PRODUCT & CHEMICAL ANALYSES

Inventory by Product Type ^a
Product by Location
Product by Container Size
Product by Weight
Product Hazard Classifications
Product Hazard Rankings
Product Hazard Grades
Product Hazard Factors
Product Security Risk Factors
Product Accessibility Factors
Product Accessibility Levels/Storage Codes
Chemicals by Product
Pure Chemicals by Location
Pure Chemicals by Weight

PRECURSOR CHEMICAL ANALYSES

Precursor Chemicals by Location
Precursor Chemicals by Container Size
Precursor Chemicals by Weight
Precursor Chemicals Hazard Classifications ^b
Precursor Chemicals Hazard Rankings
Precursor Chemicals Hazard Grades
Precursor Chemicals Hazard Factors
Precursor Chemicals Security Risk Factors
Precursor Chemicals Accessibility Factors
Precursor Chemicals Accessibility Levels/Storage Codes

SPECIALTY MODULE ANALYSES

Air Releases
Water Contaminants
Toxics
Pesticides
Hazardous Waste
Solid Waste
Storage Tanks
Munitions
Chemical Safety
Industrial Hygiene

INCOMPATIBILITY ANALYSES

Prioritized Incompatibility Threats by Product
Prioritized Incompatibility Threats by Room
Prioritized Incompatibility Threats by Building
Prioritized Incompatibility Threats by Facility

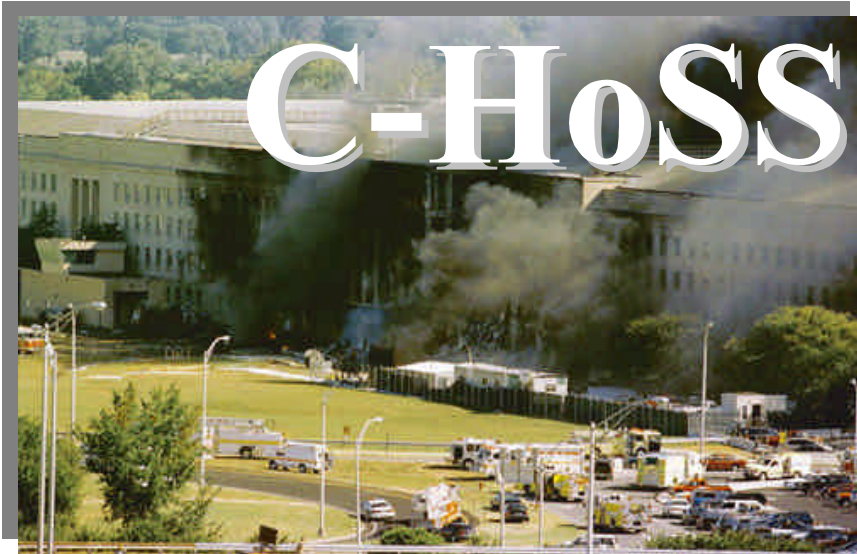
SECURITY ANALYSES

Inventory by CHF
Inventory by CSRF
Inventory by AF
Inventory by Storage Levels
Inventory (shift) by HSAS

^a Chemical, Precursor Chemical, Munition, Chemical Agent, Simulant.

^b Assigned by their worst classification: (1) innate classification, or (2) reaction product classification.

For more information . . .



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